A Fast Learning Algorithm for Deep Belief Nets

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We show how to use "complementary priors" to eliminate the explaining-away effects that make inference difficult in densely connected belief nets that have many hidden layers. Using complementary priors, we derive a fast, greedy algorithm that can learn deep, directed belief networks one layer at a time, provided the top two layers form an undirected associative memory. The fast, greedy algorithm is used to initialize a slower learning procedure that fine-tunes the weights using a contrastive version of the wake-sleep algorithm. After fine-tuning, a network with three hidden layers forms a very good generative model of the joint distribution of handwritten digit images and their labels. This generative model gives better digit classification than the best discriminative learning algorithms. The low-dimensional manifolds on which the digits lie are modeled by long ravines in the free-energy landscape of the top-level associative memory, and it is easy to explore these ravines by using the directed connections to display what the associative memory has in mind.

1 Introduction

Learning is difficult in densely connected, directed belief nets that have many hidden layers because it is difficult to infer the conditional distribution of the hidden activities when given a data vector. Variational methods use simple approximations to the true conditional distribution, but the approximations may be poor, especially at the deepest hidden layer, where the prior assumes independence. Also, variational learning still requires all of the parameters to be learned together and this makes the learning time scale poorly as the number of parameters increases.

We describe a model in which the top two hidden layers form an undirected associative memory (see Figure 1) and the remaining hidden layers
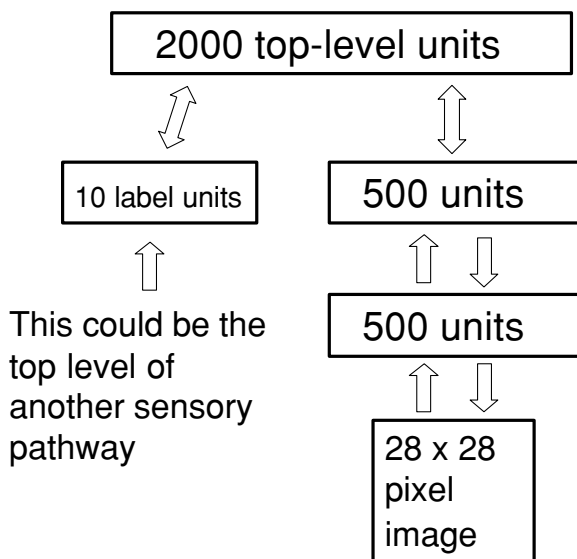
Figure 1: The network used to model the joint distribution of digit images and digit labels. In this letter, each training case consists of an image and an explicit class label, but work in progress has shown that the same learning algorithm can be used if the "labels" are replaced by a multilayer pathway whose inputs are spectrograms from multiple different speakers saying isolated digits. The network then learns to generate pairs that consist of an image and a spectrogram of the same digit class.

form a directed acyclic graph that converts the representations in the associative memory into observable variables such as the pixels of an image. This hybrid model has some attractive features:

- There is a fast, greedy learning algorithm that can find a fairly good set of parameters quickly, even in deep networks with millions of parameters and many hidden layers.

- The learning algorithm is unsupervised but can be applied to labeled data by learning a model that generates both the label and the data.

- There is a fine-tuning algorithm that learns an excellent generative model that outperforms discriminative methods on the MNIST database of hand-written digits.

- The generative model makes it easy to interpret the distributed representations in the deep hidden layers.

- The inference required for forming a percept is both fast and accurate.

- The learning algorithm is local. Adjustments to a synapse strength depend on only the states of the presynaptic and postsynaptic neuron.

- The communication is simple. Neurons need only to communicate their stochastic binary states.

Section 2 introduces the idea of a "complementary" prior that exactly cancels the "explaining away" phenomenon that makes inference difficult in directed models. An example of a directed belief network with complementary priors is presented. Section 3 shows the equivalence between restricted Boltzmann machines and infinite directed networks with tied weights.

Section 4 introduces a fast, greedy learning algorithm for constructing multilayer directed networks one layer at a time. Using a variational bound, it shows that as each new layer is added, the overall generative model improves. The greedy algorithm bears some resemblance to boosting in its repeated use of the same "weak" learner, but instead of reweighting each data vector to ensure that the next step learns something new, it re-represents it. The "weak" learner that is used to construct deep directed nets is itself an undirected graphical model.

Section 5 shows how the weights produced by the fast, greedy algorithm can be fine-tuned using the "up-down" algorithm. This is a contrastive version of the wake-sleep algorithm (Hinton, Dayan, Frey, & Neal, 1995) that does not suffer from the "mode-averaging" problems that can cause the wake-sleep algorithm to learn poor recognition weights.

Section 6 shows the pattern recognition performance of a network with three hidden layers and about 1.7 million weights on the MNIST set of handwritten digits. When no knowledge of geometry is provided and there is no special preprocessing, the generalization performance of the network is 1.25% errors on the 10,000-digit official test set. This beats the 1.5% achieved by the best backpropagation nets when they are not handcrafted for this particular application. It is also slightly better than the 1.4% errors reported by Decoste and Schoelkopf (2002) for support vector machines on the same task.

Finally, section 7 shows what happens in the mind of the network when it is running without being constrained by visual input. The network has a full generative model, so it is easy to look into its mind—we simply generate an image from its high-level representations.

Throughout the letter, we consider nets composed of stochastic binary variables, but the ideas can be generalized to other models in which the log probability of a variable is an additive function of the states of its directly connected neighbors (see appendix A for details).
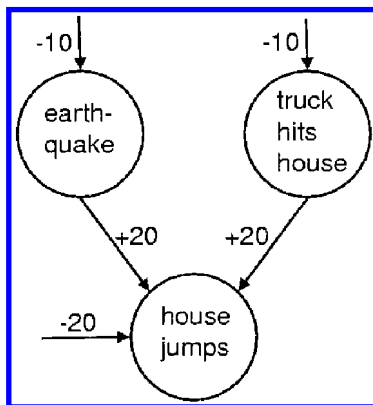
Figure 2: A simple logistic belief net containing two independent, rare causes that become highly anticorrelated when we observe the house jumping. The bias of −10 on the earthquake node means that in the absence of any observation, this node is e^{10} times more likely to be off than on. If the earthquake node is on and the truck node is off, the jump node has a total input of 0, which means that it has an even chance of being on. This is a much better explanation of the observation that the house jumped than the odds of e^{-20}, which apply if neither of the hidden causes is active. But it is wasteful to turn on both hidden causes to explain the observation because the probability of both happening is $e^{-10} \times e^{-10} = e^{-20}$. When the earthquake node is turned on, it "explains away" the evidence for the truck node.

2 Complementary Priors

The phenomenon of explaining away (illustrated in Figure 2) makes inference difficult in directed belief nets. In densely connected networks, the posterior distribution over the hidden variables is intractable except in a few special cases, such as mixture models or linear models with additive gaussian noise. Markov chain Monte Carlo methods (Neal, 1992) can be used to sample from the posterior, but they are typically very time-consuming. Variational methods (Neal & Hinton, 1998) approximate the true posterior with a more tractable distribution, and they can be used to improve a lower bound on the log probability of the training data. It is comforting that learning is guaranteed to improve a variational bound even when the inference of the hidden states is done incorrectly, but it would be much better to find a way of eliminating explaining away altogether, even in models whose hidden variables have highly correlated effects on the visible variables. It is widely assumed that this is impossible.

A logistic belief net (Neal, 1992) is composed of stochastic binary units. When the net is used to generate data, the probability of turning on unit i is a logistic function of the states of its immediate ancestors, j, and of the

weights, w_{ij}, on the directed connections from the ancestors:

$$p(s_i = 1) = \frac{1}{1 + \exp\left(-b_i - \sum_j s_j w_{ij}\right)},\qquad (2.1)$$

where b_i is the bias of unit i. If a logistic belief net has only one hidden layer, the prior distribution over the hidden variables is factorial because their binary states are chosen independently when the model is used to generate data. The nonindependence in the posterior distribution is created by the likelihood term coming from the data. Perhaps we could eliminate explaining away in the first hidden layer by using extra hidden layers to create a "complementary" prior that has exactly the opposite correlations to those in the likelihood term. Then, when the likelihood term is multiplied by the prior, we will get a posterior that is exactly factorial. It is not at all obvious that complementary priors exist, but Figure 3 shows a simple example of an infinite logistic belief net with tied weights in which the priors are complementary at every hidden layer (see appendix A for a more general treatment of the conditions under which complementary priors exist). The use of tied weights to construct complementary priors may seem like a mere trick for making directed models equivalent to undirected ones. As we shall see, however, it leads to a novel and very efficient learning algorithm that works by progressively untying the weights in each layer from the weights in higher layers.

2.1 An Infinite Directed Model with Tied Weights. We can generate data from the infinite directed net in Figure 3 by starting with a random configuration at an infinitely deep hidden layer[1] and then performing a top-down "ancestral" pass in which the binary state of each variable in a layer is chosen from the Bernoulli distribution determined by the top-down input coming from its active parents in the layer above. In this respect, it is just like any other directed acyclic belief net. Unlike other directed nets, however, we can sample from the true posterior distribution over all of the hidden layers by starting with a data vector on the visible units and then using the transposed weight matrices to infer the factorial distributions over each hidden layer in turn. At each hidden layer, we sample from the factorial posterior before computing the factorial posterior for the layer above.[2] Appendix A shows that this procedure gives unbiased samples

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[1] The generation process converges to the stationary distribution of the Markov chain, so we need to start at a layer that is deep compared with the time it takes for the chain to reach equilibrium.

[2] This is exactly the same as the inference procedure used in the wake-sleep algorithm (Hinton et al., 1995) but for the models described in this letter no variational approximation is required because the inference procedure gives unbiased samples.
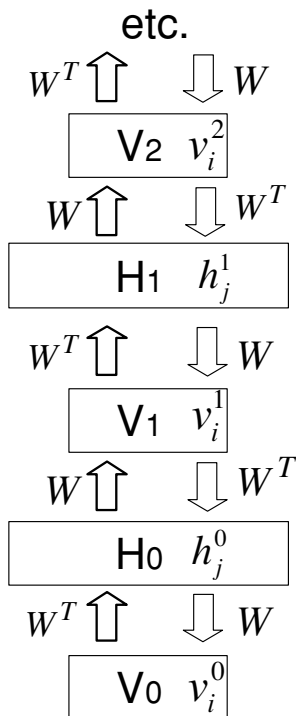
Figure 3: An infinite logistic belief net with tied weights. The downward arrows represent the generative model. The upward arrows are not part of the model. They represent the parameters that are used to infer samples from the posterior distribution at each hidden layer of the net when a data vector is clamped on V_0.

because the complementary prior at each layer ensures that the posterior distribution really is factorial.

Since we can sample from the true posterior, we can compute the derivatives of the log probability of the data. Let us start by computing the derivative for a generative weight, w_{ij}^{00}, from a unit j in layer H_0 to unit i in layer V_0 (see Figure 3). In a logistic belief net, the maximum likelihood learning rule for a single data vector, $\mathbf{v}^0$, is

$$\frac{\partial \log p(\mathbf{v}^0)}{\partial w_{ij}^{00}} = \langle h_j^0 (v_i^0 - \hat{v}_i^0) \rangle, \tag{2.2}$$

where $\langle \cdot \rangle$ denotes an average over the sampled states and $\hat{v}_i^0$ is the probability that unit i would be turned on if the visible vector was stochastically

reconstructed from the sampled hidden states. Computing the posterior distribution over the second hidden layer, V_1, from the sampled binary states in the first hidden layer, H_0, is exactly the same process as reconstructing the data, so v_i^1 is a sample from a Bernoulli random variable with probability $\hat{v}_i^0$. The learning rule can therefore be written as

$$\frac{\partial \log p(\mathbf{v}^0)}{\partial w_{ij}^{00}} = \left\langle h_j^0 \left(v_i^0 - v_i^1 \right) \right\rangle. \tag{2.3}$$

The dependence of v_i^1 on h_j^0 is unproblematic in the derivation of equation 2.3 from equation 2.2 because $\hat{v}_i^0$ is an expectation that is conditional on h_j^0. Since the weights are replicated, the full derivative for a generative weight is obtained by summing the derivatives of the generative weights between all pairs of layers:

$$\frac{\partial \log p(\mathbf{v}^0)}{\partial w_{ij}} = \left\langle h_j^0 \left(v_i^0 - v_i^1 \right) \right\rangle + \left\langle v_i^1 \left(h_j^0 - h_j^1 \right) \right\rangle + \left\langle h_j^1 \left(v_i^1 - v_i^2 \right) \right\rangle + \cdots \tag{2.4}$$

All of the pairwise products except the first and last cancel, leaving the Boltzmann machine learning rule of equation 3.1.

3 Restricted Boltzmann Machines and Contrastive Divergence Learning

It may not be immediately obvious that the infinite directed net in Figure 3 is equivalent to a restricted Boltzmann machine (RBM). An RBM has a single layer of hidden units that are not connected to each other and have undirected, symmetrical connections to a layer of visible units. To generate data from an RBM, we can start with a random state in one of the layers and then perform alternating Gibbs sampling. All of the units in one layer are updated in parallel given the current states of the units in the other layer, and this is repeated until the system is sampling from its equilibrium distribution. Notice that this is exactly the same process as generating data from the infinite belief net with tied weights. To perform maximum likelihood learning in an RBM, we can use the difference between two correlations. For each weight, w_{ij}, between a visible unit i and a hidden unit, j, we measure the correlation $\langle v_i^0 h_j^0 \rangle$ when a data vector is clamped on the visible units and the hidden states are sampled from their conditional distribution, which is factorial. Then, using alternating Gibbs sampling, we run the Markov chain shown in Figure 4 until it reaches its stationary distribution and measure the correlation $\langle v_i^\infty h_j^\infty \rangle$. The gradient of the log probability of the training data is then

$$\frac{\partial \log p(\mathbf{v}^0)}{\partial w_{ij}} = \left\langle v_i^0 h_j^0 \right\rangle - \left\langle v_i^\infty h_j^\infty \right\rangle. \tag{3.1}$$
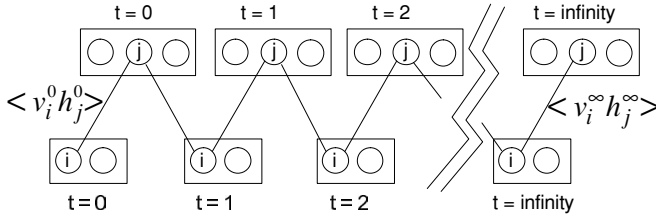
Figure 4: This depicts a Markov chain that uses alternating Gibbs sampling. In one full step of Gibbs sampling, the hidden units in the top layer are all updated in parallel by applying equation 2.1 to the inputs received from the the current states of the visible units in the bottom layer; then the visible units are all updated in parallel given the current hidden states. The chain is initialized by setting the binary states of the visible units to be the same as a data vector. The correlations in the activities of a visible and a hidden unit are measured after the first update of the hidden units and again at the end of the chain. The difference of these two correlations provides the learning signal for updating the weight on the connection.

This learning rule is the same as the maximum likelihood learning rule for the infinite logistic belief net with tied weights, and each step of Gibbs sampling corresponds to computing the exact posterior distribution in a layer of the infinite logistic belief net.

Maximizing the log probability of the data is exactly the same as minimizing the Kullback-Leibler divergence, $KL(P^0||P_\theta^\infty)$, between the distribution of the data, P^0, and the equilibrium distribution defined by the model, P_θ^∞. In contrastive divergence learning (Hinton, 2002), we run the Markov chain for only n full steps before measuring the second correlation.[3] This is equivalent to ignoring the derivatives that come from the higher layers of the infinite net. The sum of all these ignored derivatives is the derivative of the log probability of the posterior distribution in layer V_n, which is also the derivative of the Kullback-Leibler divergence between the posterior distribution in layer V_n, P_θ^n, and the equilibrium distribution defined by the model. So contrastive divergence learning minimizes the difference of two Kullback-Leibler divergences:

$$KL\left(P^0 \,\|\, P_\theta^\infty\right) - KL\left(P_\theta^n \,\|\, P_\theta^\infty\right). \tag{3.2}$$

Ignoring sampling noise, this difference is never negative because Gibbs sampling is used to produce P_θ^n from P^0, and Gibbs sampling always reduces the Kullback-Leibler divergence with the equilibrium distribution. It

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[3] Each full step consists of updating **h** given **v**, then updating **v** given **h**.

is important to notice that P_θ^n depends on the current model parameters, and the way in which P_θ^n changes as the parameters change is being ignored by contrastive divergence learning. This problem does not arise with P^0 because the training data do not depend on the parameters. An empirical investigation of the relationship between the maximum likelihood and the contrastive divergence learning rules can be found in Carreira-Perpinan and Hinton (2005).

Contrastive divergence learning in a restricted Boltzmann machine is efficient enough to be practical (Mayraz & Hinton, 2001). Variations that use real-valued units and different sampling schemes are described in Teh, Welling, Osindero, and Hinton (2003) and have been quite successful for modeling the formation of topographic maps (Welling, Hinton, & Osindero, 2003) for denoising natural images (Roth & Black, 2005) or images of biological cells (Ning et al., 2005). Marks and Movellan (2001) describe a way of using contrastive divergence to perform factor analysis and Welling, Rosen-Zvi, and Hinton (2005) show that a network with logistic, binary visible units and linear, gaussian hidden units can be used for rapid document retrieval. However, it appears that the efficiency has been bought at a high price: When applied in the obvious way, contrastive divergence learning fails for deep, multilayer networks with different weights at each layer because these networks take far too long even to reach conditional equilibrium with a clamped data vector. We now show that the equivalence between RBMs and infinite directed nets with tied weights suggests an efficient learning algorithm for multilayer networks in which the weights are not tied.

4 A Greedy Learning Algorithm for Transforming Representations

An efficient way to learn a complicated model is to combine a set of simpler models that are learned sequentially. To force each model in the sequence to learn something different from the previous models, the data are modified in some way after each model has been learned. In boosting (Freund, 1995), each model in the sequence is trained on reweighted data that emphasize the cases that the preceding models got wrong. In one version of principal components analysis, the variance in a modeled direction is removed, thus forcing the next modeled direction to lie in the orthogonal subspace (Sanger, 1989). In projection pursuit (Friedman & Stuetzle, 1981), the data are transformed by nonlinearly distorting one direction in the data space to remove all nongaussianity in that direction. The idea behind our greedy algorithm is to allow each model in the sequence to receive a different representation of the data. The model performs a nonlinear transformation on its input vectors and produces as output the vectors that will be used as input for the next model in the sequence.

Figure 5 shows a multilayer generative model in which the top two layers interact via undirected connections and all of the other connections
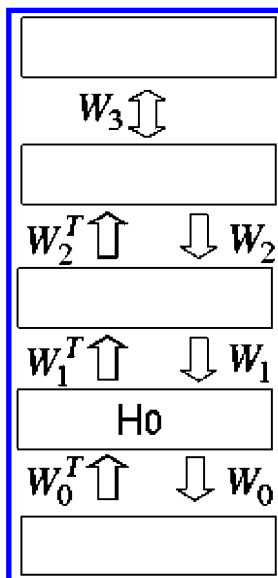
Figure 5: A hybrid network. The top two layers have undirected connections and form an associative memory. The layers below have directed, top-down generative connections that can be used to map a state of the associative memory to an image. There are also directed, bottom-up recognition connections that are used to infer a factorial representation in one layer from the binary activities in the layer below. In the greedy initial learning, the recognition connections are tied to the generative connections.

are directed. The undirected connections at the top are equivalent to having infinitely many higher layers with tied weights. There are no intralayer connections, and to simplify the analysis, all layers have the same number of units. It is possible to learn sensible (though not optimal) values for the parameters $\mathbf{W}_0$ by assuming that the parameters between higher layers will be used to construct a complementary prior for $\mathbf{W}_0$. This is equivalent to assuming that all of the weight matrices are constrained to be equal. The task of learning $\mathbf{W}_0$ under this assumption reduces to the task of learning an RBM, and although this is still difficult, good approximate solutions can be found rapidly by minimizing contrastive divergence. Once $\mathbf{W}_0$ has been learned, the data can be mapped through $\mathbf{W}_0^T$ to create higher-level "data" at the first hidden layer.

If the RBM is a perfect model of the original data, the higher-level "data" will already be modeled perfectly by the higher-level weight matrices. Generally, however, the RBM will not be able to model the original data perfectly, and we can make the generative model better using the following greedy algorithm:

1. Learn $\mathbf{W}_0$ assuming all the weight matrices are tied.

2. Freeze $\mathbf{W}_0$ and commit ourselves to using $\mathbf{W}_0^T$ to infer factorial approximate posterior distributions over the states of the variables in the first hidden layer, even if subsequent changes in higher-level weights mean that this inference method is no longer correct.

3. Keeping all the higher-weight matrices tied to each other, but untied from $\mathbf{W}_0$, learn an RBM model of the higher-level "data" that was produced by using $\mathbf{W}_0^T$ to transform the original data.

If this greedy algorithm changes the higher-level weight matrices, it is guaranteed to improve the generative model. As shown in Neal and Hinton (1998), the negative log probability of a single data vector, $\mathbf{v}^0$, under the multilayer generative model is bounded by a variational free energy, which is the expected energy under the approximating distribution, $Q(\mathbf{h}^0|\mathbf{v}^0)$, minus the entropy of that distribution. For a directed model, the "energy" of the configuration $\mathbf{v}^0, \mathbf{h}^0$ is given by

$$E(\mathbf{v}^0, \mathbf{h}^0) = -[\log p(\mathbf{h}^0) + \log p(\mathbf{v}^0|\mathbf{h}^0)], \qquad (4.1)$$

so the bound is

$$\log p(\mathbf{v}^0) \geq \sum_{\text{all } \mathbf{h}^0} Q(\mathbf{h}^0|\mathbf{v}^0)[\log p(\mathbf{h}^0) + \log p(\mathbf{v}^0|\mathbf{h}^0)]$$

$$- \sum_{\text{all } \mathbf{h}^0} Q(\mathbf{h}^0|\mathbf{v}^0) \log Q(\mathbf{h}^0|\mathbf{v}^0), \qquad (4.2)$$

where $\mathbf{h}^0$ is a binary configuration of the units in the first hidden layer, $p(\mathbf{h}^0)$ is the prior probability of $\mathbf{h}^0$ under the current model (which is defined by the weights above H_0), and $Q(\cdot|\mathbf{v}^0)$ is any probability distribution over the binary configurations in the first hidden layer. The bound becomes an equality if and only if $Q(\cdot|\mathbf{v}^0)$ is the true posterior distribution.

When all of the weight matrices are tied together, the factorial distribution over H_0 produced by applying $\mathbf{W}_0^T$ to a data vector is the true posterior distribution, so at step 2 of the greedy algorithm, $\log p(\mathbf{v}^0)$ is equal to the bound. Step 2 freezes both $Q(\cdot|\mathbf{v}^0)$ and $p(\mathbf{v}^0|\mathbf{h}^0)$, and with these terms fixed, the derivative of the bound is the same as the derivative of

$$\sum_{\text{all } \mathbf{h}^0} Q(\mathbf{h}^0|\mathbf{v}^0) \log p(\mathbf{h}^0). \qquad (4.3)$$

So maximizing the bound with respect to the weights in the higher layers is exactly equivalent to maximizing the log probability of a data set in which $\mathbf{h}^0$ occurs with probability $Q(\mathbf{h}^0|\mathbf{v}^0)$. If the bound becomes tighter, it

is possible for $\log p(\mathbf{v}^0)$ to fall even though the lower bound on it increases, but $\log p(\mathbf{v}^0)$ can never fall below its value at step 2 of the greedy algorithm because the bound is tight at this point and the bound always increases.

The greedy algorithm can clearly be applied recursively, so if we use the full maximum likelihood Boltzmann machine learning algorithm to learn each set of tied weights and then we untie the bottom layer of the set from the weights above, we can learn the weights one layer at a time with a guarantee that we will never decrease the bound on the log probability of the data under the model.[4] In practice, we replace the maximum likelihood Boltzmann machine learning algorithm by contrastive divergence learning because it works well and is much faster. The use of contrastive divergence voids the guarantee, but it is still reassuring to know that extra layers are guaranteed to improve imperfect models if we learn each layer with sufficient patience.

To guarantee that the generative model is improved by greedily learning more layers, it is convenient to consider models in which all layers are the same size so that the higher-level weights can be initialized to the values learned before they are untied from the weights in the layer below. The same greedy algorithm, however, can be applied even when the layers are different sizes.

5 Back-Fitting with the Up-Down Algorithm

Learning the weight matrices one layer at a time is efficient but not optimal. Once the weights in higher layers have been learned, neither the weights nor the simple inference procedure are optimal for the lower layers. The suboptimality produced by greedy learning is relatively innocuous for supervised methods like boosting. Labels are often scarce, and each label may provide only a few bits of constraint on the parameters, so overfitting is typically more of a problem than underfitting. Going back and refitting the earlier models may therefore cause more harm than good. Unsupervised methods, however, can use very large unlabeled data sets, and each case may be very high-dimensional, thus providing many bits of constraint on a generative model. Underfitting is then a serious problem, which can be alleviated by a subsequent stage of back-fitting in which the weights that were learned first are revised to fit in better with the weights that were learned later.

After greedily learning good initial values for the weights in every layer, we untie the "recognition" weights that are used for inference from the "generative" weights that define the model, but retain the restriction that the posterior in each layer must be approximated by a factorial distribution in which the variables within a layer are conditionally independent given

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[4] The guarantee is on the expected change in the bound.

the values of the variables in the layer below. A variant of the wake-sleep algorithm described in Hinton et al. (1995) can then be used to allow the higher-level weights to influence the lower-level ones. In the "up-pass," the recognition weights are used in a bottom-up pass that stochastically picks a state for every hidden variable. The generative weights on the directed connections are then adjusted using the maximum likelihood learning rule in equation 2.2.[5] The weights on the undirected connections at the top level are learned as before by fitting the top-level RBM to the posterior distribution of the penultimate layer.

The "down-pass" starts with a state of the top-level associative memory and uses the top-down generative connections to stochastically activate each lower layer in turn. During the down-pass, the top-level undirected connections and the generative directed connections are not changed. Only the bottom-up recognition weights are modified. This is equivalent to the sleep phase of the wake-sleep algorithm if the associative memory is allowed to settle to its equilibrium distribution before initiating the down-pass. But if the associative memory is initialized by an up-pass and then only allowed to run for a few iterations of alternating Gibbs sampling before initiating the down-pass, this is a "contrastive" form of the wake-sleep algorithm that eliminates the need to sample from the equilibrium distribution of the associative memory. The contrastive form also fixes several other problems of the sleep phase. It ensures that the recognition weights are being learned for representations that resemble those used for real data, and it also helps to eliminate the problem of mode averaging. If, given a particular data vector, the current recognition weights always pick a particular mode at the level above and ignore other very different modes that are equally good at generating the data, the learning in the down-pass will not try to alter those recognition weights to recover any of the other modes as it would if the sleep phase used a pure ancestral pass. A pure ancestral pass would have to start by using prolonged Gibbs sampling to get an equilibrium sample from the top-level associative memory. By using a top-level associative memory, we also eliminate a problem in the wake phase: independent top-level units seem to be required to allow an ancestral pass, but they mean that the variational approximation is very poor for the top layer of weights.

Appendix B specifies the details of the up-down algorithm using MATLAB-style pseudocode for the network shown in Figure 1. For simplicity, there is no penalty on the weights, no momentum, and the same learning rate for all parameters. Also, the training data are reduced to a single case.

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[5] Because weights are no longer tied to the weights above them, $\hat{v}_i^0$ must be computed using the states of the variables in the layer above i and the generative weights from these variables to i.

6 Performance on the MNIST Database

6.1 Training the Network. The MNIST database of handwritten digits contains 60,000 training images and 10,000 test images. Results for many different pattern recognition techniques are already published for this publicly available database, so it is ideal for evaluating new pattern recognition methods. For the basic version of the MNIST learning task, no knowledge of geometry is provided, and there is no special preprocessing or enhancement of the training set, so an unknown but fixed random permutation of the pixels would not affect the learning algorithm. For this "permutation-invariant" version of the task, the generalization performance of our network was 1.25% errors on the official test set. The network shown in Figure 1 was trained on 44,000 of the training images that were divided into 440 balanced mini-batches, each containing 10 examples of each digit class.[6] The weights were updated after each mini-batch.

In the initial phase of training, the greedy algorithm described in section 4 was used to train each layer of weights separately, starting at the bottom. Each layer was trained for 30 sweeps through the training set (called "epochs"). During training, the units in the "visible" layer of each RBM had real-valued activities between 0 and 1. These were the normalized pixel intensities when learning the bottom layer of weights. For training higher layers of weights, the real-valued activities of the visible units in the RBM were the activation probabilities of the hidden units in the lower-level RBM. The hidden layer of each RBM used stochastic binary values when that RBM was being trained. The greedy training took a few hours per layer in MATLAB on a 3 GHz Xeon processor, and when it was done, the error rate on the test set was 2.49% (see below for details of how the network is tested).

When training the top layer of weights (the ones in the associative memory), the labels were provided as part of the input. The labels were represented by turning on one unit in a "softmax" group of 10 units. When the activities in this group were reconstructed from the activities in the layer above, exactly one unit was allowed to be active, and the probability of picking unit i was given by

$$p_i = \frac{\exp(x_i)}{\sum_j \exp(x_j)}, \tag{6.1}$$

where x_i is the total input received by unit i. Curiously, the learning rules are unaffected by the competition between units in a softmax group, so the

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[6] Preliminary experiments with 16×16 images of handwritten digits from the USPS database showed that a good way to model the joint distribution of digit images and their labels was to use an architecture of this type, but for 16×16 images, only three-fifths as many units were used in each hidden layer.

synapses do not need to know which unit is competing with which other unit. The competition affects the probability of a unit turning on, but it is only this probability that affects the learning.

After the greedy layer-by-layer training, the network was trained, with a different learning rate and weight decay, for 300 epochs using the up-down algorithm described in section 5. The learning rate, momentum, and weight decay[7] were chosen by training the network several times and observing its performance on a separate validation set of 10,000 images that were taken from the remainder of the full training set. For the first 100 epochs of the up-down algorithm, the up-pass was followed by three full iterations of alternating Gibbs sampling in the associative memory before performing the down-pass. For the second 100 epochs, 6 iterations were performed, and for the last 100 epochs, 10 iterations were performed. Each time the number of iterations of Gibbs sampling was raised, the error on the validation set decreased noticeably.

The network that performed best on the validation set was tested and had an error rate of 1.39%. This network was then trained on all 60,000 training images[8] until its error rate on the full training set was as low as its final error rate had been on the initial training set of 44,000 images. This took a further 59 epochs, making the total learning time about a week. The final network had an error rate of 1.25%.[9] The errors made by the network are shown in Figure 6. The 49 cases that the network gets correct but for which the second-best probability is within 0.3 of the best probability are shown in Figure 7.

The error rate of 1.25% compares very favorably with the error rates achieved by feedforward neural networks that have one or two hidden layers and are trained to optimize discrimination using the backpropagation algorithm (see Table 1). When the detailed connectivity of these networks is not handcrafted for this particular task, the best reported error rate for stochastic online learning with a separate squared error on each of the 10 output units is 2.95%. These error rates can be reduced to 1.53% in a net with one hidden layer of 800 units by using small initial weights, a separate cross-entropy error function on each output unit, and very gentle learning

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[7] No attempt was made to use different learning rates or weight decays for different layers, and the learning rate and momentum were always set quite conservatively to avoid oscillations. It is highly likely that the learning speed could be considerably improved by a more careful choice of learning parameters, though it is possible that this would lead to worse solutions.

[8] The training set has unequal numbers of each class, so images were assigned randomly to each of the 600 mini-batches.

[9] To check that further learning would not have significantly improved the error rate, the network was then left running with a very small learning rate and with the test error being displayed after every epoch. After six weeks, the test error was fluctuating between 1.12% and 1.31% and was 1.18% for the epoch on which number of training errors was smallest.
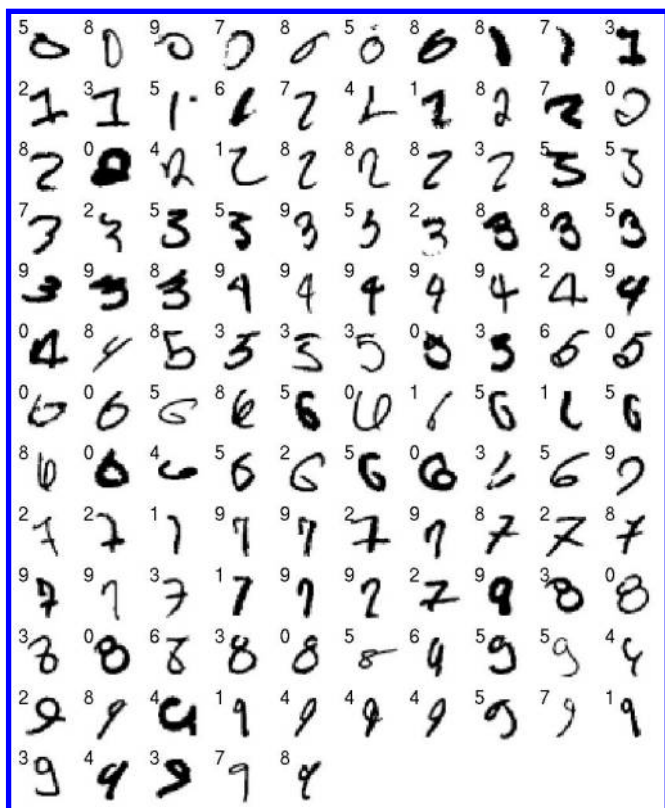
Figure 6: The 125 test cases that the network got wrong. Each case is labeled by the network's guess. The true classes are arranged in standard scan order.

(John Platt, personal communication, 2005). An almost identical result of 1.51% was achieved in a net that had 500 units in the first hidden layer and 300 in the second hidden layer by using "softmax" output units and a regularizer that penalizes the squared weights by an amount carefully chosen using a validation set. For comparison, nearest neighbor has a reported error rate (http://oldmill.uchicago.edu/wilder/Mnist/) of 3.1% if all 60,000 training cases are used (which is extremely slow) and 4.4% if 20,000 are used. This can be reduced to 2.8% and 4.0% by using an L3 norm.

The only standard machine learning technique that comes close to the 1.25% error rate of our generative model on the basic task is a support vector machine that gives an error rate of 1.4% (Decoste & Schoelkopf, 2002). But it is hard to see how support vector machines can make use of the domain-specific tricks, like weight sharing and subsampling, which LeCun, Bottou, and Haffner (1998) use to improve the performance of discriminative
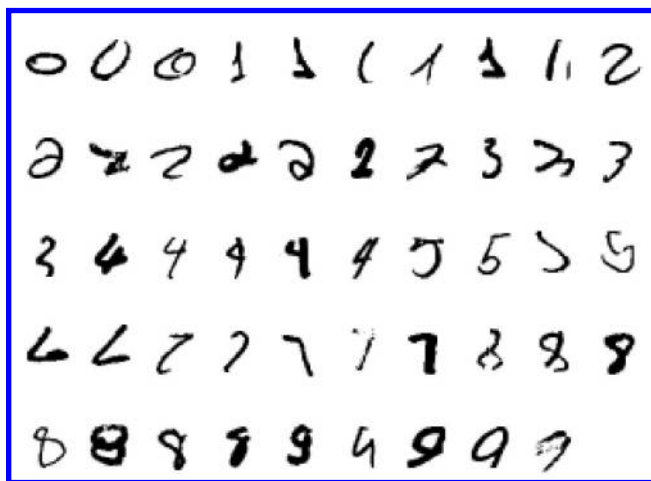
Figure 7: All 49 cases in which the network guessed right but had a second guess whose probability was within 0.3 of the probability of the best guess. The true classes are arranged in standard scan order.

neural networks from 1.5% to 0.95%. There is no obvious reason why weight sharing and subsampling cannot be used to reduce the error rate of the generative model, and we are currently investigating this approach. Further improvements can always be achieved by averaging the opinions of multiple networks, but this technique is available to all methods.

Substantial reductions in the error rate can be achieved by supplementing the data set with slightly transformed versions of the training data. Using one- and two-pixel translations, Decoste and Schoelkopf (2002) achieve 0.56%. Using local elastic deformations in a convolutional neural network, Simard, Steinkraus, and Platt (2003) achieve 0.4%, which is slightly better than the 0.63% achieved by the best hand-coded recognition algorithm (Belongie, Malik, & Puzicha, 2002). We have not yet explored the use of distorted data for learning generative models because many types of distortion need to be investigated, and the fine-tuning algorithm is currently too slow.

6.2 Testing the Network. One way to test the network is to use a stochastic up-pass from the image to fix the binary states of the 500 units in the lower layer of the associative memory. With these states fixed, the label units are given initial real-valued activities of 0.1, and a few iterations of alternating Gibbs sampling are then used to activate the correct label unit. This method of testing gives error rates that are almost 1% higher than the rates reported above.

Table 1: Error rates of Various Learning Algorithms on the MNIST Digit Recognition Task.

Version of MNIST Task	Learning Algorithm	Test Error %
Permutation invariant	Our generative model: $784 \rightarrow 500 \rightarrow 500 \leftrightarrow 2000 \leftrightarrow 10$	1.25
Permutation invariant	Support vector machine: degree 9 polynomial kernel	1.4
Permutation invariant	Backprop: $784 \rightarrow 500 \rightarrow 300 \rightarrow 10$ cross-entropy and weight-decay	1.51
Permutation invariant	Backprop: $784 \rightarrow 800 \rightarrow 10$ cross-entropy and early stopping	1.53
Permutation invariant	Backprop: $784 \rightarrow 500 \rightarrow 150 \rightarrow 10$ squared error and on-line updates	2.95
Permutation invariant	Nearest neighbor: all 60,000 examples and L3 norm	2.8
Permutation invariant	Nearest neighbor: all 60,000 examples and L2 norm	3.1
Permutation invariant	Nearest neighbor: 20,000 examples and L3 norm	4.0
Permutation invariant	Nearest neighbor: 20,000 examples and L2 norm	4.4
Unpermuted images; extra data from elastic deformations	Backprop: cross-entropy and early-stopping convolutional neural net	0.4
Unpermuted de-skewed images; extra data from 2 pixel translations	Virtual SVM: degree 9 polynomial kernel	0.56
Unpermuted images	Shape-context features: hand-coded matching	0.63
Unpermuted images; extra data from affine transformations	Backprop in LeNet5: convolutional neural net	0.8
Unpermuted images	Backprop in LeNet5: convolutional neural net	0.95

A better method is to first fix the binary states of the 500 units in the lower layer of the associative memory and to then turn on each of the label units in turn and compute the exact free energy of the resulting 510-component binary vector. Almost all the computation required is independent of which label unit is turned on (Teh & Hinton, 2001), and this method computes the exact conditional equilibrium distribution over labels instead of approximating it by Gibbs sampling, which is what the previous method is doing. This method gives error rates that are about 0.5% higher than the ones quoted because of the stochastic decisions made in the up-pass. We can remove this noise in two ways. The simpler is to make the up-pass deterministic by using probabilities of activation in place of

Figure 8: Each row shows 10 samples from the generative model with a particular label clamped on. The top-level associative memory is run for 1000 iterations of alternating Gibbs sampling between samples.

stochastic binary states. The second is to repeat the stochastic up-pass 20 times and average either the label probabilities or the label log probabilities over the 20 repetitions before picking the best one. The two types of average give almost identical results, and these results are also very similar to using a single deterministic up-pass, which was the method used for the reported results.

7 Looking into the Mind of a Neural Network

To generate samples from the model, we perform alternating Gibbs sampling in the top-level associative memory until the Markov chain converges to the equilibrium distribution. Then we use a sample from this distribution as input to the layers below and generate an image by a single down-pass through the generative connections. If we clamp the label units to a particular class during the Gibbs sampling, we can see images from the model's class-conditional distributions. Figure 8 shows a sequence of images for each class that were generated by allowing 1000 iterations of Gibbs sampling between samples.

We can also initialize the state of the top two layers by providing a random binary image as input. Figure 9 shows how the class-conditional state of the associative memory then evolves when it is allowed to run freely, but with the label clamped. This internal state is "observed" by performing a down-pass every 20 iterations to see what the associative memory has

Figure 9: Each row shows 10 samples from the generative model with a particular label clamped on. The top-level associative memory is initialized by an up-pass from a random binary image in which each pixel is on with a probability of 0.5. The first column shows the results of a down-pass from this initial high-level state. Subsequent columns are produced by 20 iterations of alternating Gibbs sampling in the associative memory.

in mind. This use of the word *mind* is not intended to be metaphorical. We believe that a mental state is the state of a hypothetical, external world in which a high-level internal representation would constitute veridical perception. That hypothetical world is what the figure shows.

8 Conclusion

We have shown that it is possible to learn a deep, densely connected belief network one layer at a time. The obvious way to do this is to assume that the higher layers do not exist when learning the lower layers, but this is not compatible with the use of simple factorial approximations to replace the intractable posterior distribution. For these approximations to work well, we need the true posterior to be as close to factorial as possible. So instead of ignoring the higher layers, we assume that they exist but have tied weights that are constrained to implement a complementary prior that makes the true posterior exactly factorial. This is equivalent to having an undirected model that can be learned efficiently using contrastive divergence. It can also be viewed as constrained variational learning because a penalty term—the divergence between the approximate and true

posteriors—has been replaced by the constraint that the prior must make the variational approximation exact.

After each layer has been learned, its weights are untied from the weights in higher layers. As these higher-level weights change, the priors for lower layers cease to be complementary, so the true posterior distributions in lower layers are no longer factorial, and the use of the transpose of the generative weights for inference is no longer correct. Nevertheless, we can use a variational bound to show that adapting the higher-level weights improves the overall generative model.

To demonstrate the power of our fast, greedy learning algorithm, we used it to initialize the weights for a much slower fine-tuning algorithm that learns an excellent generative model of digit images and their labels. It is not clear that this is the best way to use the fast, greedy algorithm. It might be better to omit the fine-tuning and use the speed of the greedy algorithm to learn an ensemble of larger, deeper networks or a much larger training set. The network in Figure 1 has about as many parameters as 0.002 cubic millimeters of mouse cortex (Horace Barlow, personal communication, 1999), and several hundred networks of this complexity could fit within a single voxel of a high-resolution fMRI scan. This suggests that much bigger networks may be required to compete with human shape recognition abilities.

Our current generative model is limited in many ways (Lee & Mumford, 2003). It is designed for images in which nonbinary values can be treated as probabilities (which is not the case for natural images); its use of top-down feedback during perception is limited to the associative memory in the top two layers; it does not have a systematic way of dealing with perceptual invariances; it assumes that segmentation has already been performed; and it does not learn to sequentially attend to the most informative parts of objects when discrimination is difficult. It does, however, illustrate some of the major advantages of generative models as compared to discriminative ones:

- Generative models can learn low-level features without requiring feedback from the label, and they can learn many more parameters than discriminative models without overfitting. In discriminative learning, each training case constrains the parameters only by as many bits of information as are required to specify the label. For a generative model, each training case constrains the parameters by the number of bits required to specify the input.

- It is easy to see what the network has learned by generating from its model.

- It is possible to interpret the nonlinear, distributed representations in the deep hidden layers by generating images from them.

- The superior classification performance of discriminative learning methods holds only for domains in which it is not possible to learn a good generative model. This set of domains is being eroded by Moore's law.

Appendix A: Complementary Priors

A.1 General Complementarity. Consider a joint distribution over observables, $\mathbf{x}$, and hidden variables, $\mathbf{y}$. For a given likelihood function, $P(\mathbf{x}|\mathbf{y})$, we define the corresponding family of complementary priors to be those distributions, $P(\mathbf{y})$, for which the joint distribution, $P(\mathbf{x}, \mathbf{y}) = P(\mathbf{x}|\mathbf{y})P(\mathbf{y})$, leads to posteriors, $P(\mathbf{y}|\mathbf{x})$, that exactly factorize, that is, leads to a posterior that can be expressed as $P(\mathbf{y}|\mathbf{x}) = \prod_j P(y_j|\mathbf{x})$.

Not all functional forms of likelihood admit a complementary prior. In this appendix, we show that the following family constitutes all likelihood functions admitting a complementary prior,

$$P(\mathbf{x}|\mathbf{y}) = \frac{1}{\Omega(\mathbf{y})} \exp \left(\sum_j \Phi_j(\mathbf{x}, y_j) + \beta(\mathbf{x}) \right)$$

$$= \exp \left(\sum_j \Phi_j(\mathbf{x}, y_j) + \beta(\mathbf{x}) - \log \Omega(\mathbf{y}) \right), \tag{A.1}$$

where Ω is the normalization term. For this assertion to hold, we need to assume positivity of distributions: that both $P(\mathbf{y}) > 0$ and $P(\mathbf{x}|\mathbf{y}) > 0$ for every value of $\mathbf{y}$ and $\mathbf{x}$. The corresponding family of complementary priors then assumes the form

$$P(\mathbf{y}) = \frac{1}{C} \exp \left(\log \Omega(\mathbf{y}) + \sum_j \alpha_j(y_j) \right), \tag{A.2}$$

where C is a constant to ensure normalization. This combination of functional forms leads to the following expression for the joint,

$$P(\mathbf{x}, \mathbf{y}) = \frac{1}{C} \exp \left(\sum_j \Phi_j(\mathbf{x}, y_j) + \beta(\mathbf{x}) + \sum_j \alpha_j(y_j) \right). \tag{A.3}$$

To prove our assertion, we need to show that every likelihood function of form equation A.1 admits a complementary prior and vice versa. First, it can be directly verified that equation A.2 is a complementary prior for the likelihood functions of equation A.1. To show the converse, let us assume that $P(\mathbf{y})$ is a complementary prior for some likelihood function $P(\mathbf{x}|\mathbf{y})$. Notice that the factorial form of the posterior simply means that the

joint distribution $P(\mathbf{x}, \mathbf{y}) = P(\mathbf{y})P(\mathbf{x}|\mathbf{y})$ satisfies the following set of conditional independencies: $y_j \perp\!\!\!\perp y_k \,|\, \mathbf{x}$ for every $j \neq k$. This set of conditional independencies corresponds exactly to the relations satisfied by an undirected graphical model having edges between every hidden and observed variable and among all observed variables. By the Hammersley-Clifford theorem and using our positivity assumption, the joint distribution must be of the form of equation A.3, and the forms for the likelihood function equation A.1 and prior equation A.2 follow from this.

A.2 Complementarity for Infinite Stacks. We now consider a subset of models of the form in equation A.3 for which the likelihood also factorizes. This means that we now have two sets of conditional independencies:

$$P(\mathbf{x}|\mathbf{y}) = \prod_i P(x_i|\mathbf{y}) \tag{A.4}$$

$$P(\mathbf{y}|\mathbf{x}) = \prod_j P(y_j|\mathbf{x}). \tag{A.5}$$

This condition is useful for our construction of the infinite stack of directed graphical models.

Identifying the conditional independencies in equations A.4 and A.5 as those satisfied by a complete bipartite undirected graphical model, and again using the Hammersley-Clifford theorem (assuming positivity), we see that the following form fully characterizes all joint distributions of interest,

$$P(\mathbf{x}, \mathbf{y}) = \frac{1}{Z} \exp \left(\sum_{i,j} \Psi_{i,j}(x_i, y_j) + \sum_i \gamma_i(x_i) + \sum_j \alpha_j(y_j) \right), \tag{A.6}$$

while the likelihood functions take on the form

$$P(\mathbf{x}|\mathbf{y}) = \exp \left(\sum_{i,j} \Psi_{i,j}(x_i, y_j) + \sum_i \gamma_i(x_i) - \log \Omega(\mathbf{y}) \right). \tag{A.7}$$

Although it is not immediately obvious, the marginal distribution over the observables, $\mathbf{x}$, in equation A.6 can also be expressed as an infinite directed model in which the parameters defining the conditional distributions between layers are tied together.

An intuitive way of validating this assertion is as follows. Consider one of the methods by which we might draw samples from the marginal distribution $P(\mathbf{x})$ implied by equation A.6. Starting from an arbitrary configuration of $\mathbf{y}$, we would iteratively perform Gibbs sampling using, in alternation, the distributions given in equations A.4 and A.5. If we run this Markov chain for long enough, then, under the mild assumption that the chain

mixes properly, we will eventually obtain unbiased samples from the joint distribution given in equation A.6.

Now let us imagine that we unroll this sequence of Gibbs updates in space, such that we consider each parallel update of the variables to constitute states of a separate layer in a graph. This unrolled sequence of states has a purely directed structure (with conditional distributions taking the form of equations A.4 and A.5 and in alternation). By equivalence to the Gibbs sampling scheme, after many layers in such an unrolled graph, adjacent pairs of layers will have a joint distribution as given in equation A.6.

We can formalize the above intuition for unrolling the graph as follows. The basic idea is to unroll the graph "upwards" (i.e., moving away from the data), so that we can put a well-defined distribution over the infinite stack of variables. Then we verify some simple marginal and conditional properties of the joint distribution and thus demonstrate the required properties of the graph in the "downwards" direction.

Let $\mathbf{x} = \mathbf{x}^{(0)}, \mathbf{y} = \mathbf{y}^{(0)}, \mathbf{x}^{(1)}, \mathbf{y}^{(1)}, \mathbf{x}^{(2)}, \mathbf{y}^{(2)}, \ldots$ be a sequence (stack) of variables, the first two of which are identified as our original observed and hidden variable. Define the functions

$$f(\mathbf{x}', \mathbf{y}') = \frac{1}{Z} \exp \left(\sum_{i,j} \Psi_{i,j}(x_i', y_j') + \sum_i \gamma_i(x_i') + \sum_j \alpha_j(y_j') \right) \tag{A.8}$$

$$f_x(\mathbf{x}') = \sum_{\mathbf{y}'} f(\mathbf{x}', \mathbf{y}') \tag{A.9}$$

$$f_y(\mathbf{y}') = \sum_{\mathbf{x}'} f(\mathbf{x}', \mathbf{y}') \tag{A.10}$$

$$g_x(\mathbf{x}'|\mathbf{y}') = f(\mathbf{x}', \mathbf{y}')/f_y(\mathbf{y}') \tag{A.11}$$

$$g_y(\mathbf{y}'|\mathbf{x}') = f(\mathbf{x}', \mathbf{y}')/f_x(\mathbf{x}'), \tag{A.12}$$

and define a joint distribution over our sequence of variables as follows:

$$P(\mathbf{x}^{(0)}, \mathbf{y}^{(0)}) = f(\mathbf{x}^{(0)}, \mathbf{y}^{(0)}) \tag{A.13}$$

$$P(\mathbf{x}^{(i)}|\mathbf{y}^{(i-1)}) = g_x(\mathbf{x}^{(i)}|\mathbf{y}^{(i-1)}) \qquad i = 1, 2, \ldots \tag{A.14}$$

$$P(\mathbf{y}^{(i)}|\mathbf{x}^{(i)}) = g_y(\mathbf{y}^{(i)}|\mathbf{x}^{(i)}). \qquad i = 1, 2, \ldots \tag{A.15}$$

We verify by induction that the distribution has the following marginal distributions:

$$P(\mathbf{x}^{(i)}) = f_x(\mathbf{x}^{(i)}) \qquad i = 0, 1, 2, \ldots \tag{A.16}$$

$$P(\mathbf{y}^{(i)}) = f_y(\mathbf{y}^{(i)}) \qquad i = 0, 1, 2, \ldots \tag{A.17}$$

For $i = 0$ this is given by definition of the distribution in equation A.13. For $i > 0$, we have:

$$P(\mathbf{x}^{(i)}) = \sum_{\mathbf{y}^{(i-1)}} P(\mathbf{x}^{(i)}|\mathbf{y}^{(i-1)}) P(\mathbf{y}^{(i-1)}) = \sum_{\mathbf{y}^{(i-1)}} \frac{f(\mathbf{x}^{(i)}, \mathbf{y}^{(i-1)})}{f_y(\mathbf{y}^{(i-1)})} f_y(\mathbf{y}^{(i-1)})$$

$$= f_x(\mathbf{x}^{(i)}) \tag{A.18}$$

and similarly for $P(\mathbf{y}^{(i)})$. Now we see that the following conditional distributions also hold true:

$$P(\mathbf{x}^{(i)}|\mathbf{y}^{(i)}) = P(\mathbf{x}^{(i)}, \mathbf{y}^{(i)})/P(\mathbf{y}^{(i)}) = g_x(\mathbf{x}^{(i)}|\mathbf{y}^{(i)}) \tag{A.19}$$

$$P(\mathbf{y}^{(i)}|\mathbf{x}^{(i+1)}) = P(\mathbf{y}^{(i)}, \mathbf{x}^{(i+1)})/P(\mathbf{x}^{(i+1)}) = g_y(\mathbf{y}^{(i)}|\mathbf{x}^{(i+1)}). \tag{A.20}$$

So our joint distribution over the stack of variables also leads to the appropriate conditional distributions for the unrolled graph in the "downwards" direction. Inference in this infinite graph is equivalent to inference in the joint distribution over the sequence of variables, that is, given $\mathbf{x}^{(0)}$, we can obtain a sample from the posterior simply by sampling $\mathbf{y}^{(0)}|\mathbf{x}^{(0)}$, $\mathbf{x}^{(1)}|\mathbf{y}^{(0)}$, $\mathbf{y}^{(1)}|\mathbf{x}^{(1)}, \ldots$. This directly shows that our inference procedure is exact for the unrolled graph.

Appendix B: Pseudocode for Up-Down Algorithm

We now present MATLAB-style pseudocode for an implementation of the up-down algorithm described in section 5 and used for back-fitting. (This method is a contrastive version of the wake-sleep algorithm; Hinton et al., 1995.)

The code outlined below assumes a network of the type shown in Figure 1 with visible inputs, label nodes, and three layers of hidden units. Before applying the up-down algorithm, we would first perform layer-wise greedy training as described in sections 3 and 4.

```
\% UP-DOWN ALGORITHM
\%
\% the data and all biases are row vectors.
\% the generative model is: lab <--> top <--> pen --> hid --> vis
\% the number of units in layer foo is numfoo
\% weight matrices have names fromlayer_tolayer
\% "rec" is for recognition biases and "gen" is for generative
\% biases.
\% for simplicity, the same learning rate, r, is used everywhere.
```

```
\% PERFORM A BOTTOM-UP PASS TO GET WAKE/POSITIVE PHASE
\% PROBABILITIES AND SAMPLE STATES
wakehidprobs = logistic(data*vishid + hidrecbiases);
wakehidstates = wakehidprobs > rand(1, numhid);
wakepenprobs = logistic(wakehidstates*hidpen + penrecbiases);
wakepenstates = wakepenprobs > rand(1, numpen);
wakeopprobs = logistic(wakepenstates*pentop + targets*labtop +
  topbiases);
wakeopstates = wakeopprobs > rand(1, numtop);

\% POSITIVE PHASE STATISTICS FOR CONTRASTIVE DIVERGENCE
poslabtopstatistics = targets' * waketopstates;
pospentopstatistics = wakepenstates' * waketopstates;

\% PERFORM numCDiters GIBBS SAMPLING ITERATIONS USING THE TOP LEVEL
\% UNDIRECTED ASSOCIATIVE MEMORY
negtopstates = waketopstates; \% to initialize loop
for iter=1:numCDiters
  negpenprobs = logistic(negtopstates*pentop' + pengenbiases);
  negpenstates = negpenprobs > rand(1, numpen);
  neglabprobs = softmax(negtopstates*labtop' + labgenbiases);
  negtopprobs = logistic(negpenstates*pentop+neglabprobs*labtop+
    topbiases);
negtopstates = negtopprobs > rand(1, numtop));
end;
\% NEGATIVE PHASE STATISTICS FOR CONTRASTIVE DIVERGENCE
negpentopstatistics = negpenstates'*negtopstates;
neglabtopstatistics = neglabprobs'*negtopstates;

\% STARTING FROM THE END OF THE GIBBS SAMPLING RUN, PERFORM A
\% TOP-DOWN GENERATIVE PASS TO GET SLEEP/NEGATIVE PHASE
\% PROBABILITIES AND SAMPLE STATES
sleeppenstates = negpenstates;
sleephidprobs = logistic(sleeppenstates*penhid + hidgenbiases);
sleephidstates = sleephidprobs > rand(1, numhid);
sleepvisprobs = logistic(sleephidstates*hidvis + visgenbiases);

\% PREDICTIONS
psleeppenstates = logistic(sleephidstates*hidpen + penrecbiases);
psleephidstates = logistic(sleepvisprobs*vishid + hidrecbiases);
pvisprobs = logistic(wakehidstates*hidvis + visgenbiases);
phidprobs = logistic(wakepenstates*penhid + hidgenbiases);

\% UPDATES TO GENERATIVE PARAMETERS
hidvis = hidvis + r*poshidstates'*(data-pvisprobs);
```

```
visgenbiases = visgenbiases + r*(data - pvisprobs);
penhid = penhid + r*wakepenstates'*(wakehidstates-phidprobs);
hidgenbiases = hidgenbiases + r*(wakehidstates - phidprobs);

\% UPDATES TO TOP LEVEL ASSOCIATIVE MEMORY PARAMETERS
labtop = labtop + r*(poslabtopstatistics-neglabtopstatistics);
labgenbiases = labgenbiases + r*(targets - neglabprobs);
pentop = pentop + r*(pospentopstatistics - negpentopstatistics);
pengenbiases = pengenbiases + r*(wakepenstates - negpenstates);
topbiases = topbiases + r*(waketopstates - negtopstates);

\%UPDATES TO RECOGNITION/INFERENCE APPROXIMATION PARAMETERS
hidpen = hidpen + r*(sleephidstates'*(sleeppenstates-
  psleeppenstates));
penrecbiases = penrecbiases + r*(sleeppenstates-psleeppenstates);
vishid = vishid + r*(sleepvisprobs'*(sleephidstates-
  psleephidstates));
hidrecbiases = hidrecbiases + r*(sleephidstates-psleephidstates);
```

Acknowledgments

References

Belongie, S., Malik, J., & Puzicha, J. (2002). Shape matching and object recognition using shape contexts. *IEEE Transactions on Pattern Analysis and Machine Intelligence, 24*(4), 509–522.

Carreira-Perpinan, M. A., & Hinton, G. E. (2005). On contrastive divergence learning. In R. G. Cowell & Z. Ghahramani (Eds.), *Artificial Intelligence and Statistics, 2005.* (pp. 33–41). Fort Lauderdale, FL: Society for Artificial Intelligence and Statistics.

Decoste, D., & Schoelkopf, B. (2002). Training invariant support vector machines, *Machine Learning, 46*, 161–190.

Freund, Y. (1995). Boosting a weak learning algorithm by majority. *Information and Computation, 12*(2), 256–285.

Friedman, J., & Stuetzle, W. (1981). Projection pursuit regression. *Journal of the American Statistical Association, 76*, 817–823.

Hinton, G. E. (2002). Training products of experts by minimizing contrastive divergence, *Neural Computation, 14*(8), 1711–1800.

Hinton, G. E., Dayan, P., Frey, B. J., & Neal, R. (1995). The wake-sleep algorithm for self-organizing neural networks. *Science, 268*, 1158–1161.

LeCun, Y., Bottou, L., & Haffner, P. (1998). Gradient-based learning applied to document recognition. *Proceedings of the IEEE, 86*(11), 2278–2324.

Lee, T. S., & Mumford, D. (2003). Hierarchical Bayesian inference in the visual cortex. *Journal of the Optical Society of America, A, 20*, 1434–1448.

Marks, T. K., & Movellan, J. R. (2001). Diffusion networks, product of experts, and factor analysis. In T. W. Lee, T.-P. Jung, S. Makeig, & T. J. Sejnowski (Eds.), *Proc. Int. Conf. on Independent Component Analysis* (pp. 481–485). San Diego.

Mayraz, G., & Hinton, G. E. (2001). Recognizing hand-written digits using hierarchical products of experts. *IEEE Transactions on Pattern Analysis and Machine Intelligence, 24*, 189–197.

Neal, R. (1992). Connectionist learning of belief networks, *Artificial Intelligence, 56*, 71–113.

Neal, R. M., & Hinton, G. E. (1998). A new view of the EM algorithm that justifies incremental, sparse and other variants. In M. I. Jordan (Ed.), *Learning in graphical models* (pp. 355–368). Norwell, MA: Kluwer.

Ning, F., Delhomme, D., LeCun, Y., Piano, F., Bottou, L., & Barbano, P. (2005). Toward automatic phenotyping of developing embryos from videos. *IEEE Transactions on Image Processing, 14*(9), 1360–1371.

Roth, S., & Black, M. J. (2005). Fields of experts: A framework for learning image priors. In *IEEE Conf. on Computer Vision and Pattern Recognition* (pp. 860–867). Piscataway, NJ: IEEE.

Sanger, T. D. (1989). Optimal unsupervised learning in a single-layer linear feedforward neural networks. *Neural Networks, 2*(6), 459–473.

Simard, P. Y., Steinkraus, D., & Platt, J. (2003). Best practice for convolutional neural networks applied to visual document analysis. In *International Conference on Document Analysis and Recogntion (ICDAR)* (pp. 958–962). Los Alamitos, CA: IEEE Computer Society.

Teh, Y., & Hinton, G. E. (2001). Rate-coded restricted Boltzmann machines for face recognition. In T. K. Leen, T. G. Dietterich, & V. Tresp (Eds.), *Advances in neural information processing systems*, 13 (pp. 908–914). Cambridge, MA: MIT Press.

Teh, Y., Welling, M., Osindero, S., & Hinton, G. E. (2003). Energy-based models for sparse overcomplete representations. *Journal of Machine Learning Research, 4*, 1235–1260.

Welling, M., Hinton, G., & Osindero, S. (2003). Learning sparse topographic representations with products of Student-t distributions. In S. Becker, S. Thrun, & K. Obermayer (Eds.), *Advances in neural information processing systems, 15* (pp. 1359–1366). Cambridge, MA: MIT Press.

Welling, M., Rosen-Zvi, M., & Hinton, G. E. (2005). Exponential family harmoniums with an application to information retrieval. In L. K. Saul, Y. Weiss, & L. Bottou (Eds.), *Advances in neural information processing systems, 17* (pp. 1481–1488). Cambridge, MA: MIT Press.

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1. Eiman Kanjo, Eman M.G. Younis, Chee Siang Ang. 2019. Deep learning analysis of mobile physiological, environmental and location sensor data for emotion detection. *Information Fusion* **49**, 46-56. [Crossref]

2. Xiuzhuang Zhou, Kai Jin, Min Xu, Guodong Guo. 2019. Learning deep compact similarity metric for kinship verification from face images. *Information Fusion* **48**, 84-94. [Crossref]

3. Randa K. Asmar, Youssef M. A. Hashash. 2019. A New Triaxial Apparatus Imposing Nonuniform Shearing for Deep Learning of Soil Behavior. *Geotechnical Testing Journal* **42**:3, 20170331. [Crossref]

4. Yanchao Li, Yongli Wang, Qi Liu, Cheng Bi, Xiaohui Jiang, Shurong Sun. 2019. Incremental semi-supervised learning on streaming data. *Pattern Recognition* **88**, 383-396. [Crossref]

5. Henry Friday Nweke, Ying Wah Teh, Ghulam Mujtaba, Mohammed Ali Al-garadi. 2019. Data fusion and multiple classifier systems for human activity detection and health monitoring: Review and open research directions. *Information Fusion* **46**, 147-170. [Crossref]

6. Wen Yu, Mario Pacheco. 2019. Impact of random weights on nonlinear system identification using convolutional neural networks. *Information Sciences* **477**, 1-14. [Crossref]

7. Fatmatülzehra Uslu, Anil Anthony Bharath. 2019. A recursive Bayesian approach to describe retinal vasculature geometry. *Pattern Recognition* **87**, 157-169. [Crossref]

8. André Listou Ellefsen, Emil Bjørlykhaug, Vilmar Æsøy, Sergey Ushakov, Houxiang Zhang. 2019. Remaining useful life predictions for turbofan engine degradation using semi-supervised deep architecture. *Reliability Engineering & System Safety* **183**, 240-251. [Crossref]

9. Vladimiro Miranda, Pedro A. Cardoso, Ricardo J. Bessa, Ildemar Decker. 2019. Through the looking glass: Seeing events in power systems dynamics. *International Journal of Electrical Power & Energy Systems* **106**, 411-419. [Crossref]

10. Xingmei Wang, Jia Jiao, Jingwei Yin, Wensheng Zhao, Xiao Han, Boxuan Sun. 2019. Underwater sonar image classification using adaptive weights convolutional neural network. *Applied Acoustics* **146**, 145-154. [Crossref]

11. Shen-Bin Zhu, Zhen-Lin Li, Shi-Min Zhang, Ying-Yu, Hai-Feng Zhang. 2019. Deep belief network-based internal valve leakage rate prediction approach. *Measurement* **133**, 182-192. [Crossref]

12. Haik Manukian, Fabio L. Traversa, Massimiliano Di Ventra. 2019. Accelerating deep learning with memcomputing. *Neural Networks* **110**, 1-7. [Crossref]

13. Ying-Hui Lai, Wei-Zhong Zheng. 2019. Multi-objective learning based speech enhancement method to increase speech quality and intelligibility for hearing aid device users. *Biomedical Signal Processing and Control* **48**, 35-45. [Crossref]

14. Blake A Richards, Timothy P Lillicrap. 2019. Dendritic solutions to the credit assignment problem. *Current Opinion in Neurobiology* **54**, 28-36. [Crossref]

15. Ryo Asaoka, Hiroshi Murata, Kazunori Hirasawa, Yuri Fujino, Masato Matsuura, Atsuya Miki, Takashi Kanamoto, Yoko Ikeda, Kazuhiko Mori, Aiko Iwase, Nobuyuki Shoji, Kenji Inoue, Junkichi Yamagami, Makoto Araie. 2019. Using Deep Learning and Transfer Learning to Accurately Diagnose Early-Onset Glaucoma From Macular Optical Coherence Tomography Images. *American Journal of Ophthalmology* **198**, 136-145. [Crossref]

16. Xianjie Gao, Maolin Shi, Xueguan Song, Chao Zhang, Hongwei Zhang. 2019. Recurrent neural networks for real-time prediction of TBM operating parameters. *Automation in Construction* **98**, 225-235. [Crossref]

17. Yachao Zhang, Jian Le, Xiaobing Liao, Feng Zheng, Yinghai Li. 2019. A novel combination forecasting model for wind power integrating least square support vector machine, deep belief network, singular spectrum analysis and locality-sensitive hashing. *Energy* **168**, 558-572. [Crossref]

18. Hongsik Jeong, Luping Shi. 2019. Memristor devices for neural networks. *Journal of Physics D: Applied Physics* **52**:2, 023003. [Crossref]

19. Su Wit Yi Aung, Soe Soe Khaing, Shwe Thinzar Aung. Multi-label Land Cover Indices Classification of Satellite Images Using Deep Learning 94-103. [Crossref]

20. Chao Hu, Byeng D. Youn, Pingfeng Wang. Time-Dependent Reliability Analysis in Operation: Prognostics and Health Management 233-301. [Crossref]

21. Rajendra Kumar Roul, Sanjay Kumar Sahay. Categorizing Text Data Using Deep Learning: A Novel Approach 793-805. [Crossref]

22. Katarzyna Stapor, Irena Roterman-Konieczna, Piotr Fabian. Machine Learning Methods for the Protein Fold Recognition Problem 101-127. [Crossref]

23. Xiumei Wang, Shaomin Mu, Aiju Shi, Zhongqi Lin. A Stacked Denoising Autoencoder Based on Supervised Pre-training 139-146. [Crossref]

24. Mengqiu Tao, Wenyi Wang, Zhihong Man, Zhenwei Cao, Hai Le Vu, Jinchuan Zheng, Antonio Cricenti. Structured Learning-Based Sinusoidal Modelling for Gear Diagnosis and Prognosis 184-193. [Crossref]

25. Wei Wang, Yu Jiang, Dan Wang. Through Wall Human Being Detection Based on Stacked Denoising Auto-encoder Algorithm 2205-2212. [Crossref]

26. Vikas Singh, Nishchal K. Verma, Zeeshan Ul Islam, Yan Cui. Feature Learning Using Stacked Autoencoder for Shared and Multimodal Fusion of Medical Images 53-66. [Crossref]

27. Rui Zhao, Ruqiang Yan, Zhenghua Chen, Kezhi Mao, Peng Wang, Robert X. Gao. 2019. Deep learning and its applications to machine health monitoring. *Mechanical Systems and Signal Processing* **115**, 213-237. [Crossref]

28. Shikhar Sharma, Shiv Naresh Shivhare, Navjot Singh, Krishan Kumar. Computationally Efficient ANN Model for Small-Scale Problems 423-435. [Crossref]

29. Umesh Chavan, Dinesh Kulkarni. Optimizing Deep Convolutional Neural Network for Facial Expression Recognitions 185-196. [Crossref]

30. Saad Mohamad, Damla Arifoglu, Chemseddine Mansouri, Abdelhamid Bouchachia. Deep Online Hierarchical Unsupervised Learning for Pattern Mining from Utility Usage Data 276-290. [Crossref]

31. Francesco Calimeri, Aldo Marzullo, Claudio Stamile, Giorgio Terracina. Blood Vessel Segmentation in Retinal Fundus Images Using Hypercube NeuroEvolution of Augmenting Topologies (HyperNEAT) 173-183. [Crossref]

32. J. Sangeetha, T. Jayasankar. Emotion Speech Recognition Based on Adaptive Fractional Deep Belief Network and Reinforcement Learning 165-174. [Crossref]

33. Thakur Aditi, Verma Karun. Speech Recognition of Punjabi Numerals Using Convolutional Neural Networks 61-69. [Crossref]

34. Dongyang Jiang. A Statistical Translation Approach by Network Model 325-331. [Crossref]

35. Mayar A. Shafaey, Mohammed A.-M. Salem, H. M. Ebied, M. N. Al-Berry, M. F. Tolba. Deep Learning for Satellite Image Classification 383-391. [Crossref]

36. Lyndon White, Roberto Togneri, Wei Liu, Mohammed Bennamoun. Introduction to Neural Networks for Machine Learning 1-21. [Crossref]

37. Vikas Singh, Anirudh Swaminathan, Nishchal K. Verma. Convolutional Neural Network with Stacked Autoencoder for Kernel Initialization 53-63. [Crossref]

38. Maged Nasser, Naomie Salim, Hentabli Hamza, Faisal Saeed. Deep Belief Network for Molecular Feature Selection in Ligand-Based Virtual Screening 3-14. [Crossref]

39. Amir Khoshaman, Walter Vinci, Brandon Denis, Evgeny Andriyash, Mohammad H Amin. 2019. Quantum variational autoencoder. *Quantum Science and Technology* **4**:1, 014001. [Crossref]

40. S. Akila Agnes, J. Anitha. Analyzing the Effect of Optimization Strategies in Deep Convolutional Neural Network 235-253. [Crossref]

41. Wen Zhang, Yuhang Du, Taketoshi Yoshida, Ye Yang. 2019. DeepRec: A deep neural network approach to recommendation with item embedding and weighted loss function. *Information Sciences* **470**, 121-140. [Crossref]

42. Wei Lan, Yixin Liu, Zhang Qi, Shimin Song, Chun He, Lijing Wang, Ke Li. The Multiple Classification Method of Signal Recognition for Spacecraft Based on SAE Network 679-689. [Crossref]

43. Kaitao Lai, Natalie Twine, Aidan O'Brien, Yi Guo, Denis Bauer. Artificial Intelligence and Machine Learning in Bioinformatics 272-286. [Crossref]

44. Italo Zoppis, Giancarlo Mauri, Riccardo Dondi. Kernel Machines: Introduction 495-502. [Crossref]

45. Massimo Guarascio, Giuseppe Manco, Ettore Ritacco. Deep Learning 634-647. [Crossref]

46. Hari Mohan Pandey, David Windridge. A Comprehensive Classification of Deep Learning Libraries 427-435. [Crossref]

47. Siddharth Seth, Mukesh A. Zaveri. Conditional Generative Recurrent Adversarial Networks 425-436. [Crossref]

48. Yu Yao, Ryad Chellali. End-to-End Mandarin Speech Recognition Using Bidirectional Long Short-Term Memory Network 726-735. [Crossref]

49. Antra Purohit, Abhishek, Rakesh, Shekhar Verma. Optimal Low Rank Tensor Factorization for Deep Learning 476-484. [Crossref]

50. Heikki Huttunen. Deep Neural Networks: A Signal Processing Perspective 133-163. [Crossref]

51. Xingjie Zhu, Yan Liu, Xingwang Liu, Chi Li. Convolutional Neural Networks for Finance Image Classification 237-245. [Crossref]

52. Jaime Niño, German Hernandez, Andrés Arévalo, Diego Leon, Javier Sandoval. CNN with Limit Order Book Data for Stock Price Prediction 444-457. [Crossref]

53. Xiao Wang, Rui Jiang, Li Li, Yi-Lun Lin, Fei-Yue Wang. 2019. Long memory is important: A test study on deep-learning based car-following model. *Physica A: Statistical Mechanics and its Applications* **514**, 786-795. [Crossref]

54. Jen-Tzung Chien. 21. [Crossref]

55. . 337. [Crossref]

56. Silvia García, Paulina Trejo, Alberto García, César Dumas. Virtual Reality and Neural Networks for Exploiting Geotechnical Data 14-30. [Crossref]

57. Jamie Roche, Varuna De Silva, Ahmet Kondoz. **858**, 638. [Crossref]

58. James Obert, Matthew Ferguson. Deep Time Series Neural Networks and Fluorescence Data Stream Noise Detection 18-32. [Crossref]

59. Aboozar Taherkhani, Georgina Cosma, Ali A. Alani, T. M. McGinnity. Activity Recognition from Multi-modal Sensor Data Using a Deep Convolutional Neural Network 203-218. [Crossref]

60. Daniel S. Levine. 191. [Crossref]

61. Francesco Carlo Morabito, Maurizio Campolo, Cosimo Ieracitano, Nadia Mammone. 219. [Crossref]

62. Leyi Wei, Ran Su, Bing Wang, Xiuting Li, Quan Zou, Xing Gao. 2019. Integration of deep feature representations and handcrafted features to improve the prediction of N6-methyladenosine sites. *Neurocomputing* **324**, 3-9. [Crossref]

63. Yifeng Li, François Fauteux, Jinfeng Zou, André Nantel, Youlian Pan. 2019. Personalized prediction of genes with tumor-causing somatic mutations based on multi-modal deep Boltzmann machine. *Neurocomputing* **324**, 51-62. [Crossref]

64. Md. Zia Uddin. 2019. A wearable sensor-based activity prediction system to facilitate edge computing in smart healthcare system. *Journal of Parallel and Distributed Computing* **123**, 46-53. [Crossref]

65. Panagiotis Kasnesis, Charalampos Z. Patrikakis, Iakovos S. Venieris. PerceptionNet: A Deep Convolutional Neural Network for Late Sensor Fusion 101-119. [Crossref]

66. Yazhou Ren, Kangrong Hu, Xinyi Dai, Lili Pan, Steven C.H. Hoi, Zenglin Xu. 2019. Semi-supervised deep embedded clustering. *Neurocomputing* **325**, 121-130. [Crossref]

67. Jie Chen, ZhongCheng Wu, Jun Zhang. 2019. Driver identification based on hidden feature extraction by using adaptive nonnegativity-constrained autoencoder. *Applied Soft Computing* **74**, 1-9. [Crossref]

68. Suman Samui, Indrajit Chakrabarti, Soumya K. Ghosh. 2019. Time–frequency masking based supervised speech enhancement framework using fuzzy deep belief network. *Applied Soft Computing* **74**, 583-602. [Crossref]

69. Lu Zhao, Yonghua Zhou, Huapu Lu, Hamido Fujita. 2019. Parallel computing method of deep belief networks and its application to traffic flow prediction. *Knowledge-Based Systems* **163**, 972-987. [Crossref]

70. Raif M. Rustamov, Leonidas J. Guibas. Wavelets on Graphs via Deep Learning 207-222. [Crossref]

71. Fenghua Huang, Ying Yu, Tinghao Feng. 2019. Hyperspectral remote sensing image change detection based on tensor and deep learning. *Journal of Visual Communication and Image Representation* **58**, 233-244. [Crossref]

72. Anna Guitart, Pei Pei Chen, Paul Bertens, África Periáñez. Forecasting Player Behavioral Data and Simulating In-Game Events 274-293. [Crossref]

73. Nourhan Mohamed Zayed, Heba A. Elnemr. Deep Learning and Medical Imaging 101-147. [Crossref]

74. Thi Kieu Khanh Ho, Jeonghwan Gwak, Chang Min Park, Ashish Khare, Jong-In Song. Deep Leaning-Based Approach for Mental Workload Discrimination from Multi-channel fNIRS 431-440. [Crossref]

75. Hantao Huang, Hao Yu. Introduction 1-8. [Crossref]

76. Hantao Huang, Hao Yu. Tensor-Solver for Deep Neural Network 63-105. [Crossref]

77. B. Benson, W. David Pan, G. Allen Gary, Q. Hu, T. Staudinger. 2019. Determining the parameter for the linear force-free magnetic field model with multi-dipolar configurations using deep neural networks. *Astronomy and Computing* **26**, 50-60. [Crossref]

78. Nudrat Nida, Muhammad Haroon Yousaf, Aun Irtaza, Sergio A. Velastin. Bag of Deep Features for Instructor Activity Recognition in Lecture Room 481-492. [Crossref]

79. Siguang Li, Maozhen Li, Changjun Jiang. 2018. Semantic enhanced deep learning for image classification. *Concurrency and Computation: Practice and Experience* **30**:23, e4388. [Crossref]

80. Zijian Wang, Lei Cao, Zuo Zhang, Xiaoliang Gong, Yaoru Sun, Haoran Wang. 2018. Short time Fourier transformation and deep neural networks for motor imagery brain computer interface recognition. *Concurrency and Computation: Practice and Experience* **30**:23, e4413. [Crossref]

81. Chunjiao Dong, Chunfu Shao, Juan Li, Zhihua Xiong. 2018. An Improved Deep Learning Model for Traffic Crash Prediction. *Journal of Advanced Transportation* **2018**, 1-13. [Crossref]

82. Huayi Shi, Houyu Wang, Xinyu Meng, Runzhi Chen, Yishu Zhang, Yuanyuan Su, Yao He. 2018. Setting Up a Surface-Enhanced Raman Scattering Database for Artificial-Intelligence-Based Label-Free Discrimination of Tumor Suppressor Genes. *Analytical Chemistry* . [Crossref]

83. Najib J. Majaj, Denis G. Pelli. 2018. Deep learning—Using machine learning to study biological vision. *Journal of Vision* **18**:13, 2. [Crossref]

84. Yinqiu Xu, Hequan Yao, Kejiang Lin. 2018. An overview of neural networks for drug discovery and the inputs used. *Expert Opinion on Drug Discovery* **13**:12, 1091-1102. [Crossref]

85. Sahar Sohangir, Dingding Wang, Anna Pomeranets, Taghi M. Khoshgoftaar. 2018. Big Data: Deep Learning for financial sentiment analysis. *Journal of Big Data* **5**:1. . [Crossref]

86. Noriko Takemura, Yasushi Makihara, Daigo Muramatsu, Tomio Echigo, Yasushi Yagi. 2018. Multi-view large population gait dataset and its performance evaluation for cross-view gait recognition. *IPSJ Transactions on Computer Vision and Applications* **10**:1. . [Crossref]

87. Zhao Chen, Yanfeng Cao, Shuaibing He, Yanjiang Qiao. 2018. Development of models for classification of action between heat-clearing herbs and blood-activating stasis-resolving herbs based on theory of traditional Chinese medicine. *Chinese Medicine* **13**:1. . [Crossref]

88. Haoyu Xu, Zhenqi Han, Songlin Feng, Han Zhou, Yuchun Fang. 2018. Foreign object debris material recognition based on convolutional neural networks. *EURASIP Journal on Image and Video Processing* **2018**:1. . [Crossref]

89. Yuchen He, Gao Wang, Guoxiang Dong, Shitao Zhu, Hui Chen, Anxue Zhang, Zhuo Xu. 2018. Ghost Imaging Based on Deep Learning. *Scientific Reports* **8**:1. . [Crossref]

90. Jian Liu, Yuhu Cheng, Xuesong Wang, Lin Zhang, Z. Jane Wang. 2018. Cancer Characteristic Gene Selection via Sample Learning Based on Deep Sparse Filtering. *Scientific Reports* **8**:1. . [Crossref]

91. Yifeng Li, Wenqiang Shi, Wyeth W. Wasserman. 2018. Genome-wide prediction of cis-regulatory regions using supervised deep learning methods. *BMC Bioinformatics* **19**:1. . [Crossref]

92. Yan Zhang, Jian Lian, Mingqu Fan, Yuanjie Zheng. 2018. Deep indicator for fine-grained classification of banana's ripening stages. *EURASIP Journal on Image and Video Processing* **2018**:1. . [Crossref]

93. Decebal Constantin Mocanu, Elena Mocanu, Peter Stone, Phuong H. Nguyen, Madeleine Gibescu, Antonio Liotta. 2018. Scalable training of artificial neural networks with adaptive sparse connectivity inspired by network science. *Nature Communications* **9**:1. . [Crossref]

94. Raouf Boutaba, Mohammad A. Salahuddin, Noura Limam, Sara Ayoubi, Nashid Shahriar, Felipe Estrada-Solano, Oscar M. Caicedo. 2018. A comprehensive survey on machine learning for networking: evolution, applications and research opportunities. *Journal of Internet Services and Applications* **9**:1. . [Crossref]

95. Angelo Ziletti, Devinder Kumar, Matthias Scheffler, Luca M. Ghiringhelli. 2018. Insightful classification of crystal structures using deep learning. *Nature Communications* **9**:1. . [Crossref]

96. Szu-Yin Lin, Chi-Chun Chiang, Jung-Bin Li, Zih-Siang Hung, Kuo-Ming Chao. 2018. Dynamic fine-tuning stacked auto-encoder neural network for weather forecast. *Future Generation Computer Systems* **89**, 446-454. [Crossref]

97. Chen Liangjun, Paul Honeine, Qu Hua, Zhao Jihong, Sun Xia. 2018. Correntropy-based robust multilayer extreme learning machines. *Pattern Recognition* **84**, 357-370. [Crossref]

98. Ilida Suleymanova, Tamas Balassa, Sushil Tripathi, Csaba Molnar, Mart Saarma, Yulia Sidorova, Peter Horvath. 2018. A deep convolutional neural network approach for astrocyte detection. *Scientific Reports* **8**:1. . [Crossref]

99. Chang Liu, Xi Wu, Xi Yu, YuanYan Tang, Jian Zhang, JiLiu Zhou. 2018. Fusing multi-scale information in convolution network for MR image super-resolution reconstruction. *BioMedical Engineering OnLine* **17**:1. . [Crossref]

100. Yongchang Gao, Jian Lian, Bin Gong. 2018. Automatic classification of refrigerator using doubly convolutional neural network with jointly optimized classification loss and similarity loss. *EURASIP Journal on Image and Video Processing* **2018**:1. . [Crossref]

101. Naoto Shibata, Masaki Tanito, Keita Mitsuhashi, Yuri Fujino, Masato Matsuura, Hiroshi Murata, Ryo Asaoka. 2018. Development of a deep residual learning algorithm to screen for glaucoma from fundus photography. *Scientific Reports* **8**:1. . [Crossref]

102. Mahmoud Khaled Abd-Ellah, Ali Ismail Awad, Ashraf A. M. Khalaf, Hesham F. A. Hamed. 2018. Two-phase multi-model automatic brain tumour diagnosis system from magnetic resonance images using convolutional neural networks. *EURASIP Journal on Image and Video Processing* **2018**:1. . [Crossref]

103. Anji Liu, Yuanjun Laili. 2018. Balance gate controlled deep neural network. *Neurocomputing* **320**, 183-194. [Crossref]

104. Rafael Garcia, Alexandru C. Telea, Bruno Castro da Silva, Jim Tørresen, João Luiz Dihl Comba. 2018. A task-and-technique centered survey on visual analytics for deep learning model engineering. *Computers & Graphics* **77**, 30-49. [Crossref]

105. Hao Yang, Junran Zhang, Qihong Liu, Yi Wang. 2018. Multimodal MRI-based classification of migraine: using deep learning convolutional neural network. *BioMedical Engineering OnLine* **17**:1. . [Crossref]

106. Kyungbook Lee, Jungtek Lim, Seongin Ahn, Jaejun Kim. 2018. Feature extraction using a deep learning algorithm for uncertainty quantification of channelized reservoirs. *Journal of Petroleum Science and Engineering* **171**, 1007-1022. [Crossref]

107. Jian Zhang, Shifei Ding, Nan Zhang. 2018. An overview on probability undirected graphs and their applications in image processing. *Neurocomputing* **321**, 156-168. [Crossref]

108. Aboozar Taherkhani, Georgina Cosma, T. M McGinnity. 2018. Deep-FS: A feature selection algorithm for Deep Boltzmann Machines. *Neurocomputing* **322**, 22-37. [Crossref]

109. Neethu Mohan, K.P. Soman, S. Sachin Kumar. 2018. A data-driven strategy for short-term electric load forecasting using dynamic mode decomposition model. *Applied Energy* **232**, 229-244. [Crossref]

110. Linkai Chen, Feiyue Ye, Yaduan Ruan, Honghui Fan, Qimei Chen. 2018. An algorithm for highway vehicle detection based on convolutional neural network. *EURASIP Journal on Image and Video Processing* **2018**:1. . [Crossref]

111. Syahril Ramadhan Saufi, Zair Asrar bin Ahmad, Mohd Salman Leong, Meng Hee Lim. 2018. Differential evolution optimization for resilient stacked sparse autoencoder and its applications on bearing fault diagnosis. *Measurement Science and Technology* **29**:12, 125002. [Crossref]

112. Liang Li, Zhiming Yuan, Yan Gao. 2018. Maximization of energy absorption for a wave energy converter using the deep machine learning. *Energy* **165**, 340-349. [Crossref]

113. Kejun Wang, Xiaoxia Qi, Hongda Liu, Jiakang Song. 2018. Deep belief network based k-means cluster approach for short-term wind power forecasting. *Energy* **165**, 840-852. [Crossref]

114. Nabil Alami, Noureddine En-nahnahi, Said Alaoui Ouatik, Mohammed Meknassi. 2018. Using Unsupervised Deep Learning for Automatic Summarization of Arabic Documents. *Arabian Journal for Science and Engineering* **43**:12, 7803-7815. [Crossref]

115. Jarrod R. McClean, Sergio Boixo, Vadim N. Smelyanskiy, Ryan Babbush, Hartmut Neven. 2018. Barren plateaus in quantum neural network training landscapes. *Nature Communications* **9**:1. . [Crossref]

116. Niannian Wang, Qingan Zhao, Shengyuan Li, Xuefeng Zhao, Peng Zhao. 2018. Damage Classification for Masonry Historic Structures Using Convolutional Neural Networks Based on Still Images. *Computer-Aided Civil and Infrastructure Engineering* **33**:12, 1073-1089. [Crossref]

117. Mohamad M. Al Rahhal, Yakoub Bazi, Mansour Al Zuair, Esam Othman, Bilel BenJdira. 2018. Convolutional Neural Networks for Electrocardiogram Classification. *Journal of Medical and Biological Engineering* **38**:6, 1014-1025. [Crossref]

118. Zhen-Jie Yao, Jie Bi, Yi-Xin Chen. 2018. Applying Deep Learning to Individual and Community Health Monitoring Data: A Survey. *International Journal of Automation and Computing* **15**:6, 643-655. [Crossref]

119. Timothée Lesort, Natalia Díaz-Rodríguez, Jean-Franqis Goudou, David Filliat. 2018. State representation learning for control: An overview. *Neural Networks* **108**, 379-392. [Crossref]

120. Lin Ning, Randall Pittman, Xipeng Shen. 2018. LCD: A Fast Contrastive Divergence Based Algorithm for Restricted Boltzmann Machine. *Neural Networks* **108**, 399-410. [Crossref]

121. Lingzhi Yi, Weihong Xiao, Wenxin Yu, Binren Wang. 2018. Dynamical analysis, circuit implementation and deep belief network control of new six-dimensional hyperchaotic system. *Journal of Algorithms & Computational Technology* **12**:4, 361-375. [Crossref]

122. Georgy Derevyanko, Sergei Grudinin, Yoshua Bengio, Guillaume Lamoureux. 2018. Deep convolutional networks for quality assessment of protein folds. *Bioinformatics* **34**:23, 4046-4053. [Crossref]

123. Mohammad Reza Mohammadnia-Qaraei, Reza Monsefi, Kamaledin Ghiasi-Shirazi. 2018. Convolutional kernel networks based on a convex combination of cosine kernels. *Pattern Recognition Letters* **116**, 127-134. [Crossref]

124. Maryam Akhavan Aghdam, Arash Sharifi, Mir Mohsen Pedram. 2018. Combination of rs-fMRI and sMRI Data to Discriminate Autism Spectrum Disorders in Young Children Using Deep Belief Network. *Journal of Digital Imaging* **31**:6, 895-903. [Crossref]

125. Ritika Wason. 2018. Deep learning: Evolution and expansion. *Cognitive Systems Research* **52**, 701-708. [Crossref]

126. Yu Wang, Lei Han, Yin-Jing Lin, Yue Shen, Wei Zhang. 2018. A tropical cyclone similarity search algorithm based on deep learning method. *Atmospheric Research* **214**, 386-398. [Crossref]

127. Chunjiao Dong, Chunfu Shao, David B. Clarke, Shashi S. Nambisan. 2018. An innovative approach for traffic crash estimation and prediction on accommodating

unobserved heterogeneities. *Transportation Research Part B: Methodological* **118**, 407-428. [Crossref]

128. Tao Zhan, Maoguo Gong, Jia Liu, Puzhao Zhang. 2018. Iterative feature mapping network for detecting multiple changes in multi-source remote sensing images. *ISPRS Journal of Photogrammetry and Remote Sensing* **146**, 38-51. [Crossref]

129. Paheding Sidike, Vijayan K. Asari, Vasit Sagan. 2018. Progressively Expanded Neural Network (PEN Net) for hyperspectral image classification: A new neural network paradigm for remote sensing image analysis. *ISPRS Journal of Photogrammetry and Remote Sensing* **146**, 161-181. [Crossref]

130. Shuhan Yuan, Xintao Wu, Yang Xiang. 2018. Incorporating pre-training in long short-term memory networks for tweet classification. *Social Network Analysis and Mining* **8**:1. . [Crossref]

131. Zelin Liu, Changhui Peng, Timothy Work, Jean-Noel Candau, Annie DesRochers, Daniel Kneeshaw. 2018. Application of machine-learning methods in forest ecology: recent progress and future challenges. *Environmental Reviews* **26**:4, 339-350. [Crossref]

132. Daiju Ueda, Akitoshi Shimazaki, Yukio Miki. 2018. Technical and clinical overview of deep learning in radiology. *Japanese Journal of Radiology* **521**. . [Crossref]

133. Markos Georgopoulos, Yannis Panagakis, Maja Pantic. 2018. Modeling of facial aging and kinship: A survey. *Image and Vision Computing* **80**, 58-79. [Crossref]

134. Yong Xu, Bo Huang, Xiaoning Zou, Liying Kong. 2018. Predicting Effectiveness of Generate-and-Validate Patch Generation Systems Using Random Forest. *Wuhan University Journal of Natural Sciences* **23**:6, 525-534. [Crossref]

135. Sheng-Xiang Lv, Lu Peng, Lin Wang. 2018. Stacked autoencoder with echo-state regression for tourism demand forecasting using search query data. *Applied Soft Computing* **73**, 119-133. [Crossref]

136. Nicholas Cummins, Alice Baird, Björn W. Schuller. 2018. Speech analysis for health: Current state-of-the-art and the increasing impact of deep learning. *Methods* **151**, 41-54. [Crossref]

137. Nada Essa, Eman El-Daydamony, Ahmed Atwan Mohamed. 2018. Enhanced technique for Arabic handwriting recognition using deep belief network and a morphological algorithm for solving ligature segmentation. *ETRI Journal* **40**:6, 774-787. [Crossref]

138. Ezequiel López-Rubio. 2018. Computational Functionalism for the Deep Learning Era. *Minds and Machines* **28**:4, 667-688. [Crossref]

139. Jinxi Guo, Ning Xu, Kailun Qian, Yang Shi, Kaiyuan Xu, Yingnian Wu, Abeer Alwan. 2018. Deep neural network based i-vector mapping for speaker verification using short utterances. *Speech Communication* **105**, 92-102. [Crossref]

140. Georg Helbing, Matthias Ritter. 2018. Deep Learning for fault detection in wind turbines. *Renewable and Sustainable Energy Reviews* **98**, 189-198. [Crossref]

141. Muxuan Liang, Ting Ye, Haoda Fu. 2018. Estimating individualized optimal combination therapies through outcome weighted deep learning algorithms. *Statistics in Medicine* **37**:27, 3869-3886. [Crossref]

142. Xianyu Zhang, Xinguo Ming, Zhiwen Liu, Dao Yin, Zhihua Chen, Yuan Chang. 2018. A reference framework and overall planning of industrial artificial intelligence (I-AI) for new application scenarios. *The International Journal of Advanced Manufacturing Technology* **18**. . [Crossref]

143. W.M. Wang, J.W. Wang, A.V. Barenji, Zhi Li, Eric Tsui. 2018. Modeling of individual customer delivery satisfaction: an AutoML and multi-agent system approach. *Industrial Management & Data Systems* **1**. . [Crossref]

144. Qiwan Hu, Mudong Feng, Luhua Lai, Jianfeng Pei. 2018. Prediction of Drug-Likeness Using Deep Autoencoder Neural Networks. *Frontiers in Genetics* **9**. . [Crossref]

145. Riccardo Miotto, Fei Wang, Shuang Wang, Xiaoqian Jiang, Joel T Dudley. 2018. Deep learning for healthcare: review, opportunities and challenges. *Briefings in Bioinformatics* **19**:6, 1236-1246. [Crossref]

146. Chen Guo, Yue-lan Liu, Xuan Jiao. 2018. Study on the influence of variable stride scale change on image recognition in CNN. *Multimedia Tools and Applications* **2**. . [Crossref]

147. David Thomas, Steven M. Kahn. 2018. Searching for Subsecond Stellar Variability with Wide-field Star Trails and Deep Learning. *The Astrophysical Journal* **868**:1, 38. [Crossref]

148. Berkman Sahiner, Aria Pezeshk, Lubomir M. Hadjiiski, Xiaosong Wang, Karen Drukker, Kenny H. Cha, Ronald M. Summers, Maryellen L. Giger. 2018. Deep learning in medical imaging and radiation therapy. *Medical Physics* **529**. . [Crossref]

149. Congcong Gu, Zhicheng Ji, Yan Wang. 2018. The improvement of classification accuracy with denoising class autoencoder. *Modern Physics Letters B* **9**, 1840108. [Crossref]

150. Lixiang Duan, Mengyun Xie, Jinjiang Wang, Tangbo Bai. 2018. Deep learning enabled intelligent fault diagnosis: Overview and applications. *Journal of Intelligent & Fuzzy Systems* **35**:5, 5771-5784. [Crossref]

151. Nimrod Rappoport, Ron Shamir. 2018. Multi-omic and multi-view clustering algorithms: review and cancer benchmark. *Nucleic Acids Research* **46**:20, 10546-10562. [Crossref]

152. Cheng Yang, Longshu Yang, Man Zhou, Haoling Xie, Chengjiu Zhang, May D Wang, Huaiqiu Zhu. 2018. LncADeep: an ab initio lncRNA identification and functional annotation tool based on deep learning. *Bioinformatics* **34**:22, 3825-3834. [Crossref]

153. Pengyang Wang, Yanjie Fu, Jiawei Zhang, Xiaolin Li, Dan Lin. 2018. Learning Urban Community Structures. *ACM Transactions on Intelligent Systems and Technology* **9**:6, 1-28. [Crossref]

154. Aras R. Dargazany, Paolo Stegagno, Kunal Mankodiya. 2018. WearableDL: Wearable Internet-of-Things and Deep Learning for Big Data Analytics—Concept, Literature, and Future. *Mobile Information Systems* **2018**, 1-20. [Crossref]

155. Mehran Mirkhan, Mohammad Reza Meybodi. 2018. Restricted Convolutional Neural Networks. *Neural Processing Letters* **7**. . [Crossref]

156. Fajie Ye, Xiongfei Li, Xiaoli Zhang. 2018. FusionCNN: a remote sensing image fusion algorithm based on deep convolutional neural networks. *Multimedia Tools and Applications* **79**. . [Crossref]

157. D. J. Jagannath, D. Raveena Judie Dolly, J. Dinesh Peter. 2018. A novel Bayesian deep learning methodology for enhanced foetal cardiac signal mining. *Journal of Experimental & Theoretical Artificial Intelligence* **1**, 1-10. [Crossref]

158. Andee Kaplan, Daniel Nordman, Stephen Vardeman. 2018. Properties and Bayesian fitting of restricted Boltzmann machines. *Statistical Analysis and Data Mining: The ASA Data Science Journal* **112**. . [Crossref]

159. Fatemeh Vakhshiteh, Farshad Almasganj. 2018. Exploration of Properly Combined Audiovisual Representation with the Entropy Measure in Audiovisual Speech Recognition. *Circuits, Systems, and Signal Processing* **61**. . [Crossref]

160. Jing Li, Yandan Wang, John See, Wenbin Liu. 2018. Micro-expression recognition based on 3D flow convolutional neural network. *Pattern Analysis and Applications* **5**. . [Crossref]

161. Zhen Qin, Erqiang Zhou, Yi Ding, Yang Zhao, Fuhu Deng, Hu Xiong. Data Service Outsourcing and Privacy Protection in Mobile Internet . [Crossref]

162. Wenwen Li, Chia-Yu Hsu. 2018. Automated terrain feature identification from remote sensing imagery: a deep learning approach. *International Journal of Geographical Information Science* **2**, 1-24. [Crossref]

163. Chaopeng Shen. 2018. A Transdisciplinary Review of Deep Learning Research and Its Relevance for Water Resources Scientists. *Water Resources Research* **53**. . [Crossref]

164. David Charte, Francisco Charte, Salvador García, María J. del Jesus, Francisco Herrera. 2018. A practical tutorial on autoencoders for nonlinear feature fusion: Taxonomy, models, software and guidelines. *Information Fusion* **44**, 78-96. [Crossref]

165. Zilong Hu, Jinshan Tang, Ziming Wang, Kai Zhang, Ling Zhang, Qingling Sun. 2018. Deep learning for image-based cancer detection and diagnosis – A survey. *Pattern Recognition* **83**, 134-149. [Crossref]

166. Fengfu Li, Hong Qiao, Bo Zhang. 2018. Discriminatively boosted image clustering with fully convolutional auto-encoders. *Pattern Recognition* **83**, 161-173. [Crossref]

167. Masafumi Nakano, Akihiko Takahashi, Soichiro Takahashi. 2018. Bitcoin technical trading with artificial neural network. *Physica A: Statistical Mechanics and its Applications* **510**, 587-609. [Crossref]

168. Shuhui Wang, Jiawei Xiang, Yongteng Zhong, Hesheng Tang. 2018. A data indicator-based deep belief networks to detect multiple faults in axial piston pumps. *Mechanical Systems and Signal Processing* **112**, 154-170. [Crossref]

169. Jiasong Wu, Shijie Qiu, Youyong Kong, Longyu Jiang, Yang Chen, Wankou Yang, Lotfi Senhadji, Huazhong Shu. 2018. PCANet: An energy perspective. *Neurocomputing* **313**, 271-287. [Crossref]

170. Zhiqi Huang, Xizhao Wang. 2018. Sensitivity of data matrix rank in non-iterative training. *Neurocomputing* **313**, 386-391. [Crossref]

171. Berna Altınel, Murat Can Ganiz. 2018. Semantic text classification: A survey of past and recent advances. *Information Processing & Management* **54**:6, 1129-1153. [Crossref]

172. Longting Chen, Guanghua Xu, Yi Wang, Jianhua Wang. 2018. Detection of weak transient signals based on unsupervised learning for bearing fault diagnosis. *Neurocomputing* **314**, 445-457. [Crossref]

173. Seongin Ahn, Changhyup Park, Jaejun Kim, Joe M. Kang. 2018. Data-driven inverse modeling with a pre-trained neural network at heterogeneous channel reservoirs. *Journal of Petroleum Science and Engineering* **170**, 785-796. [Crossref]

174. Jie Chen, ZhongCheng Wu, Jun Zhang, Fang Li, WenJing Li, ZiHeng Wu. 2018. Cross-covariance regularized autoencoders for nonredundant sparse feature representation. *Neurocomputing* **316**, 49-58. [Crossref]

175. Hongliang Yan, Zifei Yan, Gang Xiao, Weizhi Wang, Wangmeng Zuo. 2018. Deep vanishing component analysis network for pattern classification. *Neurocomputing* **316**, 240-250. [Crossref]

176. Jens Berg, Kaj Nyström. 2018. A unified deep artificial neural network approach to partial differential equations in complex geometries. *Neurocomputing* **317**, 28-41. [Crossref]

177. Linqi Huang, Jun Li, Hong Hao, Xibing Li. 2018. Micro-seismic event detection and location in underground mines by using Convolutional Neural Networks (CNN) and deep learning. *Tunnelling and Underground Space Technology* **81**, 265-276. [Crossref]

178. Yan Tian, Kaili Zhang, Jianyuan Li, Xianxuan Lin, Bailin Yang. 2018. LSTM-based traffic flow prediction with missing data. *Neurocomputing* **318**, 297-305. [Crossref]

179. Yang Zhang, Changhui Hu, Xiaobo Lu. 2018. Face recognition under varying illumination based on singular value decomposition and retina modeling. *Multimedia Tools and Applications* **77**:21, 28355-28374. [Crossref]

180. Dingfei Guo, Maiying Zhong, Hongquan Ji, Yang Liu, Rui Yang. 2018. A hybrid feature model and deep learning based fault diagnosis for unmanned aerial vehicle sensors. *Neurocomputing* **319**, 155-163. [Crossref]

181. Sergey M. Plis, Md Faijul Amin, Adam Chekroud, Devon Hjelm, Eswar Damaraju, Hyo Jong Lee, Juan R. Bustillo, KyungHyun Cho, Godfrey D. Pearlson, Vince

D. Calhoun. 2018. Reading the (functional) writing on the (structural) wall: Multimodal fusion of brain structure and function via a deep neural network based translation approach reveals novel impairments in schizophrenia. *NeuroImage* **181**, 734-747. [Crossref]

182. Hoang Nguyen, Le-Minh Kieu, Tao Wen, Chen Cai. 2018. Deep learning methods in transportation domain: a review. *IET Intelligent Transport Systems* **12**:9, 998-1004. [Crossref]

183. Junfei Qiao, Gongming Wang, Wenjing Li, Min Chen. 2018. An adaptive deep Q-learning strategy for handwritten digit recognition. *Neural Networks* **107**, 61-71. [Crossref]

184. M. Alam, L. Vidyaratne, K.M. Iftekharuddin. 2018. Novel deep generative simultaneous recurrent model for efficient representation learning. *Neural Networks* **107**, 12-22. [Crossref]

185. Ying Li, Haokui Zhang, Xizhe Xue, Yenan Jiang, Qiang Shen. 2018. Deep learning for remote sensing image classification: A survey. *Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery* **8**:6, e1264. [Crossref]

186. Mohammad Hasan Rahmani, Farshad Almasganj, Seyyed Ali Seyyedsalehi. 2018. Audio-visual feature fusion via deep neural networks for automatic speech recognition. *Digital Signal Processing* **82**, 54-63. [Crossref]

187. Yuxuan Chen, Yi Jin, Galantu Jiri. 2018. Predicting tool wear with multi-sensor data using deep belief networks. *The International Journal of Advanced Manufacturing Technology* **99**:5-8, 1917-1926. [Crossref]

188. Constantin Spille, Birger Kollmeier, Bernd T. Meyer. 2018. Comparing human and automatic speech recognition in simple and complex acoustic scenes. *Computer Speech & Language* **52**, 123-140. [Crossref]

189. Ding-Xuan Zhou. 2018. Deep distributed convolutional neural networks: Universality. *Analysis and Applications* **16**:06, 895-919. [Crossref]

190. Da Li, Ji Shujuan, Zhang Chunjin. 2018. Improved broad learning system: partial weights modification based on BP algorithm. *IOP Conference Series: Materials Science and Engineering* **439**, 032083. [Crossref]

191. Ke Yan, Xudong Wang, Yang Du, Ning Jin, Haichao Huang, Hangxia Zhou. 2018. Multi-Step Short-Term Power Consumption Forecasting with a Hybrid Deep Learning Strategy. *Energies* **11**:11, 3089. [Crossref]

192. Duy-Tang Hoang, Hee-Jun Kang. 2018. A survey on Deep Learning based bearing fault diagnosis. *Neurocomputing* . [Crossref]

193. U. Rajendra Acharya, Yuki Hagiwara, Hojjat Adeli. 2018. Automated seizure prediction. *Epilepsy & Behavior* **88**, 251-261. [Crossref]

194. Andrés Ortiz, Francisco J. Martínez Murcia, Jorge Munilla, Juan M. Górriz, Javier Ramírez. 2018. Label aided deep ranking for the automatic diagnosis of Parkinsonian syndromes. *Neurocomputing* . [Crossref]

195. Hung Nguyen, Cheol-Hong Kim, Jong-Myon Kim. 2018. Effective Prediction of Bearing Fault Degradation under Different Crack Sizes Using a Deep Neural Network. *Applied Sciences* **8**:11, 2332. [Crossref]

196. Masoumeh Zareapoor, Pourya Shamsolmoali, Deepak Kumar Jain, Haoxiang Wang, Jie Yang. 2018. Kernelized support vector machine with deep learning: An efficient approach for extreme multiclass dataset. *Pattern Recognition Letters* **115**, 4-13. [Crossref]

197. Boukaye Boubacar Traore, Bernard Kamsu-Foguem, Fana Tangara. 2018. Deep convolution neural network for image recognition. *Ecological Informatics* **48**, 257-268. [Crossref]

198. Yihui Xiong, Renguang Zuo, Emmanuel John M. Carranza. 2018. Mapping mineral prospectivity through big data analytics and a deep learning algorithm. *Ore Geology Reviews* **102**, 811-817. [Crossref]

199. Fenghua Huang, Ying Yu, Tinghao Feng. 2018. Automatic Extraction of Impervious Surfaces from High Resolution Remote Sensing Images Based on Deep Learning. *Journal of Visual Communication and Image Representation* . [Crossref]

200. Zejia Zheng, Xiang Wu, Juyang Weng. 2018. Emergent neural turing machine and its visual navigation. *Neural Networks* . [Crossref]

201. Nataliya Sokolovska, Karine Clément, Jean-Daniel Zucker. 2018. Revealing Causality between Heterogeneous Data Sources with Deep Restricted Boltzmann Machines. *Information Fusion* . [Crossref]

202. Martin Erdmann, Lukas Geiger, Jonas Glombitza, David Schmidt. 2018. Generating and Refining Particle Detector Simulations Using the Wasserstein Distance in Adversarial Networks. *Computing and Software for Big Science* **2**:1. . [Crossref]

203. Huai Chen, Libao Zhang, Jie Ma, Jue Zhang. 2018. Target heat-map network: An end-to-end deep network for target detection in remote sensing images. *Neurocomputing* . [Crossref]

204. Wei Han, Ruyi Feng, Lizhe Wang, Yafan Cheng. 2018. A semi-supervised generative framework with deep learning features for high-resolution remote sensing image scene classification. *ISPRS Journal of Photogrammetry and Remote Sensing* **145**, 23-43. [Crossref]

205. M.E. Paoletti, J.M. Haut, J. Plaza, A. Plaza. 2018. A new deep convolutional neural network for fast hyperspectral image classification. *ISPRS Journal of Photogrammetry and Remote Sensing* **145**, 120-147. [Crossref]

206. Shuang Wang, Dou Quan, Xuefeng Liang, Mengdan Ning, Yanhe Guo, Licheng Jiao. 2018. A deep learning framework for remote sensing image registration. *ISPRS Journal of Photogrammetry and Remote Sensing* **145**, 148-164. [Crossref]

207. Shuo Feng, Huiyu Zhou, Hongbiao Dong. 2018. Using deep neural network with small dataset to predict material defects. *Materials & Design* . [Crossref]

208. Kristy A Carpenter, David S Cohen, Juliet T Jarrell, Xudong Huang. 2018. Deep learning and virtual drug screening. *Future Medicinal Chemistry* **10**:21, 2557-2567. [Crossref]

209. Rob Ellis. Bodies and Other Objects **34**, . [Crossref]

210. Hao Wu, Yueli Li, Jie Xiong, Xiaohan Bi, Linna Zhang, Rongfang Bie, Junqi Guo. 2018. Weighted-learning-instance-based retrieval model using instance distance. *Machine Vision and Applications* **10**. . [Crossref]

211. Foroogh Sharifzadeh, Gholamreza Akbarizadeh, Yousef Seifi Kavian. 2018. Ship Classification in SAR Images Using a New Hybrid CNN–MLP Classifier. *Journal of the Indian Society of Remote Sensing* **5**. . [Crossref]

212. Suhang Wang, Charu Aggarwal, Huan Liu. 2018. Random-Forest-Inspired Neural Networks. *ACM Transactions on Intelligent Systems and Technology* **9**:6, 1-25. [Crossref]

213. Xiang Zhang, Bingfeng Wu, Lili Dong, Na Ye. 2018. Application of Spark parallelization technology in architectural text classification. *Journal of Computational Methods in Sciences and Engineering* **18**:4, 963-976. [Crossref]

214. Michael Pfeiffer, Thomas Pfeil. 2018. Deep Learning With Spiking Neurons: Opportunities and Challenges. *Frontiers in Neuroscience* **12**. . [Crossref]

215. Khaled Z. Abdelgawad, Mahmoud Elzenary, Salaheldin Elkatatny, Mohamed Mahmoud, Abdulazeez Abdulraheem, Shirish Patil. 2018. New approach to evaluate the equivalent circulating density (ECD) using artificial intelligence techniques. *Journal of Petroleum Exploration and Production Technology* **179**. . [Crossref]

216. Dayu Xu, Xuyao Zhang, Hailin Feng. 2018. Generalized fuzzy soft sets theory-based novel hybrid ensemble credit scoring model. *International Journal of Finance & Economics* **104**. . [Crossref]

217. Huanfei Ma, Siyang Leng, Kazuyuki Aihara, Wei Lin, Luonan Chen. 2018. Randomly distributed embedding making short-term high-dimensional data predictable. *Proceedings of the National Academy of Sciences* **115**:43, E9994-E10002. [Crossref]

218. Zhenhao Tang, Yu Wang, Yusen He, Xiaoyan Wu, Shengxian Cao. 2018. Modeling of Boiler–Turbine Unit with Two-Phase Feature Selection and Deep Belief Network. *JOURNAL OF CHEMICAL ENGINEERING OF JAPAN* **51**:10, 865-873. [Crossref]

219. Dan Guest, Kyle Cranmer, Daniel Whiteson. 2018. Deep Learning and Its Application to LHC Physics. *Annual Review of Nuclear and Particle Science* **68**:1, 161-181. [Crossref]

220. Delowar Hossain, Genci Capi. 2018. Multiobjective evolution of deep learning parameters for robot manipulator object recognition and grasping. *Advanced Robotics* **32**:20, 1090-1101. [Crossref]

221. Ohyung Kwon, Hyung Giun Kim, Min Ji Ham, Wonrae Kim, Gun-Hee Kim, Jae-Hyung Cho, Nam Il Kim, Kangil Kim. 2018. A deep neural network for classification of melt-pool images in metal additive manufacturing. *Journal of Intelligent Manufacturing* **28**. . [Crossref]

222. Junghoon Hah, Woojin Lee, Jaewook Lee, Saerom Park. 2018. Information-Based Boundary Equilibrium Generative Adversarial Networks with Interpretable Representation Learning. *Computational Intelligence and Neuroscience* **2018**, 1-14. [Crossref]

223. Jean-Pierre Briot, François Pachet. 2018. Deep learning for music generation: challenges and directions. *Neural Computing and Applications* **4**. . [Crossref]

224. Doroteo T. Toledano, María Pilar Fernández-Gallego, Alicia Lozano-Diez. 2018. Multi-resolution speech analysis for automatic speech recognition using deep neural networks: Experiments on TIMIT. *PLOS ONE* **13**:10, e0205355. [Crossref]

225. Kyu-Bong Choi, Sung Yun Woo, Won-Mook Kang, Soochang Lee, Chul-Heung Kim, Jong-Ho Bae, Suhwan Lim, Jong-Ho Lee. 2018. A Split-Gate Positive Feedback Device With an Integrate-and-Fire Capability for a High-Density Low-Power Neuron Circuit. *Frontiers in Neuroscience* **12**. . [Crossref]

226. Zhi-Hua Zhou, Ji Feng. 2018. Deep forest. *National Science Review* **50**. . [Crossref]

227. . Machine Learning Algorithms 199-226. [Crossref]

228. Yunfei Han, Tonghai Jiang, Yupeng Ma, Chunxiang Xu. 2018. Pretraining Convolutional Neural Networks for Image-Based Vehicle Classification. *Advances in Multimedia* **2018**, 1-10. [Crossref]

229. DeLiang Wang, Jitong Chen. 2018. Supervised Speech Separation Based on Deep Learning: An Overview. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **26**:10, 1702-1726. [Crossref]

230. Chi-Man Vong, Chuangquan Chen, Pak-Kin Wong. 2018. Empirical kernel map-based multilayer extreme learning machines for representation learning. *Neurocomputing* **310**, 265-276. [Crossref]

231. Mika Rafieferantsoa, Sambatra Andrianomena, Romeel Davé. 2018. Predicting the neutral hydrogen content of galaxies from optical data using machine learning. *Monthly Notices of the Royal Astronomical Society* **479**:4, 4509-4525. [Crossref]

232. Usman Safder, KiJeon Nam, Dongwoo Kim, Mohsen Shahlaei, ChangKyoo Yoo. 2018. Quantitative structure-property relationship (QSPR) models for predicting the physicochemical properties of polychlorinated biphenyls (PCBs) using deep belief network. *Ecotoxicology and Environmental Safety* **162**, 17-28. [Crossref]

233. Zhiqiang Geng, Zhongkun Li, Yongming Han. 2018. A new deep belief network based on RBM with glial chains. *Information Sciences* **463-464**, 294-306. [Crossref]

234. Bo Yue, Shuang Wang, Xuefeng Liang, Licheng Jiao. 2018. An external learning assisted self-examples learning for image super-resolution. *Neurocomputing* **312**, 107-119. [Crossref]

235. Mei Wang, Weihong Deng. 2018. Deep visual domain adaptation: A survey. *Neurocomputing* **312**, 135-153. [Crossref]

236. Aldonso Becerra, J. Ismael de la Rosa, Efrén González, A. David Pedroza, N. Iracemi Escalante. 2018. Training deep neural networks with non-uniform frame-level cost function for automatic speech recognition. *Multimedia Tools and Applications* **77**:20, 27231-27267. [Crossref]

237. Lixia Xue, Xin Zhong, Ronggui Wang, Juan Yang, Min Hu. 2018. Low - resolution vehicle recognition based on deep feature fusion. *Multimedia Tools and Applications* **77**:20, 27617-27639. [Crossref]

238. Yun Bai, Zhenzhong Sun, Bo Zeng, Jianyu Long, Chuan Li, Jin Zhang. 2018. Reservoir Inflow Forecast Using a Clustered Random Deep Fusion Approach in the Three Gorges Reservoir, China. *Journal of Hydrologic Engineering* **23**:10, 04018041. [Crossref]

239. Zhifeng Guo, Kaile Zhou, Xiaoling Zhang, Shanlin Yang. 2018. A deep learning model for short-term power load and probability density forecasting. *Energy* **160**, 1186-1200. [Crossref]

240. Junming Zhang, Yan Wu. 2018. Complex-valued unsupervised convolutional neural networks for sleep stage classification. *Computer Methods and Programs in Biomedicine* **164**, 181-191. [Crossref]

241. Khizar Hayat. 2018. Multimedia super-resolution via deep learning: A survey. *Digital Signal Processing* **81**, 198-217. [Crossref]

242. Dong-Xu Wen, Y.C. Lin, Xin-He Li, Swadesh Kumar Singh. 2018. Hot deformation characteristics and dislocation substructure evolution of a nickel-base alloy considering effects of δ phase. *Journal of Alloys and Compounds* **764**, 1008-1020. [Crossref]

243. Félix G. Harvey, Julien Roy, David Kanaa, Christopher Pal. 2018. Recurrent semi-supervised classification and constrained adversarial generation with motion capture data. *Image and Vision Computing* **78**, 42-52. [Crossref]

244. Dongxu Liu, Hongzhao Dong, Tiebei Li, Jonathan Corcoran, Shiming Ji. 2018. Vehicle scheduling approach and its practice to optimise public bicycle redistribution in Hangzhou. *IET Intelligent Transport Systems* **12**:8, 976-985. [Crossref]

245. Fenling Feng, Wan Li, Qiwei Jiang. 2018. Railway freight volume forecast using an ensemble model with optimised deep belief network. *IET Intelligent Transport Systems* **12**:8, 851-859. [Crossref]

246. Lingheng Meng, Shifei Ding, Nan Zhang, Jian Zhang. 2018. Research of stacked denoising sparse autoencoder. *Neural Computing and Applications* **30**:7, 2083-2100. [Crossref]

247. Unjin Pak, Chungsong Kim, Unsok Ryu, Kyongjin Sok, Sungnam Pak. 2018. A hybrid model based on convolutional neural networks and long short-term memory

for ozone concentration prediction. *Air Quality, Atmosphere & Health* **11**:8, 883-895. [Crossref]

248. Mohammad Ahangar Kiasari, Dennis Singh Moirangthem, Minho Lee. 2018. Joint moment-matching autoencoders. *Neural Networks* **106**, 185-193. [Crossref]

249. Michael Kampffmeyer, Sigurd Løkse, Filippo M. Bianchi, Robert Jenssen, Lorenzo Livi. 2018. The deep kernelized autoencoder. *Applied Soft Computing* **71**, 816-825. [Crossref]

250. Victor Garcia-Font, Carles Garrigues, Helena Rifà-Pous. 2018. Difficulties and Challenges of Anomaly Detection in Smart Cities: A Laboratory Analysis. *Sensors* **18**:10, 3198. [Crossref]

251. Richard M. Golden. 2018. Adaptive Learning Algorithm Convergence in Passive and Reactive Environments. *Neural Computation* **30**:10, 2805-2832. [Abstract] [Full Text] [PDF] [PDF Plus]

252. Arafat Abu Mallouh, Zakariya Qawaqneh, Buket D. Barkana. 2018. New transformed features generated by deep bottleneck extractor and a GMM–UBM classifier for speaker age and gender classification. *Neural Computing and Applications* **30**:8, 2581-2593. [Crossref]

253. Van Tung Tran, Faisal AlThobiani, Tiedo Tinga, Andrew Ball, Gang Niu. 2018. Single and combined fault diagnosis of reciprocating compressor valves using a hybrid deep belief network. *Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science* **232**:20, 3767-3780. [Crossref]

254. Fahimeh Ghasemi, Alireza Mehridehnavi, Alfonso Pérez-Garrido, Horacio Pérez-Sánchez. 2018. Neural network and deep-learning algorithms used in QSAR studies: merits and drawbacks. *Drug Discovery Today* **23**:10, 1784-1790. [Crossref]

255. Kevin D. Himberger, Hsiang-Yun Chien, Christopher J. Honey. 2018. Principles of Temporal Processing Across the Cortical Hierarchy. *Neuroscience* **389**, 161-174. [Crossref]

256. Xiang Li, Youjun Xu, Luhua Lai, Jianfeng Pei. 2018. Prediction of Human Cytochrome P450 Inhibition Using a Multitask Deep Autoencoder Neural Network. *Molecular Pharmaceutics* **15**:10, 4336-4345. [Crossref]

257. Hoon Kang, Hyun Su Lee. 2018. Projection spectral analysis: A unified approach to PCA and ICA with incremental learning. *ETRI Journal* **40**:5, 634-642. [Crossref]

258. DianGe Yang, Kun Jiang, Ding Zhao, ChunLei Yu, Zhong Cao, ShiChao Xie, ZhongYang Xiao, XinYu Jiao, SiJia Wang, Kai Zhang. 2018. Intelligent and connected vehicles: Current status and future perspectives. *Science China Technological Sciences* **61**:10, 1446-1471. [Crossref]

259. Luca Oneto, Nicolò Navarin, Alessandro Sperduti, Davide Anguita. 2018. Multilayer Graph Node Kernels: Stacking While Maintaining Convexity. *Neural Processing Letters* **48**:2, 649-667. [Crossref]

260. Bo Li, Cheng Chen. 2018. First-Order Sensitivity Analysis for Hidden Neuron Selection in Layer-Wise Training of Networks. *Neural Processing Letters* **48**:2, 1105-1121. [Crossref]

261. Lu Huang, Lu-yang Xiang. 2018. Method for Meteorological Early Warning of Precipitation-Induced Landslides Based on Deep Neural Network. *Neural Processing Letters* **48**:2, 1243-1260. [Crossref]

262. Eric W. Tramel, Marylou Gabrié, Andre Manoel, Francesco Caltagirone, Florent Krzakala. 2018. Deterministic and Generalized Framework for Unsupervised Learning with Restricted Boltzmann Machines. *Physical Review X* **8**:4. . [Crossref]

263. Tatjana Puškarov, Axel Cortés Cubero. 2018. Machine learning algorithms based on generalized Gibbs ensembles. *Journal of Statistical Mechanics: Theory and Experiment* **2018**:10, 103102. [Crossref]

264. Yujun Zeng, Lilin Qian, Junkai Ren. 2018. Evolutionary Hierarchical Sparse Extreme Learning Autoencoder Network for Object Recognition. *Symmetry* **10**:10, 474. [Crossref]

265. Xiaoyu Zhang, Zhe Shu, Rui Wang, Tao Zhang, Yabing Zha. 2018. Short-Term Load Interval Prediction Using a Deep Belief Network. *Energies* **11**:10, 2744. [Crossref]

266. Shidrokh Goudarzi, Mohd Kama, Mohammad Anisi, Seyed Soleymani, Faiyaz Doctor. 2018. Self-Organizing Traffic Flow Prediction with an Optimized Deep Belief Network for Internet of Vehicles. *Sensors* **18**:10, 3459. [Crossref]

267. Doo Seok Jeong, Cheol Seong Hwang. 2018. Nonvolatile Memory Materials for Neuromorphic Intelligent Machines. *Advanced Materials* **30**:42, 1704729. [Crossref]

268. Enrique Romero, Ferran Mazzanti, Jordi Delgado, David Buchaca. 2018. Weighted contrastive divergence. *Neural Networks* . [Crossref]

269. Patrick Rebentrost, Thomas R. Bromley, Christian Weedbrook, Seth Lloyd. 2018. Quantum Hopfield neural network. *Physical Review A* **98**:4. . [Crossref]

270. Arafat Abu Mallouh, Zakariya Qawaqneh, Buket Barkana. 2018. A New Cost Function Combining Deep Neural Networks (DNNs) and l2,1-Norm with Extraction of Robust Facial and Superpixels Features in Age Estimation. *Applied Sciences* **8**:10, 1943. [Crossref]

271. Toktam Zoughi, Mohammad Mehdi Homayounpour. 2018. DBMiP: A pre-training method for information propagation over deep networks. *Computer Speech & Language* . [Crossref]

272. Alkiviadis Savvopoulos, Andreas Kanavos, Phivos Mylonas, Spyros Sioutas. 2018. LSTM Accelerator for Convolutional Object Identification. *Algorithms* **11**:10, 157. [Crossref]

273. Wenjing Dai, Meng Wang, Zhibin Niu, Jiawan Zhang. 2018. Chart decoder: Generating textual and numeric information from chart images automatically. *Journal of Visual Languages & Computing* **48**, 101-109. [Crossref]

274. Ting Mao, Yun Zhang, Yufei Ruan, Huang Gao, Huamin Zhou, Dequn Li. 2018. Feature learning and process monitoring of injection molding using convolution-deconvolution auto encoders. *Computers & Chemical Engineering* **118**, 77-90. [Crossref]

275. Shiqing Zhang, Shiliang Zhang, Tiejun Huang, Wen Gao, Qi Tian. 2018. Learning Affective Features With a Hybrid Deep Model for Audio–Visual Emotion Recognition. *IEEE Transactions on Circuits and Systems for Video Technology* **28**:10, 3030-3043. [Crossref]

276. Fouzi Harrou, Abdelkader Dairi, Ying Sun, Mohamed Senouci. 2018. Statistical monitoring of a wastewater treatment plant: A case study. *Journal of Environmental Management* **223**, 807-814. [Crossref]

277. Yanlai Zhou, Fi-John Chang, Li-Chiu Chang, I-Feng Kao, Yi-Shin Wang. 2018. Explore a deep learning multi-output neural network for regional multi-step-ahead air quality forecasts. *Journal of Cleaner Production* . [Crossref]

278. Jinrui Wang, Shunming Li, Zenghui An, Xingxing Jiang, Weiwei Qian, Shanshan Ji. 2018. Batch-normalized deep neural networks for achieving fast intelligent fault diagnosis of machines. *Neurocomputing* . [Crossref]

279. Ahmed Dawoud, Seyed Shahristani, Chun Raun. 2018. Deep learning and software-defined networks: Towards secure IoT architecture. *Internet of Things* **3-4**, 82-89. [Crossref]

280. Jesus Lago, Karel De Brabandere, Fjo De Ridder, Bart De Schutter. 2018. Short-term forecasting of solar irradiance without local telemetry: A generalized model using satellite data. *Solar Energy* **173**, 566-577. [Crossref]

281. Elaheh Rashedi, Elaheh Barati, Matthew Nokleby, Xue-wen Chen. 2018. "Stream loss": ConvNet learning for face verification using unlabeled videos in the wild. *Neurocomputing* . [Crossref]

282. GuoJun Liu, Yang Liu, MaoZu Guo, Peng Li, MingYu Li. 2018. Variational inference with Gaussian mixture model and householder flow. *Neural Networks* . [Crossref]

283. Yaqi Chu, Xingang Zhao, Yijun Zou, Weiliang Xu, Jianda Han, Yiwen Zhao. 2018. A Decoding Scheme for Incomplete Motor Imagery EEG With Deep Belief Network. *Frontiers in Neuroscience* **12**. . [Crossref]

284. . Neural Networks, Deep Learning, and Tree-Based Methods 173-216. [Crossref]

285. Juan Li, Jing Luo, Jianhang Ding, Xi Zhao, Xinyu Yang. 2018. Regional classification of Chinese folk songs based on CRF model. *Multimedia Tools and Applications* **26**. . [Crossref]

286. Hao Zhang, Tao Huang, Zhihan Lv, Sanya Liu, Heng Yang. 2018. MOOCRC: A Highly Accurate Resource Recommendation Model for Use in MOOC Environments. *Mobile Networks and Applications* **56**. . [Crossref]

287. Zhiqiang Zhang, Yi Zhao, Xiangke Liao, Wenqiang Shi, Kenli Li, Quan Zou, Shaoliang Peng. 2018. Deep learning in omics: a survey and guideline. *Briefings in Functional Genomics* **5**. . [Crossref]

288. Michael Vogt. 2018. An overview of deep learning techniques. *at - Automatisierungstechnik* **66**:9, 690-703. [Crossref]

289. Pitoyo Hartono, Thomas Trappenberg. 2018. Topographic representation adds robustness to supervised learning. *Journal of Intelligent & Fuzzy Systems* **521**, 1-14. [Crossref]

290. Guang Shi, Jiangshe Zhang, Huirong Li, Changpeng Wang. 2018. Enhance the Performance of Deep Neural Networks via L2 Regularization on the Input of Activations. *Neural Processing Letters* **19**. . [Crossref]

291. Bin Zhang, Huaxiang Zhang, Jiande Sun, Zhenhua Wang, Hongchen Wu, Xiao Dong. 2018. Modality-Reconstructed Cross-Media Retrieval via Sparse Neural Networks Pre-Trained by Restricted Boltzmann Machines. *Journal of Advanced Computational Intelligence and Intelligent Informatics* **22**:5, 611-620. [Crossref]

292. Amirhessam Tahmassebi, Amir H. Gandomi, Simon Fong, Anke Meyer-Baese, Simon Y. Foo. 2018. Multi-stage optimization of a deep model: A case study on ground motion modeling. *PLOS ONE* **13**:9, e0203829. [Crossref]

293. Chao Ni, Yun Zhang, Dongyi Wang. 2018. Moisture Content Quantization of Masson Pine Seedling Leaf Based on Stacked Autoencoder with Near-Infrared Spectroscopy. *Journal of Electrical and Computer Engineering* **2018**, 1-8. [Crossref]

294. Bouchra Lamrini, El-Khadir Lakhal. A Survey of Deep Learning Methods for WTP Control and Monitoring . [Crossref]

295. Samira Pouyanfar, Saad Sadiq, Yilin Yan, Haiman Tian, Yudong Tao, Maria Presa Reyes, Mei-Ling Shyu, Shu-Ching Chen, S. S. Iyengar. 2018. A Survey on Deep Learning. *ACM Computing Surveys* **51**:5, 1-36. [Crossref]

296. Qianqian Wang, Fang'ai Liu, Shuning Xing, Xiaohui Zhao. 2018. A New Approach for Advertising CTR Prediction Based on Deep Neural Network via Attention Mechanism. *Computational and Mathematical Methods in Medicine* **2018**, 1-11. [Crossref]

297. Yohei Nishitsuji, Russell Exley. 2018. Elastic impedance based facies classification using support vector machine and deep learning. *Geophysical Prospecting* **2**. . [Crossref]

298. ZhiFei Lai, HuiFang Deng. 2018. Medical Image Classification Based on Deep Features Extracted by Deep Model and Statistic Feature Fusion with Multilayer Perceptron . *Computational Intelligence and Neuroscience* **2018**, 1-13. [Crossref]

299. Frank Emmert-Streib, Olli P. Yli-Harja, Matthias Dehmer. 2018. Data Analytics Applications for Streaming Data From Social Media: What to Predict?. *Frontiers in Big Data* **1**. . [Crossref]

300. Yuebing Xu, Jing Zhang, Zuqiang Long, Mingyang Lv. 2018. Daily Urban Water Demand Forecasting Based on Chaotic Theory and Continuous Deep Belief Neural Network. *Neural Processing Letters* **387**. . [Crossref]

301. Kazım Hanbay. 2018. Deep neural network based approach for ECG classification using hybrid differential features and active learning. *IET Signal Processing* . [Crossref]

302. Henry Friday Nweke, Ying Wah Teh, Mohammed Ali Al-garadi, Uzoma Rita Alo. 2018. Deep learning algorithms for human activity recognition using mobile and wearable sensor networks: State of the art and research challenges. *Expert Systems with Applications* **105**, 233-261. [Crossref]

303. Xianjun Xia, Roberto Togneri, Ferdous Sohel, David Huang. 2018. Random forest classification based acoustic event detection utilizing contextual-information and bottleneck features. *Pattern Recognition* **81**, 1-13. [Crossref]

304. Yu Xie, Maoguo Gong, Shanfeng Wang, Bin Yu. 2018. Community discovery in networks with deep sparse filtering. *Pattern Recognition* **81**, 50-59. [Crossref]

305. Xin Wang, Zhiqiang Hou, Wangsheng Yu, Lei Pu, Zefenfen Jin, Xianxiang Qin. 2018. Robust occlusion-aware part-based visual tracking with object scale adaptation. *Pattern Recognition* **81**, 456-470. [Crossref]

306. Guangzheng Hu, Huifang Li, Yuanqing Xia, Lixuan Luo. 2018. A deep Boltzmann machine and multi-grained scanning forest ensemble collaborative method and its application to industrial fault diagnosis. *Computers in Industry* **100**, 287-296. [Crossref]

307. Qiongjie Yao, Xiaofei Liao, Hai Jin. 2018. Training deep neural network on multiple GPUs with a model averaging method. *Peer-to-Peer Networking and Applications* **11**:5, 1012-1021. [Crossref]

308. Shao Haidong, Jiang Hongkai, Zhao Ke, Wei Dongdong, Li Xingqiu. 2018. A novel tracking deep wavelet auto-encoder method for intelligent fault diagnosis of electric locomotive bearings. *Mechanical Systems and Signal Processing* **110**, 193-209. [Crossref]

309. Chih-Wen Chang, Hau-Wei Lee, Chein-Hung Liu. 2018. A Review of Artificial Intelligence Algorithms Used for Smart Machine Tools. *Inventions* **3**:3, 41. [Crossref]

310. Huai Su, Enrico Zio, Jinjun Zhang, Zhe Yang, Xueyi Li, Zongjie Zhang. 2018. A systematic hybrid method for real-time prediction of system conditions in natural gas pipeline networks. *Journal of Natural Gas Science and Engineering* **57**, 31-44. [Crossref]

311. Jian Lian, Sujuan Hou, Xiaodan Sui, Fangzhou Xu, Yuanjie Zheng. 2018. Deblurring retinal optical coherence tomography via a convolutional neural network with anisotropic and double convolution layer. *IET Computer Vision* **12**:6, 900-907. [Crossref]

312. Bin Zhang, Lei Zhu, Jiande Sun, Huaxiang Zhang. 2018. Cross-media retrieval with collective deep semantic learning. *Multimedia Tools and Applications* **77**:17, 22247-22266. [Crossref]

313. Bin-Sen Peng, Hong Xia, Yong-Kuo Liu, Bo Yang, Dan Guo, Shao-Min Zhu. 2018. Research on intelligent fault diagnosis method for nuclear power plant based on correlation analysis and deep belief network. *Progress in Nuclear Energy* **108**, 419-427. [Crossref]

314. N. Kumaran, A. Vadivel, S. Saravana Kumar. 2018. Recognition of human actions using CNN-GWO: a novel modeling of CNN for enhancement of classification performance. *Multimedia Tools and Applications* **77**:18, 23115-23147. [Crossref]

315. Christos Ferles, Yannis Papanikolaou, Kevin J. Naidoo. 2018. Denoising Autoencoder Self-Organizing Map (DASOM). *Neural Networks* **105**, 112-131. [Crossref]

316. Binglong Lu, Haijun Jiang, Cheng Hu, Abdujelil Abdurahman. 2018. Synchronization of hybrid coupled reaction–diffusion neural networks with time delays via generalized intermittent control with spacial sampled-data. *Neural Networks* **105**, 75-87. [Crossref]

317. Heng Shi, Minghao Xu, Ran Li. 2018. Deep Learning for Household Load Forecasting—A Novel Pooling Deep RNN. *IEEE Transactions on Smart Grid* **9**:5, 5271-5280. [Crossref]

318. Hongyi Li, Shengyu Chen, Shaofeng Xu, Ziming Song, Jiaxin Chen, Di Zhao. 2018. EMI signal feature enhancement based on extreme energy difference and deep auto-encoder. *IET Signal Processing* **12**:7, 852-856. [Crossref]

319. Guangwu Qian, Lei Zhang. 2018. A simple feedforward convolutional conceptor neural network for classification. *Applied Soft Computing* **70**, 1034-1041. [Crossref]

320. Manish Raj, Vijay Bhaskar Semwal, G. C. Nandi. 2018. Bidirectional association of joint angle trajectories for humanoid locomotion: the restricted Boltzmann machine approach. *Neural Computing and Applications* **30**:6, 1747-1755. [Crossref]

321. R. Rostami, F. S. Bashiri, B. Rostami, Z. Yu. 2018. A Survey on Data-Driven 3D Shape Descriptors. *Computer Graphics Forum* **15**. . [Crossref]

322. P. Prahs, D. Märker, C. Mayer, H. Helbig. 2018. Deep Learning zur Unterstützung der Therapieentscheidung bei intravitrealen Injektionen. *Der Ophthalmologe* **115**:9, 722-727. [Crossref]

323. Jinglin Du, Yayun Liu, Zhijun Liu. 2018. Study of Precipitation Forecast Based on Deep Belief Networks. *Algorithms* **11**:9, 132. [Crossref]

324. Jose Bernal, Kaisar Kushibar, Daniel S. Asfaw, Sergi Valverde, Arnau Oliver, Robert Martí, Xavier Lladó. 2018. Deep convolutional neural networks for brain image analysis on magnetic resonance imaging: a review. *Artificial Intelligence in Medicine* . [Crossref]

325. N. Krishna Kumar, R. Savitha, Abdullah Al Mamun. 2018. Ocean wave characteristics prediction and its load estimation on marine structures: A transfer learning approach. *Marine Structures* **61**, 202-219. [Crossref]

326. Henry Han, Ke Men. 2018. How does normalization impact RNA-seq disease diagnosis?. *Journal of Biomedical Informatics* **85**, 80-92. [Crossref]

327. Qing Tian, Tal Arbel, James J. Clark. 2018. Structured deep Fisher pruning for efficient facial trait classification. *Image and Vision Computing* **77**, 45-59. [Crossref]

328. Yundong Li, Hongguang Li, Hongren Wang. 2018. Pixel-Wise Crack Detection Using Deep Local Pattern Predictor for Robot Application. *Sensors* **18**:9, 3042. [Crossref]

329. Supriya Patil, Gourish Naik, Radhakrishna Pai, Rajendra Gad. 2018. Stacked Autoencoder for classification of glioma grade III and grade IV. *Biomedical Signal Processing and Control* **46**, 67-75. [Crossref]

330. Shengwei Tian, Yilin Yan, Long Yu, Mei Wang, Li Li. 2018. Prediction of Anti-Malarial Activity Based on Deep Belief Network. *International Journal of Computational Intelligence and Applications* **17**:03, 1850012. [Crossref]

331. Pengfei Zhao, Kai Liu, Hao Zou, Xiantong Zhen. 2018. Multi-Stream Convolutional Neural Network for SAR Automatic Target Recognition. *Remote Sensing* **10**:9, 1473. [Crossref]

332. Xuebao Wang, Gaoming Huang, Zhiwen Zhou, Wei Tian, Jialun Yao, Jun Gao. 2018. Radar Emitter Recognition Based on the Energy Cumulant of Short Time Fourier Transform and Reinforced Deep Belief Network. *Sensors* **18**:9, 3103. [Crossref]

333. Elena Agliari, Danila Migliozzi, Daniele Tantari. 2018. Non-convex Multi-species Hopfield Models. *Journal of Statistical Physics* **172**:5, 1247-1269. [Crossref]

334. Hongji Huang, Jie Yang, Hao Huang, Yiwei Song, Guan Gui. 2018. Deep Learning for Super-Resolution Channel Estimation and DOA Estimation Based Massive MIMO System. *IEEE Transactions on Vehicular Technology* **67**:9, 8549-8560. [Crossref]

335. Kyoungman Bae, Youngjoong Ko. 2018. Speech-Act Classification Using Convolutional Neural Network and Word Embedding. *International Journal on Artificial Intelligence Tools* **27**:06, 1850026. [Crossref]

336. Weiming Wang, Biao Chen, Peng Xia, Jie Hu, Yinghong Peng. 2018. Sensor Fusion for Myoelectric Control Based on Deep Learning With Recurrent Convolutional Neural Networks. *Artificial Organs* **42**:9, E272-E282. [Crossref]

337. Wen Zhang, Yuhang Du, Ye Yang, Taketoshi Yoshida. 2018. DeRec: A data-driven approach to accurate recommendation with deep learning and weighted loss function. *Electronic Commerce Research and Applications* **31**, 12-23. [Crossref]

338. Shuai Shi, Guoren Xu. 2018. Novel performance prediction model of a biofilm system treating domestic wastewater based on stacked denoising auto-encoders deep learning network. *Chemical Engineering Journal* **347**, 280-290. [Crossref]

339. Özal Yıldırım, Paweł Pławiak, Ru-San Tan, U. Rajendra Acharya. 2018. Arrhythmia detection using deep convolutional neural network with long duration ECG signals. *Computers in Biology and Medicine* . [Crossref]

340. Dung Nguyen, Kien Nguyen, Sridha Sridharan, David Dean, Clinton Fookes. 2018. Deep spatio-temporal feature fusion with compact bilinear pooling for multimodal emotion recognition. *Computer Vision and Image Understanding* **174**, 33-42. [Crossref]

341. Hesham Mostafa, Vishwajith Ramesh, Gert Cauwenberghs. 2018. Deep Supervised Learning Using Local Errors. *Frontiers in Neuroscience* **12**. . [Crossref]

342. Zeynep Batmaz, Ali Yurekli, Alper Bilge, Cihan Kaleli. 2018. A review on deep learning for recommender systems: challenges and remedies. *Artificial Intelligence Review* **17**. . [Crossref]

343. Hongmin Gao, Shuo Lin, Yao Yang, Chenming Li, Mingxiang Yang. 2018. Convolution Neural Network Based on Two-Dimensional Spectrum for Hyperspectral Image Classification. *Journal of Sensors* **2018**, 1-13. [Crossref]

344. Md Zahangir Alom, Paheding Sidike, Mahmudul Hasan, Tarek M. Taha, Vijayan K. Asari. 2018. Handwritten Bangla Character Recognition Using the State-of-the-Art Deep Convolutional Neural Networks. *Computational Intelligence and Neuroscience* **2018**, 1-13. [Crossref]

345. Tongren Xu, Zhixia Guo, Shaomin Liu, Xinlei He, Yangfanyu Meng, Ziwei Xu, Youlong Xia, Jingfeng Xiao, Yuan Zhang, Yanfei Ma, Lisheng Song. 2018. Evaluating Different Machine Learning Methods for Upscaling Evapotranspiration from Flux Towers to the Regional Scale. *Journal of Geophysical Research: Atmospheres* **123**:16, 8674-8690. [Crossref]

346. Abdulkader Helwan, Georges El-Fakhri, Hadi Sasani, Dilber Uzun Ozsahin. 2018. Deep networks in identifying CT brain hemorrhage. *Journal of Intelligent & Fuzzy Systems* **35**:2, 2215-2228. [Crossref]

347. Le Lv, Dongbin Zhao, Kun Shao. 2018. Deep sparse representation-based mid-level visual elements discovery in fine-grained classification. *Soft Computing* **432**. . [Crossref]

348. Ming Tong, Yiran Chen, Lei Ma, He Bai, Xing Yue. 2018. NMF with local constraint and Deep NMF with temporal dependencies constraint for action recognition. *Neural Computing and Applications* **27**. . [Crossref]

349. Junjian Cui, Xiaorui Zhao, Nini Liu, Sergey Morgachev, Daixi Li. 2018. Robust Shoeprint Retrieval Method Based on Local-to-Global Feature Matching for Real Crime Scenes. *Journal of Forensic Sciences* **82**. . [Crossref]

350. Guangquan Zhao, Jin Yang, Jun Chen, Guang Zhu, Zedong Jiang, Xiaoyong Liu, Guangxing Niu, Zhong Lin Wang, Bin Zhang. 2018. Keystroke Dynamics Identification Based on Triboelectric Nanogenerator for Intelligent Keyboard Using Deep Learning Method. *Advanced Materials Technologies* **9**, 1800167. [Crossref]

351. Tai-Yuan Su, Zi-Yuan Liu, Duan-Yu Chen. 2018. Tear Film Break-Up Time Measurement Using Deep Convolutional Neural Networks for Screening Dry Eye Disease. *IEEE Sensors Journal* **18**:16, 6857-6862. [Crossref]

352. Wenping Guo, Zhuoming Xu, Haibo Zhang. 2018. Interstitial lung disease classification using improved DenseNet. *Multimedia Tools and Applications* **385**. . [Crossref]

353. M. Arif Wani, Saduf Afzal. 2018. Optimization of deep network models through fine tuning. *International Journal of Intelligent Computing and Cybernetics* **11**:3, 386-403. [Crossref]

354. Michael Hopkins, Garibaldi Pineda-García, Petruţ A. Bogdan, Steve B. Furber. 2018. Spiking neural networks for computer vision. *Interface Focus* **8**:4, 20180007. [Crossref]

355. Brian S. Freeman, Graham Taylor, Bahram Gharabaghi, Jesse Thé. 2018. Forecasting air quality time series using deep learning. *Journal of the Air & Waste Management Association* **68**:8, 866-886. [Crossref]

356. Guo-feng Zou, Gui-xia Fu, Ming-liang Gao, Jin Shen, Li-ju Yin, Xian-ye Ben. 2018. A novel construction method of convolutional neural network model based on data-driven. *Multimedia Tools and Applications* **22**. . [Crossref]

357. Chankyu Lee, Priyadarshini Panda, Gopalakrishnan Srinivasan, Kaushik Roy. 2018. Training Deep Spiking Convolutional Neural Networks With STDP-Based Unsupervised Pre-training Followed by Supervised Fine-Tuning. *Frontiers in Neuroscience* **12**. . [Crossref]

358. Yang Li, Chunxiao Fan, Yong Li, Qiong Wu, Yue Ming. 2018. Improving deep neural network with Multiple Parametric Exponential Linear Units. *Neurocomputing* **301**, 11-24. [Crossref]

359. Cong Bai, Ling Huang, Xiang Pan, Jianwei Zheng, Shengyong Chen. 2018. Optimization of deep convolutional neural network for large scale image retrieval. *Neurocomputing* **303**, 60-67. [Crossref]

360. Bo Liu, Shuo Yan, Huanling You, Yan Dong, Yong Li, Jianlei Lang, Rentao Gu. 2018. Road surface temperature prediction based on gradient extreme learning machine boosting. *Computers in Industry* **99**, 294-302. [Crossref]

361. Hongshan Yu, Zhengeng Yang, Lei Tan, Yaonan Wang, Wei Sun, Mingui Sun, Yandong Tang. 2018. Methods and datasets on semantic segmentation: A review. *Neurocomputing* **304**, 82-103. [Crossref]

362. Shenghao Tang, Changqing Shen, Dong Wang, Shuang Li, Weiguo Huang, Zhongkui Zhu. 2018. Adaptive deep feature learning network with Nesterov momentum and its application to rotating machinery fault diagnosis. *Neurocomputing* **305**, 1-14. [Crossref]

363. Junfei Qiao, Gongming Wang, Wenjing Li, Xiaoli Li. 2018. A deep belief network with PLSR for nonlinear system modeling. *Neural Networks* **104**, 68-79. [Crossref]

364. Ruonan Liu, Boyuan Yang, Enrico Zio, Xuefeng Chen. 2018. Artificial intelligence for fault diagnosis of rotating machinery: A review. *Mechanical Systems and Signal Processing* **108**, 33-47. [Crossref]

365. Yinhao Zhu, Nicholas Zabaras. 2018. Bayesian deep convolutional encoder–decoder networks for surrogate modeling and uncertainty quantification. *Journal of Computational Physics* **366**, 415-447. [Crossref]

366. Yaying Zhang, Guan Huang. 2018. traffic flow prediction model based on deep belief network and genetic algorithm. *IET Intelligent Transport Systems* **12**:6, 533-541. [Crossref]

367. Xingsen Zhang, Hongxia Zhang, Jiashu Guo, Lianzhang Zhu. 2018. Auto measurement while drilling mud pulse signal recognition based on deep neural network. *Journal of Petroleum Science and Engineering* **167**, 37-43. [Crossref]

368. Hoonyoung Jeong, Alexander Y. Sun, Jonghyun Lee, Baehyun Min. 2018. A learning-based data-driven forecast approach for predicting future reservoir performance. *Advances in Water Resources* **118**, 95-109. [Crossref]

369. Yongjian Wang, Hongguang Li. 2018. A novel intelligent modeling framework integrating convolutional neural network with an adaptive time-series window and its application to industrial process operational optimization. *Chemometrics and Intelligent Laboratory Systems* **179**, 64-72. [Crossref]

370. Gokhan Altan, Yakup Kutlu, Adnan Özhan Pekmezci, Serkan Nural. 2018. Deep learning with 3D-second order difference plot on respiratory sounds. *Biomedical Signal Processing and Control* **45**, 58-69. [Crossref]

371. Dennis Forster, Abdul-Saboor Sheikh, Jörg Lücke. 2018. Neural Simpletrons: Learning in the Limit of Few Labels with Directed Generative Networks. *Neural Computation* **30**:8, 2113-2174. [Abstract] [Full Text] [PDF] [PDF Plus]

372. A. L. Afzal, S. Asharaf. 2018. Deep kernel learning in core vector machines. *Pattern Analysis and Applications* **21**:3, 721-729. [Crossref]

373. Leandro Aparecido Passos, João Paulo Papa. 2018. Temperature-Based Deep Boltzmann Machines. *Neural Processing Letters* **48**:1, 95-107. [Crossref]

374. Peiju Chang, Jiangshe Zhang, Junying Hu, Zengjie Song. 2018. A Deep Neural Network Based on ELM for Semi-supervised Learning of Image Classification. *Neural Processing Letters* **48**:1, 375-388. [Crossref]

375. Xin Zuo, Jifeng Shen, Hualong Yu, Dan Xu, Chengshan Qian, Yongwei Shan. 2018. Fast Pedestrian Detection Based on the Selective Window Differential Filter. *Neural Processing Letters* **48**:1, 403-417. [Crossref]

376. Kun Lan, Dan-tong Wang, Simon Fong, Lian-sheng Liu, Kelvin K. L. Wong, Nilanjan Dey. 2018. A Survey of Data Mining and Deep Learning in Bioinformatics. *Journal of Medical Systems* **42**:8. . [Crossref]

377. Gowri Suryanarayana, Jesus Lago, Davy Geysen, Piotr Aleksiejuk, Christian Johansson. 2018. Thermal load forecasting in district heating networks using deep learning and advanced feature selection methods. *Energy* **157**, 141-149. [Crossref]

378. Amina Ben Hamida, Alexandre Benoit, Patrick Lambert, Chokri Ben Amar. 2018. 3-D Deep Learning Approach for Remote Sensing Image Classification. *IEEE Transactions on Geoscience and Remote Sensing* **56**:8, 4420-4434. [Crossref]

379. Shuyuan Yang, Min Wang, Zhixi Feng, Zhi Liu, Rundong Li. 2018. Deep Sparse Tensor Filtering Network for Synthetic Aperture Radar Images Classification. *IEEE Transactions on Neural Networks and Learning Systems* **29**:8, 3919-3924. [Crossref]

380. Rahib H. Abiyev, Mohammad Khaleel Sallam Ma'aitah. 2018. Deep Convolutional Neural Networks for Chest Diseases Detection. *Journal of Healthcare Engineering* **2018**, 1-11. [Crossref]

381. Jiyang Xie, Zeyu Song, Yupeng Li, Yanting Zhang, Hong Yu, Jinnan Zhan, Zhanyu Ma, Yuanyuan Qiao, Jianhua Zhang, Jun Guo. 2018. A Survey on Machine Learning-Based Mobile Big Data Analysis: Challenges and Applications. *Wireless Communications and Mobile Computing* **2018**, 1-19. [Crossref]

382. Sherin M. Mathews, Chandra Kambhamettu, Kenneth E. Barner. 2018. A novel application of deep learning for single-lead ECG classification. *Computers in Biology and Medicine* **99**, 53-62. [Crossref]

383. Gregory Merkel, Richard Povinelli, Ronald Brown. 2018. Short-Term Load Forecasting of Natural Gas with Deep Neural Network Regression †. *Energies* **11**:8, 2008. [Crossref]

384. Lee Nicholas, Shih Yin Ooi, Ying Han Pang, Seong Oun Hwang, Syh-Yuan Tan. 2018. Study of long short-term memory in flow-based network intrusion detection system. *Journal of Intelligent & Fuzzy Systems* **12**, 1-11. [Crossref]

385. Song Cheng, Jing Chen, Lei Wang. 2018. Information Perspective to Probabilistic Modeling: Boltzmann Machines versus Born Machines. *Entropy* **20**:8, 583. [Crossref]

386. Boris Kryzhanovsky, Magomed Malsagov, Iakov Karandashev. 2018. Investigation of Finite-Size 2D Ising Model with a Noisy Matrix of Spin-Spin Interactions. *Entropy* **20**:8, 585. [Crossref]

387. Lean Yu, Rongtian Zhou, Ling Tang, Rongda Chen. 2018. A DBN-based resampling SVM ensemble learning paradigm for credit classification with imbalanced data. *Applied Soft Computing* **69**, 192-202. [Crossref]

388. X. YU, H. ZHENG, C. LIU, Y. HUANG, X. DING. 2018. Classify epithelium-stroma in histopathological images based on deep transferable network. *Journal of Microscopy* **271**:2, 164-173. [Crossref]

389. A. Meyer-Lindenberg. 2018. Künstliche Intelligenz in der Psychiatrie – ein Überblick. *Der Nervenarzt* **89**:8, 861-868. [Crossref]

390. Fei Gao, Fei Ma, Jun Wang, Jinping Sun, Erfu Yang, Huiyu Zhou. 2018. Semi-Supervised Generative Adversarial Nets with Multiple Generators for SAR Image Recognition. *Sensors* **18**:8, 2706. [Crossref]

391. Yanjun Wang, Qi Chen, Lin Liu, Xiong Li, Arun Kumar Sangaiah, Kai Li. 2018. Systematic Comparison of Power Line Classification Methods from ALS and MLS Point Cloud Data. *Remote Sensing* **10**:8, 1222. [Crossref]

392. Qi Xu, Ming Zhang, Zonghua Gu, Gang Pan. 2018. Overfitting remedy by sparsifying regularization on fully-connected layers of CNNs. *Neurocomputing* . [Crossref]

393. Hao Wu, Yueli Li, Xiaohan Bi, Linna Zhang, Rongfang Bie, Yingzhuo Wang. 2018. Joint entropy based learning model for image retrieval. *Journal of Visual Communication and Image Representation* **55**, 415-423. [Crossref]

394. Yubin Xie, Xiaotong Luo, Yupeng Li, Li Chen, Wenbin Ma, Junjiu Huang, Jun Cui, Yong Zhao, Yu Xue, Zhixiang Zuo, Jian Ren. 2018. DeepNitro: Prediction of Protein Nitration and Nitrosylation Sites by Deep Learning. *Genomics, Proteomics & Bioinformatics* **16**:4, 294-306. [Crossref]

395. Yonghao Xu, Bo Du, Fan Zhang, Liangpei Zhang. 2018. Hyperspectral image classification via a random patches network. *ISPRS Journal of Photogrammetry and Remote Sensing* **142**, 344-357. [Crossref]

396. Zhuoqun Fang, Tong Jia, Qiusheng Chen, Ming Xu, Xi Yuan, Chengdong Wu. 2018. Laser Stripe Image Denoising Using Convolutional Autoencoder. *Results in Physics* . [Crossref]

397. Tohru Nitta. 2018. Resolution of singularities via deep complex-valued neural networks. *Mathematical Methods in the Applied Sciences* **41**:11, 4170-4178. [Crossref]

398. Jian Ma, Hua Su, Wan-lin Zhao, Bin Liu. 2018. Predicting the Remaining Useful Life of an Aircraft Engine Using a Stacked Sparse Autoencoder with Multilayer Self-Learning. *Complexity* **2018**, 1-13. [Crossref]

399. Xiao-Bo Jin, Guo-Sen Xie, Kaizhu Huang, Amir Hussain. 2018. Accelerating Infinite Ensemble of Clustering by Pivot Features. *Cognitive Computation* **54**. . [Crossref]

400. Anupriya Gogna, Angshul Majumdar. 2018. Discriminative Autoencoder for Feature Extraction: Application to Character Recognition. *Neural Processing Letters* **51**. . [Crossref]

401. Guangwu Qian, Lei Zhang, Qianjun Zhang. 2018. End-to-end training algorithm for conceptor-based neural networks. *Electronics Letters* **54**:15, 924-926. [Crossref]

402. Fatih Özyurt, Türker Tuncer, Engin Avci, Mustafa Koç, İhsan Serhatlioğlu. 2018. A Novel Liver Image Classification Method Using Perceptual Hash-Based Convolutional Neural Network. *Arabian Journal for Science and Engineering* **61**. . [Crossref]

403. Yan Yan, Xu-Cheng Yin, Chun Yang, Sujian Li, Bo-Wen Zhang. 2018. Biomedical literature classification with a CNNs-based hybrid learning network. *PLOS ONE* **13**:7, e0197933. [Crossref]

404. Shin Kamada, Takumi Ichimura, Akira Hara, Kenneth J. Mackin. 2018. Adaptive structure learning method of deep belief network using neuron generation–annihilation and layer generation. *Neural Computing and Applications* **22**. . [Crossref]

405. Hailong Li, Nehal A. Parikh, Lili He. 2018. A Novel Transfer Learning Approach to Enhance Deep Neural Network Classification of Brain Functional Connectomes. *Frontiers in Neuroscience* **12**. . [Crossref]

406. Mohamed Morchid, Pierre-Michel Bousquet, Waad Ben Kheder, Killian Janod. 2018. Latent Topic-based Subspace for Natural Language Processing. *Journal of Signal Processing Systems* **2**. . [Crossref]

407. Nijat Mehdiyev, Joerg Evermann, Peter Fettke. 2018. A Novel Business Process Prediction Model Using a Deep Learning Method. *Business & Information Systems Engineering* **13**. . [Crossref]

408. Amir Hossein Hadjahmadi, Mohammad Mehdi Homayounpour. 2018. Robust feature extraction and uncertainty estimation based on attractor dynamics in cyclic deep denoising autoencoders. *Neural Computing and Applications* **2**. . [Crossref]

409. Hao Wu, Rongfang Bie, Junqi Guo, Xin Meng, Shenling Wang. 2018. Sparse coding based few learning instances for image retrieval. *Multimedia Tools and Applications* **62**. . [Crossref]

410. Xiang Li, Shaomin Liu, Huaixiang Li, Yanfei Ma, Jianghao Wang, Yuan Zhang, Ziwei Xu, Tongren Xu, Lisheng Song, Xiaofan Yang, Zheng Lu, Zeyu Wang, Zhixia Guo. 2018. Intercomparison of Six Upscaling Evapotranspiration Methods: From Site to the Satellite Pixel. *Journal of Geophysical Research: Atmospheres* **123**:13, 6777-6803. [Crossref]

411. Changfan Zhang, Xiang Cheng, Jianhua Liu, Jing He, Guangwei Liu. 2018. Deep Sparse Autoencoder for Feature Extraction and Diagnosis of Locomotive Adhesion Status. *Journal of Control Science and Engineering* **2018**, 1-9. [Crossref]

412. Zhen Tan, Xiang Zhao, Yang Fang, Bin Ge, Weidong Xiao. 2018. Knowledge Graph Representation via Similarity-Based Embedding. *Scientific Programming* **2018**, 1-12. [Crossref]

413. YeonJoo Jeong, Jihang Lee, John Moon, Jong Hoon Shin, Wei D. Lu. 2018. K -means Data Clustering with Memristor Networks. *Nano Letters* **18**:7, 4447-4453. [Crossref]

414. Thomas E. Potok, Catherine Schuman, Steven Young, Robert Patton, Federico Spedalieri, Jeremy Liu, Ke-Thia Yao, Garrett Rose, Gangotree Chakma. 2018. A Study of Complex Deep Learning Networks on High-Performance, Neuromorphic, and Quantum Computers. *ACM Journal on Emerging Technologies in Computing Systems* **14**:2, 1-21. [Crossref]

415. Hasan F. M. Zaki, Faisal Shafait, Ajmal Mian. 2018. Viewpoint invariant semantic object and scene categorization with RGB-D sensors. *Autonomous Robots* **24**. . [Crossref]

416. Mischa Schmidt, Anett Schülke, Alberto Venturi, Roman Kurpatov, Enrique Blanco Henríquez. 2018. Cyber-Physical System for Energy-Efficient Stadium Operation. *ACM Transactions on Cyber-Physical Systems* **2**:4, 1-26. [Crossref]

417. Jinghan Du, Haiyan Chen, Weining Zhang. 2018. A deep learning method for data recovery in sensor networks using effective spatio-temporal correlation data. *Sensor Review* 11. . [Crossref]

418. Qingchen Zhang, Laurence T. Yang, Zhikui Chen, Peng Li. 2018. A survey on deep learning for big data. *Information Fusion* **42**, 146-157. [Crossref]

419. Haitao Pu, Jian Lian, Mingqu Fan. 2018. Automatic Recognition of Flock Behavior of Chickens with Convolutional Neural Network and Kinect Sensor. *International Journal of Pattern Recognition and Artificial Intelligence* **32**:07, 1850023. [Crossref]

420. Jiunn-Tsair Fang, Yu-Ruey Chang, Pao-Chi Chang. 2018. Deep learning of chroma representation for cover song identification in compression domain. *Multidimensional Systems and Signal Processing* **29**:3, 887-902. [Crossref]

421. Shruti R. Kulkarni, Bipin Rajendran. 2018. Spiking neural networks for handwritten digit recognition—Supervised learning and network optimization. *Neural Networks* **103**, 118-127. [Crossref]

422. Shahid Hussain, Jacky Keung, Arif Ali Khan, Awais Ahmad, Salvatore Cuomo, Francesco Piccialli, Gwanggil Jeon, Adnan Akhunzada. 2018. Implications of deep learning for the automation of design patterns organization. *Journal of Parallel and Distributed Computing* **117**, 256-266. [Crossref]

423. Marcello Benedetti, John Realpe-Gómez, Alejandro Perdomo-Ortiz. 2018. Quantum-assisted Helmholtz machines: A quantum–classical deep learning framework for industrial datasets in near-term devices. *Quantum Science and Technology* **3**:3, 034007. [Crossref]

424. Jesus Lago, Fjo De Ridder, Bart De Schutter. 2018. Forecasting spot electricity prices: Deep learning approaches and empirical comparison of traditional algorithms. *Applied Energy* **221**, 386-405. [Crossref]

425. Lei Sun, Jun Du, Zhipeng Xie, Yong Xu. 2018. Auxiliary Features from Laser-Doppler Vibrometer Sensor for Deep Neural Network Based Robust Speech Recognition. *Journal of Signal Processing Systems* **90**:7, 975-983. [Crossref]

426. Zhengqi Wen, Kehuang Li, Zhen Huang, Chin-Hui Lee, Jianhua Tao. 2018. Improving Deep Neural Network Based Speech Synthesis through Contextual Feature Parametrization and Multi-Task Learning. *Journal of Signal Processing Systems* **90**:7, 1025-1037. [Crossref]

427. Yan-Hui Tu, Jun Du, Chin-Hui Lee. 2018. A Speaker-Dependent Approach to Single-Channel Joint Speech Separation and Acoustic Modeling Based on Deep Neural Networks for Robust Recognition of Multi-Talker Speech. *Journal of Signal Processing Systems* **90**:7, 963-973. [Crossref]

428. Ju Lin, Wei Li, Yingming Gao, Yanlu Xie, Nancy F. Chen, Sabato Marco Siniscalchi, Jinsong Zhang, Chin-Hui Lee. 2018. Improving Mandarin Tone

Recognition Based on DNN by Combining Acoustic and Articulatory Features Using Extended Recognition Networks. *Journal of Signal Processing Systems* **90**:7, 1077-1087. [Crossref]

429. Ultan Mc Carthy, Ismail Uysal, Ricardo Badia-Melis, Samuel Mercier, Colm O'Donnell, Anastasia Ktenioudaki. 2018. Global food security – Issues, challenges and technological solutions. *Trends in Food Science & Technology* **77**, 11-20. [Crossref]

430. Chetan L. Srinidhi, P. Aparna, Jeny Rajan. 2018. A visual attention guided unsupervised feature learning for robust vessel delineation in retinal images. *Biomedical Signal Processing and Control* **44**, 110-126. [Crossref]

431. Ganggao Zhu, Carlos A. Iglesias. 2018. Exploiting semantic similarity for named entity disambiguation in knowledge graphs. *Expert Systems with Applications* **101**, 8-24. [Crossref]

432. Daniel A. Hashimoto, Guy Rosman, Daniela Rus, Ozanan R. Meireles. 2018. Artificial Intelligence in Surgery. *Annals of Surgery* **268**:1, 70-76. [Crossref]

433. Hao Wu, Jinsong Zhao. 2018. Deep convolutional neural network model based chemical process fault diagnosis. *Computers & Chemical Engineering* **115**, 185-197. [Crossref]

434. Dazhi Yang, Jan Kleissl, Christian A. Gueymard, Hugo T.C. Pedro, Carlos F.M. Coimbra. 2018. History and trends in solar irradiance and PV power forecasting: A preliminary assessment and review using text mining. *Solar Energy* **168**, 60-101. [Crossref]

435. Alejandro Perdomo-Ortiz, Marcello Benedetti, John Realpe-Gómez, Rupak Biswas. 2018. Opportunities and challenges for quantum-assisted machine learning in near-term quantum computers. *Quantum Science and Technology* **3**:3, 030502. [Crossref]

436. Lin Liu, Hui Huang, Shiyan Hu. 2018. Lorenz Chaotic System-Based Carbon Nanotube Physical Unclonable Functions. *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems* **37**:7, 1408-1421. [Crossref]

437. D. Yu, Z.M. Chen, K.S. Xiahou, M.S. Li, T.Y. Ji, Q.H. Wu. 2018. A radically data-driven method for fault detection and diagnosis in wind turbines. *International Journal of Electrical Power & Energy Systems* **99**, 577-584. [Crossref]

438. Oliver Faust, Yuki Hagiwara, Tan Jen Hong, Oh Shu Lih, U Rajendra Acharya. 2018. Deep learning for healthcare applications based on physiological signals: A review. *Computer Methods and Programs in Biomedicine* **161**, 1-13. [Crossref]

439. Antonino Fiannaca, Laura La Paglia, Massimo La Rosa, Giosue' Lo Bosco, Giovanni Renda, Riccardo Rizzo, Salvatore Gaglio, Alfonso Urso. 2018. Deep learning models for bacteria taxonomic classification of metagenomic data. *BMC Bioinformatics* **19**:S7. . [Crossref]

440. Masoud Mahdianpari, Bahram Salehi, Mohammad Rezaee, Fariba Mohammadimanesh, Yun Zhang. 2018. Very Deep Convolutional Neural

Networks for Complex Land Cover Mapping Using Multispectral Remote Sensing Imagery. *Remote Sensing* **10**:7, 1119. [Crossref]

441. Yoeri van de Burgt, Armantas Melianas, Scott Tom Keene, George Malliaras, Alberto Salleo. 2018. Organic electronics for neuromorphic computing. *Nature Electronics* **1**:7, 386-397. [Crossref]

442. MA Hongqiang, MA Shiping, Xu Yuelei, Zhu Mingming. 2018. An adaptive image denoising method based on Deep Rectified Denoising Auto-Encoder. *Journal of Physics: Conference Series* **1060**, 012048. [Crossref]

443. Zeyan Oo, Longbiao Wang, Khomdet Phapatanaburi, Masahiro Iwahashi, Seiichi Nakagawa, Jianwu Dang. 2018. Phase and reverberation aware DNN for distant-talking speech enhancement. *Multimedia Tools and Applications* **77**:14, 18865-18880. [Crossref]

444. Ting Sun, Leonardo J. Sales. 2018. Predicting Public Procurement Irregularity: An Application of Neural Networks. *Journal of Emerging Technologies in Accounting* **15**:1, 141-154. [Crossref]

445. Shayan Shams, Sayan Goswami, Kisung Lee, Seungwon Yang, Seung-Jong Park. Towards Distributed Cyberinfrastructure for Smart Cities Using Big Data and Deep Learning Technologies 1276-1283. [Crossref]

446. Hung Tuan Nguyen, Cuong Tuan Nguyen, Takeya Ino, Bipin Indurkhya, Masaki Nakagawa. 2018. Text-independent writer identification using convolutional neural network. *Pattern Recognition Letters* . [Crossref]

447. Xianlin Zhang, Yixin Luan, Xueming Li. 2018. Real-time image style transformation based on deep learning. *Journal of Electronic Imaging* **27**:04, 1. [Crossref]

448. Seema Wazarkar, Bettahally N. Keshavamurthy. 2018. A Survey on Image Data Analysis through Clustering Techniques for Real World Applications. *Journal of Visual Communication and Image Representation* . [Crossref]

449. Jinjiang Wang, Yulin Ma, Laibin Zhang, Robert X. Gao, Dazhong Wu. 2018. Deep learning for smart manufacturing: Methods and applications. *Journal of Manufacturing Systems* **48**, 144-156. [Crossref]

450. Jianjing Zhang, Peng Wang, Ruqiang Yan, Robert X. Gao. 2018. Long short-term memory for machine remaining life prediction. *Journal of Manufacturing Systems* **48**, 78-86. [Crossref]

451. Ting Kang, Yazhou Liu, Quansen Sun. 2018. Partial randomness hashing applied to remote sensing object classification. *Journal of Applied Remote Sensing* **12**:03, 1. [Crossref]

452. Jia Guo, Guannan Liu, Yuan Zuo, Junjie Wu. An Anomaly Detection Framework Based on Autoencoder and Nearest Neighbor 1-6. [Crossref]

453. I. M. Karandashev, B. V. Kryzhanovsky, M. Yu. Malsagov. 2018. Spectral Characteristics of a Finite 2D Ising Model. *Optical Memory and Neural Networks* **27**:3, 147-151. [Crossref]

454. Hongyuan Shi, Yunke Li, Liang Chen, Fan Jiang. Neighbouring Proximity - An Key Impact Factor of Deep Machine Learning 600-605. [Crossref]

455. Xu Zhang, Yuanyuan Zou, Shaoyuan Li, Shenghu Xu. Product Yields Forecasting for FCCU via Deep Bi-directional LSTM Network 8013-8018. [Crossref]

456. Yuanzhe Fu, Deqing Huang, Na Qin, Kaiwei Liang, Yang Yang. High-Speed Railway Bogie Fault Diagnosis Using LSTM Neural Network 5848-5852. [Crossref]

457. Rey Wiyatno, Jeff Orchard. Style Memory: Making a Classifier Network Generative 16-21. [Crossref]

458. Jie-Lin Qiu, Wei-Ye Zhao. Data Encoding Visualization Based Cognitive Emotion Recognition with AC-GAN Applied for Denoising 222-227. [Crossref]

459. Jian Li, Weidong Qu. Aero-engine Sensor Fault Diagnosis Based on Convolutional Neural Network 6049-6054. [Crossref]

460. Haifeng Song, Guangsheng Chen, Weiwei Yang. 2018. An Image Classification Algorithm and its Parallel Implementation Based on ANL-RBM. *Journal of Information Technology Research* **11**:3, 29-46. [Crossref]

461. Jian-min Liu, Min-hua Yang. 2018. Recognition on Images from Internet Street View Based on Hierarchical Features Learning with CNNs. *Journal of Information Technology Research* **11**:3, 62-74. [Crossref]

462. F Vitali, S Marini, D Pala, A Demartini, S Montoli, A Zambelli, R Bellazzi. 2018. Patient similarity by joint matrix trifactorization to identify subgroups in acute myeloid leukemia. *JAMIA Open* **1**:1, 75-86. [Crossref]

463. Tamer Moussa, Salaheldin Elkatatny, Mohamed Mahmoud, Abdulazeez Abdulraheem. 2018. Development of New Permeability Formulation From Well Log Data Using Artificial Intelligence Approaches. *Journal of Energy Resources Technology* **140**:7, 072903. [Crossref]

464. Yi Zhu, Xuegang Hu, Yuhong Zhang, Peipei Li. 2018. Transfer learning with stacked reconstruction independent component analysis. *Knowledge-Based Systems* **152**, 100-106. [Crossref]

465. Wen Zeng, Hongjiao Xu, Hui Li, Xiang Li. 2018. Research on Methodology of Correlation Analysis of Sci-Tech Literature Based on Deep Learning Technology in the Big Data. *Journal of Database Management* **29**:3, 67-88. [Crossref]

466. Jian Wu, Thomas R. Mazur, Su Ruan, Chunfeng Lian, Nalini Daniel, Hilary Lashmett, Laura Ochoa, Imran Zoberi, Mark A. Anastasio, H. Michael Gach, Sasa Mutic, Maria Thomas, Hua Li. 2018. A deep Boltzmann machine-driven level set method for heart motion tracking using cine MRI images. *Medical Image Analysis* **47**, 68-80. [Crossref]

467. Federico Cabitza, Angela Locoro, Giuseppe Banfi. 2018. Machine Learning in Orthopedics: A Literature Review. *Frontiers in Bioengineering and Biotechnology* **6**. . [Crossref]

468. Pengcheng Zhang, Yangyang Jia, Lei Zhang, Jerry Gao, Hareton Leung. 2018. A deep belief network based precipitation forecast approach using multiple environmental factors. *Intelligent Data Analysis* **22**:4, 843-866. [Crossref]

469. Xi Yang, Kaizhu Huang, Rui Zhang, John Y. Goulermas. 2018. A Novel Deep Density Model for Unsupervised Learning. *Cognitive Computation* **27**. . [Crossref]

470. Ibtissam Bakkouri, Karim Afdel. 2018. Multi-scale CNN based on region proposals for efficient breast abnormality recognition. *Multimedia Tools and Applications* **4**. . [Crossref]

471. Zhouliang Chen, Zhinong Li. 2018. Fault diagnosis method of rotating machinery based on stacked denoising autoencoder. *Journal of Intelligent & Fuzzy Systems* **34**:6, 3443-3449. [Crossref]

472. Jingjing Xie, Xiaoxue Wang, Yu Liu, Yun Bai. 2018. Autoencoder-based deep belief regression network for air particulate matter concentration forecasting. *Journal of Intelligent & Fuzzy Systems* **34**:6, 3475-3486. [Crossref]

473. Xin Wang, Yi Qin, Aibing Zhang. 2018. An intelligent fault diagnosis approach for planetary gearboxes based on deep belief networks and uniformed features. *Journal of Intelligent & Fuzzy Systems* **34**:6, 3619-3634. [Crossref]

474. Jin-Woong Lee, Jiyong Chung, Min-Young Cho, Suman Timilsina, Keemin Sohn, Ji Sik Kim, Kee-Sun Sohn. 2018. Deep-Learning Technique To Convert a Crude Piezoresistive Carbon Nanotube-Ecoflex Composite Sheet into a Smart, Portable, Disposable, and Extremely Flexible Keypad. *ACS Applied Materials & Interfaces* **10**:24, 20862-20868. [Crossref]

475. Amna Sarwar, Zahid Mehmood, Tanzila Saba, Khurram Ashfaq Qazi, Ahmed Adnan, Habibullah Jamal. 2018. A novel method for content-based image retrieval to improve the effectiveness of the bag-of-words model using a support vector machine. *Journal of Information Science* **6**, 016555151878282. [Crossref]

476. Wen Yu, Erick de la Rosa. 2018. Deep Boltzmann machine for nonlinear system modelling. *International Journal of Machine Learning and Cybernetics* **521**. . [Crossref]

477. Jack Hanson, Kuldip Paliwal, Thomas Litfin, Yuedong Yang, Yaoqi Zhou. 2018. Accurate prediction of protein contact maps by coupling residual two-dimensional bidirectional long short-term memory with convolutional neural networks. *Bioinformatics* **1**. . [Crossref]

478. Hemant Rajnathsing, Chenggang Li. 2018. A neural network based monitoring system for safety in shared work-space human-robot collaboration. *Industrial Robot: An International Journal* **45**:4, 481-491. [Crossref]

479. Rei Sonobe, Yuta Miura, Tomohito Sano, Hideki Horie. 2018. Monitoring Photosynthetic Pigments of Shade-Grown Tea from Hyperspectral Reflectance. *Canadian Journal of Remote Sensing* **13**, 1-9. [Crossref]

480. Sheelu Abraham, A K Aniyan, Ajit K Kembhavi, N S Philip, Kaustubh Vaghmare. 2018. Detection of bars in galaxies using a deep convolutional neural network. *Monthly Notices of the Royal Astronomical Society* **477**:1, 894-903. [Crossref]

481. Rui Fa, Domenico Cozzetto, Cen Wan, David T. Jones. 2018. Predicting human protein function with multi-task deep neural networks. *PLOS ONE* **13**:6, e0198216. [Crossref]

482. Ahmad M. Karim, Mehmet S. Güzel, Mehmet R. Tolun, Hilal Kaya, Fatih V. Çelebi. 2018. A New Generalized Deep Learning Framework Combining Sparse Autoencoder and Taguchi Method for Novel Data Classification and Processing. *Mathematical Problems in Engineering* **2018**, 1-13. [Crossref]

483. Dimitri Fichou, Gertrud E. Morlock. 2018. Powerful Artificial Neural Network for Planar Chromatographic Image Evaluation, Shown for Denoising and Feature Extraction. *Analytical Chemistry* **90**:11, 6984-6991. [Crossref]

484. Peter de Boves Harrington. 2018. Feature expansion by a continuous restricted Boltzmann machine for near-infrared spectrometric calibration. *Analytica Chimica Acta* **1010**, 20-28. [Crossref]

485. Peng Hu, Dezhong Peng, Jixiang Guo, Liangli Zhen. 2018. Local feature based multi-view discriminant analysis. *Knowledge-Based Systems* **149**, 34-46. [Crossref]

486. Guangquan Zhao, Xiaoyong Liu, Bin Zhang, Yuefeng Liu, Guangxing Niu, Cong Hu. 2018. A novel approach for analog circuit fault diagnosis based on Deep Belief Network. *Measurement* **121**, 170-178. [Crossref]

487. Ozsel Kilinc, Ismail Uysal. 2018. GAR: An efficient and scalable graph-based activity regularization for semi-supervised learning. *Neurocomputing* **296**, 46-54. [Crossref]

488. F Lotte, L Bougrain, A Cichocki, M Clerc, M Congedo, A Rakotomamonjy, F Yger. 2018. A review of classification algorithms for EEG-based brain–computer interfaces: a 10 year update. *Journal of Neural Engineering* **15**:3, 031005. [Crossref]

489. Peng Cui, Tingyan Zhong, Zhuo Wang, Tao Wang, Hongyu Zhao, Chenglin Liu, Hui Lu. 2018. Identification of human circadian genes based on time course gene expression profiles by using a deep learning method. *Biochimica et Biophysica Acta (BBA) - Molecular Basis of Disease* **1864**:6, 2274-2283. [Crossref]

490. Zhiqi Huang, Ran Wang, Hong Zhu, Jie Zhu. 2018. Discovering the impact of hidden layer parameters on non-iterative training of feed-forward neural networks. *Soft Computing* **22**:11, 3495-3506. [Crossref]

491. Jing Yin, Jiancheng Lv, Yongsheng Sang, Jixiang Guo. 2018. Classification model of restricted Boltzmann machine based on reconstruction error. *Neural Computing and Applications* **29**:11, 1171-1186. [Crossref]

492. Y. C. Lin, Jia Li, Ming-Song Chen, Yan-Xing Liu, Ying-Jie Liang. 2018. A deep belief network to predict the hot deformation behavior of a Ni-based superalloy. *Neural Computing and Applications* **29**:11, 1015-1023. [Crossref]

493. Hongkai Jiang, Xingqiu Li, Haidong Shao, Ke Zhao. 2018. Intelligent fault diagnosis of rolling bearings using an improved deep recurrent neural network. *Measurement Science and Technology* **29**:6, 065107. [Crossref]

494. Tanmay Bhowmik, Shyamal Kumar Das Mandal. 2018. Manner of articulation based Bengali phoneme classification. *International Journal of Speech Technology* **21**:2, 233-250. [Crossref]

495. Xintao Hu, Heng Huang, Bo Peng, Junwei Han, Nian Liu, Jinglei Lv, Lei Guo, Christine Guo, Tianming Liu. 2018. Latent source mining in FMRI via restricted Boltzmann machine. *Human Brain Mapping* **39**:6, 2368-2380. [Crossref]

496. Mugahed A. Al-antari, Mohammed A. Al-masni, Sung-Un Park, JunHyeok Park, Mohamed K. Metwally, Yasser M. Kadah, Seung-Moo Han, Tae-Seong Kim. 2018. An Automatic Computer-Aided Diagnosis System for Breast Cancer in Digital Mammograms via Deep Belief Network. *Journal of Medical and Biological Engineering* **38**:3, 443-456. [Crossref]

497. Mohammad Mehedi Hassan, Shamsul Huda, Md Zia Uddin, Ahmad Almogren, Majed Alrubaian. 2018. Human Activity Recognition from Body Sensor Data using Deep Learning. *Journal of Medical Systems* **42**:6. . [Crossref]

498. Jia Liu, Maoguo Gong, Qiguang Miao, Xiaogang Wang, Hao Li. 2018. Structure Learning for Deep Neural Networks Based on Multiobjective Optimization. *IEEE Transactions on Neural Networks and Learning Systems* **29**:6, 2450-2463. [Crossref]

499. Dongdong Chen, Jiancheng Lv, Zhang Yi. 2018. Graph Regularized Restricted Boltzmann Machine. *IEEE Transactions on Neural Networks and Learning Systems* **29**:6, 2651-2659. [Crossref]

500. Mufti Mahmud, Mohammed Shamim Kaiser, Amir Hussain, Stefano Vassanelli. 2018. Applications of Deep Learning and Reinforcement Learning to Biological Data. *IEEE Transactions on Neural Networks and Learning Systems* **29**:6, 2063-2079. [Crossref]

501. Yafei Song, Jia Li, Xiaogang Wang, Xiaowu Chen. 2018. Single Image Dehazing Using Ranking Convolutional Neural Network. *IEEE Transactions on Multimedia* **20**:6, 1548-1560. [Crossref]

502. Shoichiro Takao, Sayaka Kondo, Junji Ueno, Tadashi Kondo. 2018. Deep feedback GMDH-type neural network and its application to medical image analysis of MRI brain images. *Artificial Life and Robotics* **23**:2, 161-172. [Crossref]

503. Nabila Zrira, Haris Ahmad Khan, El Houssine Bouyakhf. 2018. Discriminative Deep Belief Network for Indoor Environment Classification Using Global Visual Features. *Cognitive Computation* **10**:3, 437-453. [Crossref]

504. Vanika Singhal, Angshul Majumdar. 2018. Majorization Minimization Technique for Optimally Solving Deep Dictionary Learning. *Neural Processing Letters* **47**:3, 799-814. [Crossref]

505. Li Zhang, Yaping Lu, Bangjun Wang, Fanzhang Li, Zhao Zhang. 2018. Sparse Auto-encoder with Smoothed $$l\_1$$ l 1 Regularization. *Neural Processing Letters* **47**:3, 829-839. [Crossref]

506. Kien Tuong Phan, Tomas Henrique Maul, Tuong Thuy Vu, Weng Kin Lai. 2018. DropCircuit : A Modular Regularizer for Parallel Circuit Networks. *Neural Processing Letters* **47**:3, 841-858. [Crossref]

507. Zhiqiang Zhao, Lei Guo, Meng Jia, Lei Wang. 2018. The Generalized Gamma-DBN for High-Resolution SAR Image Classification. *Remote Sensing* **10**:6, 878. [Crossref]

508. Dai Kusumoto, Mark Lachmann, Takeshi Kunihiro, Shinsuke Yuasa, Yoshikazu Kishino, Mai Kimura, Toshiomi Katsuki, Shogo Itoh, Tomohisa Seki, Keiichi Fukuda. 2018. Automated Deep Learning-Based System to Identify Endothelial Cells Derived from Induced Pluripotent Stem Cells. *Stem Cell Reports* **10**:6, 1687-1695. [Crossref]

509. Xin Pan, Jian Zhao. 2018. High-Resolution Remote Sensing Image Classification Method Based on Convolutional Neural Network and Restricted Conditional Random Field. *Remote Sensing* **10**:6, 920. [Crossref]

510. Xiaoyu Zhang, Rui Wang, Tao Zhang, Yajie Liu, Yabing Zha. 2018. Short-Term Load Forecasting Using a Novel Deep Learning Framework. *Energies* **11**:6, 1554. [Crossref]

511. Giacomo Torlai, Roger G. Melko. 2018. Latent Space Purification via Neural Density Operators. *Physical Review Letters* **120**:24. . [Crossref]

512. Salaheldin Elkatatny, Mohamed Mahmoud. 2018. Development of new correlations for the oil formation volume factor in oil reservoirs using artificial intelligent white box technique. *Petroleum* **4**:2, 178-186. [Crossref]

513. Vyacheslav Lyubchich, Ryan J. Woodland. 2018. Using isotope composition and other node attributes to predict edges in fish trophic networks. *Statistics & Probability Letters* . [Crossref]

514. Guilin Chen, Aiguo Wang, Shenghui Zhao, Li Liu, Chih-Yung Chang. 2018. Latent feature learning for activity recognition using simple sensors in smart homes. *Multimedia Tools and Applications* **77**:12, 15201-15219. [Crossref]

515. Aldonso Becerra, J. Ismael de la Rosa, Efrén González. 2018. Speech recognition in a dialog system: from conventional to deep processing. *Multimedia Tools and Applications* **77**:12, 15875-15911. [Crossref]

516. Jay H. Lee, Joohyun Shin, Matthew J. Realff. 2018. Machine learning: Overview of the recent progresses and implications for the process systems engineering field. *Computers & Chemical Engineering* **114**, 111-121. [Crossref]

517. Ankang Li, Xiaoli Hu, Tong Li, Huibing Zhang. Research on the Prediction Method of Power Battery SOC Based on Deep Learning 673-679. [Crossref]

518. Scott D. Hamshaw, Mandar M. Dewoolkar, Andrew W. Schroth, Beverley C. Wemple, Donna M. Rizzo. 2018. A New Machine-Learning Approach for

Classifying Hysteresis in Suspended-Sediment Discharge Relationships Using High-Frequency Monitoring Data. *Water Resources Research* **54**:6, 4040-4058. [Crossref]

519. Jun Zhang, Yu Tian, Zongjin Ren, Qingbing Chang, Zhenyuan Jia. 2018. The calibration of force offset for rocket engine based on deep belief network. *Measurement and Control* **51**:5-6, 172-181. [Crossref]

520. Radu Dogaru, Ioana Dogaru. Optimized Super Fast Support Vector Classifiers Using Python and Acceleration of RBF Computations 193-196. [Crossref]

521. Radu Dogaru, Ioana Dogaru. Optimized Extreme Learning Machine for Big Data Applications Using Python 189-192. [Crossref]

522. Yifu Xu, Bin Yan, Jian Chen, Lei Zeng, Lei Li. 2018. Projection decomposition algorithm for dual-energy computed tomography via deep neural network. *Journal of X-Ray Science and Technology* **26**:3, 361-377. [Crossref]

523. Yunliang Cai, Shaoju Wu, Wei Zhao, Zhigang Li, Zheyang Wu, Songbai Ji. 2018. Concussion classification via deep learning using whole-brain white matter fiber strains. *PLOS ONE* **13**:5, e0197992. [Crossref]

524. Kalaivani Sundararajan, Damon L. Woodard. 2018. Deep Learning for Biometrics. *ACM Computing Surveys* **51**:3, 1-34. [Crossref]

525. Glenn G. Ko, Rob A. Rutenbar. 2018. Real-Time and Low-Power Streaming Source Separation Using Markov Random Field. *ACM Journal on Emerging Technologies in Computing Systems* **14**:2, 1-22. [Crossref]

526. Charles K. Chui, Shao-Bo Lin, Ding-Xuan Zhou. 2018. Construction of Neural Networks for Realization of Localized Deep Learning. *Frontiers in Applied Mathematics and Statistics* **4**. . [Crossref]

527. Phillip Howard, Daniel Apley, George Runger. 2018. Identifying Nonlinear Variation Patterns with Deep Autoencoders. *IISE Transactions* **47**, 1-38. [Crossref]

528. Nikitha Johnsirani Venkatesan, ChoonSung Nam, Dong Ryeol Shin. 2018. Deep Learning Frameworks on Apache Spark: A Review. *IETE Technical Review* **5**, 1-14. [Crossref]

529. Tongguang Ni, Hongyuan Wang, Zhongbao Zhang, Shoubing Chen, Cui Jin. Discriminative deep transfer metric learning for cross-scenario person re-identification 24. [Crossref]

530. Yufeng Shu, Yu Huang, Bin Li. 2018. Design of deep learning accelerated algorithm for online recognition of industrial products defects. *Neural Computing and Applications* **22**. . [Crossref]

531. Qaisar Abbas, Mostafa E. A. Ibrahim, M. Arfan Jaffar. 2018. A comprehensive review of recent advances on deep vision systems. *Artificial Intelligence Review* **165**. . [Crossref]

532. N. Nishizuka, K. Sugiura, Y. Kubo, M. Den, M. Ishii. 2018. Deep Flare Net (DeFN) Model for Solar Flare Prediction. *The Astrophysical Journal* **858**:2, 113. [Crossref]

533. Amirhessam Tahmassebi. iDeepLe: deep learning in a flash 24. [Crossref]

534. ShymalaGowri Selvaganapathy, Mathappan Nivaashini, HemaPriya Natarajan. 2018. Deep belief network based detection and categorization of malicious URLs. *Information Security Journal: A Global Perspective* **27**:3, 145-161. [Crossref]

535. Zilong Jiang, Shu Gao, Mingjiang Li. 2018. An improved advertising CTR prediction approach based on the fuzzy deep neural network. *PLOS ONE* **13**:5, e0190831. [Crossref]

536. Yong Jiang, Yang Zhou, Kewei Tu. 2018. Learning and evaluation of latent dependency forest models. *Neural Computing and Applications* **10**. . [Crossref]

537. Richa Ojha, Shivam Tripathi. 2018. Using attributes of ungauged basins to improve regional regression equations for flood estimation: a deep learning approach. *ISH Journal of Hydraulic Engineering* **24**:2, 239-248. [Crossref]

538. Biswajit Dev Sarma, S. R. Mahadeva Prasanna. 2018. Acoustic–Phonetic Analysis for Speech Recognition: A Review. *IETE Technical Review* **35**:3, 305-327. [Crossref]

539. Robert Bock. Low-cost 3D security camera 15. [Crossref]

540. Qingxiu Wu, Zhanji Gui, Shuqing Li, Jun Ou. 2018. Directly Connected Convolutional Neural Networks. *International Journal of Pattern Recognition and Artificial Intelligence* **32**:05, 1859007. [Crossref]

541. Sophie Burkhardt, Stefan Kramer. 2018. Online multi-label dependency topic models for text classification. *Machine Learning* **107**:5, 859-886. [Crossref]

542. Yueqi Duan, Jiwen Lu, Jianjiang Feng, Jie Zhou. 2018. Context-Aware Local Binary Feature Learning for Face Recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **40**:5, 1139-1153. [Crossref]

543. Bahareh Taji, Adrian D. C. Chan, Shervin Shirmohammadi. 2018. False Alarm Reduction in Atrial Fibrillation Detection Using Deep Belief Networks. *IEEE Transactions on Instrumentation and Measurement* **67**:5, 1124-1131. [Crossref]

544. Nicola Amoroso, Domenico Diacono, Annarita Fanizzi, Marianna La Rocca, Alfonso Monaco, Angela Lombardi, Cataldo Guaragnella, Roberto Bellotti, Sabina Tangaro. 2018. Deep learning reveals Alzheimer's disease onset in MCI subjects: Results from an international challenge. *Journal of Neuroscience Methods* **302**, 3-9. [Crossref]

545. Jian-Ping He, Xiao-Bin Tang, Pin Gong, Peng Wang, Zhen-Yang Han, Wen Yan, Le Gao. 2018. Spectrometry analysis based on approximation coefficients and deep belief networks. *Nuclear Science and Techniques* **29**:5. . [Crossref]

546. Banghua Yang, Kaiwen Duan, Chengcheng Fan, Chenxiao Hu, Jinlong Wang. 2018. Automatic ocular artifacts removal in EEG using deep learning. *Biomedical Signal Processing and Control* **43**, 148-158. [Crossref]

547. Yuebing Xu, Jing Zhang, Zuqiang Long, Yan Chen. 2018. A Novel Dual-Scale Deep Belief Network Method for Daily Urban Water Demand Forecasting. *Energies* **11**:5, 1068. [Crossref]

548. Salaheldin Elkatatny, Mohamed Mahmoud. 2018. Development of a New Correlation for Bubble Point Pressure in Oil Reservoirs Using Artificial Intelligent Technique. *Arabian Journal for Science and Engineering* **43**:5, 2491-2500. [Crossref]

549. Yixing Wang, Meiqin Liu, Zhejing Bao, Senlin Zhang. 2018. Short-Term Load Forecasting with Multi-Source Data Using Gated Recurrent Unit Neural Networks. *Energies* **11**:5, 1138. [Crossref]

550. Faezeh Movahedi, James L. Coyle, Ervin Sejdic. 2018. Deep Belief Networks for Electroencephalography: A Review of Recent Contributions and Future Outlooks. *IEEE Journal of Biomedical and Health Informatics* **22**:3, 642-652. [Crossref]

551. Takao Marukame, Kumiko Nomura, Mari Matsumoto, Satoshi Takaya, Yoshifumi Nishi. Proposal, analysis and demonstration of Analog/Digital-mixed Neural Networks based on memristive device arrays 1-5. [Crossref]

552. Chenjian Wu, Chengwei Huang, Hong Chen. 2018. Expression recognition using semantic information and local texture features. *Multimedia Tools and Applications* **77**:9, 11575-11588. [Crossref]

553. Hongsheng Jin, Zongyao Li, Ruofeng Tong, Lanfen Lin. 2018. A deep 3D residual CNN for false-positive reduction in pulmonary nodule detection. *Medical Physics* **45**:5, 2097-2107. [Crossref]

554. Qiu Tang, Yi Chai, Jianfeng Qu, Hao Ren. 2018. Fisher Discriminative Sparse Representation Based on DBN for Fault Diagnosis of Complex System. *Applied Sciences* **8**:5, 795. [Crossref]

555. Zhaoqiong Huang, Ji Xu, Zaixiao Gong, Haibin Wang, Yonghong Yan. 2018. Source localization using deep neural networks in a shallow water environment. *The Journal of the Acoustical Society of America* **143**:5, 2922-2932. [Crossref]

556. Jeremy Liu, Federico Spedalieri, Ke-Thia Yao, Thomas Potok, Catherine Schuman, Steven Young, Robert Patton, Garrett Rose, Gangotree Chamka. 2018. Adiabatic Quantum Computation Applied to Deep Learning Networks. *Entropy* **20**:5, 380. [Crossref]

557. Zhaohui Liang, Jun Liu, Aihua Ou, Honglai Zhang, Ziping Li, Jimmy Xiangji Huang. 2018. Deep generative learning for automated EHR diagnosis of traditional Chinese medicine. *Computer Methods and Programs in Biomedicine* . [Crossref]

558. Kashif Ahmad, Mohamed Lamine Mekhalfi, Nicola Conci, Farid Melgani, Francesco De Natale. 2018. Ensemble of Deep Models for Event Recognition. *ACM Transactions on Multimedia Computing, Communications, and Applications* **14**:2, 1-20. [Crossref]

559. Mohammad H. Amin, Evgeny Andriyash, Jason Rolfe, Bohdan Kulchytskyy, Roger Melko. 2018. Quantum Boltzmann Machine. *Physical Review X* **8**:2. . [Crossref]

560. Le-Heng Fang, Wei Lin, Qiang Luo. 2018. Brain-Inspired Constructive Learning Algorithms with Evolutionally Additive Nonlinear Neurons. *International Journal of Bifurcation and Chaos* **28**:05, 1850068. [Crossref]

561. Yankang Jing, Yuemin Bian, Ziheng Hu, Lirong Wang, Xiang-Qun Sean Xie. 2018. Deep Learning for Drug Design: an Artificial Intelligence Paradigm for Drug Discovery in the Big Data Era. *The AAPS Journal* **20**:3. . [Crossref]

562. Guangle Yao, Tao Lei, Jiandan Zhong. 2018. A review of Convolutional-Neural-Network-based action recognition. *Pattern Recognition Letters* . [Crossref]

563. Sunil Kumar Sahu, Ashish Anand. 2018. What matters in a transferable neural network model for relation classification in the biomedical domain?. *Artificial Intelligence in Medicine* **87**, 60-66. [Crossref]

564. Tao Liu, Amr Abd-Elrahman. 2018. Deep convolutional neural network training enrichment using multi-view object-based analysis of Unmanned Aerial systems imagery for wetlands classification. *ISPRS Journal of Photogrammetry and Remote Sensing* **139**, 154-170. [Crossref]

565. Bi Xiaojun, Wang Haibo. 2018. Contractive Slab and Spike Convolutional Deep Boltzmann Machine. *Neurocomputing* **290**, 208-228. [Crossref]

566. Ján Drgoňa, Damien Picard, Michal Kvasnica, Lieve Helsen. 2018. Approximate model predictive building control via machine learning. *Applied Energy* **218**, 199-216. [Crossref]

567. Amir Anees, Yi-Ping Phoebe Chen. 2018. Discriminative binary feature learning and quantization in biometric key generation. *Pattern Recognition* **77**, 289-305. [Crossref]

568. Jianlong Chang, Lingfeng Wang, Gaofeng Meng, Shiming Xiang, Chunhong Pan. 2018. Deep unsupervised learning with consistent inference of latent representations. *Pattern Recognition* **77**, 438-453. [Crossref]

569. Roman Demidov, Alexander Pechenkin. Vector representation of machine instructions for vulnerability assessment of digital infrastructure components 835-840. [Crossref]

570. ZhiQiang Yuan, Bin Wang, Kai Liang, Qiong Liu, LiangLi Zhang. Application of deep belief network in prediction of secondary chemical components of sinter 2746-2751. [Crossref]

571. Wei Xiong, Qingbo He, Kesai Ouyang. Feature-difference sparse filtering for bearing health monitoring 1-5. [Crossref]

572. Ahmed Dawoud, Seyed Shahristani, Chun Raun. A Deep Learning Framework to Enhance Software Defined Networks Security 709-714. [Crossref]

573. Gang Lin, Bo Wang, Zheng Yang. Identification of Icing Thickness of Transmission Line Based on Strongly Generalized Convolutional Neural Network 499-504. [Crossref]

574. Wei Wang, Mengxue Zhao, Jigang Wang. 2018. Effective android malware detection with a hybrid model based on deep autoencoder and convolutional neural network. *Journal of Ambient Intelligence and Humanized Computing* **2**. . [Crossref]

575. Yixing Wang, Meiqin Liu, Zhejing Bao, Senlin Zhang. 2018. Stacked sparse autoencoder with PCA and SVM for data-based line trip fault diagnosis in power systems. *Neural Computing and Applications* **31**. . [Crossref]

576. Jinjiang Wang, Kebo Wang, Yangshen Wang, Zuguang Huang, Ruijuan Xue. 2018. Deep Boltzmann machine based condition prediction for smart manufacturing. *Journal of Ambient Intelligence and Humanized Computing* **1**. . [Crossref]

577. Rachid Chlaoua, Abdallah Meraoumia, Kamal Eddine Aiadi, Maarouf Korichi. 2018. Deep learning for finger-knuckle-print identification system based on PCANet and SVM classifier. *Evolving Systems* **19**. . [Crossref]

578. Guang Shi, Jiangshe Zhang, NanNan Ji, ChangPeng Wang. 2018. A new variant of restricted Boltzmann machine with horizontal connections. *Neural Computing and Applications* **5**. . [Crossref]

579. Seunghyun Choi, Myungsik Do. 2018. Prediction of Asphalt Pavement Service Life using Deep Learning. *International Journal of Highway Engineering* **20**:2, 57-65. [Crossref]

580. Catherine Hanson, Leyla Roskan Caglar, Stephen José Hanson. 2018. Attentional Bias in Human Category Learning: The Case of Deep Learning. *Frontiers in Psychology* **9**. . [Crossref]

581. Eya Mezghani, Maha Charfeddine, Chokri Ben Amar, Henri Nicolas. Speaker emotion recognition: from classical classifiers to deep neural networks 18. [Crossref]

582. Yang Jianping, Junyu Dong, Xin Sun, Changgang Wanga, Xinhua Wang. Low-contrast underwater living fish recognition using PCANet 63. [Crossref]

583. Huifang Chi, Lin Qi, Yanhai Gan, Junyu Dong, Amanuel Hirpa Madessa. Semantic attributes based texture generation 72. [Crossref]

584. Fang Du, Jiangshe Zhang, Nannan Ji, Junying Hu, Chunxia Zhang. 2018. Discriminative Representation Learning with Supervised Auto-encoder. *Neural Processing Letters* **59**. . [Crossref]

585. James S. Magnuson, Daniel Mirman, Sahil Luthra, Ted Strauss, Harlan D. Harris. 2018. Interaction in Spoken Word Recognition Models: Feedback Helps. *Frontiers in Psychology* **9**. . [Crossref]

586. Chang Min Jeong, Young Giu Jung, Sang Jo Lee. 2018. Deep belief networks based radar signal classification system. *Journal of Ambient Intelligence and Humanized Computing* **6**. . [Crossref]

587. Amir H. Ansari, Perumpillichira J. Cherian, Alexander Caicedo, Gunnar Naulaers, Maarten De Vos, Sabine Van Huffel. 2018. Neonatal Seizure Detection Using Deep Convolutional Neural Networks. *International Journal of Neural Systems* **14**, 1850011. [Crossref]

588. Joseph G Makin, Joseph E O'Doherty, Mariana M B Cardoso, Philip N Sabes. 2018. Superior arm-movement decoding from cortex with a new, unsupervised-learning algorithm. *Journal of Neural Engineering* **15**:2, 026010. [Crossref]

589. Ya-Jun Hu, Zhen-Hua Ling. 2018. Extracting Spectral Features Using Deep Autoencoders With Binary Distributed Hidden Units for Statistical Parametric Speech Synthesis. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **26**:4, 713-724. [Crossref]

590. Zeng Yu, Tianrui Li, Guangchun Luo, Hamido Fujita, Ning Yu, Yi Pan. 2018. Convolutional networks with cross-layer neurons for image recognition. *Information Sciences* **433-434**, 241-254. [Crossref]

591. Haidong Shao, Hongkai Jiang, Xingqiu Li, Tianchen Liang. 2018. Rolling bearing fault detection using continuous deep belief network with locally linear embedding. *Computers in Industry* **96**, 27-39. [Crossref]

592. Zhili Tan, Man-Wai Mak, Brian Kan-Wing Mak, Yingke Zhu. 2018. Denoised Senone I-Vectors for Robust Speaker Verification. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **26**:4, 820-830. [Crossref]

593. P. Lin, X. L. Li, Y. M. Chen, Y. He. 2018. A Deep Convolutional Neural Network Architecture for Boosting Image Discrimination Accuracy of Rice Species. *Food and Bioprocess Technology* **11**:4, 765-773. [Crossref]

594. Zheng Wang, Jinchang Ren, Dong Zhang, Meijun Sun, Jianmin Jiang. 2018. A deep-learning based feature hybrid framework for spatiotemporal saliency detection inside videos. *Neurocomputing* **287**, 68-83. [Crossref]

595. Yan Huang, Wei Wang, Liang Wang. 2018. Video Super-Resolution via Bidirectional Recurrent Convolutional Networks. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **40**:4, 1015-1028. [Crossref]

596. Chen-Yu Lee, Patrick Gallagher, Zhuowen Tu. 2018. Generalizing Pooling Functions in CNNs: Mixed, Gated, and Tree. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **40**:4, 863-875. [Crossref]

597. Yongjian Lian, Xukun Shen, Yong Hu. 2018. Detecting and inferring repetitive elements with accurate locations and shapes from façades. *The Visual Computer* **34**:4, 491-506. [Crossref]

598. Yi Liu, Jie Ling, Zhusong Liu, Jian Shen, Chongzhi Gao. 2018. Finger vein secure biometric template generation based on deep learning. *Soft Computing* **22**:7, 2257-2265. [Crossref]

599. Ammar O. Hoori, Yuichi Motai. 2018. Multicolumn RBF Network. *IEEE Transactions on Neural Networks and Learning Systems* **29**:4, 766-778. [Crossref]

600. Duo Zhang, Nicolas Martinez, Geir Lindholm, Harsha Ratnaweera. 2018. Manage Sewer In-Line Storage Control Using Hydraulic Model and Recurrent Neural Network. *Water Resources Management* **32**:6, 2079-2098. [Crossref]

601. Kaori Ambe, Kana Ishihara, Tatsuya Ochibe, Kazuyuki Ohya, Sorami Tamura, Kaoru Inoue, Midori Yoshida, Masahiro Tohkin. 2018. In Silico Prediction of Chemical-Induced Hepatocellular Hypertrophy Using Molecular Descriptors. *Toxicological Sciences* **162**:2, 667-675. [Crossref]

602. Věra Kůrková. 2018. Constructive lower bounds on model complexity of shallow perceptron networks. *Neural Computing and Applications* **29**:7, 305-315. [Crossref]

603. Zhaocheng Wang, Lan Du, Peng Zhang, Lu Li, Fei Wang, Shuwen Xu, Hongtao Su. 2018. Visual Attention-Based Target Detection and Discrimination for High-Resolution SAR Images in Complex Scenes. *IEEE Transactions on Geoscience and Remote Sensing* **56**:4, 1855-1872. [Crossref]

604. Siyuan Hao, Wei Wang, Yuanxin Ye, Tingyuan Nie, Lorenzo Bruzzone. 2018. Two-Stream Deep Architecture for Hyperspectral Image Classification. *IEEE Transactions on Geoscience and Remote Sensing* **56**:4, 2349-2361. [Crossref]

605. Ke Li, Gong Cheng, Shuhui Bu, Xiong You. 2018. Rotation-Insensitive and Context-Augmented Object Detection in Remote Sensing Images. *IEEE Transactions on Geoscience and Remote Sensing* **56**:4, 2337-2348. [Crossref]

606. Jie Geng, Hongyu Wang, Jianchao Fan, Xiaorui Ma. 2018. SAR Image Classification via Deep Recurrent Encoding Neural Networks. *IEEE Transactions on Geoscience and Remote Sensing* **56**:4, 2255-2269. [Crossref]

607. Muneki Yasuda. 2018. Learning Algorithm of Boltzmann Machine Based on Spatial Monte Carlo Integration Method. *Algorithms* **11**:4, 42. [Crossref]

608. Wei Shen, Chenting Du, Yuan Jiang, Dan Zeng, Zhijiang Zhang. 2018. Bag of Shape Features with a learned pooling function for shape recognition. *Pattern Recognition Letters* **106**, 33-40. [Crossref]

609. Zaher Mundher Yaseen, Haitham Abdulmohsin Afan, Minh-Tung Tran. 2018. Beam-column joint shear prediction using hybridized deep learning neural network with genetic algorithm. *IOP Conference Series: Earth and Environmental Science* **143**, 012025. [Crossref]

610. Takanori Kudo, Tomotaka Kimura, Yoshiaki Inoue, Hirohisa Aman, Kouji Hirata. 2018. Stochastic Modeling of Self-Evolving Botnets with Vulnerability Discovery. *Computer Communications* . [Crossref]

611. Gang Zhang, Ching-Hsien Robert Hsu, Huadong Lai, Xianghan Zheng. 2018. Deep learning based feature representation for automated skin histopathological image annotation. *Multimedia Tools and Applications* **77**:8, 9849-9869. [Crossref]

612. Junfei Qiao, Gongming Wang, Xiaoli Li, Wenjing Li. 2018. A self-organizing deep belief network for nonlinear system modeling. *Applied Soft Computing* **65**, 170-183. [Crossref]

613. Yang Xiao, Hong Hu, Ze Liu, Jiangchang Xu. 2018. Component Pin Recognition Using Algorithms Based on Machine Learning. *Journal of Physics: Conference Series* **1004**, 012004. [Crossref]

614. Dawei Li, Ruifang Zhang. 2018. Ensemble Stacked Auto-encoder Classification on LIDAR Remote Sensing Images. *Journal of the Indian Society of Remote Sensing* **46**:4, 597-604. [Crossref]

615. Achraf Oussidi, Azeddine Elhassouny. Deep generative models: Survey 1-8. [Crossref]

616. Haonan Tong, Bin Liu, Shihai Wang. 2018. Software defect prediction using stacked denoising autoencoders and two-stage ensemble learning. *Information and Software Technology* **96**, 94-111. [Crossref]

617. Jian Wu, Su Ruan, Thomas R. Mazur, Nalini Daniel, Hilary Lashmett, Laura Ochoa, Imran Zoberi, Chunfeng Lian, H. Michael Gach, Sasa Mutic, Maria Thomas, Mark A. Anastasio, Hua Li. Heart motion tracking on cine MRI based on a deep Boltzmann machine-driven level set method 1153-1156. [Crossref]

618. Avi Ben-Cohen, Eyal Klang, Michal Marianne Amitai, Jacob Goldberger, Hayit Greenspan. Anatomical data augmentation for CNN based pixel-wise classification 1096-1099. [Crossref]

619. Francesca Cipollini, Luca Oneto, Andrea Coraddu, Alan John Murphy, Davide Anguita. 2018. Condition-Based Maintenance of Naval Propulsion Systems: Data Analysis with Minimal Feedback. *Reliability Engineering & System Safety* . [Crossref]

620. Khoi Khac Nguyen, Dinh Thai Hoang, Dusit Niyato, Ping Wang, Diep Nguyen, Eryk Dutkiewicz. Cyberattack detection in mobile cloud computing: A deep learning approach 1-6. [Crossref]

621. Gang Chen, Ran Xu, Zhi Yang. 2018. Deep ranking structural support vector machine for image tagging. *Pattern Recognition Letters* **105**, 30-38. [Crossref]

622. Mohammed Mehedi Hassan, Md. Zia Uddin, Amr Mohamed, Ahmad Almogren. 2018. A robust human activity recognition system using smartphone sensors and deep learning. *Future Generation Computer Systems* **81**, 307-313. [Crossref]

623. Emily Lambert Mackevicius, Michale Sean Fee. 2018. Building a state space for song learning. *Current Opinion in Neurobiology* **49**, 59-68. [Crossref]

624. Hao Hao, Changqiao Xu, Mu Wang, Haiyong Xie, Yifeng Liu, Dapeng Oliver Wu. Knowledge-centric proactive edge caching over mobile content distribution network 450-455. [Crossref]

625. Mazdak Fatahi, Mahyar Shahsavari, Mahmood Ahmadi, Arash Ahmadi, Pierre Boulet, Philippe Devienne. 2018. Rate-coded DBN: An online strategy for spike-based deep belief networks. *Biologically Inspired Cognitive Architectures* **24**, 59-69. [Crossref]

626. Tengyu Fu, Lei Ma, Manchun Li, Brian A. Johnson. 2018. Using convolutional neural network to identify irregular segmentation objects from very high-resolution remote sensing imagery. *Journal of Applied Remote Sensing* **12**:02, 1. [Crossref]

627. Otkrist Gupta, Dan Raviv, Ramesh Raskar. 2018. Illumination invariants in deep video expression recognition. *Pattern Recognition* **76**, 25-35. [Crossref]

628. Norbert A. Agana, Emmanuel Oleka, Gabriel Awogbami, Abdollah Homaifar. Short-Term Load Forecasting Based on a Hybrid Deep Learning Model 1-6. [Crossref]

629. Pan Wang, Jiasen Wang, Jian Zhang. 2018. Methodological Research for Modular Neural Networks Based on "an Expert With Other Capabilities". *Journal of Global Information Management* **26**:2, 104-126. [Crossref]

630. Guoqiang Zhong, Xiao Ling, Li-Na Wang. 2018. From shallow feature learning to deep learning: Benefits from the width and depth of deep architectures. *Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery* **12**, e1255. [Crossref]

631. Christophe Gardella, Olivier Marre, Thierry Mora. 2018. Blindfold learning of an accurate neural metric. *Proceedings of the National Academy of Sciences* **115**:13, 3267-3272. [Crossref]

632. Zhibin Lin, Hong Pan, Guoqing Gui, Changhui Yan. Data-driven structural diagnosis and conditional assessment: from shallow to deep learning 38. [Crossref]

633. Gaurav Tripathi, Kuldeep Singh, Dinesh Kumar Vishwakarma. 2018. Convolutional neural networks for crowd behaviour analysis: a survey. *The Visual Computer* **18**. . [Crossref]

634. Hazem Toutounji, Loreen Hertäg, Daniel Durstewitz. Neural Networks and Neurocomputational Modeling 1-40. [Crossref]

635. Anan Banharnsakun. 2018. Towards improving the convolutional neural networks for deep learning using the distributed artificial bee colony method. *International Journal of Machine Learning and Cybernetics* **61**. . [Crossref]

636. Guangwu Qian, Lei Zhang, Yan Wang. 2018. Single-label and multi-label conceptor classifiers in pre-trained neural networks. *Neural Computing and Applications* **35**. . [Crossref]

637. K.M. Ibrahim Khalilullah, Shunsuke Ota, Toshiyuki Yasuda, Mitsuru Jindai. 2018. Road area detection method based on DBNN for robot navigation using single camera in outdoor environments. *Industrial Robot: An International Journal* **45**:2, 275-286. [Crossref]

638. Tao Yang, Dongmei Fu, Xiaogang Li, Kamil Říha. 2018. Manifold regularized multiple kernel learning with Hellinger distance. *Cluster Computing* **200**. . [Crossref]

639. Haitao Pu, Mingqu Fan, Jinliang Yang, Jian Lian. 2018. Quick response barcode deblurring via doubly convolutional neural network. *Multimedia Tools and Applications* **4790**. . [Crossref]

640. Yuchen Qiu, Yue Du, Roy Zhang, Abolfazl Zargari, Theresa Thai, Camille Gunderson, Katherine Moxley, Hong Liu, Bin Zheng. A performance comparison of low- and high-level features learned by deep convolutional neural networks in epithelium and stroma classification 41. [Crossref]

641. Tao Liu, Amr Abd-Elrahman, Jon Morton, Victor L. Wilhelm. 2018. Comparing fully convolutional networks, random forest, support vector machine, and patch-based deep convolutional neural networks for object-based wetland mapping using

images from small unmanned aircraft system. *GIScience & Remote Sensing* **55**:2, 243-264. [Crossref]

642. Fanhui Kong, Jian Li. 2018. The promotion strategy of supply chain flexibility based on deep belief network. *Applied Intelligence* **25**. . [Crossref]

643. Haidong Shao, Hongkai Jiang, Ying Lin, Xingqiu Li. 2018. A novel method for intelligent fault diagnosis of rolling bearings using ensemble deep auto-encoders. *Mechanical Systems and Signal Processing* **102**, 278-297. [Crossref]

644. Xiaodong Jia, Ming Zhao, Yuan Di, Pin Li, Jay Lee. 2018. Sparse filtering with the generalized lp / lq norm and its applications to the condition monitoring of rotating machinery. *Mechanical Systems and Signal Processing* **102**, 198-213. [Crossref]

645. Haidong Shao, Hongkai Jiang, Haizhou Zhang, Tianchen Liang. 2018. Electric Locomotive Bearing Fault Diagnosis Using a Novel Convolutional Deep Belief Network. *IEEE Transactions on Industrial Electronics* **65**:3, 2727-2736. [Crossref]

646. Kaige Zhang, H. D. Cheng, Boyu Zhang. 2018. Unified Approach to Pavement Crack and Sealed Crack Detection Using Preclassification Based on Transfer Learning. *Journal of Computing in Civil Engineering* **32**:2, 04018001. [Crossref]

647. Dong Yup Kim, Ha Yoon Song. 2018. Method of predicting human mobility patterns using deep learning. *Neurocomputing* **280**, 56-64. [Crossref]

648. Yongheng Wang, Shaofeng Geng, Hui Gao. 2018. A proactive decision support method based on deep reinforcement learning and state partition. *Knowledge-Based Systems* **143**, 248-258. [Crossref]

649. Jiewu Leng, Qingxin Chen, Ning Mao, Pingyu Jiang. 2018. Combining granular computing technique with deep learning for service planning under social manufacturing contexts. *Knowledge-Based Systems* **143**, 295-306. [Crossref]

650. Hossein Rahmani, Ajmal Mian, Mubarak Shah. 2018. Learning a Deep Model for Human Action Recognition from Novel Viewpoints. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **40**:3, 667-681. [Crossref]

651. Zhong Yin, Jianhua Zhang. 2018. Task-generic mental fatigue recognition based on neurophysiological signals and dynamical deep extreme learning machine. *Neurocomputing* **283**, 266-281. [Crossref]

652. Linkai Luo, Songfei Zhang, Yudan Wang, Hong Peng. 2018. An alternate method between generative objective and discriminative objective in training classification Restricted Boltzmann Machine. *Knowledge-Based Systems* **144**, 144-152. [Crossref]

653. Yi Ding, Rongfeng Dong, Tian Lan, Xuerui Li, Guangyu Shen, Hao Chen, Zhiguang Qin. 2018. Multi-modal brain tumor image segmentation based on SDAE. *International Journal of Imaging Systems and Technology* **28**:1, 38-47. [Crossref]

654. Thomas Baumeister, Steven L. Brunton, J. Nathan Kutz. 2018. Deep learning and model predictive control for self-tuning mode-locked lasers. *Journal of the Optical Society of America B* **35**:3, 617. [Crossref]

655. Wentao Mao, Wenpeng Wang, Zhi Dou, Yuan Li. 2018. Fire Recognition Based On Multi-Channel Convolutional Neural Network. *Fire Technology* **54**:2, 531-554. [Crossref]

656. Hongfu Liu, Ming Shao, Sheng Li, Yun Fu. 2018. Infinite ensemble clustering. *Data Mining and Knowledge Discovery* **32**:2, 385-416. [Crossref]

657. Laila Bashmal, Yakoub Bazi, Haikel AlHichri, Mohamad AlRahhal, Nassim Ammour, Naif Alajlan. 2018. Siamese-GAN: Learning Invariant Representations for Aerial Vehicle Image Categorization. *Remote Sensing* **10**:3, 351. [Crossref]

658. Jia Liu, Maoguo Gong, Kai Qin, Puzhao Zhang. 2018. A Deep Convolutional Coupling Network for Change Detection Based on Heterogeneous Optical and Radar Images. *IEEE Transactions on Neural Networks and Learning Systems* **29**:3, 545-559. [Crossref]

659. Ning Ma, Yu Peng, Shaojun Wang, Philip Leong. 2018. An Unsupervised Deep Hyperspectral Anomaly Detector. *Sensors* **18**:3, 693. [Crossref]

660. Liang Sun, Jian-chun Xing, Zhen-yu Wang, Xun Zhang, Liang Liu. 2018. Virtual reality of recognition technologies of the improved contour coding image based on level set and neural network models. *Neural Computing and Applications* **29**:5, 1311-1330. [Crossref]

661. Chen Ding, Ying Li, Yong Xia, Lei Zhang, Yanning Zhang. 2018. Automatic Kernel Size Determination for Deep Neural Networks Based Hyperspectral Image Classification. *Remote Sensing* **10**:3, 415. [Crossref]

662. Salima Hassairi, Ridha Ejbali, Mourad Zaied. 2018. A deep stacked wavelet auto-encoders to supervised feature extraction to pattern classification. *Multimedia Tools and Applications* **77**:5, 5443-5459. [Crossref]

663. Ridha Ejbali, Mourad Zaied. 2018. A dyadic multi-resolution deep convolutional neural wavelet network for image classification. *Multimedia Tools and Applications* **77**:5, 6149-6163. [Crossref]

664. Xiao Wang, Rui Jiang, Li Li, Yilun Lin, Xinhu Zheng, Fei-Yue Wang. 2018. Capturing Car-Following Behaviors by Deep Learning. *IEEE Transactions on Intelligent Transportation Systems* **19**:3, 910-920. [Crossref]

665. Dalton Lunga, Hsiuhan Lexie Yang, Andrew Reith, Jeanette Weaver, Jiangye Yuan, Budhendra Bhaduri. 2018. Domain-Adapted Convolutional Networks for Satellite Image Classification: A Large-Scale Interactive Learning Workflow. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* **11**:3, 962-977. [Crossref]

666. Zhun Fan, Jiewei Lu, Maoguo Gong, Honghui Xie, Erik D. Goodman. 2018. Automatic Tobacco Plant Detection in UAV Images via Deep Neural Networks. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* **11**:3, 876-887. [Crossref]

667. Tao Liu, Amr Abd-Elrahman. 2018. An Object-Based Image Analysis Method for Enhancing Classification of Land Covers Using Fully Convolutional Networks

and Multi-View Images of Small Unmanned Aerial System. *Remote Sensing* **10**:3, 457. [Crossref]

668. Yara Rizk, Nadine Hajj, Nicholas Mitri, Mariette Awad. 2018. Deep belief networks and cortical algorithms: A comparative study for supervised classification. *Applied Computing and Informatics* . [Crossref]

669. Fangzhou Cheng, Jun Wang, Liyan Qu, Wei Qiao. 2018. Rotor-Current-Based Fault Diagnosis for DFIG Wind Turbine Drivetrain Gearboxes Using Frequency Analysis and a Deep Classifier. *IEEE Transactions on Industry Applications* **54**:2, 1062-1071. [Crossref]

670. T I Kasatkina, A V Dushkin, V A Pavlov, R R Shatovkin. 2018. Algorithm for predicting the evolution of series of dynamics of complex systems in solving information problems. *Journal of Physics: Conference Series* **973**, 012035. [Crossref]

671. Raúl Cruz-Barbosa, Erik-German Ramos-Pérez, Jesús Giraldo. 2018. Representation Learning for Class C G Protein-Coupled Receptors Classification. *Molecules* **23**:3, 690. [Crossref]

672. Joel Bock. 2018. A Deep Learning Model of Perception in Color-Letter Synesthesia. *Big Data and Cognitive Computing* **2**:1, 8. [Crossref]

673. Rui Guo, Jianbo Liu, Na Li, Shibin Liu, Fu Chen, Bo Cheng, Jianbo Duan, Xinpeng Li, Caihong Ma. 2018. Pixel-Wise Classification Method for High Resolution Remote Sensing Imagery Using Deep Neural Networks. *ISPRS International Journal of Geo-Information* **7**:3, 110. [Crossref]

674. Leilei Wang, Jinyong Cheng. 2018. Protein Secondary Structure Prediction Using AutoEncoder Network and Bayes Classifier. *IOP Conference Series: Materials Science and Engineering* **322**:6, 062008. [Crossref]

675. Xue-Bo Jin, Ting-Li Su, Jian-Lei Kong, Yu-Ting Bai, Bei-Bei Miao, Chao Dou. 2018. State-of-the-Art Mobile Intelligence: Enabling Robots to Move Like Humans by Estimating Mobility with Artificial Intelligence. *Applied Sciences* **8**:3, 379. [Crossref]

676. , . 2018. EMD-Based Predictive Deep Belief Network for Time Series Prediction: An Application to Drought Forecasting. *Hydrology* **5**:1, 18. [Crossref]

677. Hong Pan, Guoqing Gui, Zhibin Lin, Changhui Yan. 2018. Deep BBN Learning for Health Assessment toward Decision-Making on Structures under Uncertainties. *KSCE Journal of Civil Engineering* **22**:3, 928-940. [Crossref]

678. Liliana Andrade, Adrien Prost-Boucle, Frederic Petrot. Overview of the state of the art in embedded machine learning 1033-1038. [Crossref]

679. Nweke Henry Friday, Mohammed Ali Al-garadi, Ghulam Mujtaba, Uzoma Rita Alo, Ahmad Waqas. Deep learning fusion conceptual frameworks for complex human activity recognition using mobile and wearable sensors 1-7. [Crossref]

680. Yidong Liu, Yanzhi Wang, Fabrizio Lombardi, Jie Han. An energy-efficient stochastic computational deep belief network 1175-1178. [Crossref]

681. Farnaz Abtahi, Tony Ro, Wei Li, Zhigang Zhu. Emotion Analysis Using Audio/ Video, EMG and EEG: A Dataset and Comparison Study 10-19. [Crossref]

682. Liang-Yan Gui, Liangke Gui, Yu-Xiong Wang, Louis-Philippe Morency, Jose M. F. Moura. Factorized Convolutional Networks: Unsupervised Fine-Tuning for Image Clustering 1205-1214. [Crossref]

683. Khaled Alrawashdeh, Carla Purdy. Fast hardware assisted online learning using unsupervised deep learning structure for anomaly detection 128-134. [Crossref]

684. Bilel Ameur, Mebarka Belahcene, Sabeur Masmoudi, Ahmed Ben Hamida. Weighted PCA-EFMNet: A deep learning network for Face Verification in the Wild 1-6. [Crossref]

685. Hinda Dridi, Kais Ouni. Applying long short-term memory concept to hybrid "CD-NN-HMM" model for keywords spotting in continuous speech 1-6. [Crossref]

686. Rabeb Kaabi, Mounir Sayadi, Moez Bouchouicha, Farhat Fnaiech, Eric Moreau, Jean Marc Ginoux. Early smoke detection of forest wildfire video using deep belief network 1-6. [Crossref]

687. Rainer Huber, Melanie Krüger, Bernd T. Meyer. 2018. Single-ended prediction of listening effort using deep neural networks. *Hearing Research* **359**, 40-49. [Crossref]

688. Junlin Hu, Yap-Peng Tan. 2018. Nonlinear dictionary learning with application to image classification. *Pattern Recognition* **75**, 282-291. [Crossref]

689. Constantin Spille, Stephan D. Ewert, Birger Kollmeier, Bernd T. Meyer. 2018. Predicting speech intelligibility with deep neural networks. *Computer Speech & Language* **48**, 51-66. [Crossref]

690. Rohit Sinha, S. Shahnawazuddin. 2018. Assessment of pitch-adaptive front-end signal processing for children's speech recognition. *Computer Speech & Language* **48**, 103-121. [Crossref]

691. Wu Hao, Rongfang Bie, Junqi Guo, Xin Meng, Shenling Wang. 2018. Optimized CNN Based Image Recognition Through Target Region Selection. *Optik - International Journal for Light and Electron Optics* **156**, 772-777. [Crossref]

692. Hao Wu, Rongfang Bie, Junqi Guo, Xin Meng, Shenling Wang. 2018. Semantic Constraint Based Target Object Recognition. *Optik* **156**, 791-796. [Crossref]

693. Gang Liu, Jundong Si, Yanzhong Hu, Shan Li. Photographic image synthesis with improved U-net 402-407. [Crossref]

694. Dingan Liao, Hu Lu. Classify autism and control based on deep learning and community structure on resting-state fMRI 289-294. [Crossref]

695. Yun Jiang, Jize Xiao, Xi Liu, Jinquan Hou. A removing redundancy Restricted Boltzmann Machine 57-62. [Crossref]

696. Guan-Sian Wu, Po-Hsuan Tseng. A Deep Neural Network-Based Indoor Positioning Method using Channel State Information 290-294. [Crossref]

697. Fang Xu, Guo Yi, Wang Qi, Fan Zhen. Research on automatic summary of Chinese short text based on LSTM and keywords correction 467-472. [Crossref]

698. Mario Munoz-Organero, Ramona Ruiz-Blaquez, Luis Sánchez-Fernández. 2018. Automatic detection of traffic lights, street crossings and urban roundabouts combining outlier detection and deep learning classification techniques based on GPS traces while driving. *Computers, Environment and Urban Systems* **68**, 1-8. [Crossref]

699. Sehla Loussaief, Afef Abdelkrim. Deep learning vs. bag of features in machine learning for image classification 6-10. [Crossref]

700. Fouzi Harrou, Abdelkader Dairi, Ying Sun, Mohamed Senouci. Reliable detection of abnormal ozone measurements using an air quality sensors network 1-5. [Crossref]

701. Martha Dais Ferreira, Débora Cristina Corrêa, Luis Gustavo Nonato, Rodrigo Fernandes de Mello. 2018. Designing architectures of convolutional neural networks to solve practical problems. *Expert Systems with Applications* **94**, 205-217. [Crossref]

702. Swarnava Dey, Arijit Mukherjee. Implementing Deep Learning and Inferencing on Fog and Edge Computing Systems 818-823. [Crossref]

703. Yuequan Bao, Zhiyi Tang, Hui Li, Yufeng Zhang. 2018. Computer vision and deep learning–based data anomaly detection method for structural health monitoring. *Structural Health Monitoring: An International Journal* **19**, 147592171875740. [Crossref]

704. Sander van der Hoog. 2018. Surrogate Modelling in (and of) Agent-Based Models: A Prospectus. *Computational Economics* **18**. . [Crossref]

705. Salman Khan, Hossein Rahmani, Syed Afaq Ali Shah, Mohammed Bennamoun. 2018. A Guide to Convolutional Neural Networks for Computer Vision. *Synthesis Lectures on Computer Vision* **8**:1, 1-207. [Crossref]

706. Zhenglun Kong, Junyi Luo, Shengpu Xu, Ting Li. Automatical and accurate segmentation of cerebral tissues in fMRI dataset with combination of image processing and deep learning 9. [Crossref]

707. Bertrand Higy, Alessio Mereta, Giorgio Metta, Leonardo Badino. 2018. Speech Recognition for the iCub Platform. *Frontiers in Robotics and AI* **5**. . [Crossref]

708. Zhenglun Kong, Ting Li, Junyi Luo, Shengpu Xu. Automatic tissue image segmentation based on image processing and deep learning 63. [Crossref]

709. Igor F Tsigelny. 2018. Artificial intelligence in drug combination therapy. *Briefings in Bioinformatics* **4**. . [Crossref]

710. Hassan S. Salehi, Nima Karimian, Mina Mahdian, Hisham Alnajjar, Aditya Tadinada. Deep learning classifier with optical coherence tomography images for early dental caries detection 3. [Crossref]

711. Qianjun Zhang, Lei Zhang. 2018. Convolutional adaptive denoising autoencoders for hierarchical feature extraction. *Frontiers of Computer Science* **18**. . [Crossref]

712. R. Rani Saritha, Varghese Paul, P. Ganesh Kumar. 2018. Content based image retrieval using deep learning process. *Cluster Computing* **2** . . [Crossref]

713. Manohar Latha, Ganesan Kavitha. 2018. Detection of Schizophrenia in brain MR images based on segmented ventricle region and deep belief networks. *Neural Computing and Applications* **14** . . [Crossref]

714. Helen Miller, Zhaokun Zhou, Jack Shepherd, Adam J M Wollman, Mark C Leake. 2018. Single-molecule techniques in biophysics: a review of the progress in methods and applications. *Reports on Progress in Physics* **81**:2, 024601. [Crossref]

715. Xiaoyi Pan, Jing Wang, Xudong Zhang, Yuan Mei, Lu Shi, Guoqiang Zhong. 2018. A deep-learning model for the amplitude inversion of internal waves based on optical remote-sensing images. *International Journal of Remote Sensing* **39**:3, 607-618. [Crossref]

716. Liangjun Chen, Hua Qu, Jihong Zhao. 2018. Generalized Correntropy based deep learning in presence of non-Gaussian noises. *Neurocomputing* **278**, 41-50. [Crossref]

717. Weichen Sun, Fei Su, Leiquan Wang. 2018. Improving deep neural networks with multi-layer maxout networks and a novel initialization method. *Neurocomputing* **278**, 34-40. [Crossref]

718. Huei-Fang Yang, Kevin Lin, Chu-Song Chen. 2018. Supervised Learning of Semantics-Preserving Hash via Deep Convolutional Neural Networks. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **40**:2, 437-451. [Crossref]

719. Yang Xu, Shunlong Li, Dongyu Zhang, Yao Jin, Fujian Zhang, Na Li, Hui Li. 2018. Identification framework for cracks on a steel structure surface by a restricted Boltzmann machines algorithm based on consumer-grade camera images. *Structural Control and Health Monitoring* **25**:2, e2075. [Crossref]

720. Pinghua Xu, Xuemei Ding, Xiongying Wu, Rongwu Wang. 2018. Characterization and assessment of fabric smoothness appearance based on sparse coding. *Textile Research Journal* **88**:4, 367-378. [Crossref]

721. Yanfang Ye, Lingwei Chen, Shifu Hou, William Hardy, Xin Li. 2018. DeepAM: a heterogeneous deep learning framework for intelligent malware detection. *Knowledge and Information Systems* **54**:2, 265-285. [Crossref]

722. Tanmoy Chakraborty, Subrata Nandi. 2018. Universal trajectories of scientific success. *Knowledge and Information Systems* **54**:2, 487-509. [Crossref]

723. Yuxin Peng, Jinwei Qi, Xin Huang, Yuxin Yuan. 2018. CCL: Cross-modal Correlation Learning With Multigrained Fusion by Hierarchical Network. *IEEE Transactions on Multimedia* **20**:2, 405-420. [Crossref]

724. Hwasuk Cho, Hyunwoo Son, Kihwan Seong, Byungsub Kim, Hong-June Park, Jae-Yoon Sim. 2018. An On-Chip Learning Neuromorphic Autoencoder With Current-Mode Transposable Memory Read and Virtual Lookup Table. *IEEE Transactions on Biomedical Circuits and Systems* **12**:1, 161-170. [Crossref]

725. Son N. Tran, Artur S. d'Avila Garcez. 2018. Deep Logic Networks: Inserting and Extracting Knowledge From Deep Belief Networks. *IEEE Transactions on Neural Networks and Learning Systems* **29**:2, 246-258. [Crossref]

726. Yansheng Li, Yongjun Zhang, Xin Huang, Hu Zhu, Jiayi Ma. 2018. Large-Scale Remote Sensing Image Retrieval by Deep Hashing Neural Networks. *IEEE Transactions on Geoscience and Remote Sensing* **56**:2, 950-965. [Crossref]

727. Shuang Feng, C. L. Philip Chen. 2018. A Fuzzy Restricted Boltzmann Machine: Novel Learning Algorithms Based on the Crisp Possibilistic Mean Value of Fuzzy Numbers. *IEEE Transactions on Fuzzy Systems* **26**:1, 117-130. [Crossref]

728. Yangqin Feng, Lei Zhang, Zhang Yi. 2018. Breast cancer cell nuclei classification in histopathology images using deep neural networks. *International Journal of Computer Assisted Radiology and Surgery* **13**:2, 179-191. [Crossref]

729. Jing Chen, Song Cheng, Haidong Xie, Lei Wang, Tao Xiang. 2018. Equivalence of restricted Boltzmann machines and tensor network states. *Physical Review B* **97**:8. . [Crossref]

730. D. Douglas Miller, Eric W. Brown. 2018. Artificial Intelligence in Medical Practice: The Question to the Answer?. *The American Journal of Medicine* **131**:2, 129-133. [Crossref]

731. Jing Zhang, Lu Chen, Li Zhuo, Xi Liang, Jiafeng Li. 2018. An Efficient Hyperspectral Image Retrieval Method: Deep Spectral-Spatial Feature Extraction with DCGAN and Dimensionality Reduction Using t-SNE-Based NM Hashing. *Remote Sensing* **10**:2, 271. [Crossref]

732. Yumeng Tao, Kuolin Hsu, Alexander Ihler, Xiaogang Gao, Soroosh Sorooshian. 2018. A Two-Stage Deep Neural Network Framework for Precipitation Estimation from Bispectral Satellite Information. *Journal of Hydrometeorology* **19**:2, 393-408. [Crossref]

733. Péter Bodnár, Tamás Grósz, László Tóth, László G. Nyúl. 2018. Efficient visual code localization with neural networks. *Pattern Analysis and Applications* **21**:1, 249-260. [Crossref]

734. Qi Yue, Caiwen Ma. 2018. Hyperspectral data classification based on flexible momentum deep convolution neural network. *Multimedia Tools and Applications* **77**:4, 4417-4429. [Crossref]

735. Yun Bai, Zhenzhong Sun, Jun Deng, Lin Li, Jianyu Long, Chuan Li. 2018. Manufacturing Quality Prediction Using Intelligent Learning Approaches: A Comparative Study. *Sustainability* **10**:2, 85. [Crossref]

736. Peng Liang, Wenzhong Shi, Xiaokang Zhang. 2018. Remote Sensing Image Classification Based on Stacked Denoising Autoencoder. *Remote Sensing* **10**:2, 16. [Crossref]

737. Paolo Massimo Buscema, Giulia Massini, Marco Fabrizi, Marco Breda, Francesca Della Torre. 2018. The ANNS approach to DEM reconstruction. *Computational Intelligence* **34**:1, 310-344. [Crossref]

738. Guoqiang Zhong, Shoujun Yan, Kaizhu Huang, Yajuan Cai, Junyu Dong. 2018. Reducing and Stretching Deep Convolutional Activation Features for Accurate Image Classification. *Cognitive Computation* **10**:1, 179-186. [Crossref]

739. Haiqin Yang, Lap Pong Cheung. 2018. Implicit Heterogeneous Features Embedding in Deep Knowledge Tracing. *Cognitive Computation* **10**:1, 3-14. [Crossref]

740. Yang Zhang, Ping Jiang, Hongyan Zhang, Peng Cheng. 2018. Study on Urban Heat Island Intensity Level Identification Based on an Improved Restricted Boltzmann Machine. *International Journal of Environmental Research and Public Health* **15**:2, 186. [Crossref]

741. Liping Yang, Alan MacEachren, Prasenjit Mitra, Teresa Onorati. 2018. Visually-Enabled Active Deep Learning for (Geo) Text and Image Classification: A Review. *ISPRS International Journal of Geo-Information* **7**:2, 65. [Crossref]

742. Chensi Cao, Feng Liu, Hai Tan, Deshou Song, Wenjie Shu, Weizhong Li, Yiming Zhou, Xiaochen Bo, Zhi Xie. 2018. Deep Learning and Its Applications in Biomedicine. *Genomics, Proteomics & Bioinformatics* **16**:1, 17-32. [Crossref]

743. Fouzi Harrou, Abdelkader Dairi, Ying Sun, Mohamed Senouci. Wastewater treatment plant monitoring via a deep learning approach 1544-1548. [Crossref]

744. D. Cárdenas-Peña, D. Collazos-Huertas, A. Álvarez-Meza, G. Castellanos-Dominguez. 2018. Supervised kernel approach for automated learning using General Stochastic Networks. *Engineering Applications of Artificial Intelligence* **68**, 10-17. [Crossref]

745. Ali Kalantari, Amirrudin Kamsin, Shahaboddin Shamshirband, Abdullah Gani, Hamid Alinejad-Rokny, Anthony T. Chronopoulos. 2018. Computational intelligence approaches for classification of medical data: State-of-the-art, future challenges and research directions. *Neurocomputing* **276**, 2-22. [Crossref]

746. Kazuyuki Hiraoka, Toshihiko Hamada, Gen Hori. 2018. Necessary and sufficient conditions of proper estimators based on self density ratio for unnormalized statistical models. *Neural Networks* **98**, 263-270. [Crossref]

747. Jindong Wang, Yiqiang Chen, Shuji Hao, Xiaohui Peng, Lisha Hu. 2018. Deep learning for sensor-based activity recognition: A Survey. *Pattern Recognition Letters* . [Crossref]

748. Hongtao Shi, Hongping Li, Dan Zhang, Chaqiu Cheng, Xuanxuan Cao. 2018. An efficient feature generation approach based on deep learning and feature selection techniques for traffic classification. *Computer Networks* **132**, 81-98. [Crossref]

749. Francesca Cipollini, Luca Oneto, Andrea Coraddu, Alan John Murphy, Davide Anguita. 2018. Condition-Based Maintenance of Naval Propulsion Systems with supervised Data Analysis. *Ocean Engineering* **149**, 268-278. [Crossref]

750. Xinggang Wang, Yongluan Yan, Peng Tang, Xiang Bai, Wenyu Liu. 2018. Revisiting multiple instance neural networks. *Pattern Recognition* **74**, 15-24. [Crossref]

751. Cheng Shi, Chi-Man Pun. 2018. Superpixel-based 3D deep neural networks for hyperspectral image classification. *Pattern Recognition* **74**, 600-616. [Crossref]

752. Fei Li, Jie Zhang, Chao Shang, Dexian Huang, Eni Oko, Meihong Wang. 2018. Modelling of a post-combustion CO_2 capture process using deep belief network. *Applied Thermal Engineering* **130**, 997-1003. [Crossref]

753. Haidong Shao, Hongkai Jiang, Haizhou Zhang, Wenjing Duan, Tianchen Liang, Shuaipeng Wu. 2018. Rolling bearing fault feature learning using improved convolutional deep belief network with compressed sensing. *Mechanical Systems and Signal Processing* **100**, 743-765. [Crossref]

754. Hirohito Kiwata. 2018. Parameter inference in a probabilistic model from data: Regulation of transition rate in the Monte Carlo method. *Physica A: Statistical Mechanics and its Applications* **491**, 1014-1022. [Crossref]

755. Jinyong Wang, Ce Zhang. 2018. Software reliability prediction using a deep learning model based on the RNN encoder–decoder. *Reliability Engineering & System Safety* **170**, 73-82. [Crossref]

756. Abdelkader Dairi, Fouzi Harrou, Mohamed Senouci, Ying Sun. 2018. Unsupervised obstacle detection in driving environments using deep-learning-based stereovision. *Robotics and Autonomous Systems* **100**, 287-301. [Crossref]

757. Kun Li, Shaoguang Mao, Xu Li, Zhiyong Wu, Helen Meng. 2018. Automatic lexical stress and pitch accent detection for L2 English speech using multi-distribution deep neural networks. *Speech Communication* **96**, 28-36. [Crossref]

758. John S.H. Baxter, Eli Gibson, Roy Eagleson, Terry M. Peters. 2018. The semiotics of medical image Segmentation. *Medical Image Analysis* **44**, 54-71. [Crossref]

759. Sérgio Pereira, Raphael Meier, Richard McKinley, Roland Wiest, Victor Alves, Carlos A. Silva, Mauricio Reyes. 2018. Enhancing interpretability of automatically extracted machine learning features: application to a RBM-Random Forest system on brain lesion segmentation. *Medical Image Analysis* **44**, 228-244. [Crossref]

760. Mohammed Ali Al-Garadi, Kasturi Dewi Varathan, Sri Devi Ravana, Ejaz Ahmed, Ghulam Mujtaba, Muhammad Usman Shahid Khan, Samee U. Khan. 2018. Analysis of Online Social Network Connections for Identification of Influential Users. *ACM Computing Surveys* **51**:1, 1-37. [Crossref]

761. Hu Zhenlong, Zhao Qiang, Wang Jun. 2018. The Prediction Model of Cotton Yarn Intensity Based on the CNN-BP Neural Network. *Wireless Personal Communications* **24**. . [Crossref]

762. C. Manjula, Lilly Florence. 2018. Deep neural network based hybrid approach for software defect prediction using software metrics. *Cluster Computing* **153**. . [Crossref]

763. Salaheldin Elkatatny, Zeeshan Tariq, Mohamed Mahmoud, Abdulazeez Abdulraheem, Ibrahim Mohamed. 2018. An integrated approach for estimating static Young's modulus using artificial intelligence tools. *Neural Computing and Applications* **51**. . [Crossref]

764. Yu Liu, Yingyezhe Jin, Peng Li. 2018. Online Adaptation and Energy Minimization for Hardware Recurrent Spiking Neural Networks. *ACM Journal on Emerging Technologies in Computing Systems* **14**:1, 1-21. [Crossref]

765. Wen-Shyen Eric Chen, Chun-Fang Huang, Ming-Jen Huang. 2018. iSDS: a self-configurable software-defined storage system for enterprise. *Enterprise Information Systems* **12**:1, 54-75. [Crossref]

766. Longhao Yuan, Jianting Cao. Patients' EEG Data Analysis via Spectrogram Image with a Convolution Neural Network 13-21. [Crossref]

767. Tavpritesh Sethi. Big Data to Big Knowledge for Next Generation Medicine: A Data Science Roadmap 371-399. [Crossref]

768. Makoto Ikeda, Yuki Sakai, Tetsuya Oda, Leonard Barolli. Performance Evaluation of a Vegetable Recognition System Using Caffe and Chainer 24-30. [Crossref]

769. Simon Fong, Suash Deb, Xin-she Yang. How Meta-heuristic Algorithms Contribute to Deep Learning in the Hype of Big Data Analytics 3-25. [Crossref]

770. Ricardo F. Alvear-Sandoval, Aníbal R. Figueiras-Vidal. 2018. On building ensembles of stacked denoising auto-encoding classifiers and their further improvement. *Information Fusion* **39**, 41-52. [Crossref]

771. Tomáš Ježowicz, Petr Gajdoš, Vojtěch Uher, Stanislav Mišák, Václav Snášel. Improving the Speed and Quality of Extreme Learning Machine by Conjugate Gradient Method 128-137. [Crossref]

772. Łukasz Chechliński, Bartłomiej Chechliński. Polish Road Signs Detection and Classification System Based on Sign Sketches and ConvNet 546-553. [Crossref]

773. Jayashree Padmanabhan, J. Melvin Jose Premkumar. Advanced Deep Neural Networks for Pattern Recognition: An Experimental Study 166-175. [Crossref]

774. Ke Li, Ruicong Ran, Shimin Song, Jun Wang, Lijing Wang. Spacecraft Electrical Signal Classification Method of Reliability Test Based on Random Forest 457-465. [Crossref]

775. Woo-Sup Han, Il-Song Han. Enhanced Object Segmentation for Vehicle Tracking and Dental CBCT by Neuromorphic Visual Processing with Controlled Neuron 67-77. [Crossref]

776. Cosmin Stamate, George D. Magoulas, Michael S. C. Thomas. Initialising Deep Neural Networks: An Approach Based on Linear Interval Tolerance 477-485. [Crossref]

777. Sanam Narejo, Eros Pasero. **69**, 139. [Crossref]

778. John B. Butcher, Abigail V. Rutter, Adam J. Wootton, Charles R. Day, Josep Sulé-Suso. Artificial Neural Network Analysis of Volatile Organic Compounds for the Detection of Lung Cancer 183-190. [Crossref]

779. Jiangqin Xu, Zhongqiang Huang, Minghui Shi, Min Jiang. Emotion Detection in E-learning Using Expectation-Maximization Deep Spatial-Temporal Inference Network 245-252. [Crossref]

780. Chitta Baral, Olac Fuentes, Vladik Kreinovich. Why Deep Neural Networks: A Possible Theoretical Explanation 1-5. [Crossref]

781. Ke Li, Changqing Zou, Shuhui Bu, Yun Liang, Jian Zhang, Minglun Gong. 2018. Multi-modal feature fusion for geographic image annotation. *Pattern Recognition* **73**, 1-14. [Crossref]

782. Romain Serizel, Victor Bisot, Slim Essid, Gaël Richard. Acoustic Features for Environmental Sound Analysis 71-101. [Crossref]

783. Krzysztof J. Cios. Deep Neural Networks—A Brief History 183-200. [Crossref]

784. J. H. Park, S. U. Park, Md. Zia Uddin, M. A. Al-antari, M. A. Al-masni, T.-S. Kim. A Single Depth Sensor Based Human Activity Recognition via Convolutional Neural Network 541-545. [Crossref]

785. Tao Ma, Yang Yu, Fen Wang, Qiang Zhang, Xiaoyun Chen. A Hybrid Methodologies for Intrusion Detection Based Deep Neural Network with Support Vector Machine and Clustering Technique 123-134. [Crossref]

786. Yanxing Liu, Yi Chai, Shanbi Wei, Zhixiang Luo. Circuit Fault Diagnosis Method of Wind Power Converter with Wavelet-DBN 623-633. [Crossref]

787. Dmitry Yudin, Bassel Zeno. Event Recognition on Images by Fine-Tuning of Deep Neural Networks 479-487. [Crossref]

788. Nabila Zrira, Mohamed Hannat, El Houssine Bouyakhf, Haris Ahmad Khan. 2D/3D Object Recognition and Categorization Approaches for Robotic Grasping 567-593. [Crossref]

789. Haonan Guo, Xudie Ren, Shenghong Li. A New Pruning Method to Train Deep Neural Networks 767-775. [Crossref]

790. Xin Su, Xin-hua Jiang, Shun-miao Zhang, Yao He. Application of Double-Hidden Layer BP Neural Network in Transformer Fault Alarm 161-169. [Crossref]

791. Chia-Yu Kao, Mallika Madduri, Leonard McMillan. A Deep Learning Architecture for Histology Image Classification with Curriculum Learning 1102-1111. [Crossref]

792. Italo Zoppis, Giancarlo Mauri, Riccardo Dondi. Kernel Machines: Applications . [Crossref]

793. John Kundert-Gibbs. Image-Based Content Retrieval via Class-Based Histogram Comparisons 3-10. [Crossref]

794. Qiule Sun, Jianxin Zhang, Aoqi Yang, Qiang Zhang. Palmprint Recognition with Deep Convolutional Features 12-19. [Crossref]

795. Jun Li, Heyou Chang, Jian Yang, Wei Luo, Yun Fu. 2018. Visual Representation and Classification by Learning Group Sparse Deep Stacking Network. *IEEE Transactions on Image Processing* **27**:1, 464-476. [Crossref]

796. Emmanuel T. Affonso, Renata L. Rosa, Demostenes Z. Rodriguez. 2018. Speech Quality Assessment Over Lossy Transmission Channels Using Deep Belief Networks. *IEEE Signal Processing Letters* **25**:1, 70-74. [Crossref]

797. Seunghye Lee, Jingwan Ha, Mehriniso Zokhirova, Hyeonjoon Moon, Jaehong Lee. 2018. Background Information of Deep Learning for Structural Engineering. *Archives of Computational Methods in Engineering* **25**:1, 121-129. [Crossref]

798. Xiaoqiang Zhou, Baotian Hu, Qingcai Chen, Xiaolong Wang. 2018. Recurrent convolutional neural network for answer selection in community question answering. *Neurocomputing* **274**, 8-18. [Crossref]

799. ## #. 2018. Application of Singular Value Decomposition and Deep Learning in Bearing Fault Diagnosis. *Dynamical Systems and Control* **07**:01, 1. [Crossref]

800. Shao Haidong, Jiang Hongkai, Li Xingqiu, Wu Shuaipeng. 2018. Intelligent fault diagnosis of rolling bearing using deep wavelet auto-encoder with extreme learning machine. *Knowledge-Based Systems* **140**, 1-14. [Crossref]

801. Kunihiko Fukushima. 2018. Margined winner-take-all: New learning rule for pattern recognition. *Neural Networks* **97**, 152-161. [Crossref]

802. Saikat Basu, Supratik Mukhopadhyay, Manohar Karki, Robert DiBiano, Sangram Ganguly, Ramakrishna Nemani, Shreekant Gayaka. 2018. Deep neural networks for texture classification—A theoretical analysis. *Neural Networks* **97**, 173-182. [Crossref]

803. Shun-ichi Amari, Tomoko Ozeki, Ryo Karakida, Yuki Yoshida, Masato Okada. 2018. Dynamics of Learning in MLP: Natural Gradient and Singularity Revisited. *Neural Computation* **30**:1, 1-33. [Abstract] [Full Text] [PDF] [PDF Plus]

804. Guowei Yang, Qiang Luo, Yinding Yang, Yin Zhuang. **473**, 249. [Crossref]

805. Jiedi Sun, Changhong Yan, Jiangtao Wen. 2018. Intelligent Bearing Fault Diagnosis Method Combining Compressed Data Acquisition and Deep Learning. *IEEE Transactions on Instrumentation and Measurement* **67**:1, 185-195. [Crossref]

806. Jason Deutsch, David He. 2018. Using Deep Learning-Based Approach to Predict Remaining Useful Life of Rotating Components. *IEEE Transactions on Systems, Man, and Cybernetics: Systems* **48**:1, 11-20. [Crossref]

807. Anima Majumder, Laxmidhar Behera, Venkatesh K. Subramanian. 2018. Automatic Facial Expression Recognition System Using Deep Network-Based Data Fusion. *IEEE Transactions on Cybernetics* **48**:1, 103-114. [Crossref]

808. Junqi Deng, Yu-Kwong Kwok. 2018. Large vocabulary automatic chord estimation using bidirectional long short-term memory recurrent neural network with even chance training. *Journal of New Music Research* **47**:1, 53-67. [Crossref]

809. K. Balaji, K. Lavanya. **14**, 201. [Crossref]

810. Erfaneh Gharavi, Hadi Veisi, Kayvan Bijari, Kiarash Zahirnia. **10478**, 94. [Crossref]

811. Lichao Mou, Pedram Ghamisi, Xiao Xiang Zhu. 2018. Unsupervised Spectral–Spatial Feature Learning via Deep Residual Conv–Deconv Network for Hyperspectral Image Classification. *IEEE Transactions on Geoscience and Remote Sensing* **56**:1, 391-406. [Crossref]

812. Wenzhangzhi Guo, Parham Aarabi. 2018. Hair Segmentation Using Heuristically-Trained Neural Networks. *IEEE Transactions on Neural Networks and Learning Systems* **29**:1, 25-36. [Crossref]

813. C. L. Philip Chen, Zhulin Liu. 2018. Broad Learning System: An Effective and Efficient Incremental Learning System Without the Need for Deep Architecture. *IEEE Transactions on Neural Networks and Learning Systems* **29**:1, 10-24. [Crossref]

814. Laisen Nie, Xiaojie Wang, Liangtian Wan, Shui Yu, Houbing Song, Dingde Jiang. 2018. Network Traffic Prediction Based on Deep Belief Network and Spatiotemporal Compressive Sensing in Wireless Mesh Backbone Networks. *Wireless Communications and Mobile Computing* **2018**, 1. [Crossref]

815. Jun WANG, Guoqing WANG, Zaiyu PAN. 2018. Gender Attribute Mining with Hand-Dorsa Vein Image Based on Unsupervised Sparse Feature Learning. *IEICE Transactions on Information and Systems* **E101.D**:1, 257-260. [Crossref]

816. Kheir Eddine Farfar, Mohamed Tarek Khadir. 2018. A two-stage short-term load forecasting approach using temperature daily profiles estimation. *Neural Computing and Applications* . [Crossref]

817. Carlos Bentes, Domenico Velotto, Bjorn Tings. 2018. Ship Classification in TerraSAR-X Images With Convolutional Neural Networks. *IEEE Journal of Oceanic Engineering* **43**:1, 258-266. [Crossref]

818. Renguang Zuo, Yihui Xiong. 2018. Big Data Analytics of Identifying Geochemical Anomalies Supported by Machine Learning Methods. *Natural Resources Research* **27**:1, 5-13. [Crossref]

819. Yanxiong Li, Xue Zhang, Hai Jin, Xianku Li, Qin Wang, Qianhua He, Qian Huang. 2018. Using multi-stream hierarchical deep neural network to extract deep audio feature for acoustic event detection. *Multimedia Tools and Applications* **77**:1, 897-916. [Crossref]

820. Mingyang Jiang, Yanchun Liang, Xiaoyue Feng, Xiaojing Fan, Zhili Pei, Yu Xue, Renchu Guan. 2018. Text classification based on deep belief network and softmax regression. *Neural Computing and Applications* **29**:1, 61-70. [Crossref]

821. Yu Xu, Dezhi Li, Zhenyong Wang, Gongliang Liu, Haibo Lv. Transfer Learning Method for Convolutional Neural Network in Automatic Modulation Classification 371-380. [Crossref]

822. Shaunak De, Lorenzo Bruzzone, Avik Bhattacharya, Francesca Bovolo, Subhasis Chaudhuri. 2018. A Novel Technique Based on Deep Learning and a Synthetic Target Database for Classification of Urban Areas in PolSAR Data. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* **11**:1, 154-170. [Crossref]

823. Tameem Albash, Daniel A. Lidar. 2018. Adiabatic quantum computation. *Reviews of Modern Physics* **90**:1. . [Crossref]

824. Athanasios Voulodimos, Nikolaos Doulamis, Anastasios Doulamis, Eftychios Protopapadakis. 2018. Deep Learning for Computer Vision: A Brief Review. *Computational Intelligence and Neuroscience* **2018**, 1-13. [Crossref]

825. Senmao Wang, Jingyong Hou, Lei Xie, Yufeng Hao. HelloNPU: A Corpus for Small-Footprint Wake-Up Word Detection Research 70-79. [Crossref]

826. Danish Bukhari, Jiangyan Yi, Zhengqi Wen, Bin Liu, Jianhua Tao. Multi-task Learning in Prediction and Correction for Low Resource Speech Recognition 80-88. [Crossref]

827. Toru NAKASHIKA. 2018. Deep Relational Model: A Joint Probabilistic Model with a Hierarchical Structure for Bidirectional Estimation of Image and Labels. *IEICE Transactions on Information and Systems* **E101.D**:2, 428-436. [Crossref]

828. Rafael G. Pires, Daniel S. Santos, Gustavo B. Souza, Aparecido N. Marana, Alexandre L. M. Levada, João Paulo Papa. A Deep Boltzmann Machine-Based Approach for Robust Image Denoising 525-533. [Crossref]

829. Sandro Skansi. From Logic to Cognitive Science 1-16. [Crossref]

830. Sandro Skansi. An Overview of Different Neural Network Architectures 175-183. [Crossref]

831. Hongqiang Ma, Shiping Ma, Yuelei Xu, Mingming Zhu. 2018. Deep Marginalized Sparse Denoising Auto-Encoder for Image Denoising. *Journal of Physics: Conference Series* **960**, 012033. [Crossref]

832. Xiangchun Yu, Zhezhou Yu, Wei Pang, Minghao Li, Lei Wu. 2018. An Improved EMD-Based Dissimilarity Metric for Unsupervised Linear Subspace Learning. *Complexity* **2018**, 1-24. [Crossref]

833. Urszula Markowska-Kaczmar, Halina Kwaśnicka. Deep Learning—A New Era in Bridging the Semantic Gap 123-159. [Crossref]

834. Seunghye Lee, Mehriniso Zokhirova, Tan Tien Nguyen, Jaehong Lee. Effect of Hyper-Parameters on Deep Learning Networks in Structural Engineering 537-544. [Crossref]

835. Adnan Farooq, Emad U Din Mohammad, Abdullah Ahmad Zarir, Amelia Ritahani Ismail, Suriani Sulaiman. 2018. Real-Time Human Action Recognition using Stacked Sparse Autoencoders. *Indian Journal of Science and Technology* **11**:4, 1-6. [Crossref]

836. Nannan Wang, Xinbo Gao, Dacheng Tao, Heng Yang, Xuelong Li. 2018. Facial feature point detection: A comprehensive survey. *Neurocomputing* **275**, 50-65. [Crossref]

837. ## #. 2018. Development Analysis of Artificial Intelligence and Neural Networks. *Computer Science and Application* **08**:02, 154-165. [Crossref]

838. Paolo Massimo Buscema, Giulia Massini, Marco Breda, Weldon A. Lodwick, Francis Newman, Masoud Asadi-Zeydabadi. Advances, the K-Contractive Map: A Supervised Version of Auto-CM 105-119. [Crossref]

839. Paolo Massimo Buscema, Giulia Massini, Marco Breda, Weldon A. Lodwick, Francis Newman, Masoud Asadi-Zeydabadi. Comparison of Auto-CM to Various Other Data Understanding Approaches 121-146. [Crossref]

840. Bin Zhang, Huaxiang Zhang, Jiande Sun, Zhenhua Wang, Hongchen Wu, Xiao Dong. Cross-Media Semantic Matching via Sparse Neural Network Pre-trained by Deep Restricted Boltzmann Machines 280-289. [Crossref]

841. Ting Rui, Sai Zhang, Junhua Zou, You Zhou, Jian Tang. Deep Auto-Encoder Based on Supervised Learning for Damaged Face Reconstruction 290-299. [Crossref]

842. Guoxi Su, Xiangmin Xu, Chaowen Chen, Bolun Cai, Chunmei Qing. Progressive Lifelong Learning by Sharing Representations for Few Labeled Data 411-418. [Crossref]

843. Yelin Kim, Tolga Soyata, Reza Feyzi Behnagh. 2018. Towards Emotionally Aware AI Smart Classroom: Current Issues and Directions for Engineering and Education. *IEEE Access* **6**, 5308-5331. [Crossref]

844. Xiuquan Du, Weiwei Zhang, Heye Zhang, Jun Chen, Yanping Zhang, James Claude Warrington, Gary Brahm, Shuo Li. 2018. Deep Regression Segmentation for Cardiac Bi-Ventricle MR Images. *IEEE Access* **6**, 3828-3838. [Crossref]

845. Wai-Xi Liu, Jie Zhang, Zhong-Wei Liang, Ling-Xi Peng, Jun Cai. 2018. Content Popularity Prediction and Caching for ICN: A Deep Learning Approach With SDN. *IEEE Access* **6**, 5075-5089. [Crossref]

846. Syed Afaq Ali Shah, Mohammed Bennamoun, Farid Boussaid, Lyndon While. 2018. Evolutionary Feature Learning for 3-D Object Recognition. *IEEE Access* **6**, 2434-2444. [Crossref]

847. Quan Sun, Youren Wang, Yuanyuan Jiang. 2018. A Novel Fault Diagnostic Approach for DC-DC Converters Based on CSA-DBN. *IEEE Access* **6**, 6273-6285. [Crossref]

848. Justin Ker, Lipo Wang, Jai Rao, Tchoyoson Lim. 2018. Deep Learning Applications in Medical Image Analysis. *IEEE Access* **6**, 9375-9389. [Crossref]

849. Yong Ding. 45. [Crossref]

850. Yong Ding. 161. [Crossref]

851. Akihiro Suzuki, Takashi Morie, Hakaru Tamukoh, Jun Ma. 2018. A shared synapse architecture for efficient FPGA implementation of autoencoders. *PLOS ONE* **13**:3, e0194049. [Crossref]

852. Yonghua Mao, Junjie Shen, Xiaolin Gui. 2018. A Study on Deep Belief Net for Branch Prediction. *IEEE Access* **6**, 10779-10786. [Crossref]

853. Brahim Ait Skourt, Abdelhamid El Hassani, Aicha Majda. 2018. Lung CT Image Segmentation Using Deep Neural Networks. *Procedia Computer Science* **127**, 109-113. [Crossref]

854. Mourad Gridach. Deep Learning Approach for Arabic Named Entity Recognition 439-451. [Crossref]

855. Francky Catthoor, Srinjoy Mitra, Anup Das, Siebren Schaafsma. Very Large-Scale Neuromorphic Systems for Biological Signal Processing 315-340. [Crossref]

856. Tomasz Olas, Wojciech K. Mleczko, Marcin Wozniak, Robert K. Nowicki, Pawel Gepner. Performance Evaluation of DBN Learning on Intel Multi- and Manycore Architectures 565-575. [Crossref]

857. Vikas Singh, Nishchal K. Verma. Deep Learning Architecture for High-Level Feature Generation Using Stacked Auto Encoder for Business Intelligence 269-283. [Crossref]

858. Wei Cui, Qi Zhou. 2018. Application of a Hybrid Model Based on a Convolutional Auto-Encoder and Convolutional Neural Network in Object-Oriented Remote Sensing Classification. *Algorithms* **11**:1, 9. [Crossref]

859. Chengdong Li, Zixiang Ding, Jianqiang Yi, Yisheng Lv, Guiqing Zhang. 2018. Deep Belief Network Based Hybrid Model for Building Energy Consumption Prediction. *Energies* **11**:1, 242. [Crossref]

860. Woo-Sup Han, Il Song Han. Object Segmentation for Vehicle Video and Dental CBCT by Neuromorphic Convolutional Recurrent Neural Network 264-284. [Crossref]

861. Ruipeng Gao, Fan Ye, Guojie Luo, Jason Cong. Smartphone-Based Real-Time Vehicle Tracking in Indoor Parking Structures 81-109. [Crossref]

862. A. Meraoumia, S. Chitroub, O. Chergui, H. Bendjenna. Investments in Deep Learning Techniques for Improving the Biometric System Accuracy 197-209. [Crossref]

863. Shun KATAOKA. 2018. Statistical Machine Learning in Markov Random Fields. *IEICE ESS Fundamentals Review* **11**:4, 256-265. [Crossref]

864. Leontios J. Hadjileontiadis, Zahra M. K. Moussavi. Current Techniques for Breath Sound Analysis 139-177. [Crossref]

865. Nazneen N. Sultana, N. B. Puhan. Recent Deep Learning Methods for Melanoma Detection: A Review 118-132. [Crossref]

866. Soheila Gheisari, Daniel R. Catchpoole, Amanda Charlton, Paul J. Kennedy. Patched Completed Local Binary Pattern is an Effective Method for Neuroblastoma Histological Image Classification 57-71. [Crossref]

867. Ryan A. Rossi. 2018. Relational time series forecasting. *The Knowledge Engineering Review* **33**. . [Crossref]

868. Huaizhong Zhu, Xiaoguang Yang, Yizhe Wang. 2018. Prediction of Daily Entrance and Exit Passenger Flow of Rail Transit Stations by Deep Learning Method. *Journal of Advanced Transportation* **2018**, 1-11. [Crossref]

869. Indar Sugiarto, Felix Pasila. 2018. Understanding a Deep Learning Technique through a Neuromorphic System a Case Study with SpiNNaker Neuromorphic Platform. *MATEC Web of Conferences* **164**, 01015. [Crossref]

870. Kaile Zhou, Shanlin Yang. 5.11 Smart Energy Management 423-456. [Crossref]

871. K. V. Kislov, V. V. Gravirov. 2018. Deep Artificial Neural Networks as a Tool for the Analysis of Seismic Data. *Seismic Instruments* **54**:1, 8-16. [Crossref]

872. Marilu Cervantes Salgado, Raúl Pinto Elías. Feature Selection for Pattern Recognition: Upcoming Challenges 77-100. [Crossref]

873. Monica Bianchini, Giovanna Maria Dimitri, Marco Maggini, Franco Scarselli. Deep Neural Networks for Structured Data 29-51. [Crossref]

874. Mahmoud Keshavarzi, Tobias Goehring, Justin Zakis, Richard E. Turner, Brian C. J. Moore. 2018. Use of a Deep Recurrent Neural Network to Reduce Wind Noise: Effects on Judged Speech Intelligibility and Sound Quality. *Trends in Hearing* **22**, 233121651877096. [Crossref]

875. Manuel Titos, Angel Bueno, Luz Garcia, Carmen Benitez. 2018. A Deep Neural Networks Approach to Automatic Recognition Systems for Volcano-Seismic Events. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* 1-12. [Crossref]

876. Guanzhou Chen, Xiaodong Zhang, Qing Wang, Fan Dai, Yuanfu Gong, Kun Zhu. 2018. Symmetrical Dense-Shortcut Deep Fully Convolutional Networks for Semantic Segmentation of Very-High-Resolution Remote Sensing Images. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* 1-12. [Crossref]

877. ## #. 2018. The Latest Progress of Deep Learning. *Computer Science and Application* **08**:04, 565-571. [Crossref]

878. Yufa Xia, Huailing Zhang, Lin Xu, Zhifan Gao, Heye Zhang, Huafeng Liu, Shuo Li. 2018. An Automatic Cardiac Arrhythmia Classification System With Wearable Electrocardiogram. *IEEE Access* **6**, 16529-16538. [Crossref]

879. Edo D'Agaro. 2018. Artificial intelligence used in genome analysis studies. *The EuroBiotech Journal* **2**:2. . [Crossref]

880. Ting Rui, Sai Zhang, Tongwei Ren, Jian Tang, Junhua Zou. Data Reconstruction Based on Supervised Deep Auto-Encoder 869-879. [Crossref]

881. Peng Lu, Saidi Guo, Hongpo Zhang, Qihang Li, Yuchen Wang, Yingying Wang, Lianxin Qi. 2018. Research on Improved Depth Belief Network-Based Prediction of Cardiovascular Diseases. *Journal of Healthcare Engineering* **2018**, 1-9. [Crossref]

882. Roman Zajdel, Maciej Kusy. Application of Reinforcement Learning to Stacked Autoencoder Deep Network Architecture Optimization 267-276. [Crossref]

883. Janusz Kolbusz, Pawel Rozycki, Oleksandr Lysenko, Bogdan M. Wilamowski. Neural Networks Saturation Reduction 108-117. [Crossref]

884. Yuta Nakaya, Yuko Osana. Deep Q-Network Using Reward Distribution 160-169. [Crossref]

885. Nan Zheng, Pinaki Mazumder. 2018. Learning in Memristor Crossbar-Based Spiking Neural Networks through Modulation of Weight Dependent Spike-Timing-Dependent Plasticity. *IEEE Transactions on Nanotechnology* 1-1. [Crossref]

886. Elena Mocanu, Phuong H. Nguyen, Madeleine Gibescu. Deep Learning for Power System Data Analysis 125-158. [Crossref]

887. Di Zhou, Yuxin Zhao, Chang Liu, Yanlong Liu. Speedup of Network Training Process by Eliminating the Overshoots of Outputs 462-470. [Crossref]

888. E. Izquierdo-Verdiguier, V. Laparra, J Muñoz-Marí, L. Gómez-Chova, G. Camps-Valls. Advanced Feature Extraction for Earth Observation Data Processing 108-133. [Crossref]

889. Marco Gori. Deep Architectures 236-338. [Crossref]

890. J.J. Wen, W.K. Wong. Fundamentals of common computer vision techniques for fashion textile modeling, recognition, and retrieval 17-44. [Crossref]

891. . Bibliography 534-551. [Crossref]

892. Li Deng, Yang Liu. A Joint Introduction to Natural Language Processing and to Deep Learning 1-22. [Crossref]

893. Weiwei Song, Shutao Li, Leyuan Fang, Ting Lu. 2018. Hyperspectral Image Classification With Deep Feature Fusion Network. *IEEE Transactions on Geoscience and Remote Sensing* 1-12. [Crossref]

894. Gokhan Tur, Asli Celikyilmaz, Xiaodong He, Dilek Hakkani-Tür, Li Deng. Deep Learning in Conversational Language Understanding 23-48. [Crossref]

895. Pegah Khosravi, Ehsan Kazemi, Marcin Imielinski, Olivier Elemento, Iman Hajirasouliha. 2018. Deep Convolutional Neural Networks Enable Discrimination of Heterogeneous Digital Pathology Images. *EBioMedicine* **27**, 317-328. [Crossref]

896. Călin-Adrian Popa. Complex-Valued Stacked Denoising Autoencoders 64-71. [Crossref]

897. Călin-Adrian Popa. Complex-Valued Deep Belief Networks 72-78. [Crossref]

898. Vladislav Avramov, Vadzim Herasimovich, Alexander Petrovsky. Sound Signal Invariant DAE Neural Network-Based Quantizer Architecture of Audio/Speech Coder Using the Matching Pursuit Algorithm 511-520. [Crossref]

899. Abdolreza Sabzi Shahrebabaki, Ali Shariq Imran, Negar Olfati, Torbjørn Svendsen. Acoustic Feature Comparison for Different Speaking Rates 176-189. [Crossref]

900. Yuanming Zhou, Shifeng Zhao, Xuesong Wang, Wei Liu. Deep Learning Model and Its Application in Big Data 795-806. [Crossref]

901. Zhenhua Zhang, Qing He, Jing Gao, Ming Ni. 2018. A deep learning approach for detecting traffic accidents from social media data. *Transportation Research Part C: Emerging Technologies* **86**, 580-596. [Crossref]

902. Xiaochuan Sun, Tao Li, Yingqi Li, Qun Li, Yue Huang, Jiayu Liu. 2018. Recurrent neural system with minimum complexity: A deep learning perspective. *Neurocomputing* **275**, 1333-1349. [Crossref]

903. Nan Zhang, Shifei Ding, Jian Zhang, Yu Xue. 2018. An overview on Restricted Boltzmann Machines. *Neurocomputing* **275**, 1186-1199. [Crossref]

904. Chao Zhang, Junchi Yan, Changsheng Li, Rongfang Bie. 2018. Contour detection via stacking random forest learning. *Neurocomputing* **275**, 2702-2715. [Crossref]

905. Enrique Garcia-Ceja, Md. Zia Uddin, Jim Torresen. 2018. Classification of Recurrence Plots' Distance Matrices with a Convolutional Neural Network for Activity Recognition. *Procedia Computer Science* **130**, 157-163. [Crossref]

906. Xiao Wang, Yuanyuan Zhang, Shengnan Yu, Xiwei Liu, Fei-Yue Wang. Computerized Adaptive English Ability Assessment Based on Deep Learning 158-171. [Crossref]

907. Yunhua Chen, Jin Du, Qian Liu, Bi Zeng. Robust Expression Recognition Using ResNet with a Biologically-Plausible Activation Function 426-438. [Crossref]

908. Zhaoqing Xie, Qing Liu. LSTM Networks for Vessel Traffic Flow Prediction in Inland Waterway 418-425. [Crossref]

909. Bong-Ki Lee, Kyoungjin Noh, Joon-Hyuk Chang, Kihyun Choo, Eunmi Oh. 2018. Sequential Deep Neural Networks Ensemble for Speech Bandwidth Extension. *IEEE Access* 1-1. [Crossref]

910. Tingyi Zheng, Li Wang. Unlabeled Text Classification Optimization Algorithm Based on Active Self-Paced Learning 404-409. [Crossref]

911. Jacob Bortnik, Xiangning Chu, Qianli Ma, Wen Li, Xiaojia Zhang, Richard M. Thorne, Vassilis Angelopoulos, Richard E. Denton, Craig A. Kletzing, George B. Hospodarsky, Harlan E. Spence, Geoffrey D. Reeves, Shrikanth G. Kanekal, Daniel N. Baker. Artificial Neural Networks for Determining Magnetospheric Conditions 279-300. [Crossref]

912. Meixin Mao, Zili Li, Zhao Zhao, Li Zeng. Bibliometric Analysis of the Deep Learning Research Status with the Data from Web of Science 585-595. [Crossref]

913. Minglong Lei, Yong Shi, Peijia Li, Lingfeng Niu. Deep Streaming Graph Representations 512-518. [Crossref]

914. Yu Chen, Hong Li, Yuan Ma, Zhiqiang Shi, Limin Sun. Robust Network-Based Binary-to-Vector Encoding for Scalable IoT Binary File Retrieval 53-65. [Crossref]

915. Prathmesh R. Madhu, Manjunath V. Joshi. Digital Heritage Reconstruction Using Deep Learning-Based Super-Resolution 67-86. [Crossref]

916. Ayush Garg, Deepika Naryani, Garvit Aggarwal, Swati Aggarwal. DL-GSA: A Deep Learning Metaheuristic Approach to Missing Data Imputation 513-521. [Crossref]

917. Wei Wang, Jiapeng Xiu, Zhengqiu Yang, Chen Liu. A Deep Learning Model for Predicting Movie Box Office Based on Deep Belief Network 530-541. [Crossref]

918. Jie Yin, Son N. Tran, Qing Zhang. Human Identification via Unsupervised Feature Learning from UWB Radar Data 322-334. [Crossref]

919. O. BUYUK, M. L. ARSLAN. 2018. Combination of Long-Term and Short-Term Features for Age Identification from Voice. *Advances in Electrical and Computer Engineering* **18**:2, 101-108. [Crossref]

920. Xi-Li Wang, Fen Chen. 2018. Shape Modeling Based on Convolutional Restricted Boltzmann Machines. *MATEC Web of Conferences* **173**, 01022. [Crossref]

921. Yuanyuan Hu, Jianchao Fan, Jun Wang. 2018. Classification of PolSAR Images Based on Adaptive Nonlocal Stacked Sparse Autoencoder. *IEEE Geoscience and Remote Sensing Letters* 1-5. [Crossref]

922. Ying-Hui Lai, Yu Tsao, Xugang Lu, Fei Chen, Yu-Ting Su, Kuang-Chao Chen, Yu-Hsuan Chen, Li-Ching Chen, Lieber Po-Hung Li, Chin-Hui Lee. 2018. Deep Learning–Based Noise Reduction Approach to Improve Speech Intelligibility for Cochlear Implant Recipients. *Ear and Hearing* **39**:4, 795-809. [Crossref]

923. Shen Rong, Zhang Bao-wen. 2018. The research of regression model in machine learning field. *MATEC Web of Conferences* **176**, 01033. [Crossref]

924. Hisanari Otsu, Shinichi Kinuwaki, Toshiya Hachisuka. Supervised Learning of How to Blend Light Transport Simulations 409-427. [Crossref]

925. Ping Yang, Dan Wang, Xiao-Lin Du, Meng Wang. Evolutionary DBN for the Customers' Sentiment Classification with Incremental Rules 119-134. [Crossref]

926. Chen Chen, Jing-Jing Zhang, Chun-Hou Zheng, Qing Yan, Li-Na Xun. Classification of Hyperspectral Data Using a Multi-Channel Convolutional Neural Network 81-92. [Crossref]

927. Xiaoyu Zhang, Rui Wang, Tao Zhang, Ling Wang, Yajie Liu, Yabing Zha. Short-Term Load Forecasting Based on RBM and NARX Neural Network 193-203. [Crossref]

928. Mohamed Mhiri, Sherif Abuelwafa, Christian Desrosiers, Mohamed Cheriet. 2018. Hierarchical representation learning using spherical k-means for segmentation-free word spotting. *Pattern Recognition Letters* **101**, 52-59. [Crossref]

929. Usman Ali, Tariq Mahmood. Using Deep Learning to Predict Short Term Traffic Flow: A Systematic Literature Review 90-101. [Crossref]

930. Ziqiang Zheng, Chao Wang, Zhibin Yu, Haiyong Zheng, Bing Zheng. 2018. Instance Map Based Image Synthesis With a Denoising Generative Adversarial Network. *IEEE Access* **6**, 33654-33665. [Crossref]

931. Nataliya Sokolovska, Yann Chevaleyre, Jean-Daniel Zucker. Risk Scores Learned by Deep Restricted Boltzmann Machines with Trained Interval Quantization 421-435. [Crossref]

932. Weiqing Wang, Hongzhi Yin, Zi Huang, Xiaoshuai Sun, Nguyen Quoc Viet Hung. Restricted Boltzmann Machine Based Active Learning for Sparse Recommendation 100-115. [Crossref]

933. Abdul Qayyum, Naufal M. Saad, Nidal Kamel, Aamir Saeed Malik. 2018. Deep convolutional neural network processing of aerial stereo imagery to monitor vulnerable zones near power lines. *Journal of Applied Remote Sensing* **12**:01, 1. [Crossref]

934. Ghasem Abdi, Farhad Samadzadegan, Peter Reinartz. 2018. Deep learning decision fusion for the classification of urban remote sensing data. *Journal of Applied Remote Sensing* **12**:01, 1. [Crossref]

935. Youngjin Yoo, Lisa Y.W. Tang, Tom Brosch, David K.B. Li, Shannon Kolind, Irene Vavasour, Alexander Rauscher, Alex L. MacKay, Anthony Traboulsee, Roger C. Tam. 2018. Deep learning of joint myelin and T1w MRI features in normal-appearing brain tissue to distinguish between multiple sclerosis patients and healthy controls. *NeuroImage: Clinical* **17**, 169-178. [Crossref]

936. Xingzhen Tao, Wenxiang Wang, Lei Lu. The Reorganization of Handwritten Figures Based on Convolutional Neural Network 525-531. [Crossref]

937. SunGil Yoo, Dongik Oh. 2018. An artificial neural network–based fall detection. *International Journal of Engineering Business Management* **10**, 184797901878790. [Crossref]

938. Eduardo Pinho, Carlos Costa. 2018. Unsupervised Learning for Concept Detection in Medical Images: A Comparative Analysis. *Applied Sciences* **8**:8, 1213. [Crossref]

939. Xinhuan Chen, Yong Zhang, Kangzhi Zhao, Qingcheng Hu, Chunxiao Xing. Domain Supervised Deep Learning Framework for Detecting Chinese Diabetes-Related Topics 53-71. [Crossref]

940. Yan Wang, Xili Wang. Image Segmentation Based on MRF Combining with Deep Learning Shape Priors 182-191. [Crossref]

941. Patrick Glauner. Künstliche Intelligenz – die nächste Revolution (The Artificial Intelligence Revolution) 67-78. [Crossref]

942. Teresa Pamula. 2018. Road Traffic Conditions Classification Based on Multilevel Filtering of Image Content Using Convolutional Neural Networks. *IEEE Intelligent Transportation Systems Magazine* **10**:3, 11-21. [Crossref]

943. Meng Qiu, Haoyu Yin, Qiang Chen, Yingjian Liu. Automatic Cloud Detection Based on Deep Learning from AVHRR Data 127-138. [Crossref]

944. Xin Zong. Local Binary Patterns Based on Subspace Representation of Image Patch for Face Recognition 130-139. [Crossref]

945. Charu C. Aggarwal. Teaching Deep Learners to Generalize 169-216. [Crossref]

946. Charu C. Aggarwal. Restricted Boltzmann Machines 235-270. [Crossref]

947. Liang Sun, Wenjing Kang, Yuxuan Han, Hongwei Ge. 2018. Multi-View Transformation via Mutual-Encoding InfoGenerative Adversarial Networks. *IEEE Access* 1-1. [Crossref]

948. Bens Pardamean, Tjeng Wawan Cenggoro, Reza Rahutomo, Arif Budiarto, Ettikan Kandasamy Karuppiah. 2018. Transfer Learning from Chest X-Ray Pre-

trained Convolutional Neural Network for Learning Mammogram Data. *Procedia Computer Science* **135**, 400-407. [Crossref]

949. Baptiste Wicht, Andreas Fischer, Jean Hennebert. DLL: A Fast Deep Neural Network Library 54-65. [Crossref]

950. Maxime Sazadaly, Pierre Pinchon, Arthur Fagot, Lionel Prevost, Myriam Maumy-Bertrand. Cascade of Ordinal Classification and Local Regression for Audio-Based Affect Estimation 268-280. [Crossref]

951. Maria Schuld, Francesco Petruccione. Machine Learning 21-73. [Crossref]

952. Dariusz Badura. Prediction of Urban Traffic Flow Based on Generative Neural Network Model 3-17. [Crossref]

953. Jesús Gonzalez, Wen Yu. 2018. Non-linear system modeling using LSTM neural networks. *IFAC-PapersOnLine* **51**:13, 485-489. [Crossref]

954. Serge Thomas, Mickala Bourobou, Jie Li. Ensemble of Deep Autoencoder Classifiers for Activity Recognition Based on Sensor Modalities in Smart Homes 273-295. [Crossref]

955. Vineeth N. Balasubramanian. From Recognition to Generation Using Deep Learning: A Case Study with Video Generation 25-36. [Crossref]

956. Alaa S. Al-Waisy, Rami Qahwaji, Stanley Ipson, Shumoos Al-Fahdawi. 2018. A multimodal deep learning framework using local feature representations for face recognition. *Machine Vision and Applications* **29**:1, 35-54. [Crossref]

957. M. Erdmann, J. Glombitza, D. Walz. 2018. A deep learning-based reconstruction of cosmic ray-induced air showers. *Astroparticle Physics* **97**, 46-53. [Crossref]

958. Wei Zhou, Zhibo Chen, Weiping Li. Stereoscopic Video Quality Prediction Based on End-to-End Dual Stream Deep Neural Networks 482-492. [Crossref]

959. Athanasios Psaltis, Kostas C. Apostolakis, Kosmas Dimitropoulos, Petros Daras. 2018. Multimodal Student Engagement Recognition in Prosocial Games. *IEEE Transactions on Games* 1-1. [Crossref]

960. Zhaoli Hong, Dongping Ming, Keqi Zhou, Ya Guo, Tingting Lu. 2018. Road Extraction From a High Spatial Resolution Remote Sensing Image Based on Richer Convolutional Features. *IEEE Access* **6**, 46988-47000. [Crossref]

961. Congyuan Xu, Jizhong Shen, Xin Du, Fan Zhang. 2018. An Intrusion Detection System Using a Deep Neural Network With Gated Recurrent Units. *IEEE Access* **6**, 48697-48707. [Crossref]

962. Lin Chen, Zhilin Qiao, Minggang Wang, Chao Wang, Ruijin Du, Harry Eugene Stanley. 2018. Which Artificial Intelligence Algorithm Better Predicts the Chinese Stock Market?. *IEEE Access* **6**, 48625-48633. [Crossref]

963. Dong Hwi Jeong, Jong Min Lee. 2018. Enhancement of modifier adaptation scheme via feedforward decision maker using historical disturbance data and deep machine learning. *Computers & Chemical Engineering* **108**, 31-46. [Crossref]

964. Tingting Yang, Shuwen Jia, Huanhuan Zhang, Mingquan Zhou. Research on Image Classification of Marine Pollutants with Convolution Neural Network 665-673. [Crossref]

965. Maxime Sazadaly, Pierre Pinchon, Arthur Fagot, Lionel Prevost, Myriam Maumy Bertrand. Fast and Accurate Affect Prediction Using a Hierarchy of Random Forests 771-781. [Crossref]

966. Lili Mou, Zhi Jin. Introduction 1-7. [Crossref]

967. Lili Mou, Zhi Jin. Background and Related Work 9-35. [Crossref]

968. Jie Zou, Qingshan She, Farong Gao, Ming Meng. Multi-task Motor Imagery EEG Classification Using Broad Learning and Common Spatial Pattern 3-10. [Crossref]

969. Fahimeh Ghasemi, Alireza Mehridehnavi, Afshin Fassihi, Horacio Pérez-Sánchez. 2018. Deep neural network in QSAR studies using deep belief network. *Applied Soft Computing* **62**, 251-258. [Crossref]

970. Jie Liang, Jufeng Yang, Hsin-Ying Lee, Kai Wang, Ming-Hsuan Yang. Sub-GAN: An Unsupervised Generative Model via Subspaces 726-743. [Crossref]

971. Paniti Achararit, Itaru Hida, Takao Marukame, Tetsuya Asai, Yuko Hara-Azumi. 2018. Structural exploration of stochastic neural networks for severely-constrained 3D memristive devices. *Nonlinear Theory and Its Applications, IEICE* **9**:4, 466-478. [Crossref]

972. Wen Lai, Xiaobing Zhao, Xiaqing Li. Research on Chinese-Tibetan Neural Machine Translation 99-108. [Crossref]

973. Mohammad Tavakolian, Abdenour Hadid. Deep Discriminative Model for Video Classification 401-418. [Crossref]

974. Wenbo Zhu, Zachary Webb, Xianyao Han, Kaitian Mao, Wei Sun, José Romagnoli. 2018. Generic Process Visualization Using Parametric t-SNE. *IFAC-PapersOnLine* **51**:18, 803-808. [Crossref]

975. Yuting Lyu, Junghui Chen, Zhihuan Song. 2018. Image-Based Process Monitoring Using Deep Belief Networks. *IFAC-PapersOnLine* **51**:18, 115-120. [Crossref]

976. Michael Sharp, Brian A. Weiss. 2018. Hierarchical modeling of a manufacturing work cell to promote contextualized PHM information across multiple levels. *Manufacturing Letters* **15**, 46-49. [Crossref]

977. Peng Tang, Kaixiang Peng, Kai Zhang, Zhiwen Chen, Xu Yang, Linlin Li. 2018. A Deep Belief Network-based Fault Detection Method for Nonlinear Processes. *IFAC-PapersOnLine* **51**:24, 9-14. [Crossref]

978. Hong Shao, Liujun Tang, Ligang Dong, Long Chen, Xian Jiang, Weiming Wang. A Research on the Identification of Internet User Based on Deep Learning 73-80. [Crossref]

979. Josef Michálek, Jan Vaněk. A Survey of Recent DNN Architectures on the TIMIT Phone Recognition Task 436-444. [Crossref]

980. Alberto Fernández, Salvador García, Mikel Galar, Ronaldo C. Prati, Bartosz Krawczyk, Francisco Herrera. Imbalanced Classification with Multiple Classes 197-226. [Crossref]

981. Hongyi Liu, Tongtong Fang, Tianyu Zhou, Yuquan Wang, Lihui Wang. 2018. Deep Learning-based Multimodal Control Interface for Human-Robot Collaboration. *Procedia CIRP* **72**, 3-8. [Crossref]

982. Jianjing Zhang, Peng Wang, Ruqiang Yan, Robert X. Gao. 2018. Deep Learning for Improved System Remaining Life Prediction. *Procedia CIRP* **72**, 1033-1038. [Crossref]

983. Soujanya Poria, Amir Hussain, Erik Cambria. Literature Survey and Datasets 37-78. [Crossref]

984. Benjamin Wulff, Jannis Schuecker, Christian Bauckhage. SPSA for Layer-Wise Training of Deep Networks 564-573. [Crossref]

985. Yu Wang, G. Alan Wang, Weiguo Fan, Jiexun Li. A Deep Learning Based Pipeline for Image Grading of Diabetic Retinopathy 240-248. [Crossref]

986. Yonggyun Yu, Taeil Hur, Jaeho Jung, In Gwun Jang. 2018. Deep learning for determining a near-optimal topological design without any iteration. *Structural and Multidisciplinary Optimization* . [Crossref]

987. Yihan Deng, André Sander, Lukas Faulstich, Kerstin Denecke. 2018. Towards automatic encoding of medical procedures using convolutional neural networks and autoencoders. *Artificial Intelligence in Medicine* . [Crossref]

988. Kun Sun, Xin Yin, Mingxin Yang, Yang Wang, Jianying Fan. 2018. The Face Recognition Method Based on CS-LBP and DBN. *Mathematical Problems in Engineering* **2018**, 1. [Crossref]

989. Chung-Han Ho, Ping-Teng Chang, Kuo-Chen Hung, Kuo-Ping Lin. 2018. Developing intuitionistic fuzzy seasonality regression with particle swarm optimization for air pollution forecasting. *Industrial Management & Data Systems* . [Crossref]

990. Guido Montúfar. **252**, 75. [Crossref]

991. Duo Zhang, Geir Lindholm, Harsha Ratnaweera. 2018. Use long short-term memory to enhance Internet of Things for combined sewer overflow monitoring. *Journal of Hydrology* **556**, 409-418. [Crossref]

992. Naila Marir, Huiqiang Wang, Guangsheng Feng, Bingyang Li, Meijuan Jia. 2018. Distributed Abnormal Behavior Detection Approach based on Deep Belief Network and Ensemble SVM using Spark. *IEEE Access* 1-1. [Crossref]

993. Navdeep Kaur, Gautam Kunapuli, Tushar Khot, Kristian Kersting, William Cohen, Sriraam Natarajan. Relational Restricted Boltzmann Machines: A Probabilistic Logic Learning Approach 94-111. [Crossref]

994. Seok-Jun Bu, Sung-Bae Cho. Learning Optimal Q-Function Using Deep Boltzmann Machine for Reliable Trading of Cryptocurrency 468-480. [Crossref]

995. Julián Muñoz-Ordóñez, Carlos Cobos, Martha Mendoza, Enrique Herrera-Viedma, Francisco Herrera, Siham Tabik. Framework for the Training of Deep Neural Networks in TensorFlow Using Metaheuristics 801-811. [Crossref]

996. Shuai Wang, Heinrich Dinkel, Yanmin Qian, Kai Yu. Covariance Based Deep Feature for Text-Dependent Speaker Verification 231-242. [Crossref]

997. Xianbing Xu, Chengbin Peng, Jiangjian Xiao, Huimin Jing, Xiaojie Wu. A Fast Positioning Algorithm Based on 3D Posture Recognition 360-370. [Crossref]

998. Ancheng Lin, Jun Li, Lujuan Zhang, Lei Shi, Zhenyuan Ma. A New Family of Generative Adversarial Nets Using Heterogeneous Noise to Model Complex Distributions 706-717. [Crossref]

999. Heba M. Afify, Mohammed A. Al-Masni. 2018. Taxonomy metagenomic analysis for microbial sequences in three domains system via machine learning approaches. *Informatics in Medicine Unlocked* **13**, 151-157. [Crossref]

1000. R. Chimatapu, H. Hagras, A. J. Starkey, G. Owusu. Enhancing Human Decision Making for Workforce Optimisation Using a Stacked Auto Encoder Based Hybrid Genetic Algorithm 63-75. [Crossref]

1001. Yuyao He, Baoqi Li, Yaohua Zhao. New Default Box Strategy of SSD for Small Target Detection 416-425. [Crossref]

1002. Chaoqi Chen, Weiping Xie, Yue Huang, Xian Yu, Xinghao Ding. Weakly-Supervised Man-Made Object Recognition in Underwater Optimal Image Through Deep Domain Adaptation 311-322. [Crossref]

1003. Xiaodan Deng, Sibo Feng, Ping Guo, Qian Yin. Fast Image Recognition with Gabor Filter and Pseudoinverse Learning AutoEncoders 501-511. [Crossref]

1004. Lei Xia, Jiancheng Lv, Yong Xu. A Data Augmentation Model Based on Variational Approach 157-168. [Crossref]

1005. Francesca Cipollini, Luca Oneto, Andrea Coraddu, Stefano Savio, Davide Anguita. 2018. Unintrusive Monitoring of Induction Motors Bearings via Deep Learning on Stator Currents. *Procedia Computer Science* **144**, 42-51. [Crossref]

1006. Masatoshi Hamanaka, Keiji Hirata, Satoshi Tojo. deepGTTM-III: Multi-task Learning with Grouping and Metrical Structures 238-251. [Crossref]

1007. Konstantinos Makantasis, Anastasios D. Doulamis, Nikolaos D. Doulamis, Antonis Nikitakis. 2018. Tensor-Based Classification Models for Hyperspectral Data Analysis. *IEEE Transactions on Geoscience and Remote Sensing* 1-15. [Crossref]

1008. Elina Stoffel, Anton S. Becker, Moritz C. Wurnig, Magda Marcon, Soleen Ghafoor, Nicole Berger, Andreas Boss. 2018. Distinction between phyllodes tumor and fibroadenoma in breast ultrasound using deep learning image analysis. *European Journal of Radiology Open* **5**, 165-170. [Crossref]

1009. Jie-Lin Qiu, Xin-Yi Qiu, Kai Hu. Emotion Recognition Based on Gramian Encoding Visualization 3-12. [Crossref]

1010. Yaqiong Qin, Zhaohui Ye, Conghui Zhang. 2018. Application of deep learning for division of petroleum reservoirs. *MATEC Web of Conferences* **246**, 03004. [Crossref]

1011. Jie Tao, Shaobo Zhang, Dalian Yang. The Safety Detection for Double Tapered Roller Bearing Based on Deep Learning 485-496. [Crossref]

1012. Hongbin Sun, Xin Pan, Changxin Meng. 2017. A Short-Term Power Load Prediction Algorithm of Based on Power Load Factor Deep Cluster Neural Network. *Wireless Personal Communications* **29**. . [Crossref]

1013. Zhe Li, Yi Wang, Kesheng Wang. 2017. A data-driven method based on deep belief networks for backlash error prediction in machining centers. *Journal of Intelligent Manufacturing* **26**. . [Crossref]

1014. Tongwen Li, Huanfeng Shen, Qiangqiang Yuan, Xuechen Zhang, Liangpei Zhang. 2017. Estimating Ground-Level PM 2.5 by Fusing Satellite and Station Observations: A Geo-Intelligent Deep Learning Approach. *Geophysical Research Letters* **44**:23, 11,985-11,993. [Crossref]

1015. Marcel van Gerven. 2017. Computational Foundations of Natural Intelligence. *Frontiers in Computational Neuroscience* **11**. . [Crossref]

1016. Jordan Guerguiev, Timothy P Lillicrap, Blake A Richards. 2017. Towards deep learning with segregated dendrites. *eLife* **6**. . [Crossref]

1017. Xin Pan, Jian Zhao. 2017. A central-point-enhanced convolutional neural network for high-resolution remote-sensing image classification. *International Journal of Remote Sensing* **38**:23, 6554-6581. [Crossref]

1018. Sonam Nahar, Manjunath V. Joshi. 2017. A learned sparseness and IGMRF-based regularization framework for dense disparity estimation using unsupervised feature learning. *IPSJ Transactions on Computer Vision and Applications* **9**:1. . [Crossref]

1019. John Kim, Fariya Mostafa, Douglas Blair Tweed. 2017. The order of complexity of visuomotor learning. *BMC Neuroscience* **18**:1. . [Crossref]

1020. Kisang Kim, Hyung-Il Choi, Kyoungsu Oh. 2017. Object detection using ensemble of linear classifiers with fuzzy adaptive boosting. *EURASIP Journal on Image and Video Processing* **2017**:1. . [Crossref]

1021. Ross P. Holder, Jules R. Tapamo. 2017. Improved gradient local ternary patterns for facial expression recognition. *EURASIP Journal on Image and Video Processing* **2017**:1. . [Crossref]

1022. Toru Nakashika, Yasuhiro Minami. 2017. Speaker-adaptive-trainable Boltzmann machine and its application to non-parallel voice conversion. *EURASIP Journal on Audio, Speech, and Music Processing* **2017**:1. . [Crossref]

1023. Yanan Zhu, Qi Ouyang, Youdong Mao. 2017. A deep convolutional neural network approach to single-particle recognition in cryo-electron microscopy. *BMC Bioinformatics* **18**:1. . [Crossref]

1024. Zhao-Chun Xu, Peng Wang, Wang-Ren Qiu, Xuan Xiao. 2017. iSS-PC: Identifying Splicing Sites via Physical-Chemical Properties Using Deep Sparse Auto-Encoder. *Scientific Reports* **7**:1. . [Crossref]

1025. Wei Wang, Yu Jiang, Dan Wang, Min Zhang. 2017. Through wall human detection under small samples based on deep learning algorithm. *Pattern Recognition* **72**, 458-465. [Crossref]

1026. Eleni Tsironi, Pablo Barros, Cornelius Weber, Stefan Wermter. 2017. An analysis of Convolutional Long Short-Term Memory Recurrent Neural Networks for gesture recognition. *Neurocomputing* **268**, 76-86. [Crossref]

1027. Kee-Sun Sohn, Jiyong Chung, Min-Young Cho, Suman Timilsina, Woon Bae Park, Myungho Pyo, Namsoo Shin, Keemin Sohn, Ji Sik Kim. 2017. An extremely simple macroscale electronic skin realized by deep machine learning. *Scientific Reports* **7**:1. . [Crossref]

1028. Junying Hu, Jiangshe Zhang, Nannan Ji, Chunxia Zhang. 2017. A modified version of Helmholtz machine by using a Restricted Boltzmann Machine to model the generative probability of the top layer. *Neurocomputing* **267**, 1-17. [Crossref]

1029. Haiou Li, Jie Hou, Badri Adhikari, Qiang Lyu, Jianlin Cheng. 2017. Deep learning methods for protein torsion angle prediction. *BMC Bioinformatics* **18**:1. . [Crossref]

1030. Oyebade K. Oyedotun, Adnan Khashman. 2017. Deep learning in vision-based static hand gesture recognition. *Neural Computing and Applications* **28**:12, 3941-3951. [Crossref]

1031. Xue Jiang, Han Zhang, Feng Duan, Xiongwen Quan. 2017. Identify Huntington's disease associated genes based on restricted Boltzmann machine with RNA-seq data. *BMC Bioinformatics* **18**:1. . [Crossref]

1032. A. Benou, R. Veksler, A. Friedman, T. Riklin Raviv. 2017. Ensemble of expert deep neural networks for spatio-temporal denoising of contrast-enhanced MRI sequences. *Medical Image Analysis* **42**, 145-159. [Crossref]

1033. Yu Zhao, Qinglin Dong, Hanbo Chen, Armin Iraji, Yujie Li, Milad Makkie, Zhifeng Kou, Tianming Liu. 2017. Constructing fine-granularity functional brain network atlases via deep convolutional autoencoder. *Medical Image Analysis* **42**, 200-211. [Crossref]

1034. Geert Litjens, Thijs Kooi, Babak Ehteshami Bejnordi, Arnaud Arindra Adiyoso Setio, Francesco Ciompi, Mohsen Ghafoorian, Jeroen A.W.M. van der Laak, Bram van Ginneken, Clara I. Sánchez. 2017. A survey on deep learning in medical image analysis. *Medical Image Analysis* **42**, 60-88. [Crossref]

1035. Justin Zhan, Binay Dahal. 2017. Using deep learning for short text understanding. *Journal of Big Data* **4**:1. . [Crossref]

1036. Guoyin Wang. 2017. DGCC: data-driven granular cognitive computing. *Granular Computing* **2**:4, 343-355. [Crossref]

1037. Young Joon Park, Hyung Seok Kim, Donghwa Kim, Hankyu Lee, Seoung Bum Kim, Pilsung Kang. 2017. A deep learning-based sports player evaluation model

based on game statistics and news articles. *Knowledge-Based Systems* **138**, 15-26. [Crossref]

1038. Lars C. Ebert, Jakob Heimer, Wolf Schweitzer, Till Sieberth, Anja Leipner, Michael Thali, Garyfalia Ampanozi. 2017. Automatic detection of hemorrhagic pericardial effusion on PMCT using deep learning - a feasibility study. *Forensic Science, Medicine and Pathology* **13**:4, 426-431. [Crossref]

1039. Tian Gao, Jun Du, Li-Rong Dai, Chin-Hui Lee. 2017. A unified DNN approach to speaker-dependent simultaneous speech enhancement and speech separation in low SNR environments. *Speech Communication* **95**, 28-39. [Crossref]

1040. Saraswathi Duraisamy, Srinivasan Emperumal. 2017. Computer-aided mammogram diagnosis system using deep learning convolutional fully complex-valued relaxation neural network classifier. *IET Computer Vision* **11**:8, 656-662. [Crossref]

1041. Zohreh Ansari, Seyyed Ali Seyyedsalehi. 2017. Toward growing modular deep neural networks for continuous speech recognition. *Neural Computing and Applications* **28**:S1, 1177-1196. [Crossref]

1042. Qiang Zhang, Jiafeng Li, Li Zhuo, Hui Zhang, Xiaoguang Li. 2017. Vehicle Color Recognition with Vehicle-Color Saliency Detection and Dual-Orientational Dimensionality Reduction of CNN Deep Features. *Sensing and Imaging* **18**:1. . [Crossref]

1043. Jinwei Qi, Xin Huang, Yuxin Peng. 2017. Cross-media similarity metric learning with unified deep networks. *Multimedia Tools and Applications* **76**:23, 25109-25127. [Crossref]

1044. Ting Rui, Junhua Zou, You Zhou, Husheng Fang, Qiyu Gao. 2017. Pedestrian detection based on multi-convolutional features by feature maps pruning. *Multimedia Tools and Applications* **76**:23, 25079-25089. [Crossref]

1045. Wei Zhao, Zhirui Wang, Maoguo Gong, Jia Liu. 2017. Discriminative Feature Learning for Unsupervised Change Detection in Heterogeneous Images Based on a Coupled Neural Network. *IEEE Transactions on Geoscience and Remote Sensing* **55**:12, 7066-7080. [Crossref]

1046. Yu-Jun Zheng, Wei-Guo Sheng, Xing-Ming Sun, Sheng-Yong Chen. 2017. Airline Passenger Profiling Based on Fuzzy Deep Machine Learning. *IEEE Transactions on Neural Networks and Learning Systems* **28**:12, 2911-2923. [Crossref]

1047. Rahul Kumar Sevakula, Nishchal Kumar Verma. 2017. Assessing Generalization Ability of Majority Vote Point Classifiers. *IEEE Transactions on Neural Networks and Learning Systems* **28**:12, 2985-2997. [Crossref]

1048. Alexandros Iosifidis, Moncef Gabbouj. 2017. Class-Specific Kernel Discriminant Analysis Revisited: Further Analysis and Extensions. *IEEE Transactions on Cybernetics* **47**:12, 4485-4496. [Crossref]

1049. Panagiotis Tzirakis, George Trigeorgis, Mihalis A. Nicolaou, Bjorn W. Schuller, Stefanos Zafeiriou. 2017. End-to-End Multimodal Emotion Recognition Using

Deep Neural Networks. *IEEE Journal of Selected Topics in Signal Processing* **11**:8, 1301-1309. [Crossref]

1050. Meng Ma, Chuang Sun, Xuefeng Chen. 2017. Discriminative Deep Belief Networks with Ant Colony Optimization for Health Status Assessment of Machine. *IEEE Transactions on Instrumentation and Measurement* **66**:12, 3115-3125. [Crossref]

1051. Quanzeng You, Ran Pang, Liangliang Cao, Jiebo Luo. 2017. Image-Based Appraisal of Real Estate Properties. *IEEE Transactions on Multimedia* **19**:12, 2751-2759. [Crossref]

1052. Afsaneh Asaei, Milos Cernak, Herve Bourlard. 2017. Perceptual Information Loss due to Impaired Speech Production. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **25**:12, 2433-2443. [Crossref]

1053. Myungjong Kim, Beiming Cao, Ted Mau, Jun Wang. 2017. Speaker-Independent Silent Speech Recognition From Flesh-Point Articulatory Movements Using an LSTM Neural Network. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **25**:12, 2323-2336. [Crossref]

1054. Bo Wu, Minglei Yang, Kehuang Li, Zhen Huang, Sabato Marco Siniscalchi, Tong Wang, Chin-Hui Lee. 2017. A reverberation-time-aware DNN approach leveraging spatial information for microphone array dereverberation. *EURASIP Journal on Advances in Signal Processing* **2017**:1. . [Crossref]

1055. Roee Diamant, Filippo Campagnaro, Michele de Filippo de Grazia, Paolo Casari, Alberto Testolin, Violeta Sanjuan Calzado, Michele Zorzi. 2017. On the Relationship Between the Underwater Acoustic and Optical Channels. *IEEE Transactions on Wireless Communications* **16**:12, 8037-8051. [Crossref]

1056. Yiyi Liao, Sarath Kodagoda, Yue Wang, Lei Shi, Yong Liu. 2017. Place Classification With a Graph Regularized Deep Neural Network. *IEEE Transactions on Cognitive and Developmental Systems* **9**:4, 304-315. [Crossref]

1057. Zhen Cui, Zhiheng Niu, Luoqi Liu, Shuicheng Yan. 2017. Layerwise Class-Aware Convolutional Neural Network. *IEEE Transactions on Circuits and Systems for Video Technology* **27**:12, 2601-2612. [Crossref]

1058. Dimitrios Kosmopoulos, Konstantinos Papoutsakis, Antonis Argyros. 2017. A Framework for Online Segmentation and Classification of Modeled Actions Performed in the Context of Unmodeled Ones. *IEEE Transactions on Circuits and Systems for Video Technology* **27**:12, 2578-2590. [Crossref]

1059. Xinhuai Zou, Ming Cheng, Cheng Wang, Yan Xia, Jonathan Li. 2017. Tree Classification in Complex Forest Point Clouds Based on Deep Learning. *IEEE Geoscience and Remote Sensing Letters* **14**:12, 2360-2364. [Crossref]

1060. Yu-Jun Zheng, Sheng-Yong Chen, Yu Xue, Jin-Yun Xue. 2017. A Pythagorean-Type Fuzzy Deep Denoising Autoencoder for Industrial Accident Early Warning. *IEEE Transactions on Fuzzy Systems* **25**:6, 1561-1575. [Crossref]

1061. Timothy O'Shea, Jakob Hoydis. 2017. An Introduction to Deep Learning for the Physical Layer. *IEEE Transactions on Cognitive Communications and Networking* **3**:4, 563-575. [Crossref]

1062. Xiao Xiang Zhu, Devis Tuia, Lichao Mou, Gui-Song Xia, Liangpei Zhang, Feng Xu, Friedrich Fraundorfer. 2017. Deep Learning in Remote Sensing: A Comprehensive Review and List of Resources. *IEEE Geoscience and Remote Sensing Magazine* **5**:4, 8-36. [Crossref]

1063. Bomin Mao, Zubair Md. Fadlullah, Fengxiao Tang, Nei Kato, Osamu Akashi, Takeru Inoue, Kimihiro Mizutani. A Tensor Based Deep Learning Technique for Intelligent Packet Routing 1-6. [Crossref]

1064. Ricardo Silva Carvalho, Rommel Novaes Carvalho, Guilherme Novaes Ramos, Roberto Nunes Mour�o. Predicting Waiting Time Overflow on Bank Teller Queues 842-847. [Crossref]

1065. Iago Correa, Paulo Drews, Silvia Botelho, Marcio Silva de Souza, Virg�nia Maria Tavano. Deep Learning for Microalgae Classification 20-25. [Crossref]

1066. Abhronil Sengupta, Kaushik Roy. 2017. Encoding neural and synaptic functionalities in electron spin: A pathway to efficient neuromorphic computing. *Applied Physics Reviews* **4**:4, 041105. [Crossref]

1067. Kuo Men, Jianrong Dai, Yexiong Li. 2017. Automatic segmentation of the clinical target volume and organs at risk in the planning CT for rectal cancer using deep dilated convolutional neural networks. *Medical Physics* **44**:12, 6377-6389. [Crossref]

1068. Pingping Zhu, Jason Isaacs, Bo Fu, Silvia Ferrari. Deep learning feature extraction for target recognition and classification in underwater sonar images 2724-2731. [Crossref]

1069. M. Arif Wani, Saduf Afzal. A New Framework for Fine Tuning of Deep Networks 359-363. [Crossref]

1070. Vui Ann Shim, Miaolong Yuan, Boon Hwa Tan. Automatic object searching by a mobile robot with single RGB-D camera 056-062. [Crossref]

1071. Pegah Ghahremani, Vimal Manohar, Hossein Hadian, Daniel Povey, Sanjeev Khudanpur. Investigation of transfer learning for ASR using LF-MMI trained neural networks 279-286. [Crossref]

1072. Yong Oh Lee, Jun Jo, Jongwoon Hwang. Application of deep neural network and generative adversarial network to industrial maintenance: A case study of induction motor fault detection 3248-3253. [Crossref]

1073. Peter Xenopoulos. Introducing DeepBalance: Random deep belief network ensembles to address class imbalance 3684-3689. [Crossref]

1074. Ping Lin, Yongming Chen, Jianqiang He, Xiaorong Fu. Determination of the Varieties of Rice Kernels Based on Machine Vision and Deep Learning Technology 169-172. [Crossref]

1075. Saibo Xing, Yaguo Lei, Feng Jia, Jing Lin. Intelligent fault diagnosis of rotating machinery using locally connected restricted boltzmann machine in big data era 1930-1934. [Crossref]

1076. Xin Wang, Jun Du, Yannan Wang. A maximum likelihood approach to deep neural network based speech dereverberation 155-158. [Crossref]

1077. Rongfeng Su, Lan Wang, Xunying Liu. Multimodal learning using 3D audio-visual data for audio-visual speech recognition 40-43. [Crossref]

1078. Zhulin Liu, C. L. Philip Chen. Broad learning system: Structural extensions on single-layer and multi-layer neural networks 136-141. [Crossref]

1079. Long Xu Yihua Yan. Machine learning for astronomical big data processing 1-4. [Crossref]

1080. Yuping Zhang, Jile Li, Qiaoling Li. Fault diagnosis based on deep belief networks and fisher discriminant analysis 247-250. [Crossref]

1081. Zongming Yin, Junzhang Zhu, Xiaofeng Zhang. Forecast customer flow using long short-term memory networks 61-66. [Crossref]

1082. Csaba Veres. 2017. Strong Cognitive Symbiosis: Cognitive Computing for Humans. *Big Data and Cognitive Computing* **1**:1, 6. [Crossref]

1083. Babar Khan, Zhijie Wang, Fang Han, Ather Iqbal, Rana Masood. 2017. Fabric Weave Pattern and Yarn Color Recognition and Classification Using a Deep ELM Network. *Algorithms* **10**:4, 117. [Crossref]

1084. Wei Zhao, Qing-Hao Meng, Ming Zeng, Pei-Feng Qi. 2017. Stacked Sparse Auto-Encoders (SSAE) Based Electronic Nose for Chinese Liquors Classification. *Sensors* **17**:12, 2855. [Crossref]

1085. Alex Obinikpo, Burak Kantarci. 2017. Big Sensed Data Meets Deep Learning for Smarter Health Care in Smart Cities. *Journal of Sensor and Actuator Networks* **6**:4, 26. [Crossref]

1086. Ovidiu Moldovan, Simona Dzitac, Ioan Moga, Tiberiu Vesselenyi, Ioan Dzitac. 2017. Tool-Wear Analysis Using Image Processing of the Tool Flank. *Symmetry* **9**:12, 296. [Crossref]

1087. Evan Hurwitz, Ali N Hasan, Chigozie Orji. Soft biometric thermal face recognition using FWT and LDA feature extraction method with RBM DBN and FFNN classifier algorithms 1-6. [Crossref]

1088. Gan-lin ZHANG, Feng LIU, Xiao-dong SONG. 2017. Recent progress and future prospect of digital soil mapping: A review. *Journal of Integrative Agriculture* **16**:12, 2871-2885. [Crossref]

1089. Kasiprasad Mannepalli, Panyam Narahari Sastry, Maloji Suman. 2017. A novel Adaptive Fractional Deep Belief Networks for speaker emotion recognition. *Alexandria Engineering Journal* **56**:4, 485-497. [Crossref]

1090. Yanliang Chen, Minghua Zhu, Bo Xiao, Dan Meng. FPGA-Accelerated for Constrained High Dispersal Network 840-845. [Crossref]

1091. Fabio Massimo Zennaro, Ke Chen. 2017. Towards understanding sparse filtering: A theoretical perspective. *Neural Networks* . [Crossref]

1092. Atsuya Oishi, Genki Yagawa. 2017. Computational mechanics enhanced by deep learning. *Computer Methods in Applied Mechanics and Engineering* **327**, 327-351. [Crossref]

1093. Zhanpeng Zhang, Jinsong Zhao. 2017. A deep belief network based fault diagnosis model for complex chemical processes. *Computers & Chemical Engineering* **107**, 395-407. [Crossref]

1094. Gustaaf J.C. van Baar, Muhammad Ruslin, Maureen van Eijnatten, George K. Sándor, Tymour Forouzanfar, Jan Wolff. 2017. 3D assessment of damaged bicycle helmets and corresponding craniomaxillo-mandibular skull injuries: A feasibility study. *Injury* **48**:12, 2872-2878. [Crossref]

1095. Kasthurirangan Gopalakrishnan, Siddhartha K. Khaitan, Alok Choudhary, Ankit Agrawal. 2017. Deep Convolutional Neural Networks with transfer learning for computer vision-based data-driven pavement distress detection. *Construction and Building Materials* **157**, 322-330. [Crossref]

1096. Andreas Holzinger. 2017. Introduction to MAchine Learning & Knowledge Extraction (MAKE). *Machine Learning and Knowledge Extraction* **1**:1, 1. [Crossref]

1097. Cheng Shi, Chi-Man Pun. 2017. 3D multi-resolution wavelet convolutional neural networks for hyperspectral image classification. *Information Sciences* **420**, 49-65. [Crossref]

1098. Xueheng Qiu, Le Zhang, Ponnuthurai Nagaratnam Suganthan, Gehan A.J. Amaratunga. 2017. Oblique random forest ensemble via Least Square Estimation for time series forecasting. *Information Sciences* **420**, 249-262. [Crossref]

1099. Wei Wang, Jiayu Chen, Gongsheng Huang, Yujie Lu. 2017. Energy efficient HVAC control for an IPS-enabled large space in commercial buildings through dynamic spatial occupancy distribution. *Applied Energy* **207**, 305-323. [Crossref]

1100. Afzal A.L., Asharaf S.. 2017. Deep multiple multilayer kernel learning in core vector machines. *Expert Systems with Applications* . [Crossref]

1101. Yuancheng Li, Xiangqian Nie, Rong Huang. 2017. Web Spam Classification Method Based on Deep Belief Networks. *Expert Systems with Applications* . [Crossref]

1102. Melvin Wong, Bilal Farooq, Guillaume-Alexandre Bilodeau. 2017. Discriminative conditional restricted Boltzmann machine for discrete choice and latent variable modelling. *Journal of Choice Modelling* . [Crossref]

1103. Hao Wu, Rongfang Bie, Junqi Guo, Xin Meng, Chenyun Zhang. 2017. CNN refinement based object recognition through optimized segmentation. *Optik - International Journal for Light and Electron Optics* **150**, 76-82. [Crossref]

1104. Lijun Lan, Ying Liu, Wen Feng Lu. 2017. Automatic Discovery of Design Task Structure Using Deep Belief Nets. *Journal of Computing and Information Science in Engineering* **17**:4, 041001. [Crossref]

1105. Makoto Ikeda, Tetsuya Oda, Leonard Barolli. 2017. A vegetable category recognition system: a comparison study for caffe and Chainer DNN frameworks. *Soft Computing* **10**. . [Crossref]

1106. Sogol Haghani, Mohammad Reza Keyvanpour. 2017. A systemic analysis of link prediction in social network. *Artificial Intelligence Review* **25**. . [Crossref]

1107. Amin Khatami, Abbas Khosravi, Thanh Nguyen, Chee Peng Lim, Saeid Nahavandi. 2017. Medical image analysis using wavelet transform and deep belief networks. *Expert Systems with Applications* **86**, 190-198. [Crossref]

1108. Young-Bum Kim, Karl Stratos, Ruhi Sarikaya. 2017. A Framework for pre-training hidden-unit conditional random fields and its extension to long short term memory networks. *Computer Speech & Language* **46**, 311-326. [Crossref]

1109. Niko Moritz, Kamil Adiloğlu, Jörn Anemüller, Stefan Goetze, Birger Kollmeier. 2017. Multi-Channel Speech Enhancement and Amplitude Modulation Analysis for Noise Robust Automatic Speech Recognition. *Computer Speech & Language* **46**, 558-573. [Crossref]

1110. Milos Cernak, Juan Rafael Orozco-Arroyave, Frank Rudzicz, Heidi Christensen, Juan Camilo V?squez-Correa, Elmar N?th. 2017. Characterisation of voice quality of Parkinson?s disease using differential phonological posterior features. *Computer Speech & Language* **46**, 196-208. [Crossref]

1111. Mohammad Ali Keyvanrad, Mohammad Mehdi Homayounpour. 2017. Effective sparsity control in deep belief networks using normal regularization term. *Knowledge and Information Systems* **53**:2, 533-550. [Crossref]

1112. Soojeong Lee, Joon-Hyuk Chang. 2017. Deep learning ensemble with asymptotic techniques for oscillometric blood pressure estimation. *Computer Methods and Programs in Biomedicine* **151**, 1-13. [Crossref]

1113. Satoru Ishikawa, Jorma Laaksonen. 2017. Uni- and multimodal methods for single- and multi-label recognition. *Multimedia Tools and Applications* **76**:21, 22405-22423. [Crossref]

1114. Yuhan Jia, Jianping Wu, Moshe Ben-Akiva, Ravi Seshadri, Yiman Du. 2017. Rainfall-integrated traffic speed prediction using deep learning method. *IET Intelligent Transport Systems* **11**:9, 531-536. [Crossref]

1115. Khomdet Phapatanaburi, Longbiao Wang, Zeyan Oo, Weifeng Li, Seiichi Nakagawa, Masahiro Iwahashi. 2017. Noise robust voice activity detection using joint phase and magnitude based feature enhancement. *Journal of Ambient Intelligence and Humanized Computing* **8**:6, 845-859. [Crossref]

1116. Jiunn-Tsair Fang, Chi-Ting Day, Pao-Chi Chang. 2017. Deep feature learning for cover song identification. *Multimedia Tools and Applications* **76**:22, 23225-23238. [Crossref]

1117. Asghar Feizi. 2017. High-Level Feature Extraction for Classification and Person Re-Identification. *IEEE Sensors Journal* **17**:21, 7064-7073. [Crossref]

1118. Bomin Mao, Zubair Md. Fadlullah, Fengxiao Tang, Nei Kato, Osamu Akashi, Takeru Inoue, Kimihiro Mizutani. 2017. Routing or Computing? The Paradigm Shift Towards Intelligent Computer Network Packet Transmission Based on Deep Learning. *IEEE Transactions on Computers* **66**:11, 1946-1960. [Crossref]

1119. Hongzhi Yin, Weiqing Wang, Hao Wang, Ling Chen, Xiaofang Zhou. 2017. Spatial-Aware Hierarchical Collaborative Deep Learning for POI Recommendation. *IEEE Transactions on Knowledge and Data Engineering* **29**:11, 2537-2551. [Crossref]

1120. Xiangrong Zhang, Yanjie Liang, Chen Li, Ning Huyan, Licheng Jiao, Huiyu Zhou. 2017. Recursive Autoencoders-Based Unsupervised Feature Learning for Hyperspectral Image Classification. *IEEE Geoscience and Remote Sensing Letters* **14**:11, 1928-1932. [Crossref]

1121. Arun Singh Pundir, Balasubramanian Raman. 2017. Deep Belief Network For Smoke Detection. *Fire Technology* **53**:6, 1943-1960. [Crossref]

1122. Xiaoqing Wan, Chunhui Zhao, Yanchun Wang, Wu Liu. 2017. Stacked sparse autoencoder in hyperspectral data classification using spectral-spatial, higher order statistics and multifractal spectrum features. *Infrared Physics & Technology* **86**, 77-89. [Crossref]

1123. Moez Hamad, Sébastien Thomassey, Pascal Bruniaux. 2017. A new sizing system based on 3D shape descriptor for morphology clustering. *Computers & Industrial Engineering* **113**, 683-692. [Crossref]

1124. Ronggui Wang, Yunfei Xie, Juan Yang, Lixia Xue, Min Hu, Qingyang Zhang. 2017. Large scale automatic image annotation based on convolutional neural network. *Journal of Visual Communication and Image Representation* **49**, 213-224. [Crossref]

1125. Rui Xie, Jia Wen, Andrew Quitadamo, Jianlin Cheng, Xinghua Shi. 2017. A deep auto-encoder model for gene expression prediction. *BMC Genomics* **18**:S9. . [Crossref]

1126. R. K. TRIPATHY, MARIO R. ARRIETA PATERNINA, JUAN G. ARRIETA, P. PATTANAIK. 2017. AUTOMATED DETECTION OF ATRIAL FIBRILLATION ECG SIGNALS USING TWO STAGE VMD AND ATRIAL FIBRILLATION DIAGNOSIS INDEX. *Journal of Mechanics in Medicine and Biology* **17**:07, 1740044. [Crossref]

1127. Yue Huang, Han Zheng, Chi Liu, Xinghao Ding, Gustavo K. Rohde. 2017. Epithelium-Stroma Classification via Convolutional Neural Networks and Unsupervised Domain Adaptation in Histopathological Images. *IEEE Journal of Biomedical and Health Informatics* **21**:6, 1625-1632. [Crossref]

1128. Davide Del Testa, Matteo Danieletto, Michele Zorzi. 2017. A Machine Learning-Based ETA Estimator for Wi-Fi Transmissions. *IEEE Transactions on Wireless Communications* **16**:11, 7011-7024. [Crossref]

1129. Jianhua Zhang, Sunan Li. 2017. A deep learning scheme for mental workload classification based on restricted Boltzmann machines. *Cognition, Technology & Work* **19**:4, 607-631. [Crossref]

1130. Szu-Yin Lin, Chi-Chun Chiang, Zih-Siang Hung, Yu-Hui Zou. A Dynamic Data-Driven Fine-Tuning Approach for Stacked Auto-Encoder Neural Network 226-231. [Crossref]

1131. Yuri Lenon Barbosa Nogueira, Creto Augusto Vidal, Joaquim Bento Cavalcante-Neto. Towards Playing a 3D First-Person Shooter Game Using a Classification Deep Neural Network Architecture 120-126. [Crossref]

1132. Nozomi Koyama, Soichiro Yokoyama, Tomohisa Yamashita, Hidenori Kawamura, Kiyotaka Takeda, Makoto Yokogawa. Recognition of snow condition using a convolutional neural network and control of road-heating systems 122-126. [Crossref]

1133. Zhiqian Chen, Chih-Wei Wu, Yen-Cheng Lu, Alexander Lerch, Chang-Tien Lu. Learning to Fuse Music Genres with Generative Adversarial Dual Learning 817-822. [Crossref]

1134. Y. Q. Neo, T. T. Teo, W. L. Woo, T. Logenthiran, A. Sharma. Forecasting of photovoltaic power using deep belief network 1189-1194. [Crossref]

1135. Dan Li, William Yang, Yifan Zhang, Jack Y. Yang, Weida Tong, Renchu Guan, Mary Qu Yang. Comprehensive analysis of pulmonary adenocarcinoma in situ (AIS) revealed new insights into lung cancer progression 792-797. [Crossref]

1136. Linchen Xiao, Arash Behboodi, Rudolf Mathar. A deep learning approach to fingerprinting indoor localization solutions 1-7. [Crossref]

1137. Shin Kamada, Takumi Ichimura. Shortening time required for adaptive structural learning method of deep belief network with multi-modal data arrangement 97-102. [Crossref]

1138. Yoshitaka Fujii, Takumi Ichimura. An evaluation of distillation deep learning network architecture 103-108. [Crossref]

1139. Lin Ning, Randall Pittman, Xipeng Shen. LCD: A Fast Contrastive Divergence Based Algorithm for Restricted Boltzmann Machine 1015-1020. [Crossref]

1140. Jungming Huang, Xiangmin Xu, Tong Zhang. Emotion classification using deep neural networks and emotional patches 958-962. [Crossref]

1141. Murman Dwi Prasetio, Tomohiro Hayashida, Ichiro Nishizaki, Shinya Sekizaki. Structural optimization of deep belief network theorem for classification in speech recognition 121-128. [Crossref]

1142. Musab Coskun, Aysegul Ucar, Ozal Yildirim, Yakup Demir. Face recognition based on convolutional neural network 376-379. [Crossref]

1143. Jerome Williams, Gustavo Carneiro, David Suter. Region of Interest Autoencoders with an Application to Pedestrian Detection 1-8. [Crossref]

1144. Xiaojun Zhang, Zhi Tao, Heming Zhao, Tianqi Xu. Pathological voice recognition by deep neural network 464-468. [Crossref]

1145. Aldonso Becerra, J. Ismael de la Rosa, Efren Gonzalez, A. David Pedroza, J. Manuel Martinez, N. Iracemi Escalante. Speech recognition using deep neural networks trained with non-uniform frame-level cost functions 1-6. [Crossref]

1146. Si-Yu Shao, Wen-Jun Sun, Ru-Qiang Yan, Peng Wang, Robert X Gao. 2017. A Deep Learning Approach for Fault Diagnosis of Induction Motors in Manufacturing. *Chinese Journal of Mechanical Engineering* **30**:6, 1347-1356. [Crossref]

1147. Li-Hua Wang, Xiao-Ping Zhao, Jia-Xin Wu, Yang-Yang Xie, Yong-Hong Zhang. 2017. Motor Fault Diagnosis Based on Short-time Fourier Transform and Convolutional Neural Network. *Chinese Journal of Mechanical Engineering* **30**:6, 1357-1368. [Crossref]

1148. Mandar Gogate, Ahsan Adeel, Amir Hussain. Deep learning driven multimodal fusion for automated deception detection 1-6. [Crossref]

1149. Zhiqiang Wan, Yazhou Zhang, Haibo He. Variational autoencoder based synthetic data generation for imbalanced learning 1-7. [Crossref]

1150. Afiq Ahmad Shakri, Syahrul Affandi Saidi, Muhammad Naufal Mansor, Haryati Jaafar, Ahmad Kadri Junoh, Wan Azani Mustafa. Contrast virus microscopy images recognition via k-NN classifiers 352-355. [Crossref]

1151. Xiongtao Zhang, Xingguang Pan, Shitong Wang. Fuzzy DBN with rule-based knowledge representation and high interpretability 1-7. [Crossref]

1152. Mandar Gogate, Ahsan Adeel, Amir Hussain. A novel brain-inspired compression-based optimised multimodal fusion for emotion recognition 1-7. [Crossref]

1153. Teny Handhayani, Janson Hendryli, Lely Hiryanto. Comparison of shallow and deep learning models for classification of Lasem batik patterns 11-16. [Crossref]

1154. Simone A. Ludwig. Intrusion detection of multiple attack classes using a deep neural net ensemble 1-7. [Crossref]

1155. Bo Tang, Paul M. Baggenstoss, Haibo He. Kernel-based generative learning in distortion feature space 1-8. [Crossref]

1156. Afiq Ahmad Shakri, Syahrul Affandi Saidi, Haryati Jaafar, Muhammad Naufal Mansor, Wan Azani Mustafa, Ahmad Kadri Junoh. Entropy virus microscopy images recognition via neural network classifiers 348-351. [Crossref]

1157. Mathias Seuret, Michele Alberti, Marcus Liwicki, Rolf Ingold. PCA-Initialized Deep Neural Networks Applied to Document Image Analysis 877-882. [Crossref]

1158. Saba S. Edris, Mohamed Zarka, Wael Ouarda, Adel M. Alimi. A fuzzy ontology driven context classification system using large-scale image recognition based on deep CNN 1-9. [Crossref]

1159. Ahmed Mohammed Yousef, Yasser M.K. Omar, Essam Fakharany. Deep generative image model using a hybrid system of generative adversarial nets (GANs) 278-285. [Crossref]

1160. M. Dian Bah, Adel Hafiane, Raphael Canals. Weeds detection in UAV imagery using SLIC and the hough transform 1-6. [Crossref]

1161. Xing Wang, Him Wai Ng, Jie Liang. Lapped convolutional neural networks for embedded systems 1135-1139. [Crossref]

1162. Xiao Zhou, Chengchen Wang, Yiteng Xu, Xiao Wang, Peter Chin. Domain specific inpainting with concurrently pretrained generative adversarial networks 1185-1189. [Crossref]

1163. Firouzeh Razavi, Jalil Nourmohammadi Khiarak, Esmaeil Fakhimi Gheshlagh Mohammad Beig, Samaneh Mazaheri. Recognizing Farsi numbers utilizing deep belief network and limited training samples 271-275. [Crossref]

1164. Phong D. Vo, Alexandru Ginsca, Hervé Le Borgne, Adrian Popescu. 2017. Harnessing noisy Web images for deep representation. *Computer Vision and Image Understanding* **164**, 68-81. [Crossref]

1165. Mehdi Cherti, Balazs Kegl, Akin Kazakci. Out-of-Class Novelty Generation : An Experimental Foundation 1312-1319. [Crossref]

1166. Tanmay Bhowmik, Shyamal Kumar Das Mandal. Inclusion of manner of articulation to achieve improved phoneme classification accuracy for Bengali continuous speech 1-6. [Crossref]

1167. Fatemeh Vakhshiteh, Farshad Almasganj. Lip-Reading via Deep Neural Network Using Appearance-Based Visual Features 1-6. [Crossref]

1168. Xiao Ke, Mingke Zhou, Yuzhen Niu, Wenzhong Guo. 2017. Data equilibrium based automatic image annotation by fusing deep model and semantic propagation. *Pattern Recognition* **71**, 60-77. [Crossref]

1169. Loris Nanni, Stefano Ghidoni, Sheryl Brahnam. 2017. Handcrafted vs. non-handcrafted features for computer vision classification. *Pattern Recognition* **71**, 158-172. [Crossref]

1170. Lijuan Liu, Rung-Ching Chen. 2017. A novel passenger flow prediction model using deep learning methods. *Transportation Research Part C: Emerging Technologies* **84**, 74-91. [Crossref]

1171. Qin Song, Mei-Rong Zhao, Xiao-Han Zhou, Yu Xue, Yu-Jun Zheng. 2017. Predicting gastrointestinal infection morbidity based on environmental pollutants: Deep learning versus traditional models. *Ecological Indicators* **82**, 76-81. [Crossref]

1172. João Paulo Papa, Gustavo H. Rosa, Danillo R. Pereira, Xin-She Yang. 2017. Quaternion-based Deep Belief Networks fine-tuning. *Applied Soft Computing* **60**, 328-335. [Crossref]

1173. Liang Liang, Minliang Liu, Wei Sun. 2017. A deep learning approach to estimate chemically-treated collagenous tissue nonlinear anisotropic stress-strain responses from microscopy images. *Acta Biomaterialia* **63**, 227-235. [Crossref]

1174. Xiaoqing Wan, Chunhui Zhao, Bing Gao. 2017. Integration of adaptive guided filtering, deep feature learning, and edge-detection techniques for hyperspectral image classification. *Optical Engineering* **56**:11, 1. [Crossref]

1175. Ning Ma, Shaojun Wang, Yu Peng, JinXiang Yu. A DBN based anomaly targets detector for HSI 2850. [Crossref]

1176. Tim Albrecht, Gregory Slabaugh, Eduardo Alonso, SM Masudur R Al-Arif. 2017. Deep learning for single-molecule science. *Nanotechnology* **28**:42, 423001. [Crossref]

1177. Moritz Hess, Stefan Lenz, Tamara J Blätte, Lars Bullinger, Harald Binder. 2017. Partitioned learning of deep Boltzmann machines for SNP data. *Bioinformatics* **33**:20, 3173-3180. [Crossref]

1178. Min Peng, Chongyang Wang, Tong Chen, Guangyuan Liu, Xiaolan Fu. 2017. Dual Temporal Scale Convolutional Neural Network for Micro-Expression Recognition. *Frontiers in Psychology* **8**. . [Crossref]

1179. Kangil Kim, Yun Jin, Seung-Hoon Na, Young-Kil Kim. 2017. Center-shared sliding ensemble of neural networks for syntax analysis of natural language. *Expert Systems with Applications* **83**, 215-225. [Crossref]

1180. Eunsuk Chong, Chulwoo Han, Frank C. Park. 2017. Deep learning networks for stock market analysis and prediction: Methodology, data representations, and case studies. *Expert Systems with Applications* **83**, 187-205. [Crossref]

1181. Chongsheng Zhang, Changchang Liu, Xiangliang Zhang, George Almpanidis. 2017. An up-to-date comparison of state-of-the-art classification algorithms. *Expert Systems with Applications* **82**, 128-150. [Crossref]

1182. Shuhui Bu, Lei Wang, Pengcheng Han, Zhenbao Liu, Ke Li. 2017. 3D shape recognition and retrieval based on multi-modality deep learning. *Neurocomputing* **259**, 183-193. [Crossref]

1183. Ke Li, Yalei Wu, Yu Nan, Pengfei Li, Yang Li. 2017. Hierarchical multi-class classification in multimodal spacecraft data using DNN and weighted support vector machine. *Neurocomputing* **259**, 55-65. [Crossref]

1184. Sebastien C. Wong, Victor Stamatescu, Adam Gatt, David Kearney, Ivan Lee, Mark D. McDonnell. 2017. Track Everything: Limiting Prior Knowledge in Online Multi-Object Recognition. *IEEE Transactions on Image Processing* **26**:10, 4669-4683. [Crossref]

1185. NhatHai Phan, Xintao Wu, Dejing Dou. 2017. Preserving differential privacy in convolutional deep belief networks. *Machine Learning* **106**:9-10, 1681-1704. [Crossref]

1186. Dianhui Wang, Ming Li. 2017. Stochastic Configuration Networks: Fundamentals and Algorithms. *IEEE Transactions on Cybernetics* **47**:10, 3466-3479. [Crossref]

1187. Zhen Li, Yuqing Wang, Tian Zhi, Tianshi Chen. 2017. A survey of neural network accelerators. *Frontiers of Computer Science* **11**:5, 746-761. [Crossref]

1188. Jianwei Zhao, Yongbiao Lv, Zhenghua Zhou, Feilong Cao. 2017. A novel deep learning algorithm for incomplete face recognition: Low-rank-recovery network. *Neural Networks* **94**, 115-124. [Crossref]

1189. Shao-Bo Lin. 2017. Limitations of shallow nets approximation. *Neural Networks* **94**, 96-102. [Crossref]

1190. Zhizhong Han, Zhenbao Liu, Junwei Han, Chi-Man Vong, Shuhui Bu, Chun Lung Philip Chen. 2017. Mesh Convolutional Restricted Boltzmann Machines for Unsupervised Learning of Features With Structure Preservation on 3-D Meshes. *IEEE Transactions on Neural Networks and Learning Systems* **28**:10, 2268-2281. [Crossref]

1191. Tohru Nitta. 2017. Resolution of Singularities Introduced by Hierarchical Structure in Deep Neural Networks. *IEEE Transactions on Neural Networks and Learning Systems* **28**:10, 2282-2293. [Crossref]

1192. Cuicui Luo, Desheng Wu, Dexiang Wu. 2017. A deep learning approach for credit scoring using credit default swaps. *Engineering Applications of Artificial Intelligence* **65**, 465-470. [Crossref]

1193. Mingmin Chi, Zhongyi Sun, Yiqing Qin, Jinsheng Shen, Jon Atli Benediktsson. 2017. A Novel Methodology to Label Urban Remote Sensing Images Based on Location-Based Social Media Photos. *Proceedings of the IEEE* **105**:10, 1926-1936. [Crossref]

1194. Gong Cheng, Junwei Han, Xiaoqiang Lu. 2017. Remote Sensing Image Scene Classification: Benchmark and State of the Art. *Proceedings of the IEEE* **105**:10, 1865-1883. [Crossref]

1195. Arash Ardakani, Francois Leduc-Primeau, Naoya Onizawa, Takahiro Hanyu, Warren J. Gross. 2017. VLSI Implementation of Deep Neural Network Using Integral Stochastic Computing. *IEEE Transactions on Very Large Scale Integration (VLSI) Systems* **25**:10, 2688-2699. [Crossref]

1196. Luca Oneto, Emanuele Fumeo, Giorgio Clerico, Renzo Canepa, Federico Papa, Carlo Dambra, Nadia Mazzino, Davide Anguita. 2017. Dynamic Delay Predictions for Large-Scale Railway Networks: Deep and Shallow Extreme Learning Machines Tuned via Thresholdout. *IEEE Transactions on Systems, Man, and Cybernetics: Systems* **47**:10, 2754-2767. [Crossref]

1197. Chang-Hung Tsai, Wan-Ju Yu, Wing Hung Wong, Chen-Yi Lee. 2017. A 41.3/26.7 pJ per Neuron Weight RBM Processor Supporting On-Chip Learning/ Inference for IoT Applications. *IEEE Journal of Solid-State Circuits* **52**:10, 2601-2612. [Crossref]

1198. Jonathan D. Young, Chunhui Cai, Xinghua Lu. 2017. Unsupervised deep learning reveals prognostically relevant subtypes of glioblastoma. *BMC Bioinformatics* **18**:S11. . [Crossref]

1199. Gene Sher, Degui Zhi, Shaojie Zhang. 2017. DRREP: deep ridge regressed epitope predictor. *BMC Genomics* **18**:S6. . [Crossref]

1200. Gholam Ali Montazer, Davar Giveki. 2017. Scene Classification Using Multi-Resolution WAHOLB Features and Neural Network Classifier. *Neural Processing Letters* **46**:2, 681-704. [Crossref]

1201. Hongda Bu, Yanglan Gan, Yang Wang, Shuigeng Zhou, Jihong Guan. 2017. A new method for enhancer prediction based on deep belief network. *BMC Bioinformatics* **18**:S12. . [Crossref]

1202. T. Vesselenyi, S. Moca, A. Rus, T. Mitran, B. Tătaru. 2017. Driver drowsiness detection using ANN image processing. *IOP Conference Series: Materials Science and Engineering* **252**, 012097. [Crossref]

1203. Ta Zhou, Fu-Lai Chung, Shitong Wang. 2017. Deep TSK Fuzzy Classifier With Stacked Generalization and Triply Concise Interpretability Guarantee for Large Data. *IEEE Transactions on Fuzzy Systems* **25**:5, 1207-1221. [Crossref]

1204. Md. Zia Uddin, Mohammed Mehedi Hassan, Ahmad Almogren, Mansour Zuair, Giancarlo Fortino, Jim Torresen. 2017. A facial expression recognition system using robust face features from depth videos and deep learning. *Computers & Electrical Engineering* **63**, 114-125. [Crossref]

1205. Li Haochen, Zheng Bin, Sun Xiaoyong, Zhao Yongting. CNN-Based Model for Pose Detection of Industrial PCB 390-393. [Crossref]

1206. Svitlana Galeshchuk, Sumitra Mukherjee. 2017. Deep networks for predicting direction of change in foreign exchange rates. *Intelligent Systems in Accounting, Finance and Management* **24**:4, 100-110. [Crossref]

1207. Chong Zhang, Pin Lim, A. K. Qin, Kay Chen Tan. 2017. Multiobjective Deep Belief Networks Ensemble for Remaining Useful Life Estimation in Prognostics. *IEEE Transactions on Neural Networks and Learning Systems* **28**:10, 2306-2318. [Crossref]

1208. Leandro Aparecido Passos, Joao Paulo Papa. Fine-Tuning Infinity Restricted Boltzmann Machines 63-70. [Crossref]

1209. Rafael Goncalves Pires, Daniel Felipe Silva Santos, Luis Augusto Martins Pereira, Gustavo Botelho De Souza, Alexandre Luis Magalhaes Levada, Joao Paulo Papa. A Robust Restricted Boltzmann Machine for Binary Image Denoising 390-396. [Crossref]

1210. Pablo Loyola, Yutaka Matsuo. Learning Feature Representations from Change Dependency Graphs for Defect Prediction 361-372. [Crossref]

1211. Jose Marques, Joao Andrade, Gabriel Falcao. Unreliable memory operation on a convolutional neural network processor 1-6. [Crossref]

1212. Mario Lopez, Wen Yu. Nonlinear system modeling using convolutional neural networks 1-5. [Crossref]

1213. Fangzhou Cheng, Jun Wang, Liyan Qu, Wei Qiao. Rotor current-based fault diagnosis for DFIG wind turbine drivetrain gearboxes using frequency analysis and a deep classifier 1-9. [Crossref]

1214. Wenbin Ruan, Zhenye Gan, Bin Liu, Yin Guo. An Improved Tibetan Lhasa Speech Recognition Method Based on Deep Neural Network 303-306. [Crossref]

1215. Xiangyong Lu, Kaoru Ota, Mianxiong Dong, Chen Yu, Hai Jin. 2017. Predicting Transportation Carbon Emission with Urban Big Data. *IEEE Transactions on Sustainable Computing* **2**:4, 333-344. [Crossref]

1216. Jose David Bermudez Castro, Raul Queiroz Feitoza, Laura Cue La Rosa, Pedro Marco Achanccaray Diaz, Ieda Del Arco Sanches. A Comparative Analysis of Deep Learning Techniques for Sub-Tropical Crop Types Recognition from Multitemporal Optical/SAR Image Sequences 382-389. [Crossref]

1217. Daniel Felipe Silva Santos, Gustavo Botelho De Souza, Aparecido Nilceu Marana. A 2D Deep Boltzmann Machine for Robust and Fast Vehicle Classification 155-162. [Crossref]

1218. Sergio Montazzolli Silva, Claudio Rosito Jung. Real-Time Brazilian License Plate Detection and Recognition Using Deep Convolutional Neural Networks 55-62. [Crossref]

1219. Mahmoud M. Abu Ghosh, Ashraf Y. Maghari. A Comparative Study on Handwriting Digit Recognition Using Neural Networks 77-81. [Crossref]

1220. Yan Pei. Autoencoder using kernel methoc 322-327. [Crossref]

1221. Shin Kamada, Takumi Ichimura. Knowledge extracted from recurrent deep belief network for real time deterministic control 825-830. [Crossref]

1222. Feng Shuang, C. L. Philip Chen. Fuzzy restricted Boltzmann machine and deep belief network: A comparison on image reconstruction 1828-1833. [Crossref]

1223. Hamdi Amroun, M'hamed Hamy Temkit, Mehdi Ammi. Study of the viewers' TV-watching behaviors before, during and after watching a TV program using iot network 1850-1855. [Crossref]

1224. Collins Leke, A. R. Ndjiongue, Bhekisipho Twala, Tshilidzi Marwala. Deep learning-bat high-dimensional missing data estimator 483-488. [Crossref]

1225. Xiao Wang, Yuanyuan Zhang, Shengnan Yu, Xiwei Liu, Yong Yuan, Fei-Yue Wang. E-learning recommendation framework based on deep learning 455-460. [Crossref]

1226. Hanene Ben Yedder, Umme Zakia, Aly Ahmed, Ljiljana Trajkovic. Modeling prediction in recommender systems using restricted boltzmann machine 2063-2068. [Crossref]

1227. Qiaoxuan Yin, Bin Duan, Mengjun Shen, Xiangshuai Qu. Stacked sparse autoencoder based fault detection and location method for modular five-level converters 1580-1585. [Crossref]

1228. Moein Owhadi-Kareshk, Yasser Sedaghat, Mohammad-R. Akbarzadeh-T.. Pre-training of an artificial neural network for software fault prediction 223-228. [Crossref]

1229. Steven McElwee, Jeffrey Heaton, James Fraley, James Cannady. Deep learning for prioritizing and responding to intrusion detection alerts 1-5. [Crossref]

1230. Apurva Narayan, Keith W. Hipel. Long short term memory networks for short-term electric load forecasting 2573-2578. [Crossref]

1231. Xiaomin Li, Chunming Zhao, Ming Jiang. Neural network for demodulating the output signals of nonlinear systems with memory 1-5. [Crossref]

1232. Dragan Mlakic, Srete Nikolovski, Zoran Baus. Detection of faults in electrical panels using deep learning method 55-61. [Crossref]

1233. Guangcong Wang, Xiaohua Xie, Jianhuang Lai, Jiaxuan Zhuo. Deep Growing Learning 2831-2839. [Crossref]

1234. Tanya Marwah, Gaurav Mittal, Vineeth N. Balasubramanian. Attentive Semantic Video Generation Using Captions 1435-1443. [Crossref]

1235. Justin Lazarow, Long Jin, Zhuowen Tu. Introspective Neural Networks for Generative Modeling 2793-2802. [Crossref]

1236. Donggi Jeong, Minjin Baek, Sang-Sun Lee. Long-term prediction of vehicle trajectory based on a deep neural network 725-727. [Crossref]

1237. G. Ososkov, P. Goncharov. 2017. Shallow and deep learning for image classification. *Optical Memory and Neural Networks* **26**:4, 221-248. [Crossref]

1238. Moh. Faturrahman, Ito Wasito, Ratna Mufidah, Fakhirah Dianah Ghaisani. Multi feature fusion using deep belief network for automatic pap-smear cell image classification 18-22. [Crossref]

1239. Moacir Antonelli Ponti, Leonardo Sampaio Ferraz Ribeiro, Tiago Santana Nazare, Tu Bui, John Collomosse. Everything You Wanted to Know about Deep Learning for Computer Vision but Were Afraid to Ask 17-41. [Crossref]

1240. Yuechao Chen, Xiaonan Xu. The research of underwater target recognition method based on deep learning 1-5. [Crossref]

1241. Qiang Wang, Linqing Wang, Jun Zhao, Wei Wang. Long-term time series prediction based on deep denoising recurrent temporal restricted Boltzmann machine network 2422-2427. [Crossref]

1242. Hatem Magdy Keshk, Xu-Cheng Yin. Satellite super-resolution images depending on deep learning methods: A comparative study 1-7. [Crossref]

1243. Jun Zhou, Wenli Shan, Zhaoxia Duan. Stability and case studies of linear continuous-time systems under deep belief network controllers 2059-2064. [Crossref]

1244. Shuangran Bai, Yungang Liu, Ting Zhang, Fengzhong Li. Applications of deep learning in supervised speech separation 6539-6544. [Crossref]

1245. Qing Wu, Yungang Liu, Qiang Li, Shaoli Jin, Fengzhong Li. The application of deep learning in computer vision 6522-6527. [Crossref]

1246. Xuefeng Liu, Qiaoqiao Sun, Bin Liu, Biao Huang, Min Fu. Hyperspectral image classification based on convolutional neural network and dimension reduction 1686-1690. [Crossref]

1247. Marc Masana, Joost van de Weijer, Luis Herranz, Andrew D. Bagdanov, Jose M. Alvarez. Domain-Adaptive Deep Network Compression 4299-4307. [Crossref]

1248. Michael Opitz, Georg Waltner, Horst Possegger, Horst Bischof. BIER — Boosting Independent Embeddings Robustly 5199-5208. [Crossref]

1249. James Thewlis, Hakan Bilen, Andrea Vedaldi. Unsupervised Learning of Object Landmarks by Factorized Spatial Embeddings 3229-3238. [Crossref]

1250. Zhangjie Cao, Mingsheng Long, Jianmin Wang, Philip S. Yu. HashNet: Deep Learning to Hash by Continuation 5609-5618. [Crossref]

1251. Shivajee Pandey, Divya Srivastava, Suneeta Agarwal. An efficient approach for dynamic PCA filter selection in PCANet for image classification 139-144. [Crossref]

1252. Hao Xu. Stereo matching and depth map collection algorithm based on deep learning 1-6. [Crossref]

1253. Alessio Brutti, Andrea Cavallaro. Unsupervised Cross-Modal Deep-Model Adaptation for Audio-Visual Re-identification with Wearable Cameras 438-445. [Crossref]

1254. Yu Pei, Xing Hongyan, Ding Yuan. Classification of marine noise signals based on DNN (Deep Neural Networks) model 465-470. [Crossref]

1255. Maneet Singh, Shruti Nagpal, Mayank Vatsa, Richa Singh, Afzel Noore, Angshul Majumdar. Gender and ethnicity classification of Iris images using deep class-encoder 666-673. [Crossref]

1256. Zeyu Sun, Juhua Zhang. Brain tissue segmentation based on convolutional neural networks 1-6. [Crossref]

1257. Yi Xie, Cai Meng, ShaoYa Guan, Qi Wang. Single shot 2D3D image regisraton 1-5. [Crossref]

1258. Chengdong Li, Zixiang Ding, Dongbin Zhao, Jianqiang Yi, Guiqing Zhang. 2017. Building Energy Consumption Prediction: An Extreme Deep Learning Approach. *Energies* **10**:10, 1525. [Crossref]

1259. Ye Zhou, Feng Zhang, Zhenhong Du, Xinyue Ye, Renyi Liu. 2017. Integrating Cellular Automata with the Deep Belief Network for Simulating Urban Growth. *Sustainability* **9**:10, 1786. [Crossref]

1260. Chunqing Zhao, Jianwei Gong, Chao Lu, Guangming Xiong, Weijie Mei. Speed and steering angle prediction for intelligent vehicles based on deep belief network 301-306. [Crossref]

1261. Siyuan Wang, Yong Liu, Xu Zhang. A differentiated DBN model based on CRBM for time series forecasting 1926-1931. [Crossref]

1262. Tao Han, Kuangrong Hao, Yongsheng Ding, Xuesong Tang. 2017. A sparse autoencoder compressed sensing method for acquiring the pressure array information of clothing. *Neurocomputing* . [Crossref]

1263. Wenqing Sun, Bin Zheng, Wei Qian. 2017. Automatic feature learning using multichannel ROI based on deep structured algorithms for computerized lung cancer diagnosis. *Computers in Biology and Medicine* **89**, 530-539. [Crossref]

1264. Yixiang Dai, Xue Wang, Pengbo Zhang, Weihang Zhang. 2017. Wearable biosensor network enabled multimodal daily-life emotion recognition employing reputation-driven imbalanced fuzzy classification. *Measurement* **109**, 408-424. [Crossref]

1265. Zhong Yin, Jianhua Zhang. 2017. Cross-subject recognition of operator functional states via EEG and switching deep belief networks with adaptive weights. *Neurocomputing* **260**, 349-366. [Crossref]

1266. Laurence Aitchison, Máté Lengyel. 2017. With or without you: predictive coding and Bayesian inference in the brain. *Current Opinion in Neurobiology* **46**, 219-227. [Crossref]

1267. Xinqing Wang, Jie Huang, Guoting Ren, Dong Wang. 2017. A hydraulic fault diagnosis method based on sliding-window spectrum feature and deep belief network. *Journal of Vibroengineering* **19**:6, 4272-4284. [Crossref]

1268. Jianan Cui, Xin Liu, Yile Wang, Huafeng Liu. 2017. Deep reconstruction model for dynamic PET images. *PLOS ONE* **12**:9, e0184667. [Crossref]

1269. Kazuma Matsumoto, Takato Tatsumi, Hiroyuki Sato, Tim Kovacs, Keiki Takadama. 2017. XCSR Learning from Compressed Data Acquired by Deep Neural Network. *Journal of Advanced Computational Intelligence and Intelligent Informatics* **21**:5, 856-867. [Crossref]

1270. M. W. Spratling. 2017. A predictive coding model of gaze shifts and the underlying neurophysiology. *Visual Cognition* **25**:7-8, 770-801. [Crossref]

1271. Umut Güçlü, Marcel van Gerven. Probing Human Brain Function with Artificial Neural Networks 413-423. [Crossref]

1272. Ian McLoughlin, Haomin Zhang, Zhipeng Xie, Yan Song, Wei Xiao, Huy Phan. 2017. Continuous robust sound event classification using time-frequency features and deep learning. *PLOS ONE* **12**:9, e0182309. [Crossref]

1273. Artur Kadurin, Sergey Nikolenko, Kuzma Khrabrov, Alex Aliper, Alex Zhavoronkov. 2017. druGAN: An Advanced Generative Adversarial Autoencoder Model for de Novo Generation of New Molecules with Desired Molecular Properties in Silico. *Molecular Pharmaceutics* **14**:9, 3098-3104. [Crossref]

1274. Xingrui Yu, Xiaomin Wu, Chunbo Luo, Peng Ren. 2017. Deep learning in remote sensing scene classification: a data augmentation enhanced convolutional neural network framework. *GIScience & Remote Sensing* **54**:5, 741-758. [Crossref]

1275. Shuang Bai. 2017. Scene Categorization Through Using Objects Represented by Deep Features. *International Journal of Pattern Recognition and Artificial Intelligence* **31**:09, 1755013. [Crossref]

1276. Igor M. Coelho, Vitor N. Coelho, Eduardo J. da S. Luz, Luiz S. Ochi, Frederico G. Guimarães, Eyder Rios. 2017. A GPU deep learning metaheuristic based model for time series forecasting. *Applied Energy* **201**, 412-418. [Crossref]

1277. Sining Sun, Binbin Zhang, Lei Xie, Yanning Zhang. 2017. An unsupervised deep domain adaptation approach for robust speech recognition. *Neurocomputing* **257**, 79-87. [Crossref]

1278. Hamid Moeini, Farhad Mohammad Torab. 2017. Comparing compositional multivariate outliers with autoencoder networks in anomaly detection at Hamich exploration area, east of Iran. *Journal of Geochemical Exploration* **180**, 15-23. [Crossref]

1279. Luisa F. Polania, Kenneth E. Barner. 2017. Exploiting Restricted Boltzmann Machines and Deep Belief Networks in Compressed Sensing. *IEEE Transactions on Signal Processing* **65**:17, 4538-4550. [Crossref]

1280. Killian Janod, Mohamed Morchid, Richard Dufour, Georges Linares, Renato De Mori. 2017. Denoised Bottleneck Features From Deep Autoencoders for Telephone Conversation Analysis. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **25**:9, 1505-1516. [Crossref]

1281. Elena Agliari, Adriano Barra, Chiara Longo, Daniele Tantari. 2017. Neural Networks Retrieving Boolean Patterns in a Sea of Gaussian Ones. *Journal of Statistical Physics* **168**:5, 1085-1104. [Crossref]

1282. Jun Wei, Guo-Qing Jiang, Xin Liu. 2017. Parameterization of typhoon-induced ocean cooling using temperature equation and machine learning algorithms: an example of typhoon Soulik (2013). *Ocean Dynamics* **67**:9, 1179-1193. [Crossref]

1283. Guoyin Wang, Jie Yang, Ji Xu. 2017. Granular computing: from granularity optimization to multi-granularity joint problem solving. *Granular Computing* **2**:3, 105-120. [Crossref]

1284. Tom Botterill, Scott Paulin, Richard Green, Samuel Williams, Jessica Lin, Valerie Saxton, Steven Mills, XiaoQi Chen, Sam Corbett-Davies. 2017. A Robot System for Pruning Grape Vines. *Journal of Field Robotics* **34**:6, 1100-1122. [Crossref]

1285. Ritika Singh, Shashi Srivastava. 2017. Stock prediction using deep learning. *Multimedia Tools and Applications* **76**:18, 18569-18584. [Crossref]

1286. Wang Fuan, Jiang Hongkai, Shao Haidong, Duan Wenjing, Wu Shuaipeng. 2017. An adaptive deep convolutional neural network for rolling bearing fault diagnosis. *Measurement Science and Technology* **28**:9, 095005. [Crossref]

1287. Xiangyi Cheng, Huaping Liu, Xinying Xu, Fuchun Sun. 2017. Denoising deep extreme learning machine for sparse representation. *Memetic Computing* **9**:3, 199-212. [Crossref]

1288. Waseem Rawat, Zenghui Wang. 2017. Deep Convolutional Neural Networks for Image Classification: A Comprehensive Review. *Neural Computation* **29**:9, 2352-2449. [Abstract] [Full Text] [PDF] [PDF Plus]

1289. Youbiao He, Gihan J. Mendis, Jin Wei. 2017. Real-Time Detection of False Data Injection Attacks in Smart Grid: A Deep Learning-Based Intelligent Mechanism. *IEEE Transactions on Smart Grid* **8**:5, 2505-2516. [Crossref]

1290. Xu Zhu, Takeo Fujii. 2017. Modulation classification for cognitive radios using stacked denoising autoencoders. *International Journal of Satellite Communications and Networking* **35**:5, 517-531. [Crossref]

1291. Jun Shi, Jinjie Wu, Yan Li, Qi Zhang, Shihui Ying. 2017. Histopathological Image Classification With Color Pattern Random Binary Hashing-Based PCANet and Matrix-Form Classifier. *IEEE Journal of Biomedical and Health Informatics* **21**:5, 1327-1337. [Crossref]

1292. Myungjong Kim, Younggwan Kim, Joohong Yoo, Jun Wang, Hoirin Kim. 2017. Regularized Speaker Adaptation of KL-HMM for Dysarthric Speech Recognition. *IEEE Transactions on Neural Systems and Rehabilitation Engineering* **25**:9, 1581-1591. [Crossref]

1293. Yan Huang, Wei Wang, Liang Wang, Tieniu Tan. 2017. Conditional High-Order Boltzmann Machines for Supervised Relation Learning. *IEEE Transactions on Image Processing* **26**:9, 4297-4310. [Crossref]

1294. Jiwen Lu, Junlin Hu, Yap-Peng Tan. 2017. Discriminative Deep Metric Learning for Face and Kinship Verification. *IEEE Transactions on Image Processing* **26**:9, 4269-4282. [Crossref]

1295. S. Chandrakala, Natarajan Rajeswari. 2017. Representation Learning Based Speech Assistive System for Persons With Dysarthria. *IEEE Transactions on Neural Systems and Rehabilitation Engineering* **25**:9, 1510-1517. [Crossref]

1296. Xiaoyang Wang, Qiang Ji. 2017. Hierarchical Context Modeling for Video Event Recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **39**:9, 1770-1782. [Crossref]

1297. Wenceslao J. Gonzalez. 2017. From Intelligence to Rationality of Minds and Machines in Contemporary Society: The Sciences of Design and the Role of Information. *Minds and Machines* **27**:3, 397-424. [Crossref]

1298. Alaa S. Al-Waisy, Rami Qahwaji, Stanley Ipson, Shumoos Al-Fahdawi. A multimodal biometrie system for personal identification based on deep learning approaches 163-168. [Crossref]

1299. Vladimir Golovko, Sergei Bezobrazov, Alexander Kroshchanka, Anatoliy Sachenko, Myroslav Komar, Andriy Karachka. Convolutional neural network based solar photovoltaic panel detection in satellite photos 14-19. [Crossref]

1300. Mohasinina Binte Kamal, Jin Wei, Gihan J. Mendis. Data-driven energy management architecture for more-electric aircrafts 1-6. [Crossref]

1301. Kaiji Sugimoto, Saerom Lee, Yoshifumi Okada. Classification of anger emotion using Japanese vowel 33-36. [Crossref]

1302. Shaojia Ge, Jianchun Lu, Hong Gu, Zeshi Yuan, Weimin Su. Polarimetrie SAR image classification based on deep belief network and superpixel segmentation 114-119. [Crossref]

1303. Zhengbing Hu, Yevgeniy V. Bodyanskiy, Oleksii K. Tyshchenko. A hybrid growing ENFN-based neuro-fuzzy system and its rapid deep learning 514-519. [Crossref]

1304. Mian Pan, Jie Jiang, Qingpeng Kong, Jianguang Shi, Qinghua Sheng, Tao Zhou. 2017. Radar HRRP Target Recognition Based on t-SNE Segmentation and Discriminant Deep Belief Network. *IEEE Geoscience and Remote Sensing Letters* **14**:9, 1609-1613. [Crossref]

1305. Liuqing Li, He Feng, Wenjie Zhuang, Na Meng, Barbara Ryder. CCLearner: A Deep Learning-Based Clone Detection Approach 249-260. [Crossref]

1306. Tianqi Yang, Shuangxi Huang. Fault Diagnosis Based on Improved Deep Belief Network 305-310. [Crossref]

1307. R. Vinayakumar, K. P. Soman, Prabaharan Poornachandran. Evaluating effectiveness of shallow and deep networks to intrusion detection system 1282-1289. [Crossref]

1308. R Vinayakumar, K. P. Soman, Prabaharan Poornachandran. Evaluating shallow and deep networks for secure shell (ssh)traffic analysis 266-274. [Crossref]

1309. Victor Bisot, Romain Serizel, Slim Essid, Gael Richard. Leveraging deep neural networks with nonnegative representations for improved environmental sound classification 1-6. [Crossref]

1310. Anwen Zhu, Xiaohui Li, Zhiyong Mo, Ruaren Wu. Wind power prediction based on a convolutional neural network 131-135. [Crossref]

1311. V. Sowmya, Aleena Ajay, D. Govind, K. P. Soman. Improved color scene classification system using deep belief networks and support vector machines 33-38. [Crossref]

1312. Subhajit Chaudhury, Sakyasingha Dasgupta, Asim Munawar, Md. A. Salam Khan, Ryuki Tachibana. Text to image generative model using constrained embedding space mapping 1-6. [Crossref]

1313. Andros Tjandra, Sakriani Sakti, Satoshi Nakamura. Speech recognition features based on deep latent Gaussian models 1-6. [Crossref]

1314. Hantao Huang, Leibin Ni, Hao Yu. LTNN: An energy-efficient machine learning accelerator on 3D CMOS-RRAM for layer-wise tensorized neural network 280-285. [Crossref]

1315. Gavneet Singh Chadha, Andreas Schwung. Comparison of deep neural network architectures for fault detection in Tennessee Eastman process 1-8. [Crossref]

1316. Azam Bagheri, Math H.J. Bollen, Irene Y.H. Gu. Big data from smart grids 1-5. [Crossref]

1317. Kavya Gupta, Angshul Majumdar. Learning autoencoders with low-rank weights 3899-3903. [Crossref]

1318. Jingyu Yang, Xin Liu, Xiaolin Song, Kun Li. Estimation of signal-dependent noise level function using multi-column convolutional neural network 2418-2422. [Crossref]

1319. Cheng-Yaw Low, Andrew Beng-Jin Teoh. Stacking-based deep neural network: Deep analytic network on convolutional spectral histogram features 1592-1596. [Crossref]

1320. Chih-Wei Chien, Ting-Nan Tsai, L.-F. Wu, N.-C. Fang, C.-Y. Liu, Tzuu-Hseng S. Li. Deep belief network based gaze tracker for auto-aiming system 58-58. [Crossref]

1321. Jake Snell, Karl Ridgeway, Renjie Liao, Brett D. Roads, Michael C. Mozer, Richard S. Zemel. Learning to generate images with perceptual similarity metrics 4277-4281. [Crossref]

1322. Atif Mughees, Ahmad Ali, Linmi Tao. Hyperspectral image classification via shape-adaptive deep learning 375-379. [Crossref]

1323. Xiuyan Li, Yang Lu, Jianming Wang, Xin Dang, Qi Wang, Xiaojie Duan, Yukuan Sun. An image reconstruction framework based on deep neural network for electrical impedance tomography 3585-3589. [Crossref]

1324. Jyoti Maggu, Angshul Majumdar. Greedy deep transform learning 1822-1826. [Crossref]

1325. Yiming Yan, Zhichao Tan, Nan Su, Chunhui Zhao. 2017. Building Extraction Based on an Optimized Stacked Sparse Autoencoder of Structure and Training Samples Using LIDAR DSM and Optical Images. *Sensors* **17**:9, 1957. [Crossref]

1326. Tycho Tax, Pedro Mediano, Murray Shanahan. 2017. The Partial Information Decomposition of Generative Neural Network Models. *Entropy* **19**:9, 474. [Crossref]

1327. William Gu, Gerald Seet, Nadia Magnenat-Thalmanna. 2017. Perception-Link Behavior Model: Supporting a Novel Operator Interface for a Customizable Anthropomorphic Telepresence Robot. *Robotics* **6**:3, 16. [Crossref]

1328. Soujanya Poria, Erik Cambria, Rajiv Bajpai, Amir Hussain. 2017. A review of affective computing: From unimodal analysis to multimodal fusion. *Information Fusion* **37**, 98-125. [Crossref]

1329. Dapeng Xiong, Jianyang Zeng, Haipeng Gong. 2017. A deep learning framework for improving long-range residue–residue contact prediction using a hierarchical strategy. *Bioinformatics* **33**:17, 2675-2683. [Crossref]

1330. Babajide O. Ayinde, Jacek M. Zurada. 2017. Nonredundant sparse feature extraction using autoencoders with receptive fields clustering. *Neural Networks* **93**, 99-109. [Crossref]

1331. Yujian Li, Ting Zhang. 2017. Deep neural mapping support vector machines. *Neural Networks* **93**, 185-194. [Crossref]

1332. Sai Zhang, Hailin Hu, Jingtian Zhou, Xuan He, Tao Jiang, Jianyang Zeng. 2017. Analysis of Ribosome Stalling and Translation Elongation Dynamics by Deep Learning. *Cell Systems* **5**:3, 212-220.e6. [Crossref]

1333. Tippaya Thinsungnoen, Kittisak Kerdprasop, Nittaya Kerdprasop. 2017. A Deep Learning of Time Series for Efficient Analysis. *International Journal of Future Computer and Communication* **6**:3, 123-127. [Crossref]

1334. Stanisław Brodowski, Andrzej Bielecki, Maciej Filocha. 2017. A hybrid system for forecasting 24-h power load profile for Polish electric grid. *Applied Soft Computing* **58**, 527-539. [Crossref]

1335. Yun Bai, Zhenzhong Sun, Bo Zeng, Jun Deng, Chuan Li. 2017. A multi-pattern deep fusion model for short-term bus passenger flow forecasting. *Applied Soft Computing* **58**, 669-680. [Crossref]

1336. Xinyu Guo, Kelli C. Dominick, Ali A. Minai, Hailong Li, Craig A. Erickson, Long J. Lu. 2017. Diagnosing Autism Spectrum Disorder from Brain Resting-State Functional Connectivity Patterns Using a Deep Neural Network with a Novel Feature Selection Method. *Frontiers in Neuroscience* **11**. . [Crossref]

1337. Máximo Sánchez-Gutiérrez, Enrique M. Albornoz, Hugo L. Rufiner, John Goddard Close. 2017. Post-training discriminative pruning for RBMs. *Soft Computing* **35**. . [Crossref]

1338. Mohammad Ali Keyvanrad, Mohammad Mehdi Homayounpour. 2017. Dynamic sparsity control in Deep Belief Networks. *Intelligent Data Analysis* **21**:4, 963-979. [Crossref]

1339. Harry A. Pierson, Michael S. Gashler. 2017. Deep learning in robotics: a review of recent research. *Advanced Robotics* **31**:16, 821-835. [Crossref]

1340. Yi Liu, Yu Fan, Junghui Chen. 2017. Flame Images for Oxygen Content Prediction of Combustion Systems Using DBN. *Energy & Fuels* **31**:8, 8776-8783. [Crossref]

1341. . Deep Learning for Very High-Resolution Imagery Classification 113-130. [Crossref]

1342. Earnest Paul Ijjina, Chalavadi Krishna Mohan. Human Behavioral Analysis Using Evolutionary Algorithms and Deep Learning 165-186. [Crossref]

1343. Siddharth Srivastava, Brejesh Lall. Brain-Inspired Machine Intelligence for Image Analysis: Convolutional Neural Networks 127-163. [Crossref]

1344. . Preliminaries of Artificial Neural Network 1-10. [Crossref]

1345. Rongbing Huang, Chang Liu, Jiliu Zhou. 2017. Discriminant analysis via jointly L 2 , 1 -norm sparse tensor preserving embedding for image classification. *Journal of Visual Communication and Image Representation* **47**, 10-22. [Crossref]

1346. Xiaochuan Sun, Tao Li, Qun Li, Yue Huang, Yingqi Li. 2017. Deep belief echo-state network and its application to time series prediction. *Knowledge-Based Systems* **130**, 17-29. [Crossref]

1347. F K van Evert, S Fountas, D Jakovetic, V Crnojevic, I Travlos, C Kempenaar. 2017. Big Data for weed control and crop protection. *Weed Research* **57**:4, 218-233. [Crossref]

1348. Shifei Ding, Lili Guo, Yanlu Hou. 2017. Extreme learning machine with kernel model based on deep learning. *Neural Computing and Applications* **28**:8, 1975-1984. [Crossref]

1349. Zheng Zhou, Kan Li, Lin Bai. 2017. A general description generator for human activity images based on deep understanding framework. *Neural Computing and Applications* **28**:8, 2147-2163. [Crossref]

1350. Fréjus A. A. Laleye, Eugène C. Ezin, Cina Motamed. 2017. Fuzzy-based algorithm for Fongbe continuous speech segmentation. *Pattern Analysis and Applications* **20**:3, 855-864. [Crossref]

1351. Rajendra Kumar Roul, Shubham Rohan Asthana, Gaurav Kumar. 2017. Study on suitability and importance of multilayer extreme learning machine for classification of text data. *Soft Computing* **21**:15, 4239-4256. [Crossref]

1352. Tarek M. Hassan, Mohammed Elmogy, El-Sayed Sallam. 2017. Diagnosis of Focal Liver Diseases Based on Deep Learning Technique for Ultrasound Images. *Arabian Journal for Science and Engineering* **42**:8, 3127-3140. [Crossref]

1353. Johan A. K. Suykens. 2017. Deep Restricted Kernel Machines Using Conjugate Feature Duality. *Neural Computation* **29**:8, 2123-2163. [Abstract] [Full Text] [PDF] [PDF Plus]

1354. Sabato Marco Siniscalchi, Valerio Mario Salerno. 2017. Adaptation to New Microphones Using Artificial Neural Networks With Trainable Activation Functions. *IEEE Transactions on Neural Networks and Learning Systems* **28**:8, 1959-1965. [Crossref]

1355. Zahra Sadeghi, Alberto Testolin. 2017. Learning representation hierarchies by sharing visual features: a computational investigation of Persian character recognition with unsupervised deep learning. *Cognitive Processing* **18**:3, 273-284. [Crossref]

1356. Joseph Geraci, Pamela Wilansky, Vincenzo de Luca, Anvesh Roy, James L Kennedy, John Strauss. 2017. Applying deep neural networks to unstructured text notes in electronic medical records for phenotyping youth depression. *Evidence Based Mental Health* **20**:3, 83-87. [Crossref]

1357. Bradley J. Erickson, Panagiotis Korfiatis, Zeynettin Akkus, Timothy Kline, Kenneth Philbrick. 2017. Toolkits and Libraries for Deep Learning. *Journal of Digital Imaging* **30**:4, 400-405. [Crossref]

1358. Jianwei Zhao, Minshu Zhang, Zhenghua Zhou, Jianjun Chu, Feilong Cao. 2017. Automatic detection and classification of leukocytes using convolutional neural networks. *Medical & Biological Engineering & Computing* **55**:8, 1287-1301. [Crossref]

1359. Jie Chen, Vishal M. Patel, Li Liu, Vili Kellokumpu, Guoying Zhao, Matti Pietik?inen, Rama Chellappa. 2017. Robust local features for remote face recognition. *Image and Vision Computing* **64**, 34-46. [Crossref]

1360. Domingos S. P. Salazar. 2017. Nonequilibrium thermodynamics of restricted Boltzmann machines. *Physical Review E* **96**:2. . [Crossref]

1361. Yue Deng, Zhiquan Ren, Youyong Kong, Feng Bao, Qionghai Dai. 2017. A Hierarchical Fused Fuzzy Deep Neural Network for Data Classification. *IEEE Transactions on Fuzzy Systems* **25**:4, 1006-1012. [Crossref]

1362. Jun Ma, Shihong Ni, Wujie Xie, Wenhan Dong. 2017. Deep auto-encoder observer multiple-model fast aircraft actuator fault diagnosis algorithm. *International Journal of Control, Automation and Systems* **15**:4, 1641-1650. [Crossref]

1363. Longlong Liu, Mingjiao Ma, Jing Cui. 2017. A novel model-based on FCM–LM algorithm for prediction of protein folding rate. *Journal of Bioinformatics and Computational Biology* **15**:04, 1750012. [Crossref]

1364. Wojciech Czaja, Weilin Li. 2017. Analysis of time-frequency scattering transforms. *Applied and Computational Harmonic Analysis* . [Crossref]

1365. Hong Yu, Yi Ma, Longfei Wang, Yongsai Zhai, Xiaoqian Wang. A landslide intelligent detection method based on CNN and RSG_R 40-44. [Crossref]

1366. Gal Mishne, Uri Shaham, Alexander Cloninger, Israel Cohen. 2017. Diffusion nets. *Applied and Computational Harmonic Analysis* . [Crossref]

1367. Souleyman Chaib, Huan Liu, Yanfeng Gu, Hongxun Yao. 2017. Deep Feature Fusion for VHR Remote Sensing Scene Classification. *IEEE Transactions on Geoscience and Remote Sensing* **55**:8, 4775-4784. [Crossref]

1368. Dino Nienhold, Rolf Dornberger, Safak Korkut. Pattern Recognition for Automated Healthcare Assessment Using Non-invasive, Ambient Sensors 189-197. [Crossref]

1369. Jingjing Li, Yue Wu, Ke Lu. 2017. Structured Domain Adaptation. *IEEE Transactions on Circuits and Systems for Video Technology* **27**:8, 1700-1713. [Crossref]

1370. Jiwen Lu, Gang Wang, Jie Zhou. 2017. Simultaneous Feature and Dictionary Learning for Image Set Based Face Recognition. *IEEE Transactions on Image Processing* **26**:8, 4042-4054. [Crossref]

1371. Esam Othman, Yakoub Bazi, Farid Melgani, Haikel Alhichri, Naif Alajlan, Mansour Zuair. 2017. Domain Adaptation Network for Cross-Scene Classification. *IEEE Transactions on Geoscience and Remote Sensing* **55**:8, 4441-4456. [Crossref]

1372. Feng Li, Guangfan Zhang, Wei Wang, Roger Xu, Tom Schnell, Jonathan Wen, Frederic McKenzie, Jiang Li. 2017. Deep Models for Engagement Assessment With Scarce Label Information. *IEEE Transactions on Human-Machine Systems* **47**:4, 598-605. [Crossref]

1373. Bing Tian, Liang Li, Yansheng Qu, Li Yan. Video Object Detection for Tractability with Deep Learning Method 397-401. [Crossref]

1374. Hexuan Hu, Bo Tang, Xuejiao Gong, Wei Wei, Huihui Wang. 2017. Intelligent Fault Diagnosis of the High-Speed Train With Big Data Based on Deep Neural Networks. *IEEE Transactions on Industrial Informatics* **13**:4, 2106-2116. [Crossref]

1375. Yusen He, Jiahao Deng, Huajin Li. Short-Term Power Load Forecasting with Deep Belief Network and Copula Models 191-194. [Crossref]

1376. Shota Shirakawa, Naohiro Fukumura. Extraction of easily interpretable representation using five-layered autoencoder 1-4. [Crossref]

1377. Paul M. Baggenstoss. Evaluating the RBM without integration using PDF projection 828-832. [Crossref]

1378. Rogerio G. Borin, Magno T. M. Silva. Voice activity detection using discriminative restricted Boltzmann machines 523-527. [Crossref]

1379. Kede Ma, Wentao Liu, Tongliang Liu, Zhou Wang, Dacheng Tao. 2017. dipIQ: Blind Image Quality Assessment by Learning-to-Rank Discriminable Image Pairs. *IEEE Transactions on Image Processing* **26**:8, 3951-3964. [Crossref]

1380. Roneel V Sharan, Tom J Moir. 2017. Robust acoustic event classification using deep neural networks. *Information Sciences* **396**, 24-32. [Crossref]

1381. Lingli Lin, Shangping Zhong, Cunmin Jia, Kaizhi Chen. Insider Threat Detection Based on Deep Belief Network Feature Representation 54-59. [Crossref]

1382. Huijuan Ye, Xianghan Zheng, Chunming Rong. Hybridization of PMF and LSTM for Recommendation of Intelligent Resource 6-10. [Crossref]

1383. Yun Bai, Zhenzhong Sun, Jun Deng. Manufacturing Quality Prediction Based on Two-Step Feature Learning Approach 260-263. [Crossref]

1384. Xuduo Wang, Lixiang Duan, Qiang Fu, Chen Huang, Junqi Wang. Auxiliary Feature Based Domain Adaptation for Reciprocating Compressor Diagnosis 132-136. [Crossref]

1385. Yoshika Chhabra, Sanchit Varshney, Ankita. Hybrid particle swarm training for convolution neural network (CNN) 1-3. [Crossref]

1386. Mudassar Raza, Chen Zonghai, Saeed Ur Rehman, Jamal Hussain Shah. Pedestrian classification by using stacked sparse autoencoders 37-42. [Crossref]

1387. Badr Albanna, Christopher Hillar, Jascha Sohl-Dickstein, Michael DeWeese. 2017. Minimum and Maximum Entropy Distributions for Binary Systems with Known Means and Pairwise Correlations. *Entropy* **19**:8, 427. [Crossref]

1388. Dongmei Song, Yaxiong Ding, Xiaofeng Li, Biao Zhang, Mingyu Xu. 2017. Ocean Oil Spill Classification with RADARSAT-2 SAR Based on an Optimized Wavelet Neural Network. *Remote Sensing* **9**:8, 799. [Crossref]

1389. Xiao Jianqiang, Genci Capi. Robot painting recognition based on deep belief learning 1-5. [Crossref]

1390. Zhiqiang Chen, Shengcai Deng, Xudong Chen, Chuan Li, René-Vinicio Sanchez, Huafeng Qin. 2017. Deep neural networks-based rolling bearing fault diagnosis. *Microelectronics Reliability* **75**, 327-333. [Crossref]

1391. Li Zhang, Hongli Gao, Juan Wen, Shichao Li, Qi Liu. 2017. A deep learning-based recognition method for degradation monitoring of ball screw with multi-sensor data fusion. *Microelectronics Reliability* **75**, 215-222. [Crossref]

1392. Yang Zhao, Jianping Li, Lean Yu. 2017. A deep learning ensemble approach for crude oil price forecasting. *Energy Economics* **66**, 9-16. [Crossref]

1393. Katherine M. Simonson, R. Derek West, Ross L. Hansen, Thomas E. LaBruyere, Mark H. Van Benthem. 2017. A statistical approach to combining multisource information in one-class classifiers. *Statistical Analysis and Data Mining: The ASA Data Science Journal* **10**:4, 199-210. [Crossref]

1394. A. Binch, C.W. Fox. 2017. Controlled comparison of machine vision algorithms for Rumex and Urtica detection in grassland. *Computers and Electronics in Agriculture* **140**, 123-138. [Crossref]

1395. Xiaoshun Zhang, Tao Bao, Tao Yu, Bo Yang, Chuanjia Han. 2017. Deep transfer Q-learning with virtual leader-follower for supply-demand Stackelberg game of smart grid. *Energy* **133**, 348-365. [Crossref]

1396. Ding Yuxin, Zhu Siyi. 2017. Malware detection based on deep learning algorithm. *Neural Computing and Applications* **20**. . [Crossref]

1397. Ashesh K. Dhawale, Maurice A. Smith, Bence P. Ölveczky. 2017. The Role of Variability in Motor Learning. *Annual Review of Neuroscience* **40**:1, 479-498. [Crossref]

1398. Souleyman Chaib, Hongxun Yao, Yanfeng Gu, Moussa Amrani. Deep feature extraction and combination for remote sensing image classification based on pre-trained CNN models 104203D. [Crossref]

1399. Yan Qiang, Lei Ge, Xin Zhao, Xiaolong Zhang, Xiaoxian Tang. 2017. Pulmonary nodule diagnosis using dual-modal supervised autoencoder based on extreme learning machine. *Expert Systems* **24**, e12224. [Crossref]

1400. Sai Zhang, Hailin Hu, Tao Jiang, Lei Zhang, Jianyang Zeng. 2017. TITER: predicting translation initiation sites by deep learning. *Bioinformatics* **33**:14, i234-i242. [Crossref]

1401. Keting Zhang, Liqing Zhang. 2017. Supervised Dictionary Learning with Smooth Shrinkage for Image Denoising. *Neural Processing Letters* **54**. . [Crossref]

1402. Wei Bao, Jun Yue, Yulei Rao. 2017. A deep learning framework for financial time series using stacked autoencoders and long-short term memory. *PLOS ONE* **12**:7, e0180944. [Crossref]

1403. Ahmad Al-Sallab, Ramy Baly, Hazem Hajj, Khaled Bashir Shaban, Wassim El-Hajj, Gilbert Badaro. 2017. AROMA. *ACM Transactions on Asian and Low-Resource Language Information Processing* **16**:4, 1-20. [Crossref]

1404. Kenji Suzuki. 2017. Overview of deep learning in medical imaging. *Radiological Physics and Technology* **2012**. . [Crossref]

1405. Jungkyu Lee, Byonghwa Oh, Jihoon Yang, Unsang Park. 2017. RLCF: A collaborative filtering approach based on reinforcement learning with sequential ratings. *Intelligent Automation & Soft Computing* **23**:3, 439-444. [Crossref]

1406. J. Gitanjali, Muhammad Rukunuddin Ghalib. 2017. A Novel Framework for Human Activity Recognition with Time Labelled Real Time Sensor Data. *New Review of Information Networking* **22**:2, 71-84. [Crossref]

1407. Věra Kůrková, Marcello Sanguineti. 2017. Probabilistic lower bounds for approximation by shallow perceptron networks. *Neural Networks* **91**, 34-41. [Crossref]

1408. Saeid Asgari Taghanaki, Jeremy Kawahara, Brandon Miles, Ghassan Hamarneh. 2017. Pareto-optimal multi-objective dimensionality reduction deep auto-encoder for mammography classification. *Computer Methods and Programs in Biomedicine* **145**, 85-93. [Crossref]

1409. Anton S. Becker, Magda Marcon, Soleen Ghafoor, Moritz C. Wurnig, Thomas Frauenfelder, Andreas Boss. 2017. Deep Learning in Mammography. *Investigative Radiology* **52**:7, 434-440. [Crossref]

1410. S. Shahnawazuddin, Deepak Thotappa, Abhishek Dey, Siddika Imani, S. R. M. Prasanna, Rohit Sinha. 2017. Improvements in IITG Assamese Spoken Query System: Background Noise Suppression and Alternate Acoustic Modeling. *Journal of Signal Processing Systems* **88**:1, 91-102. [Crossref]

1411. Haidong Shao, Hongkai Jiang, Fuan Wang, Yanan Wang. 2017. Rolling bearing fault diagnosis using adaptive deep belief network with dual-tree complex wavelet packet. *ISA Transactions* **69**, 187-201. [Crossref]

1412. J. Frontera-Pons, F. Sureau, J. Bobin, E. Le Floc'h. 2017. Unsupervised feature-learning for galaxy SEDs with denoising autoencoders. *Astronomy & Astrophysics* **603**, A60. [Crossref]

1413. Binbin Yong, Gaofeng Zhang, Huaming Chen, Qingguo Zhou. 2017. Intelligent monitor system based on cloud and convolutional neural networks. *The Journal of Supercomputing* **73**:7, 3260-3276. [Crossref]

1414. Qingsong Feng, Yabin Zhang, Chao Li, Zheng Dou, Jin Wang. 2017. Anomaly detection of spectrum in wireless communication via deep auto-encoders. *The Journal of Supercomputing* **73**:7, 3161-3178. [Crossref]

1415. Thibault Lesieur, Florent Krzakala, Lenka Zdeborová. 2017. Constrained low-rank matrix estimation: phase transitions, approximate message passing and applications. *Journal of Statistical Mechanics: Theory and Experiment* **2017**:7, 073403. [Crossref]

1416. Shekoofeh Azizi, Parvin Mousavi, Pingkun Yan, Amir Tahmasebi, Jin Tae Kwak, Sheng Xu, Baris Turkbey, Peter Choyke, Peter Pinto, Bradford Wood, Purang Abolmaesumi. 2017. Transfer learning from RF to B-mode temporal enhanced ultrasound features for prostate cancer detection. *International Journal of Computer Assisted Radiology and Surgery* **12**:7, 1111-1121. [Crossref]

1417. Giacomo Torlai, Roger G. Melko. 2017. Neural Decoder for Topological Codes. *Physical Review Letters* **119**:3. . [Crossref]

1418. M. Salomon, R. Couturier, C. Guyeux, J.-F. Couchot, J.M. Bahi. 2017. Steganalysis via a convolutional neural network using large convolution filters for embedding process with same stego key: A deep learning approach for telemedicine. *European Research in Telemedicine / La Recherche Européenne en Télémédecine* **6**:2, 79-92. [Crossref]

1419. Zixing Zhang, Nicholas Cummins, Bjoern Schuller. 2017. Advanced Data Exploitation in Speech Analysis: An overview. *IEEE Signal Processing Magazine* **34**:4, 107-129. [Crossref]

1420. Partha Pratim Roy, Guoqiang Zhong, Mohamed Cheriet. 2017. Tandem hidden Markov models using deep belief networks for offline handwriting recognition. *Frontiers of Information Technology & Electronic Engineering* **18**:7, 978-988. [Crossref]

1421. Babajide O. Ayinde, Jacek M. Zurada. 2017. Discovery Through Constraints: Imposing Constraints on Autoencoders for Data Representation and Dictionary Learning. *IEEE Systems, Man, and Cybernetics Magazine* **3**:3, 13-24. [Crossref]

1422. Wenzhi Zhao, Shihong Du, William J. Emery. 2017. Object-Based Convolutional Neural Network for High-Resolution Imagery Classification. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* **10**:7, 3386-3396. [Crossref]

1423. Sheng Deng, Lan Du, Chen Li, Jun Ding, Hongwei Liu. 2017. SAR Automatic Target Recognition Based on Euclidean Distance Restricted Autoencoder. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* **10**:7, 3323-3333. [Crossref]

1424. Xuejun Wang, Yan Zhang. The Detection and Recognition of Bridges' Cracks Based on Deep Belief Network 768-771. [Crossref]

1425. I. M. Karandashev, B. V. Kryzhanovsky, M. Yu. Malsagov. 2017. Analytical expressions for a finite-size 2D Ising model. *Optical Memory and Neural Networks* **26**:3, 165-171. [Crossref]

1426. Tiantong Guo, Hojjat Seyed Mousavi, Tiep Huu Vu, Vishal Monga. Deep Wavelet Prediction for Image Super-Resolution 1100-1109. [Crossref]

1427. Nguyen Thanh Van, Tran Ngoc Thinh, Le Thanh Sach. An anomaly-based network intrusion detection system using Deep learning 210-214. [Crossref]

1428. Jian-Guo Wang, Zhi-Duo Cao, Bang-Hua Yang, Shi-Wei Ma, Min-Rui Fei, Hao Wang, Yuan Yao, Tao Chen, Xiao-Fei Wang. A mothed of improving identification accuracy via deep learning algorithm under condition of deficient labeled data 2281-2286. [Crossref]

1429. Fei Wu, Zhuhao Wang, Weiming Lu, Xi Li, Yi Yang, Jiebo Luo, Yueting Zhuang. 2017. Regularized Deep Belief Network for Image Attribute Detection. *IEEE Transactions on Circuits and Systems for Video Technology* **27**:7, 1464-1477. [Crossref]

1430. Qing Tian, Tal Arbel, James J. Clark. Deep LDA-Pruned Nets for Efficient Facial Gender Classification 512-521. [Crossref]

1431. Gang Liu, Liang Xiao, Caiquan Xiong. Image Classification with Deep Belief Networks and Improved Gradient Descent 375-380. [Crossref]

1432. Mansoureh Pezhman Pour, Huseyin Seker, Ling Shao. Automated lesion segmentation and dermoscopic feature segmentation for skin cancer analysis 640-643. [Crossref]

1433. Andre Reichstaller, Alexander Knapp. Transferring Context-Dependent Test Inputs 65-72. [Crossref]

1434. Yanhai Gan, Huifang Chi, Ying Gao, Jun Liu, Guoqiang Zhong, Junyu Dong. Perception driven texture generation 889-894. [Crossref]

1435. Yuxi Dong, Yuchao Pan, Jun Zhang, Wei Xu. Learning to Read Chest X-Ray Images from 16000+ Examples Using CNN 51-57. [Crossref]

1436. Xianjun Xia, Roberto Togneri, Ferdous Sohel, David Huang. Random forest regression based acoustic event detection with bottleneck features 157-162. [Crossref]

1437. Timothy J. Shields, Mohamed R. Amer, Max Ehrlich, Amir Tamrakar. Action-Affect-Gender Classification Using Multi-task Representation Learning 2249-2258. [Crossref]

1438. Nijat Mehdiyev, Joerg Evermann, Peter Fettke. A Multi-stage Deep Learning Approach for Business Process Event Prediction 119-128. [Crossref]

1439. Haiqing Ren, Weiqiang Wang, Ke Lu, Jianshe Zhou, Qiuchen Yuan. An end-to-end recognizer for in-air handwritten Chinese characters based on a new recurrent neural networks 841-846. [Crossref]

1440. Maotong Xu, Sultan Alamro, Tian Lan, Suresh Subramaniam. LASER: A Deep Learning Approach for Speculative Execution and Replication of Deadline-Critical Jobs in Cloud 1-8. [Crossref]

1441. Amit K. Shukla, Taniya Seth, Pranab K. Muhuri. Interval type-2 fuzzy sets for enhanced learning in deep belief networks 1-6. [Crossref]

1442. Long Wang, Zijun Zhang, Jieqiu Chen. 2017. Short-Term Electricity Price Forecasting With Stacked Denoising Autoencoders. *IEEE Transactions on Power Systems* **32**:4, 2673-2681. [Crossref]

1443. Behrooz Shahriari, Melody Moh, Teng-Sheng Moh. Generic Online Learning for Partial Visible Dynamic Environment with Delayed Feedback: Online Learning for 5G C-RAN Load-Balancer 176-185. [Crossref]

1444. Tanfang Chen, Shangfei Wang, Shiyu Chen. Deep multimodal network for multi-label classification 955-960. [Crossref]

1445. S. Prabhanjan, R. Dinesh. 2017. Deep Learning Approach for Devanagari Script Recognition. *International Journal of Image and Graphics* **17**:03, 1750016. [Crossref]

1446. Juan Zheng, Zhimin He, Zhe Lin. Hybrid adversarial sample crafting for black-box evasion attack 236-242. [Crossref]

1447. Shuzhi Dong, Zhifen Zhang, Gurangrui Wen, Shuzhi Dong, Zhifen Zhang, Guangrui Wen. Design and application of unsupervised convolutional neural networks integrated with deep belief networks for mechanical fault diagnosis 1-7. [Crossref]

1448. Yun Bai, Chuan Li, Zhenzhong Sun, Haibin Chen. Deep neural network for manufacturing quality prediction 1-5. [Crossref]

1449. Zhulin Liu, Jin Zhou, C. L. Philip Chen. Broad learning system: Feature extraction based on K-means clustering algorithm 683-687. [Crossref]

1450. Qiaoqiao Sun, Xuefeng Liu, Min Fu. Classification of hyperspectral image based on principal component analysis and deep learning 356-359. [Crossref]

1451. Yuan Tian, Yuanlong Yu. A new pruning algorithm for extreme learning machine 704-709. [Crossref]

1452. Quan Sun, Youren Wang, Yuanyuan Jiang, Liwei Shao, Donglei Chen. Fault diagnosis of SEPIC converters based on PSO-DBN and wavelet packet energy spectrum 1-7. [Crossref]

1453. Youngjoon Yoo, Sangdoo Yun, Hyung Jin Chang, Yiannis Demiris, Jin Young Choi. Variational Autoencoded Regression: High Dimensional Regression of Visual Data on Complex Manifold 2943-2952. [Crossref]

1454. Jin Xue, Patrick P. K. Chan, Xian Hu. Experimental study on stacked autoencoder on insufficient training samples 223-229. [Crossref]

1455. Lei Tai, Shaohua Li, Ming Liu. 2017. Autonomous exploration of mobile robots through deep neural networks. *International Journal of Advanced Robotic Systems* **14**:4, 172988141770357. [Crossref]

1456. Gui-Song Xia, Jingwen Hu, Fan Hu, Baoguang Shi, Xiang Bai, Yanfei Zhong, Liangpei Zhang, Xiaoqiang Lu. 2017. AID: A Benchmark Data Set for Performance Evaluation of Aerial Scene Classification. *IEEE Transactions on Geoscience and Remote Sensing* **55**:7, 3965-3981. [Crossref]

1457. Zhuyun Chen, Weihua Li. 2017. Multisensor Feature Fusion for Bearing Fault Diagnosis Using Sparse Autoencoder and Deep Belief Network. *IEEE Transactions on Instrumentation and Measurement* **66**:7, 1693-1702. [Crossref]

1458. Ning Kong, Xiaoxi Liu, Chunyan Liu, Jie Lian, Hongwei Wang. Deep architecture for Heparin dosage prediction during continuous renal replacement therapy 11166-11171. [Crossref]

1459. Qi Dou, Hao Chen, Lequan Yu, Jing Qin, Pheng-Ann Heng. 2017. Multilevel Contextual 3-D CNNs for False Positive Reduction in Pulmonary Nodule Detection. *IEEE Transactions on Biomedical Engineering* **64**:7, 1558-1567. [Crossref]

1460. Yuan Zhou, Siyu Xia, Junkang Zhang, Dandi Chen. Collaborative filtering motivated automatic photo tagging 10989-10994. [Crossref]

1461. Guangzheng Hu, Huifang Li, Lixuan Luo, Yuanqing Xia. An improved dropout method and its application into DBN-based handwriting recognition 11145-11149. [Crossref]

1462. Jian-Guo Wang, Jin-Qiu Min, Li-Lan Liu, Bang-Hua Yang, Shi-Wei Ma, Min-Rui Fei, Yi-Min Guo, Yuan Yao, Yi-Ping Wu. A deep learning-based operation optimization strategy for BFG/coal co-firing boiler 9720-9724. [Crossref]

1463. Yin Zhong, Zhang Jianhua. Cross-subject classification of mental fatigue by neurophysiological signals and ensemble deep belief networks 10966-10971. [Crossref]

1464. Takuhiro Kaneko, Kaoru Hiramatsu, Kunio Kashino. Generative Attribute Controller with Conditional Filtered Generative Adversarial Networks 7006-7015. [Crossref]

1465. Wang Gongming, Li Wenjing, Qiao Junfei, Wu Guandi. Nonlinear system identification using deep belief network based on PLSR 10807-10812. [Crossref]

1466. Eunsuk Chong, Taejin Choi, Hyungmin Kim, Seung-Jong Kim, Yoha Hwang, Jong Min Lee. Informative sensor selection and learning for prediction of lower limb kinematics using generative stochastic neural networks 2043-2046. [Crossref]

1467. Chao Wang, Hong Zhang, Fan Wu, Bo Zhang, Sirui Tian. Ship classification with deep learning using COSMO-SkyMed SAR data 558-561. [Crossref]

1468. Dalton Lunga, Lexie Yang, Jiangye Yuan, Budhendra Bhaduri. Hashed binary search sampling for convolutional network training with large overhead image patches 767-770. [Crossref]

1469. Maoguo Gong, Hailun Yang, Puzhao Zhang. 2017. Feature learning and change feature classification based on deep learning for ternary change detection in SAR images. *ISPRS Journal of Photogrammetry and Remote Sensing* **129**, 212-225. [Crossref]

1470. Yangyang Li, Linhao Zhou, Gao Lu, Biao Hou, Licheng Jiao. Change detection in synthetic aperture radar images based on log-mean operator and stacked auto-encoder 3090-3096. [Crossref]

1471. Poonam Sharma, Akansha Singh. Era of deep neural networks: A review 1-5. [Crossref]

1472. Gongming Wang, Junfei Qiao, Xiaoli Li, Lei Wang, Xiaolong Qian. 2017. Improved Classification with Semi-supervised Deep Belief Network. *IFAC-PapersOnLine* **50**:1, 4174-4179. [Crossref]

1473. M. Khoshdeli, I. Niazazari, R. Jalilzadeh Hamidi, H. Livani, B. Parvin. Electromagnetic transient events (EMTE) classification in transmission grids 1-5. [Crossref]

1474. Ye Tac, Ming Zhang, Mark Parsons. Deep learning in photovoltaic penetration classification 1-5. [Crossref]

1475. S. Venkatramanan, S. Y. Chung, S. Selvam, J. H. Son, Y. J. Kim. 2017. Interrelationship between geochemical elements of sediment and groundwater at

Samrak Park Delta of Nakdong River Basin in Korea: multivariate statistical analyses and artificial neural network approaches. *Environmental Earth Sciences* **76**:13. . [Crossref]

1476. Jun He, Shixi Yang, Chunbiao Gan. 2017. Unsupervised Fault Diagnosis of a Gear Transmission Chain Using a Deep Belief Network. *Sensors* **17**:7, 1564. [Crossref]

1477. Jason Deutsch, Miao He, David He. 2017. Remaining Useful Life Prediction of Hybrid Ceramic Bearings Using an Integrated Deep Learning and Particle Filter Approach. *Applied Sciences* **7**:7, 649. [Crossref]

1478. Shengnan Zhang, Yuexian Hou, Benyou Wang, Dawei Song. 2017. Regularizing Neural Networks via Retaining Confident Connections. *Entropy* **19**:7, 313. [Crossref]

1479. Sourabrata Mukherjee. t-SNE based feature extraction technique for multi-layer perceptron neural network classifier 660-664. [Crossref]

1480. Chengwei Yao, Deng Cai, Jiajun Bu, Gencai Chen. 2017. Pre-training the deep generative models with adaptive hyperparameter optimization. *Neurocomputing* **247**, 144-155. [Crossref]

1481. Ze Hu, Zhan Zhang, Haiqin Yang, Qing Chen, Decheng Zuo. 2017. A deep learning approach for predicting the quality of online health expert question-answering services. *Journal of Biomedical Informatics* **71**, 241-253. [Crossref]

1482. Haoyu Yang, Luyang Luo, Jing Su, Chenxi Lin, Bei Yu. 2017. Imbalance aware lithography hotspot detection: a deep learning approach. *Journal of Micro/Nanolithography, MEMS, and MOEMS* **16**:03, 1. [Crossref]

1483. Demis Hassabis, Dharshan Kumaran, Christopher Summerfield, Matthew Botvinick. 2017. Neuroscience-Inspired Artificial Intelligence. *Neuron* **95**:2, 245-258. [Crossref]

1484. Yang Zhao, Zheng Hong Guo, Jian Ming Yan. 2017. Vibration signal analysis and fault diagnosis of bogies of the high-speed train based on deep neural networks. *Journal of Vibroengineering* . [Crossref]

1485. Zhiqiang Chen, Xudong Chen, Chuan Li, Ren?-Vinicio Sanchez, Huafeng Qin. 2017. Vibration-based gearbox fault diagnosis using deep neural networks. *Journal of Vibroengineering* . [Crossref]

1486. Zhenhen Hu, Yonggang Wen, Luoqi Liu, Jianguo Jiang, Richang Hong, Meng Wang, Shuicheng Yan. 2017. Visual Classification of Furniture Styles. *ACM Transactions on Intelligent Systems and Technology* **8**:5, 1-20. [Crossref]

1487. Xiumin Li, Qing Chen, Fangzheng Xue. 2017. Biological modelling of a computational spiking neural network with neuronal avalanches. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* **375**:2096, 20160286. [Crossref]

1488. Evangelos Stromatias, Miguel Soto, Teresa Serrano-Gotarredona, Bernab? Linares-Barranco. 2017. An Event-Driven Classifier for Spiking Neural Networks

Fed with Synthetic or Dynamic Vision Sensor Data. *Frontiers in Neuroscience* **11**. . [Crossref]

1489. Kaoru Ota, Minh Son Dao, Vasileios Mezaris, Francesco G. B. De Natale. 2017. Deep Learning for Mobile Multimedia. *ACM Transactions on Multimedia Computing, Communications, and Applications* **13**:3s, 1-22. [Crossref]

1490. Xiuquan Du, Shiwei Sun, Changlin Hu, Yu Yao, Yuanting Yan, Yanping Zhang. 2017. DeepPPI: Boosting Prediction of Protein?Protein Interactions with Deep Neural Networks. *Journal of Chemical Information and Modeling* **57**:6, 1499-1510. [Crossref]

1491. Xuan Song, Ryosuke Shibasaki, Nicholos Jing Yuan, Xing Xie, Tao Li, Ryutaro Adachi. 2017. DeepMob. *ACM Transactions on Information Systems* **35**:4, 1-19. [Crossref]

1492. Dinggang Shen, Guorong Wu, Heung-Il Suk. 2017. Deep Learning in Medical Image Analysis. *Annual Review of Biomedical Engineering* **19**:1, 221-248. [Crossref]

1493. Xiaomeng Han, Qun Dai. 2017. Batch-normalized Mlpconv-wise supervised pre-training network in network. *Applied Intelligence* **10**. . [Crossref]

1494. Kaneharu Nishino, Mary Inaba. The filling-in function of the Bayesian AutoEncoder Network 104431E. [Crossref]

1495. Garrett B. Goh, Nathan O. Hodas, Abhinav Vishnu. 2017. Deep learning for computational chemistry. *Journal of Computational Chemistry* **38**:16, 1291-1307. [Crossref]

1496. Yufei Ding, Lin Ning, Hui Guan, Xipeng Shen. 2017. Generalizations of the theory and deployment of triangular inequality for compiler-based strength reduction. *ACM SIGPLAN Notices* **52**:6, 33-48. [Crossref]

1497. Jae Kwon Kim, Young Shin Han, Jong Sik Lee. 2017. Particle swarm optimization-deep belief network-based rare class prediction model for highly class imbalance problem. *Concurrency and Computation: Practice and Experience* **29**:11, e4128. [Crossref]

1498. Waseem Rawat, Zenghui Wang. Deep Convolutional Neural Networks for Image Classification: A Comprehensive Review. *Neural Computation*, ahead of print1-98. [Abstract] [PDF] [PDF Plus]

1499. Mengjiao Qin, Zhihang Li, Zhenhong Du. 2017. Red tide time series forecasting by combining ARIMA and deep belief network. *Knowledge-Based Systems* **125**, 39-52. [Crossref]

1500. Jun Yang, Jiangdong Deng, Shujuan Li, Yongle Hao. 2017. Improved traffic detection with support vector machine based on restricted Boltzmann machine. *Soft Computing* **21**:11, 3101-3112. [Crossref]

1501. Ju-Chin Chen, Chao-Feng Liu. 2017. Deep net architectures for visual-based clothing image recognition on large database. *Soft Computing* **21**:11, 2923-2939. [Crossref]

1502. Jun Li, Tong Zhang, Wei Luo, Jian Yang, Xiao-Tong Yuan, Jian Zhang. 2017. Sparseness Analysis in the Pretraining of Deep Neural Networks. *IEEE Transactions on Neural Networks and Learning Systems* **28**:6, 1425-1438. [Crossref]

1503. I-Hsin Chung, Tara N. Sainath, Bhuvana Ramabhadran, Michael Picheny, John Gunnels, Vernon Austel, Upendra Chauhari, Brian Kingsbury. 2017. Parallel Deep Neural Network Training for Big Data on Blue Gene/Q. *IEEE Transactions on Parallel and Distributed Systems* **28**:6, 1703-1714. [Crossref]

1504. Di Wu, Yiming Huang, Huabin Chen, Yinshui He, Shanben Chen. 2017. VPPAW penetration monitoring based on fusion of visual and acoustic signals using t-SNE and DBN model. *Materials & Design* **123**, 1-14. [Crossref]

1505. Xiaoqing Wan, Chunhui Zhao. 2017. Local receptive field constrained stacked sparse autoencoder for classification of hyperspectral images. *Journal of the Optical Society of America A* **34**:6, 1011. [Crossref]

1506. N. Michael Mayer, Ying-Hao Yu. 2017. Orthogonal Echo State Networks and Stochastic Evaluations of Likelihoods. *Cognitive Computation* **9**:3, 379-390. [Crossref]

1507. Yaxing Li, Sangwon Kang. 2017. Deep neural network-based linear predictive parameter estimations for speech enhancement. *IET Signal Processing* **11**:4, 469-476. [Crossref]

1508. Salem Ameen, Sunil Vadera. 2017. A convolutional neural network to classify American Sign Language fingerspelling from depth and colour images. *Expert Systems* **34**:3, e12197. [Crossref]

1509. Haixia Sun, Sikun Li. 2017. An optimization method for speech enhancement based on deep neural network. *IOP Conference Series: Earth and Environmental Science* **69**, 012139. [Crossref]

1510. A. K. Aniyan, K. Thorat. 2017. Classifying Radio Galaxies with the Convolutional Neural Network. *The Astrophysical Journal Supplement Series* **230**:2, 20. [Crossref]

1511. Hiroshi Ohno. 2017. Linear guided autoencoder: Representation learning with linearity. *Applied Soft Computing* **55**, 566-575. [Crossref]

1512. Stanton R. Price, Derek T. Anderson. Genetic prOgramming for image feature descriptor learning 854-860. [Crossref]

1513. Zhang Jiulong, Guo Luming, Yang Su, Sun Xudong, Li Xiaoshan. Detecting Chinese calligraphy style consistency by deep learning and one-class SVM 83-86. [Crossref]

1514. Hao Zhang, Heng Yang, Tao Huang, Gaoqiang Zhan. DBNCF: Personalized Courses Recommendation System Based on DBN in MOOC Environment 106-108. [Crossref]

1515. Shuai Zheng, Kosta Ristovski, Ahmed Farahat, Chetan Gupta. Long Short-Term Memory Network for Remaining Useful Life estimation 88-95. [Crossref]

1516. Hyeryung Jang, Hyungwon Choi, Yung Yi, Jinwoo Shin. Adiabatic Persistent Contrastive Divergence learning 3005-3009. [Crossref]

1517. Omid Ghahabi, Javier Hernando. 2017. Restricted Boltzmann machines for vector representation of speech in speaker recognition. *Computer Speech & Language* . [Crossref]

1518. Zhenbao Liu, Zhen Jia, Chi-Man Vong, Shuhui Bu, Junwei Han, Xiaojun Tang. 2017. Capturing High-Discriminative Fault Features for Electronics-Rich Analog System via Deep Learning. *IEEE Transactions on Industrial Informatics* **13**:3, 1213-1226. [Crossref]

1519. Pengcheng Zhang, Lei Zhang, Hareton Leung, Jimin Wang. A Deep-Learning Based Precipitation Forecasting Approach Using Multiple Environmental Factors 193-200. [Crossref]

1520. Nasser R. Sabar, Ayad Turky, Andy Song, Abdul Sattar. Optimising Deep Belief Networks by hyper-heuristic approach 2738-2745. [Crossref]

1521. Huaming Chen, Jun Shen, Lei Wang, Jiangning Song. Leveraging Stacked Denoising Autoencoder in Prediction of Pathogen-Host Protein-Protein Interactions 368-375. [Crossref]

1522. Nadiya Straton, Raghava Rao Mukkamala, Ravi Vatrapu. Big Social Data Analytics for Public Health: Predicting Facebook Post Performance Using Artificial Neural Networks and Deep Learning 89-96. [Crossref]

1523. Chunlei Huo, Zhixin Zhou, Kun Ding, Chunhong Pan. 2017. Online Target Recognition for Time-Sensitive Space Information Networks. *IEEE Transactions on Computational Imaging* **3**:2, 254-263. [Crossref]

1524. Aibek Musaev, De Wang, Jiateng Xie, Calton Pu. REX: Rapid Ensemble Classification System for Landslide Detection Using Social Media 1240-1249. [Crossref]

1525. Na Lu, Tengfei Li, Xiaodong Ren, Hongyu Miao. 2017. A Deep Learning Scheme for Motor Imagery Classification based on Restricted Boltzmann Machines. *IEEE Transactions on Neural Systems and Rehabilitation Engineering* **25**:6, 566-576. [Crossref]

1526. Ryad Zemouri. An evolutionary building algorithm for Deep Neural Networks 1-7. [Crossref]

1527. Chungheon Yi, Wonik Choi, Ling Liu, Youngjun Jeon. Cloud-Based Positioning Method with Visualized Signal Images 122-129. [Crossref]

1528. Pedram Ghamisi, Bernhard Hofle, Xiao Xiang Zhu. 2017. Hyperspectral and LiDAR Data Fusion Using Extinction Profiles and Deep Convolutional Neural Network. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* **10**:6, 3011-3024. [Crossref]

1529. Wenjian Hu, Rajiv R. P. Singh, Richard T. Scalettar. 2017. Discovering phases, phase transitions, and crossovers through unsupervised machine learning: A critical examination. *Physical Review E* **95**:6. . [Crossref]

1530. Venice Erin Liong, Jiwen Lu, Yap-Peng Tan, Jie Zhou. 2017. Deep Coupled Metric Learning for Cross-Modal Matching. *IEEE Transactions on Multimedia* **19**:6, 1234-1244. [Crossref]

1531. Yiyi Liao, Yue Wang, Yong Liu. 2017. Graph Regularized Auto-Encoders for Image Representation. *IEEE Transactions on Image Processing* **26**:6, 2839-2852. [Crossref]

1532. Ping Zhong, Zhiqiang Gong, Shutao Li, Carola-Bibiane Schonlieb. 2017. Learning to Diversify Deep Belief Networks for Hyperspectral Image Classification. *IEEE Transactions on Geoscience and Remote Sensing* **55**:6, 3516-3530. [Crossref]

1533. Fen Wang, Yongchao Wang, Xi Chen. Graphic Constellations and DBN Based Automatic Modulation Classification 1-5. [Crossref]

1534. Liangzhi Li, Kaoru Ota, Mianxiong Dong. Everything is Image: CNN-based Short-Term Electrical Load Forecasting for Smart Grid 344-351. [Crossref]

1535. Qiao Weilei, Zhang Xinggan, Fen Ge. An automatic target recognition algorithm for SAR image based on improved convolution neural network 551-555. [Crossref]

1536. Wenjie Liu, Weijun Li, Linjun Sun, Liping Zhang, Peng Chen. Finger vein recognition based on deep learning 205-210. [Crossref]

1537. YangZhen Yu, Jing Hui. A study on text classification based on stacked contractive auto-encoder 1-6. [Crossref]

1538. Liu Wancun, Tang Wenyan, Zhang Liguo, Zhang Xiaolin, Li Jiafu. Multi-scale behavior learning for multi-object tracking 1-5. [Crossref]

1539. Joonhyuck Lee, Dongsik Jang, Sangsung Park. 2017. Deep Learning-Based Corporate Performance Prediction Model Considering Technical Capability. *Sustainability* **9**:6, 899. [Crossref]

1540. Md Zahangir Alom, Tarek M. Taha. Network intrusion detection for cyber security using unsupervised deep learning approaches 63-69. [Crossref]

1541. Khaled Alrawashdeh, Carla Purdy. Reducing calculation requirements in FPGA implementation of deep learning algorithms for online anomaly intrusion detection 57-62. [Crossref]

1542. Sai Zhang, Muxuan Liang, Zhongjun Zhou, Chen Zhang, Ning Chen, Ting Chen, Jianyang Zeng. 2017. Elastic restricted Boltzmann machines for cancer data analysis. *Quantitative Biology* **5**:2, 159-172. [Crossref]

1543. Yandong Li, Ferdous Sohel, Mohammed Bennamoun, Hang Lei. 2017. Discriminative feature learning and region consistency activation for robust scene labeling. *Neurocomputing* **243**, 174-186. [Crossref]

1544. Robert DiBiano, Supratik Mukhopadhyay. 2017. Automated diagnostics for manufacturing machinery based on well-regularized deep neural networks. *Integration* **58**, 303-310. [Crossref]

1545. Hao Liu, Jiwen Lu, Jianjiang Feng, Jie Zhou. 2017. Group-aware deep feature learning for facial age estimation. *Pattern Recognition* **66**, 82-94. [Crossref]

1546. Johan A. K. Suykens. Deep Restricted Kernel Machines Using Conjugate Feature Duality. *Neural Computation*, ahead of print1-41. [Abstract] [PDF] [PDF Plus]

1547. Nilanjan Dey, Amira S. Ashour, Gia Nhu Nguyen. Deep Learning for Multimedia Content Analysis 193-203. [Crossref]

1548. H Rachmatia, W A Kusuma, L S Hasibuan. 2017. Prediction of maize phenotype based on whole-genome single nucleotide polymorphisms using deep belief networks. *Journal of Physics: Conference Series* **835**, 012003. [Crossref]

1549. Bo Yuan, Keshab K. Parhi. 2017. VLSI Architectures for the Restricted Boltzmann Machine. *ACM Journal on Emerging Technologies in Computing Systems* **13**:3, 1-19. [Crossref]

1550. Jing Zheng, Xiao Fu, Guijun Zhang. 2017. Research on exchange rate forecasting based on deep belief network. *Neural Computing and Applications* **26**. . [Crossref]

1551. Ke Li, Nan Yu, Pengfei Li, Shimin Song, Yalei Wu, Yang Li, Meng Liu. 2017. Multi-label spacecraft electrical signal classification method based on DBN and random forest. *PLOS ONE* **12**:5, e0176614. [Crossref]

1552. Amir Moradifar, Asghar Akbari Foroud, Khalil Gorgani Firouzjah. 2017. Comprehensive identification of multiple harmonic sources using fuzzy logic and adjusted probabilistic neural network. *Neural Computing and Applications* **15**. . [Crossref]

1553. Iryna Dzieciuch. Biologically-inspired approach to automatic processing fly eye radar antenna array patterns with convolutional neural networks 101950C. [Crossref]

1554. Dalton Rosario, Patrick Rauss. Deep learning over diurnal and other environmental effects 101980E. [Crossref]

1555. Bryce Murray, Derek T. Anderson, Robert H. Luke, Kathryn Williams. Multispectral signal processing of synthetic aperture acoustics for side attack explosive ballistic detection 101821E. [Crossref]

1556. Amir Shirkhodaie, Durga Telagamsetti, Alex L. Chan. Utilization-based object recognition in confined spaces 1020013. [Crossref]

1557. James C. R. Whittington, Rafal Bogacz. 2017. An Approximation of the Error Backpropagation Algorithm in a Predictive Coding Network with Local Hebbian Synaptic Plasticity. *Neural Computation* **29**:5, 1229-1262. [Abstract] [Full Text] [PDF] [PDF Plus]

1558. ROMAIN SERIZEL, DIEGO GIULIANI. 2017. Deep-neural network approaches for speech recognition with heterogeneous groups of speakers including children. *Natural Language Engineering* **23**:03, 325-350. [Crossref]

1559. Paolo Massimo Buscema, Guido Maurelli, Francesco Saverio Mennini, Lara Gitto, Simone Russo, Matteo Ruggeri, Silvia Coretti, Americo Cicchetti. 2017. Artificial neural networks and their potentialities in analyzing budget health data: an application for Italy of what-if theory. *Quality & Quantity* **51**:3, 1261-1276. [Crossref]

1560. Yi Zeng, Tielin Zhang, Bo Xu. 2017. Improving multi-layer spiking neural networks by incorporating brain-inspired rules. *Science China Information Sciences* **60**:5. . [Crossref]

1561. Kun Li, Xixin Wu, Helen Meng. 2017. Intonation classification for L2 English speech using multi-distribution deep neural networks. *Computer Speech & Language* **43**, 18-33. [Crossref]

1562. Haiping Huang. 2017. Statistical mechanics of unsupervised feature learning in a restricted Boltzmann machine with binary synapses. *Journal of Statistical Mechanics: Theory and Experiment* **2017**:5, 053302. [Crossref]

1563. Li Liu, Mengyang Yu, Ling Shao. 2017. Latent Structure Preserving Hashing. *International Journal of Computer Vision* **122**:3, 439-457. [Crossref]

1564. Maoguo Gong, Tao Zhan, Puzhao Zhang, Qiguang Miao. 2017. Superpixel-Based Difference Representation Learning for Change Detection in Multispectral Remote Sensing Images. *IEEE Transactions on Geoscience and Remote Sensing* **55**:5, 2658-2673. [Crossref]

1565. Peter B . Marschik, Florian B. Pokorny, Robert Peharz, Dajie Zhang, Jonathan O'Muircheartaigh, Herbert Roeyers, Sven Bölte, Alicia J. Spittle, Berndt Urlesberger, Björn Schuller, Luise Poustka, Sally Ozonoff, Franz Pernkopf, Thomas Pock, Kristiina Tammimies, Christian Enzinger, Magdalena Krieber, Iris Tomantschger, Katrin D. Bartl-Pokorny, Jeff Sigafoos, Laura Roche, Gianluca Esposito, Markus Gugatschka, Karin Nielsen-Saines, Christa Einspieler, Walter E. Kaufmann. 2017. A Novel Way to Measure and Predict Development: A Heuristic Approach to Facilitate the Early Detection of Neurodevelopmental Disorders. *Current Neurology and Neuroscience Reports* **17**:5. . [Crossref]

1566. Leyuan Fang, David Cunefare, Chong Wang, Robyn H. Guymer, Shutao Li, Sina Farsiu. 2017. Automatic segmentation of nine retinal layer boundaries in OCT images of non-exudative AMD patients using deep learning and graph search. *Biomedical Optics Express* **8**:5, 2732. [Crossref]

1567. Qian Yu, Yongxin Yang, Feng Liu, Yi-Zhe Song, Tao Xiang, Timothy M. Hospedales. 2017. Sketch-a-Net: A Deep Neural Network that Beats Humans. *International Journal of Computer Vision* **122**:3, 411-425. [Crossref]

1568. Lei Zhang, Zhenwei He, Yan Liu. 2017. Deep object recognition across domains based on adaptive extreme learning machine. *Neurocomputing* **239**, 194-203. [Crossref]

1569. Yonghyun Nam, Oak-Sung Choo, Yu-Ri Lee, Yun-Hoon Choung, Hyunjung Shin. 2017. Cascade recurring deep networks for audible range prediction. *BMC Medical Informatics and Decision Making* **17**:S1. . [Crossref]

1570. Yong-ping Du, Chang-qing Yao, Shu-hua Huo, Jing-xuan Liu. 2017. A new item-based deep network structure using a restricted Boltzmann machine for collaborative filtering. *Frontiers of Information Technology & Electronic Engineering* **18**:5, 658-666. [Crossref]

1571. Brita Elvevåg, Peter W. Foltz, Mark Rosenstein, Ramon Ferrer-i-Cancho, Simon De Deyne, Eduardo Mizraji, Alex Cohen. 2017. Thoughts About Disordered Thinking: Measuring and Quantifying the Laws of Order and Disorder. *Schizophrenia Bulletin* **43**:3, 509-513. [Crossref]

1572. Kristina Vassiljeva, Aleksei Tepljakov, Eduard Petlenkov, Eduard Netsajev. Computational intelligence approach for estimation of vehicle insurance risk level 4073-4078. [Crossref]

1573. Rodrigo F. Berriel, Andre Teixeira Lopes, Alexandre Rodrigues, Flavio Miguel Varejao, Thiago Oliveira-Santos. Monthly energy consumption forecast: A deep learning approach 4283-4290. [Crossref]

1574. Dandan Guo, Bo Chen. SAR image target recognition via deep Bayesian generative network 1-4. [Crossref]

1575. Ershad Banijamali, Ali Ghodsi, Pascal Popuart. Generative mixture of networks 3753-3760. [Crossref]

1576. Navid Kardan, Kenneth O. Stanley. Mitigating fooling with competitive overcomplete output layer neural networks 518-525. [Crossref]

1577. C. V. Dolph, M. Alam, Z. Shboul, M. D. Samad, K. M. Iftekharuddin. Deep learning of texture and structural features for multiclass Alzheimer's disease classification 2259-2266. [Crossref]

1578. Ashley Varghese, Jayavardhana Gubbi, Hrishikesh Sharma, P. Balamuralidhar. Power infrastructure monitoring and damage detection using drone captured images 1681-1687. [Crossref]

1579. Masatoshi Yamaguchi, Hakaru Tamukoh, Hideyuki Suzuki, Takashi Morie. A CMOS chaotic Boltzmann machine circuit and three-neuron network operation 1218-1224. [Crossref]

1580. S. Graziani, M. G. Xibilia. A deep learning based soft sensor for a sour water stripping plant 1-6. [Crossref]

1581. Shumin Kong, Masahiro Takatsuka. Hexpo: A vanishing-proof activation function 2562-2567. [Crossref]

1582. Weite Li, Jinglu Hu. A multilayer gated bilinear classifier: From optimizing a deep rectified network to a support vector machine 140-146. [Crossref]

1583. Michael Hauser, Yiwei Fu, Yue Li, Shashi Phoha, Asok Ray. Probabilistic forecasting of symbol sequences with deep neural networks 3147-3152. [Crossref]

1584. Yumeng Tao, Xiaogang Gao, Alexander Ihler, Soroosh Sorooshian, Kuolin Hsu. 2017. Precipitation Identification with Bispectral Satellite Information Using Deep Learning Approaches. *Journal of Hydrometeorology* **18**:5, 1271-1283. [Crossref]

1585. Ni-Bin Chang, Chandan Mostafiz, Zhibin Sun, Wei Gao, Chi-Farn Chen. Developing a prototype satellite-based cyber-physical system for smart wastewater treatment 339-344. [Crossref]

1586. Lu Liu, Yu Cheng, Lin Cai, Sheng Zhou, Zhisheng Niu. Deep learning based optimization in wireless network 1-6. [Crossref]

1587. Mohaned Essam, Tong Boon Tang, Eric Tatt Wei Ho, Hsin Chen. Dynamic point stochastic rounding algorithm for limited precision arithmetic in Deep Belief Network training 629-632. [Crossref]

1588. Jiqian Li, Yan Wu, Junqiao Zhao, Linting Guan, Chen Ye, Tao Yang. Pedestrian detection with dilated convolution, region proposal network and boosted decision trees 4052-4057. [Crossref]

1589. Ariel Ruiz-Garcia, Mark Elshaw, Abdulrahman Altahhan, Vasile Palade. Stacked deep convolutional auto-encoders for emotion recognition from facial expressions 1586-1593. [Crossref]

1590. Tushar Ojha, Gregory L. Heileman, Manel Martinez-Ramon, Ahmad Slim. Prediction of graduation delay based on student performance 3454-3460. [Crossref]

1591. Ardavan S. Nobandegani, Jad Kabbara, Ioannis N. Psaromiligkos. Relevance effect: Exploiting Bayesian networks to improve supervised learning 2887-2893. [Crossref]

1592. Muhammad Salman Khan, Sana Siddiqui, Ken Ferens. Using information fractal dimension as temperature in restricted Boltzmann Machine 2290-2297. [Crossref]

1593. Satoshi Suzuki, Hayaru Shouno. A study on visual interpretation of network in network 903-910. [Crossref]

1594. Minwoo Lee, Charles W. Anderson. Can a reinforcement learning agent practice before it starts learning? 4006-4013. [Crossref]

1595. Maneet Singh, Shruti Nagpal, Richa Singh, Mayank Vatsa. Class representative autoencoder for low resolution multi-spectral gender classification 1026-1033. [Crossref]

1596. Xiao Bao, Tian Gao, Jun Du, Li-Rong Dai. An investigation of high-resolution modeling units of deep neural networks for acoustic scene classification 3028-3035. [Crossref]

1597. Luca Oneto, Nicolo Navarin, Alessandro Sperduti, Davide Anguita. Deep graph node kernels: A convex approach 316-323. [Crossref]

1598. Yufei Tang, Jun Yang. Dynamic event monitoring using unsupervised feature learning towards smart grid big data 1480-1487. [Crossref]

1599. C. L. Philip Chen, Zhulin Liu. Broad learning system: A new learning paradigm and system without going deep 1271-1276. [Crossref]

1600. Jingjing Deng, Xianghua Xie. Nested Shallow CNN-Cascade for Face Detection in the Wild 165-172. [Crossref]

1601. Mahmood Yousefi-Azar, Vijay Varadharajan, Len Hamey, Uday Tupakula. Autoencoder-based feature learning for cyber security applications 3854-3861. [Crossref]

1602. Deger Ayata, Yusuf Yaslan, Mustafa Kamasak. Multi channel brain EEG signals based emotional arousal classification with unsupervised feature learning using autoencoders 1-4. [Crossref]

1603. Bahareh Taji, Adrian D. C. Chan, Shervin Shirmohammadi. Classifying measured electrocardiogram signal quality using deep belief networks 1-6. [Crossref]

1604. Md Zahangir Alom, M. Alam, Tarek M. Taha, K. M. Iftekharuddin. Object recognition using cellular simultaneous recurrent networks and convolutional neural network 2873-2880. [Crossref]

1605. Gustavo B. Souza, Daniel F. S. Santos, Rafael G. Pires, Aparecido N. Marana, Joao P. Papa. Deep Boltzmann machines for robust fingerprint spoofing attack detection 1863-1870. [Crossref]

1606. Weiqing Min, Shuqiang Jiang, Jitao Sang, Huayang Wang, Xinda Liu, Luis Herranz. 2017. Being a Supercook: Joint Food Attributes and Multimodal Content Modeling for Recipe Retrieval and Exploration. *IEEE Transactions on Multimedia* **19**:5, 1100-1113. [Crossref]

1607. Xuan Peng, Xunzhang Gao, Xiang Li. An infinite classification RBM model for radar HRRP recognition 1442-1448. [Crossref]

1608. Xiaogang Deng, Xuemin Tian, Sheng Chen, Chris J. Harris. Deep learning based nonlinear principal component analysis for industrial process fault detection 1237-1243. [Crossref]

1609. Qiubin Liang, Wenge Rong, Jiayi Zhang, Jingshuang Liu, Zhang Xiong. Restricted Boltzmann machine based stock market trend prediction 1380-1387. [Crossref]

1610. Bruno U. Pedroni, Sadique Sheik, Gert Cauwenberghs. Pipelined parallel contrastive divergence for continuous generative model learning 1-4. [Crossref]

1611. Xu Yang, Jingjing Gao, Lei Zhang, Xiaoli Li, Liu Gu, Jiarui Cui, Chaonan Tong. A forecasting method of air conditioning energy consumption based on extreme learning machine algorithm 89-93. [Crossref]

1612. Hinda Dridi, Kais Ouni. Hybrid context dependent CD-DNN-HMM keywords spotting on continuous speech 1-7. [Crossref]

1613. Jie Yang, Zhihuan Song, Li Jiang. Fault diagnosis based on sparse class Gaussian Restrict Boltzmann Machine model 518-523. [Crossref]

1614. Allah Bux Sargano, Xiaofeng Wang, Plamen Angelov, Zulfiqar Habib. Human action recognition using transfer learning with deep representations 463-469. [Crossref]

1615. Paul M. Baggenstoss. 2017. Uniform Manifold Sampling (UMS): Sampling the Maximum Entropy PDF. *IEEE Transactions on Signal Processing* **65**:9, 2455-2470. [Crossref]

1616. Takumi Ichimura, Shin Kamada. Adaptive learning method of recurrent temporal deep belief network to analyze time series data 2346-2353. [Crossref]

1617. Weiwu Yan, Di Tang, Yujun Lin. 2017. A Data-Driven Soft Sensor Modeling Method Based on Deep Learning and its Application. *IEEE Transactions on Industrial Electronics* **64**:5, 4237-4245. [Crossref]

1618. Yan Zhang, Jiazhen Han, Jing Liu, Tingliang Zhou, Junfeng Suni, Juan Luo. Safety prediction of rail transit system based on deep learning 851-856. [Crossref]

1619. Md Zahangir Alom, Tarek M. Taha. Network intrusion detection for cyber security on neuromorphic computing system 3830-3837. [Crossref]

1620. Fateme Fahiman, Sarah M. Erfani, Sutharshan Rajasegarar, Marimuthu Palaniswami, Christopher Leckie. Improving load forecasting based on deep learning and K-shape clustering 4134-4141. [Crossref]

1621. Xiumin Li, Lin Yang, Fangzheng Xue, Hongjun Zhou. Time series prediction of stock price using deep belief networks with intrinsic plasticity 1237-1242. [Crossref]

1622. Wen-Jia Kuo, Li-Yun Wang, Pen-Jen Chen. Preliminary results of computer aided system with the 2nd-generation narrow-band imaging for endoscopic screening of colorectal neoplasms 854-857. [Crossref]

1623. Zehai Gao, Cunbao Ma, Dong Song, Yang Liu. 2017. Deep quantum inspired neural network with application to aircraft fuel system fault diagnosis. *Neurocomputing* **238**, 13-23. [Crossref]

1624. Liu Jian-Min, Yang Min-Hua. The signal processing and recognition of street view images by CNNs and softmax 875-879. [Crossref]

1625. Xueqin Zhang, Jiahao Chen. Deep learning based intelligent intrusion detection 1133-1137. [Crossref]

1626. Heqing Ya, Haonan Sun, Jeffrey Helt, Tai Sing Lee. Learning to Associate Words and Images Using a Large-Scale Graph 16-23. [Crossref]

1627. Gang Fu, Changjun Liu, Rong Zhou, Tao Sun, Qijian Zhang. 2017. Classification for High Resolution Remote Sensing Imagery Using a Fully Convolutional Network. *Remote Sensing* **9**:5, 498. [Crossref]

1628. Xueheng Qiu, Ye Ren, Ponnuthurai Nagaratnam Suganthan, Gehan A.J. Amaratunga. 2017. Empirical Mode Decomposition based ensemble deep learning for load demand time series forecasting. *Applied Soft Computing* **54**, 246-255. [Crossref]

1629. Lin Wu, Chunhua Shen, Anton van den Hengel. 2017. Deep linear discriminant analysis on fisher networks: A hybrid architecture for person re-identification. *Pattern Recognition* **65**, 238-250. [Crossref]

1630. Aleksander B. Bapst, Jonathan Tran, Mark W. Koch, Mary M. Moya, Robert Swahn. Open set recognition of aircraft in aerial imagery using synthetic template models 1020206. [Crossref]

1631. K. M. Iftekharuddin, M. Alam, L. Vidyaratne. Contemporary deep recurrent learning for recognition 1020302. [Crossref]

1632. Seongyoun Woo, Chulhee Lee. Feature extraction for deep neural networks based on decision boundaries 1020306. [Crossref]

1633. S. Ben Driss, M. Soua, R. Kachouri, M. Akil. A comparison study between MLP and convolutional neural network models for character recognition 1022306. [Crossref]

1634. Oliver Lomp, Christian Faubel, Gregor Schöner. 2017. A Neural-Dynamic Architecture for Concurrent Estimation of Object Pose and Identity. *Frontiers in Neurorobotics* **11**. . [Crossref]

1635. Juan Wang, Robert M. Nishikawa, Yongyi Yang. 2017. Global detection approach for clustered microcalcifications in mammograms using a deep learning network. *Journal of Medical Imaging* **4**:2, 024501. [Crossref]

1636. Chuang Wang, Pingyu Jiang. 2017. Deep neural networks based order completion time prediction by using real-time job shop RFID data. *Journal of Intelligent Manufacturing* **19**. . [Crossref]

1637. Ming Wen, Zhimin Zhang, Shaoyu Niu, Haozhi Sha, Ruihan Yang, Yonghuan Yun, Hongmei Lu. 2017. Deep-Learning-Based Drug–Target Interaction Prediction. *Journal of Proteome Research* **16**:4, 1401-1409. [Crossref]

1638. Anastasia Ioannidou, Elisavet Chatzilari, Spiros Nikolopoulos, Ioannis Kompatsiaris. 2017. Deep Learning Advances in Computer Vision with 3D Data. *ACM Computing Surveys* **50**:2, 1-38. [Crossref]

1639. Ling Shao, Ziyun Cai, Li Liu, Ke Lu. 2017. Performance evaluation of deep feature learning for RGB-D image/video classification. *Information Sciences* **385-386**, 266-283. [Crossref]

1640. Soojeong Lee, Joon-Hyuk Chang. 2017. Oscillometric Blood Pressure Estimation Based on Deep Learning. *IEEE Transactions on Industrial Informatics* **13**:2, 461-472. [Crossref]

1641. Neeraj Dhungel, Gustavo Carneiro, Andrew P. Bradley. 2017. A deep learning approach for the analysis of masses in mammograms with minimal user intervention. *Medical Image Analysis* **37**, 114-128. [Crossref]

1642. Chen Lu, Zhenya Wang, Bo Zhou. 2017. Intelligent fault diagnosis of rolling bearing using hierarchical convolutional network based health state classification. *Advanced Engineering Informatics* **32**, 139-151. [Crossref]

1643. Nhathai Phan, Dejing Dou, Hao Wang, David Kil, Brigitte Piniewski. 2017. Ontology-based deep learning for human behavior prediction with explanations in health social networks. *Information Sciences* **384**, 298-313. [Crossref]

1644. T Alwajeeh, A F Alharthi, R F Rahmat, R Budiarto. 2017. Fast Learning for Big Data Using Dynamic Function. *IOP Conference Series: Materials Science and Engineering* **190**, 012015. [Crossref]

1645. M. W. Spratling. 2017. A Hierarchical Predictive Coding Model of Object Recognition in Natural Images. *Cognitive Computation* **9**:2, 151-167. [Crossref]

1646. Heung-Il Suk, Seong-Whan Lee, Dinggang Shen. 2017. Deep ensemble learning of sparse regression models for brain disease diagnosis. *Medical Image Analysis* **37**, 101-113. [Crossref]

1647. Travis Ebesu, Yi Fang. 2017. Neural Semantic Personalized Ranking for item cold-start recommendation. *Information Retrieval Journal* **20**:2, 109-131. [Crossref]

1648. Xinghao Yang, Weifeng Liu, Dapeng Tao, Jun Cheng. 2017. Canonical correlation analysis networks for two-view image recognition. *Information Sciences* **385-386**, 338-352. [Crossref]

1649. Yuma Koizumi, Kenta Niwa, Yusuke Hioka, Kazunori Kobayashi, Hitoshi Ohmuro. 2017. Informative Acoustic Feature Selection to Maximize Mutual Information for Collecting Target Sources. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **25**:4, 768-779. [Crossref]

1650. Varun Kumar Ojha, Ajith Abraham, Václav Snášel. 2017. Metaheuristic design of feedforward neural networks: A review of two decades of research. *Engineering Applications of Artificial Intelligence* **60**, 97-116. [Crossref]

1651. Qin Hao-ran, Lin Ji-ming, Wang Jun-yi. 2017. Stacked Denoising Autoencoders Applied to Star/Galaxy Classification. *Chinese Astronomy and Astrophysics* **41**:2, 282-292. [Crossref]

1652. Yixuan Yuan, Max Q.-H. Meng. 2017. Deep learning for polyp recognition in wireless capsule endoscopy images. *Medical Physics* **44**:4, 1379-1389. [Crossref]

1653. Hyunsoo Lee. 2017. Framework and development of fault detection classification using IoT device and cloud environment. *Journal of Manufacturing Systems* **43**, 257-270. [Crossref]

1654. Chaoqun Hong, Jun Yu, You Jane, Zhiwen Yu, Xuhui Chen. 2017. Three-dimensional image-based human pose recovery with hypergraph regularized autoencoders. *Multimedia Tools and Applications* **76**:8, 10919-10937. [Crossref]

1655. Changyou Zhang, Xiaoya Wang, Jun Feng, Yu Cheng, Cheng Guo. 2017. A car-face region-based image retrieval method with attention of SIFT features. *Multimedia Tools and Applications* **76**:8, 10939-10958. [Crossref]

1656. Ya. M. Karandashev, M. Yu. Malsagov. 2017. Polynomial algorithm for exact calculation of partition function for binary spin model on planar graphs. *Optical Memory and Neural Networks* **26**:2, 87-95. [Crossref]

1657. Fan Liu, Feng Xu, Sai Yang. A Flood Forecasting Model Based on Deep Learning Algorithm via Integrating Stacked Autoencoders with BP Neural Network 58-61. [Crossref]

1658. Mingyuan Jiu, Hichem Sahbi. 2017. Nonlinear Deep Kernel Learning for Image Annotation. *IEEE Transactions on Image Processing* **26**:4, 1820-1832. [Crossref]

1659. Syed Moshfeq Salaken, Abbas Khosravi, Amin Khatami, Saeid Nahavandi, Mohammad Anwar Hosen. Lung cancer classification using deep learned features on low population dataset 1-5. [Crossref]

1660. Bo Du, Wei Xiong, Jia Wu, Lefei Zhang, Liangpei Zhang, Dacheng Tao. 2017. Stacked Convolutional Denoising Auto-Encoders for Feature Representation. *IEEE Transactions on Cybernetics* **47**:4, 1017-1027. [Crossref]

1661. Herman Wandabwa, Muhammad Asif Naeem, Farhaan Mirza. Document level semantic comprehension of noisy text streams via convolutional neural networks 475-479. [Crossref]

1662. Shaunak De, Abhishek Maity, Vritti Goel, Sanjay Shitole, Avik Bhattacharya. Predicting the popularity of instagram posts for a lifestyle magazine using deep learning 174-177. [Crossref]

1663. Jie Geng, Hongyu Wang, Jianchao Fan, Xiaorui Ma. 2017. Deep Supervised and Contractive Neural Network for SAR Image Classification. *IEEE Transactions on Geoscience and Remote Sensing* **55**:4, 2442-2459. [Crossref]

1664. Mian Mian Lau, King Hann Lim. Investigation of activation functions in deep belief network 201-206. [Crossref]

1665. Hao Liu, Jiwen Lu, Jianjiang Feng, Jie Zhou. 2017. Learning Deep Sharable and Structural Detectors for Face Alignment. *IEEE Transactions on Image Processing* **26**:4, 1666-1678. [Crossref]

1666. Omid Ghahabi, Javier Hernando. 2017. Deep Learning Backend for Single and Multisession i-Vector Speaker Recognition. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **25**:4, 807-817. [Crossref]

1667. Yundong Li, Weigang Zhao, Jiahao Pan. 2017. Deformable Patterned Fabric Defect Detection With Fisher Criterion-Based Deep Learning. *IEEE Transactions on Automation Science and Engineering* **14**:2, 1256-1264. [Crossref]

1668. Weichen Sun, Fei Su. 2017. A novel companion objective function for regularization of deep convolutional neural networks. *Image and Vision Computing* **60**, 58-63. [Crossref]

1669. Anush Sankaran, Mayank Vatsa, Richa Singh, Angshul Majumdar. 2017. Group sparse autoencoder. *Image and Vision Computing* **60**, 64-74. [Crossref]

1670. Harikumar Rajaguru, Sunil Kumar Prabhakar. Modified expectation maximization based sparse representation classifier for classification of epilepsy from EEG signals 607-610. [Crossref]

1671. Nassim Ammour, Haikel Alhichri, Yakoub Bazi, Bilel Benjdira, Naif Alajlan, Mansour Zuair. 2017. Deep Learning Approach for Car Detection in UAV Imagery. *Remote Sensing* **9**:4, 312. [Crossref]

1672. Jian Shu, Qifan Chen, Linlan Liu, Lei Xu. 2017. A link prediction approach based on deep learning for opportunistic sensor network. *International Journal of Distributed Sensor Networks* **13**:4, 155014771770064. [Crossref]

1673. Boukaye Boubacar Traore, Bernard Kamsu-Foguem, Fana Tangara. 2017. Data mining techniques on satellite images for discovery of risk areas. *Expert Systems with Applications* **72**, 443-456. [Crossref]

1674. Xianlun Tang, Na Zhang, Jialin Zhou, Qing Liu. 2017. Hidden-layer visible deep stacking network optimized by PSO for motor imagery EEG recognition. *Neurocomputing* **234**, 1-10. [Crossref]

1675. Weibo Liu, Zidong Wang, Xiaohui Liu, Nianyin Zeng, Yurong Liu, Fuad E. Alsaadi. 2017. A survey of deep neural network architectures and their applications. *Neurocomputing* **234**, 11-26. [Crossref]

1676. Shizhou Zhang, Jinjun Wang, Xiaoyu Tao, Yihong Gong, Nanning Zheng. 2017. Constructing Deep Sparse Coding Network for image classification. *Pattern Recognition* **64**, 130-140. [Crossref]

1677. Mostafa Mehdipour Ghazi, Berrin Yanikoglu, Erchan Aptoula. 2017. Plant identification using deep neural networks via optimization of transfer learning parameters. *Neurocomputing* **235**, 228-235. [Crossref]

1678. Yoshihiro Hayakawa, Takanori Oonuma, Hideyuki Kobayashi, Akiko Takahashi, Shinji Chiba, Nahomi M Fujiki. 2017. Feature Extraction of Video Using Artificial Neural Network. *International Journal of Cognitive Informatics and Natural Intelligence* **11**:2, 25-40. [Crossref]

1679. Raja Sekhar Dheekonda, Sampad Panda, Md Nazmuzzaman khan, Mohammad Hasan, Sohel Anwar. Object Detection from a Vehicle Using Deep Learning Network and Future Integration with Multi-Sensor Fusion Algorithm . [Crossref]

1680. Francesco Rigoli, Giovanni Pezzulo, Raymond Dolan, Karl Friston. 2017. A Goal-Directed Bayesian Framework for Categorization. *Frontiers in Psychology* **8**. . [Crossref]

1681. Leibin Ni, Hantao Huang, Zichuan Liu, Rajiv V. Joshi, Hao Yu. 2017. Distributed In-Memory Computing on Binary RRAM Crossbar. *ACM Journal on Emerging Technologies in Computing Systems* **13**:3, 1-18. [Crossref]

1682. Haoyu Yang, Luyang Luo, Jing Su, Chenxi Lin, Bei Yu. Imbalance aware lithography hotspot detection: a deep learning approach 1014807. [Crossref]

1683. Najiba Tagougui, Monji Kherallah. Recognizing online Arabic handwritten characters using a deep architecture 103410L. [Crossref]

1684. Mohamed Sakkari, Ridha Ejbali, Mourad Zaied. Deep SOMs for automated feature extraction and classification from big data streaming 103412L. [Crossref]

1685. T. Azim. 2017. Fisher kernels match deep models. *Electronics Letters* **53**:6, 397-399. [Crossref]

1686. Justin S. Paul, Andrew J. Plassard, Bennett A. Landman, Daniel Fabbri. Deep learning for brain tumor classification 1013710. [Crossref]

1687. Fei He, Ye Han, Han Wang, Jinchao Ji, Yuanning Liu, Zhiqiang Ma. 2017. Deep learning architecture for iris recognition based on optimal Gabor filters and deep belief network. *Journal of Electronic Imaging* **26**:2, 023005. [Crossref]

1688. Rifai Chai, Sai Ho Ling, Phyo Phyo San, Ganesh R. Naik, Tuan N. Nguyen, Yvonne Tran, Ashley Craig, Hung T. Nguyen. 2017. Improving EEG-Based

Driver Fatigue Classification Using Sparse-Deep Belief Networks. *Frontiers in Neuroscience* **11**. . [Crossref]

1689. Francisco Ortega-Zamorano, José M. Jerez, Iván Gómez, Leonardo Franco. 2017. Layer multiplexing FPGA implementation for deep back-propagation learning. *Integrated Computer-Aided Engineering* **24**:2, 171-185. [Crossref]

1690. Andrea E. Martin, Leonidas A. A. Doumas. 2017. A mechanism for the cortical computation of hierarchical linguistic structure. *PLOS Biology* **15**:3, e2000663. [Crossref]

1691. Arash Samadi, Timothy P. Lillicrap, Douglas B. Tweed. 2017. Deep Learning with Dynamic Spiking Neurons and Fixed Feedback Weights. *Neural Computation* **29**:3, 578-602. [Abstract] [Full Text] [PDF] [PDF Plus]

1692. Sandra Vieira, Walter H.L. Pinaya, Andrea Mechelli. 2017. Using deep learning to investigate the neuroimaging correlates of psychiatric and neurological disorders: Methods and applications. *Neuroscience & Biobehavioral Reviews* **74**, 58-75. [Crossref]

1693. Dan Xu, Yan Yan, Elisa Ricci, Nicu Sebe. 2017. Detecting anomalous events in videos by learning deep representations of appearance and motion. *Computer Vision and Image Understanding* **156**, 117-127. [Crossref]

1694. Zheng Zhao, Weihai Chen, Xingming Wu, Peter C. Y. Chen, Jingmeng Liu. 2017. LSTM network: a deep learning approach for short-term traffic forecast. *IET Intelligent Transport Systems* **11**:2, 68-75. [Crossref]

1695. Weishan Zhang, Pengcheng Duan, Laurence T Yang, Feng Xia, Zhongwei Li, Qinghua Lu, Wenjuan Gong, Su Yang. 2017. Resource requests prediction in the cloud computing environment with a deep belief network. *Software: Practice and Experience* **47**:3, 473-488. [Crossref]

1696. Hong Li, Long Yu, Shengwei Tian, Li Li, Mei Wang, Xueyuan Lu. 2017. Deep learning in pharmacy: The prediction of aqueous solubility based on deep belief network. *Automatic Control and Computer Sciences* **51**:2, 97-107. [Crossref]

1697. Long Yu, Xinyu Shi, Shengwei Tian, Shuangyin Gao, Li Li. 2017. Classification of Cytochrome P450 1A2 Inhibitors and Noninhibitors Based on Deep Belief Network. *International Journal of Computational Intelligence and Applications* **16**:01, 1750002. [Crossref]

1698. Steve Furber. 2017. Microprocessors: the engines of the digital age. *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Science* **473**:2199, 20160893. [Crossref]

1699. Huihua Yang, Baichao Hu, Xipeng Pan, Shengke Yan, Yanchun Feng, Xuebo Zhang, Lihui Yin, Changqin Hu. 2017. Deep belief network-based drug identification using near infrared spectroscopy. *Journal of Innovative Optical Health Sciences* **10**:02, 1630011. [Crossref]

1700. Kathryn Merrick. 2017. Value systems for developmental cognitive robotics: A survey. *Cognitive Systems Research* **41**, 38-55. [Crossref]

1701. Estanislau Lima, Xin Sun, Junyu Dong, Hui Wang, Yuting Yang, Lipeng Liu. 2017. Learning and Transferring Convolutional Neural Network Knowledge to Ocean Front Recognition. *IEEE Geoscience and Remote Sensing Letters* **14**:3, 354-358. [Crossref]

1702. Lachezar Bozhkov, Petia Koprinkova-Hristova, Petia Georgieva. 2017. Reservoir computing for emotion valence discrimination from EEG signals. *Neurocomputing* **231**, 28-40. [Crossref]

1703. Lijuan Liu, Rung-Ching Chen. A MRT Daily Passenger Flow Prediction Model with Different Combinations of Influential Factors 601-605. [Crossref]

1704. Ambaw B Ambaw, Mohammad Bari, Milos Doroslovacki. A case for stacked autoencoder based order recognition of continuous-phase FSK 1-6. [Crossref]

1705. Tobias Gruber, Sebastian Cammerer, Jakob Hoydis, Stephan ten Brink. On deep learning-based channel decoding 1-6. [Crossref]

1706. Dung Nguyen, Kien Nguyen, Sridha Sridharan, Afsane Ghasemi, David Dean, Clinton Fookes. Deep Spatio-Temporal Features for Multimodal Emotion Recognition 1215-1223. [Crossref]

1707. Yue Huang, Han Zheng, Chi Liu, Gustavo Rohde, Delu Zeng, Jiaqi Wang, Xinghao Ding. Epithelium-stroma classification in histopathological images via convolutional neural networks and self-taught learning 1073-1077. [Crossref]

1708. Yue Zhao, Xingyu Jin, Xiaolin Hu. Recurrent convolutional neural network for speech processing 5300-5304. [Crossref]

1709. Milos Cernak, Elmar Noth, Frank Rudzicz, Heidi Christensen, Juan Rafael Orozco-Arroyave, Raman Arora, Tobias Bocklet, Hamidreza Chinaei, Julius Hannink, Phani Sankar Nidadavolu, Juan Camilo Vasquez, Maria Yancheva, Alyssa Vann, Nikolai Vogler. On the impact of non-modal phonation on phonological features 5090-5094. [Crossref]

1710. Hendrik Meutzner, Ning Ma, Robert Nickel, Christopher Schymura, Dorothea Kolossa. Improving audio-visual speech recognition using deep neural networks with dynamic stream reliability estimates 5320-5324. [Crossref]

1711. Jing Han, Zixing Zhang, Fabien Ringeval, Bjorn Schuller. Prediction-based learning for continuous emotion recognition in speech 5005-5009. [Crossref]

1712. Erzhu Li, Peijun Du, Alim Samat, Yaping Meng, Meiqin Che. 2017. Mid-Level Feature Representation via Sparse Autoencoder for Remotely Sensed Scene Classification. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* **10**:3, 1068-1081. [Crossref]

1713. A. Ragni, C. Wu, M. J. F. Gales, J. Vasilakes, K. M. Knill. Stimulated training for automatic speech recognition and keyword search in limited resource conditions 4830-4834. [Crossref]

1714. P. Nieters, J. Leugering, G. Pipa. 2017. Neuromorphic computation in multi-delay coupled models. *IBM Journal of Research and Development* **61**:2/3, 8:7-8:9. [Crossref]

1715. Yuhang Dong, Zhuocheng Jiang, Hongda Shen, W. David Pan. Classification accuracies of malaria infected cells using deep convolutional neural networks based on decompressed images 1-6. [Crossref]

1716. Jun Li, Xue Mei, Danil Prokhorov, Dacheng Tao. 2017. Deep Neural Network for Structural Prediction and Lane Detection in Traffic Scene. *IEEE Transactions on Neural Networks and Learning Systems* **28**:3, 690-703. [Crossref]

1717. Hyun-Chul Kim, Jong-Hwan Lee. Evaluation of weight sparsity regularizion schemes of deep neural networks applied to functional neuroimaging data 6150-6154. [Crossref]

1718. Kien Nguyen, Clinton Fookes, Sridha Sridharan. Deep Context Modeling for Semantic Segmentation 56-63. [Crossref]

1719. Laisen Nie, Dingde Jiang, Shui Yu, Houbing Song. Network Traffic Prediction Based on Deep Belief Network in Wireless Mesh Backbone Networks 1-5. [Crossref]

1720. Kenta Niwa, Yuma Koizumi, Tomoko Kawase, Kazunori Kobayashi, Yusuke Hioka. Supervised source enhancement composed of nonnegative auto-encoders and complementarity subtraction 266-270. [Crossref]

1721. Tsubasa Ochiai, Shigeki Matsuda, Hideyuki Watanabe, Shigeru Katagiri. Automatic node selection for Deep Neural Networks using Group Lasso regularization 5485-5489. [Crossref]

1722. Miloš Cerňak, Štefan Beňuš, Alexandros Lazaridis. 2017. Speech vocoding for laboratory phonology. *Computer Speech & Language* **42**, 100-121. [Crossref]

1723. Norsalina Hassan, Dzati Athiar Ramli, Haryati Jaafar. Deep neural network approach to frog species recognition 173-178. [Crossref]

1724. Hari Krishna Vydana, Anil Kumar Vuppala. Investigative study of various activation functions for speech recognition 1-5. [Crossref]

1725. Sebastian Ewert, Mark B. Sandler. Structured dropout for weak label and multi-instance learning and its application to score-informed source separation 2277-2281. [Crossref]

1726. Tim de Bruin, Kim Verbert, Robert Babuska. 2017. Railway Track Circuit Fault Diagnosis Using Recurrent Neural Networks. *IEEE Transactions on Neural Networks and Learning Systems* **28**:3, 523-533. [Crossref]

1727. Pan Zhou, Chao Zhang, Zhouchen Lin. 2017. Bilevel Model-Based Discriminative Dictionary Learning for Recognition. *IEEE Transactions on Image Processing* **26**:3, 1173-1187. [Crossref]

1728. Xiaohang Ren, Yi Zhou, Jianhua He, Kai Chen, Xiaokang Yang, Jun Sun. 2017. A Convolutional Neural Network-Based Chinese Text Detection Algorithm via Text Structure Modeling. *IEEE Transactions on Multimedia* **19**:3, 506-518. [Crossref]

1729. Samuel J. Gershman. 2017. On the Blessing of Abstraction. *Quarterly Journal of Experimental Psychology* **70**:3, 361-365. [Crossref]

1730. Jun Du, Yong Xu. 2017. Hierarchical deep neural network for multivariate regression. *Pattern Recognition* **63**, 149-157. [Crossref]

1731. Anthony Hoak, Henry Medeiros, Richard Povinelli. 2017. Image-Based Multi-Target Tracking through Multi-Bernoulli Filtering with Interactive Likelihoods. *Sensors* **17**:3, 501. [Crossref]

1732. Ran Zhang, Zhen Peng, Lifeng Wu, Beibei Yao, Yong Guan. 2017. Fault Diagnosis from Raw Sensor Data Using Deep Neural Networks Considering Temporal Coherence. *Sensors* **17**:3, 549. [Crossref]

1733. Yantao Wei, Yicong Zhou, Hong Li. 2017. Spectral-Spatial Response for Hyperspectral Image Classification. *Remote Sensing* **9**:3, 203. [Crossref]

1734. Fei Jiang, Huating Li, Xuhong Hou, Bin Sheng, Ruimin Shen, Xiao-Yang Liu, Weiping Jia, Ping Li, Ruogu Fang. 2017. Abdominal adipose tissues extraction using multi-scale deep neural network. *Neurocomputing* **229**, 23-33. [Crossref]

1735. Min Jiang, Ruru Lu, Jun Kong, Xiao-Jun Wu, Hongtao Huo, Xiaofeng Wang. 2017. GB(2D) 2 PCA-based convolutional network for face recognition. *Journal of Electronic Imaging* **26**:2, 023001. [Crossref]

1736. Henry A. Leopold, Jeff Orchard, John Zelek, Vasudevan Lakshminarayanan. Segmentation and feature extraction of retinal vascular morphology 101330V. [Crossref]

1737. Henry A. Leopold, Jeff Orchard, John Zelek, Vasudevan Lakshminarayanan. Use of Gabor filters and deep networks in the segmentation of retinal vessel morphology 100680R. [Crossref]

1738. Hongkai Jiang, Fuan Wang, Haidong Shao, Haizhou Zhang. 2017. Rolling bearing fault identification using multilayer deep learning convolutional neural network. *Journal of Vibroengineering* **19**:1, 138-149. [Crossref]

1739. Junfei Qiao, Guangyuan Pan, Honggui Han. 2017. A regularization-reinforced DBN for digital recognition. *Natural Computing* **24**. . [Crossref]

1740. Priyadarshini Panda, Abhronil Sengupta, Kaushik Roy. 2017. Energy-Efficient and Improved Image Recognition with Conditional Deep Learning. *ACM Journal on Emerging Technologies in Computing Systems* **13**:3, 1-21. [Crossref]

1741. Chen Xue-juan, Wu Xiang, Yuan Zhong-qiang, Chen Xiang, Zhang Yu-wu, Cao Chun-xiang. 2017. Spectral characteristics and species identification of rhododendrons using a discriminative restricted Boltzmann machine. *Spectroscopy Letters* **50**:2, 65-72. [Crossref]

1742. Fahimeh Ghasemi, Afshin Fassihi, Horacio Pérez-Sánchez, Alireza Mehri Dehnavi. 2017. The role of different sampling methods in improving biological activity prediction using deep belief network. *Journal of Computational Chemistry* **38**:4, 195-203. [Crossref]

1743. Rufin VanRullen. 2017. Perception Science in the Age of Deep Neural Networks. *Frontiers in Psychology* **8**. . [Crossref]

1744. Christoph Wick. 2017. Deep Learning. *Informatik-Spektrum* **40**:1, 103-107. [Crossref]

1745. Hu Chen, Yi Zhang, Weihua Zhang, Peixi Liao, Ke Li, Jiliu Zhou, Ge Wang. 2017. aLow-dose CT via convolutional neural network. *Biomedical Optics Express* **8**:2, 679. [Crossref]

1746. A. R. Revathi, Dhananjay Kumar. 2017. An efficient system for anomaly detection using deep learning classifier. *Signal, Image and Video Processing* **11**:2, 291-299. [Crossref]

1747. Junkai Chen, Qihao Ou, Zheru Chi, Hong Fu. 2017. Smile detection in the wild with deep convolutional neural networks. *Machine Vision and Applications* **28**:1-2, 173-183. [Crossref]

1748. Yuzhou Liu, DeLiang Wang. 2017. Speaker-dependent multipitch tracking using deep neural networks. *The Journal of the Acoustical Society of America* **141**:2, 710-721. [Crossref]

1749. Mahmood Yousefi-Azar, Len Hamey. 2017. Text summarization using unsupervised deep learning. *Expert Systems with Applications* **68**, 93-105. [Crossref]

1750. Hongjun Xiao, Daoping Huang, Yongping Pan, Yiqi Liu, Kang Song. 2017. Fault diagnosis and prognosis of wastewater processes with incomplete data by the auto-associative neural networks and ARMA model. *Chemometrics and Intelligent Laboratory Systems* **161**, 96-107. [Crossref]

1751. Alvin Rajkomar, Sneha Lingam, Andrew G. Taylor, Michael Blum, John Mongan. 2017. High-Throughput Classification of Radiographs Using Deep Convolutional Neural Networks. *Journal of Digital Imaging* **30**:1, 95-101. [Crossref]

1752. Luis G. Moyano. 2017. Learning network representations. *The European Physical Journal Special Topics* **226**:3, 499-518. [Crossref]

1753. Haizhou Chen, Jiaxu Wang, Baoping Tang, Ke Xiao, Junyang Li. 2017. An integrated approach to planetary gearbox fault diagnosis using deep belief networks. *Measurement Science and Technology* **28**:2, 025010. [Crossref]

1754. Jean-Marc Deltorn. 2017. Deep Creations: Intellectual Property and the Automata. *Frontiers in Digital Humanities* **4**. . [Crossref]

1755. Anthony F. Morse, Angelo Cangelosi. 2017. Why Are There Developmental Stages in Language Learning? A Developmental Robotics Model of Language Development. *Cognitive Science* **41**, 32-51. [Crossref]

1756. Boris Kryzhanovsky, Leonid Litinskii. 2017. Applicability of n-vicinity method for calculation of free energy of Ising model. *Physica A: Statistical Mechanics and its Applications* **468**, 493-507. [Crossref]

1757. Edward J. Kim, Robert J. Brunner. 2017. Star–galaxy classification using deep convolutional neural networks. *Monthly Notices of the Royal Astronomical Society* **464**:4, 4463-4475. [Crossref]

1758. Luis Miralles-Pechuán, Dafne Rosso, Fernando Jiménez, Jose M. García. 2017. A methodology based on Deep Learning for advert value calculation in CPM, CPC and CPA networks. *Soft Computing* **21**:3, 651-665. [Crossref]

1759. Markus Harz. 2017. Cancer, Computers and Complexity: Decision Making for the Patient. *European Review* **25**:01, 96-106. [Crossref]

1760. Peter Bell, Pawel Swietojanski, Steve Renals. 2017. Multitask Learning of Context-Dependent Targets in Deep Neural Network Acoustic Models. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **25**:2, 238-247. [Crossref]

1761. Hai B. Huang, Ren X. Li, Ming L. Yang, Teik C. Lim, Wei P. Ding. 2017. Evaluation of vehicle interior sound quality using a continuous restricted Boltzmann machine-based DBN. *Mechanical Systems and Signal Processing* **84**, 245-267. [Crossref]

1762. Tanmay Bhowmik, Shyamal Kumar Das Mandal. Detection and classification of place and manner of articulation for Bengali continuous speech 578-583. [Crossref]

1763. Qin Song, Yu-Jun Zheng, Yu Xue, Wei-Guo Sheng, Mei-Rong Zhao. 2017. An evolutionary deep neural network for predicting morbidity of gastrointestinal infections by food contamination. *Neurocomputing* **226**, 16-22. [Crossref]

1764. Jiangshe Zhang, Weifu Ding. 2017. Prediction of Air Pollutants Concentration Based on an Extreme Learning Machine: The Case of Hong Kong. *International Journal of Environmental Research and Public Health* **14**:2, 114. [Crossref]

1765. Majid Masoumi, A. Ben Hamza. 2017. Spectral shape classification: A deep learning approach. *Journal of Visual Communication and Image Representation* **43**, 198-211. [Crossref]

1766. Wenbin Jiang, Peilin Liu, Fei Wen. 2017. An improved vector quantization method using deep neural network. *AEU - International Journal of Electronics and Communications* **72**, 178-183. [Crossref]

1767. Diego Rueda Plata, Raúl Ramos-Pollán, Fabio A. González. 2017. Effective training of convolutional neural networks with small, specialized datasets. *Journal of Intelligent & Fuzzy Systems* **32**:2, 1333-1342. [Crossref]

1768. 2017. IVUS Tissue Characterization of Coronary Plaque by Classification Restricted Boltzmann Machine. *Journal of Advanced Computational Intelligence and Intelligent Informatics* **21**:1, 67-73. [Crossref]

1769. Olivia Guest, Bradley C Love. 2017. What the success of brain imaging implies about the neural code. *eLife* **6**. . [Crossref]

1770. Salaheldin Elkatatny, Mohamed Mahmoud, Zeeshan Tariq, Abdulazeez Abdulraheem. 2017. New insights into the prediction of heterogeneous carbonate reservoir permeability from well logs using artificial intelligence network. *Neural Computing and Applications* **6**. . [Crossref]

1771. Delowar Hossain, Genci Capi, Mitsuru Jindai, Shin-ichiro Kaneko. 2017. Pick-place of dynamic objects by robot manipulator based on deep learning and easy user

interface teaching systems. *Industrial Robot: An International Journal* **44**:1, 11-20. [Crossref]

1772. Prateek Tandon, Stanley Lam, Ben Shih, Tanay Mehta, Alex Mitev, Zhiyang Ong. 2017. Quantum Robotics: A Primer on Current Science and Future Perspectives. *Synthesis Lectures on Quantum Computing* **6**:1, 1-149. [Crossref]

1773. Daniel Johnson, Dan Ventura. 2017. Musical Motif Discovery from Non-Musical Inspiration Sources. *Computers in Entertainment* **14**:2, 1-22. [Crossref]

1774. Siqing Nie, Jinhua Yu, Ping Chen, Yuanyuan Wang, Jian Qiu Zhang. 2017. Automatic Detection of Standard Sagittal Plane in the First Trimester of Pregnancy Using 3-D Ultrasound Data. *Ultrasound in Medicine & Biology* **43**:1, 286-300. [Crossref]

1775. Yulong Li, Zhenhong Chen, Yi Cai, Dongping Huang, Qing Li. Accelerating Convolutional Neural Networks Using Fine-Tuned Backpropagation Progress 256-266. [Crossref]

1776. Jürgen Schmidhuber. Deep Learning 338-348. [Crossref]

1777. Xiaoyang Fu. Unsupervised Pre-training Classifier Based on Restricted Boltzmann Machine with Imbalanced Data 102-110. [Crossref]

1778. Arpan Sen, Shrestha Ghosh, Debottam Kundu, Debleena Sarkar, Jaya Sil. Study of Engineered Features and Learning Features in Machine Learning - A Case Study in Document Classification 161-172. [Crossref]

1779. Yanfang Wang, Song Gao. Application of DBNs for concerned internet information detecting 090005. [Crossref]

1780. V. A. Golovko. 2017. Deep learning: an overview and main paradigms. *Optical Memory and Neural Networks* **26**:1, 1-17. [Crossref]

1781. Mehdi Hajinoroozi, Zijing Mao, Yuan-Pin Lin, Yufei Huang. Deep Transfer Learning for Cross-subject and Cross-experiment Prediction of Image Rapid Serial Visual Presentation Events from EEG Data 45-55. [Crossref]

1782. Michael Kampffmeyer, Sigurd Løkse, Filippo M. Bianchi, Robert Jenssen, Lorenzo Livi. Deep Kernelized Autoencoders 419-430. [Crossref]

1783. Hao Yu, Leibin Ni, Hantao Huang. Distributed In-Memory Computing on Binary Memristor-Crossbar for Machine Learning 275-304. [Crossref]

1784. Yu Lin, Yanchun Liang, Shinichi Yoshida, Xiaoyue Feng, Renchu Guan. A Hybrid Algorithm of Extreme Learning Machine and Sparse Auto-Encoder 194-204. [Crossref]

1785. Yingfeng Cai, Hai Wang, Xiao-qiang Sun, Long Chen. 2017. Visual Vehicle Tracking Based on Deep Representation and Semisupervised Learning. *Journal of Sensors* **2017**, 1-6. [Crossref]

1786. Ching-Hua Weng, Ying-Hsiu Lai, Shang-Hong Lai. Driver Drowsiness Detection via a Hierarchical Temporal Deep Belief Network 117-133. [Crossref]

1787. Loris Nanni, Stefano Ghidoni. 2017. How could a subcellular image, or a painting by Van Gogh, be similar to a great white shark or to a pizza?. *Pattern Recognition Letters* **85**, 1-7. [Crossref]

1788. Zakariya Qawaqneh, Arafat Abu Mallouh, Buket D. Barkana. 2017. Deep neural network framework and transformed MFCCs for speaker's age and gender classification. *Knowledge-Based Systems* **115**, 5-14. [Crossref]

1789. Vladimir Golovko, Mikhno Egor, Aliaksandr Brich, Anatoliy Sachenko. A Shallow Convolutional Neural Network for Accurate Handwritten Digits Classification 77-85. [Crossref]

1790. Kunlun Li, Xuefei Geng, Weiduan Li. Deep Convolution Neural Network Recognition Algorithm Based on Maximum Scatter Difference Criterion 146-153. [Crossref]

1791. Suraj Srinivas, Ravi K. Sarvadevabhatla, Konda R. Mopuri, Nikita Prabhu, Srinivas S.S. Kruthiventi, R. Venkatesh Babu. An Introduction to Deep Convolutional Neural Nets for Computer Vision 25-52. [Crossref]

1792. Boris Ginsburg. Application case study—machine learning 345-367. [Crossref]

1793. Chen Lu, Zhen-Ya Wang, Wei-Li Qin, Jian Ma. 2017. Fault diagnosis of rotary machinery components using a stacked denoising autoencoder-based health state identification. *Signal Processing* **130**, 377-388. [Crossref]

1794. Sri Vijay Bharat Peddi, Pallavi Kuhad, Abdulsalam Yassine, Parisa Pouladzadeh, Shervin Shirmohammadi, Ali Asghar Nazari Shirehjini. 2017. An intelligent cloud-based data processing broker for mobile e-health multimedia applications. *Future Generation Computer Systems* **66**, 71-86. [Crossref]

1795. Kun Li, Xiaojun Qian, Helen Meng. 2017. Mispronunciation Detection and Diagnosis in L2 English Speech Using Multidistribution Deep Neural Networks. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **25**:1, 193-207. [Crossref]

1796. Jingfei Jiang, Zhiqiang Liu, Jinwei Xu, Rongdong Hu. A Super-Vector Deep Learning Coprocessor with High Performance-Power Ratio 81-92. [Crossref]

1797. Chung-Wei Yeh, Tse-Yu Pan, Min-Chun Hu. A Sensor-Based Official Basketball Referee Signals Recognition System Using Deep Belief Networks 565-575. [Crossref]

1798. Daniel Sonntag, Sonja Zillner, Patrick van der Smagt, András Lörincz. Overview of the CPS for Smart Factories Project: Deep Learning, Knowledge Acquisition, Anomaly Detection and Intelligent User Interfaces 487-504. [Crossref]

1799. Teng Ma, Hui Li, Hao Yang, Xulin Lv, Peiyang Li, Tiejun Liu, Dezhong Yao, Peng Xu. 2017. The extraction of motion-onset VEP BCI features based on deep learning and compressed sensing. *Journal of Neuroscience Methods* **275**, 80-92. [Crossref]

1800. Lin Ma, Xiao Lin, Linhua Jiang. Differential-Weighted Global Optimum of BP Neural Network on Image Classification 544-552. [Crossref]

1801. Galina Lavrentyeva, Sergey Novoselov, Konstantin Simonchik. Anti-spoofing Methods for Automatic Speaker Verification System 172-184. [Crossref]

1802. Nick Dadson, Lisa Pinheiro, Jimmy Royer. Decision Making with Machine Learning in Our Modern, Data-Rich Health-Care Industry 277-289. [Crossref]

1803. Sanjiban Sekhar Roy, Abhinav Mallik, Rishab Gulati, Mohammad S. Obaidat, P. V. Krishna. A Deep Learning Based Artificial Neural Network Approach for Intrusion Detection 44-53. [Crossref]

1804. Shaoyu Wang, Minjeong Kim, Guorong Wu, Dinggang Shen. Scalable High Performance Image Registration Framework by Unsupervised Deep Feature Representations Learning 245-269. [Crossref]

1805. Bo Wu, Kehuang Li, Minglei Yang, Chin-Hui Lee. 2017. A Reverberation-Time-Aware Approach to Speech Dereverberation Based on Deep Neural Networks. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **25**:1, 102-111. [Crossref]

1806. Chengxu Li, Dewang Chen, Ling Yang. Research on Fault Detection of High-Speed Train Bogie 253-260. [Crossref]

1807. Vivek Parmar, Manan Suri. Exploiting Variability in Resistive Memory Devices for Cognitive Systems 175-195. [Crossref]

1808. Francis Heylighen. 2017. Towards an intelligent network for matching offer and demand: From the sharing economy to the global brain. *Technological Forecasting and Social Change* **114**, 74-85. [Crossref]

1809. Tu Tran Anh, The Dung Luong. Malwares Classification Using Quantum Neural Network 340-346. [Crossref]

1810. Gregory Burlet, Abram Hindle. 2017. Isolated guitar transcription using a deep belief network. *PeerJ Computer Science* **3**, e109. [Crossref]

1811. Masayuki HITOKOTO, Masaaki SAKURABA. 2017. HYBRID DEEP NEURAL NETWORK AND DISTRIBUTED RAINFALL-RUNOFF MODEL FOR THE REAL-TIME RIVER STAGE PREDICTION. *Journal of Japan Society of Civil Engineers, Ser. B1 (Hydraulic Engineering)* **73**:1, 22-33. [Crossref]

1812. Y. C. Lin, Ying-Jie Liang, Ming-Song Chen, Xiao-Min Chen. 2017. A comparative study on phenomenon and deep belief network models for hot deformation behavior of an Al–Zn–Mg–Cu alloy. *Applied Physics A* **123**:1. . [Crossref]

1813. Malte Probst, Franz Rothlauf, Jörn Grahl. 2017. Scalability of using Restricted Boltzmann Machines for combinatorial optimization. *European Journal of Operational Research* **256**:2, 368-383. [Crossref]

1814. Amira Bouallégue, Salima Hassairi, Ridha Ejbali, Mourad Zaied. Learning Deep Wavelet Networks for Recognition System of Arabic Words 498-507. [Crossref]

1815. Tomoko Kawase, Kenta Niwa, Yusuke Hioka, Kazunori Kobayashi. 2017. Automatic Parameter Switching of Noise Reduction for Speech Recognition. *Journal of Signal Processing* **21**:2, 63-71. [Crossref]

1816. Naman Kohli, Mayank Vatsa, Richa Singh, Afzel Noore, Angshul Majumdar. 2017. Hierarchical Representation Learning for Kinship Verification. *IEEE Transactions on Image Processing* **26**:1, 289-302. [Crossref]

1817. Bo-Jhen Huang, Jun-Wei Hsieh, Chun-Ming Tsai. Vehicle Detection in Hsuehshan Tunnel Using Background Subtraction and Deep Belief Network 217-226. [Crossref]

1818. Yuki Sakai, Tetsuya Oda, Makoto Ikeda, Leonard Barolli. VegeShop Tool: A Tool for Vegetable Recognition Using DNN 683-691. [Crossref]

1819. Phyo P. San, Pravin Kakar, Xiao-Li Li, Shonali Krishnaswamy, Jian-Bo Yang, Minh N. Nguyen. Deep Learning for Human Activity Recognition 186-204. [Crossref]

1820. Meng Fan, Lenan Wu. Demodulator based on deep belief networks in communication system 1-5. [Crossref]

1821. Michele Di Capua, Alfredo Petrosino. A Deep Learning Approach to Deal with Data Uncertainty in Sentiment Analysis 172-184. [Crossref]

1822. Baris Gecer, George Azzopardi, Nicolai Petkov. 2017. Color-blob-based COSFIRE filters for object recognition. *Image and Vision Computing* **57**, 165-174. [Crossref]

1823. Florin C. Ghesu, Bogdan Georgescu, Joachim Hornegger. Efficient Medical Image Parsing 55-81. [Crossref]

1824. Francis Heylighen. 2017. The offer network protocol: Mathematical foundations and a roadmap for the development of a global brain. *The European Physical Journal Special Topics* **226**:2, 283-312. [Crossref]

1825. Nabila Zrira, Mohamed Hannat, El Houssine Bouyakhf. VFH-Color and Deep Belief Network for 3D Point Cloud Recognition 445-452. [Crossref]

1826. Geoffrey Hinton. Deep Belief Nets 335-338. [Crossref]

1827. Li Huang, Lei Wang. 2017. Accelerated Monte Carlo simulations with restricted Boltzmann machines. *Physical Review B* **95**:3. . [Crossref]

1828. Gang Li, Changhai Yu, Hui Fan, Shuguo Gao, Yu Song, Yunpeng Liu. 2017. Large Power Transformer Fault Diagnosis and Prognostic Based on DBNC and D-S Evidence Theory. *Energy and Power Engineering* **09**:04, 232-239. [Crossref]

1829. Jinwei Qi, Xin Huang, Yuxin Peng. Cross-Media Retrieval by Multimodal Representation Fusion with Deep Networks 218-227. [Crossref]

1830. Fengling Mao, Wei Xiong, Bo Du, Lefei Zhang. Stochastic Decorrelation Constraint Regularized Auto-Encoder for Visual Recognition 368-380. [Crossref]

1831. Danfeng Xie, Lei Zhang, Li Bai. 2017. Deep Learning in Visual Computing and Signal Processing. *Applied Computational Intelligence and Soft Computing* **2017**, 1-13. [Crossref]

1832. G.A. Papakostas, K.I. Diamantaras, T. Papadimitriou. 2017. Parallel pattern classification utilizing GPU-based kernelized Slackmin algorithm. *Journal of Parallel and Distributed Computing* **99**, 90-99. [Crossref]

1833. Thuy Vu, D. Stott Parker. Mining Community Structure with Node Embeddings 123-140. [Crossref]

1834. Schahin Tofangchi, Andre Hanelt, Lutz M. Kolbe. Towards Distributed Cognitive Expert Systems 145-159. [Crossref]

1835. Watshara Shoombuatong, Philip Prathipati, Wiwat Owasirikul, Apilak Worachartcheewan, Saw Simeon, Nuttapat Anuwongcharoen, Jarl E. S. Wikberg, Chanin Nantasenamat. Towards the Revival of Interpretable QSAR Models 3-55. [Crossref]

1836. June-Goo Lee, Sanghoon Jun, Young-Won Cho, Hyunna Lee, Guk Bae Kim, Joon Beom Seo, Namkug Kim. 2017. Deep Learning in Medical Imaging: General Overview. *Korean Journal of Radiology* **18**:4, 570. [Crossref]

1837. Fangzheng Xue, Xuyang Chen, Xiumin Li. Real-Time Classification Through a Spiking Deep Belief Network with Intrinsic Plasticity 188-196. [Crossref]

1838. Junbin Gao, Yi Guo, Zhiyong Wang. Matrix Neural Networks 313-320. [Crossref]

1839. Kao-Shing Hwang, Chi-Wei Hsieh, Wei-Cheng Jiang, Jin-Ling Lin. A Reinforcement Learning Method with Implicit Critics from a Bystander 363-370. [Crossref]

1840. Guangwu Qian, Lei Zhang, Qianjun Zhang. Fast Conceptor Classifier in Pre-trained Neural Networks for Visual Recognition 290-298. [Crossref]

1841. Vadim Sokolov. 2017. Discussion of 'Deep learning for finance: deep portfolios'. *Applied Stochastic Models in Business and Industry* **33**:1, 16-18. [Crossref]

1842. Haibin Yan, Jiwen Lu. Feature Learning for Facial Kinship Verification 7-36. [Crossref]

1843. Sherif Abuelwafa, Mohamed Mhiri, Rachid Hedjam, Sara Zhalehpour, Andrew Piper, Chad Wellmon, Mohamed Cheriet. Feature Learning for Footnote-Based Document Image Classification 643-650. [Crossref]

1844. Kan Luo, Jianqing Li, Zhigang Wang, Alfred Cuschieri. 2017. Patient-Specific Deep Architectural Model for ECG Classification. *Journal of Healthcare Engineering* **2017**, 1-13. [Crossref]

1845. Shimeng Yu. Introduction to Neuro-Inspired Computing Using Resistive Synaptic Devices 1-15. [Crossref]

1846. Masatoshi Hamanaka, Kei Taneishi, Hiroaki Iwata, Jun Ye, Jianguo Pei, Jinlong Hou, Yasushi Okuno. 2017. CGBVS-DNN: Prediction of Compound-protein Interactions Based on Deep Learning. *Molecular Informatics* **36**:1-2, 1600045. [Crossref]

1847. Kai Chen, Xin-Cong Zhou, Jun-Qiang Fang, Peng-fei Zheng, Jun Wang. 2017. Fault Feature Extraction and Diagnosis of Gearbox Based on EEMD and Deep Briefs Network. *International Journal of Rotating Machinery* **2017**, 1-10. [Crossref]

1848. ?? ?. 2017. Single-Channel Speech Enhancement Based on Sparse Regressive Deep Neural Network. *Software Engineering and Applications* **06**:01, 8-19. [Crossref]

1849. Yoshitaka Masutani, Sakon Noriki, Shoji Kido, Hidetaka Arimura, Morimasa Tomikawa, Hidekata Hontani, Yoshinobu Sato. Introduction 1-37. [Crossref]

1850. Hidekata Hontani, Yasushi Hirano, Xiao Dong, Akinobu Shimizu, Shohei Hanaoka. Fundamental Theories and Techniques 39-150. [Crossref]

1851. Mario Rivas-Sánchez, Maria De La Paz Guerrero-Lebrero, Elisa Guerrero, Guillermo Bárcena-Gonzalez, Jaime Martel, Pedro L. Galindo. Using Deep Learning for Image Similarity in Product Matching 281-290. [Crossref]

1852. Aaron Montero, Thiago Mosqueiro, Ramon Huerta, Francisco B. Rodriguez. Exploring a Mathematical Model of Gain Control via Lateral Inhibition in the Antennal Lobe 317-326. [Crossref]

1853. Lorena Álvarez-Pérez, Anas Ahachad, Aníbal R. Figueiras-Vidal. Pre-emphasizing Binarized Ensembles to Improve Classification Performance 339-350. [Crossref]

1854. Arnaldo Gouveia, Miguel Correia. A Systematic Approach for the Application of Restricted Boltzmann Machines in Network Intrusion Detection 432-446. [Crossref]

1855. Collins Leke, Alain Richard Ndjiongue, Bhekisipho Twala, Tshilidzi Marwala. A Deep Learning-Cuckoo Search Method for Missing Data Estimation in High-Dimensional Datasets 561-572. [Crossref]

1856. Shyamapada Mandal, B. Santhi, S. Sridhar, K. Vinolia, P. Swaminathan. 2017. Nuclear Power Plant Thermocouple Sensor Fault Detection and Classification using Deep Learning and Generalized Likelihood Ratio Test. *IEEE Transactions on Nuclear Science* 1-1. [Crossref]

1857. Xianchun Zou, Guijun Wang, Guoxian Yu. 2017. Protein Function Prediction Using Deep Restricted Boltzmann Machines. *BioMed Research International* **2017**, 1-9. [Crossref]

1858. Christin Seifert, Aisha Aamir, Aparna Balagopalan, Dhruv Jain, Abhinav Sharma, Sebastian Grottel, Stefan Gumhold. Visualizations of Deep Neural Networks in Computer Vision: A Survey 123-144. [Crossref]

1859. Yong Jin, Harry Zhang, Donglei Du. Incorporating Positional Information into Deep Belief Networks for Sentiment Classification 1-15. [Crossref]

1860. Naoya ONIZAWA, Kazumichi MATSUMIYA, Takahiro HANYU. 2017. Energy-efficient Brainware LSI Based on Stochastic Computation. *IEICE ESS Fundamentals Review* **11**:1, 28-39. [Crossref]

1861. R. Prashanth, K. Deepak, Amit Kumar Meher. High Accuracy Predictive Modelling for Customer Churn Prediction in Telecom Industry 391-402. [Crossref]

1862. Ruimin Cao, Fengli Wang, Lina Hao. Extreme Learning Machine Based Modified Deep Auto-Encoder Network Classifier Algorithm 173-180. [Crossref]

1863. Wei Qi Yan. Surveillance Data Analytics 65-106. [Crossref]

1864. Hoo-Chang Shin, Holger R. Roth, Mingchen Gao, Le Lu, Ziyue Xu, Isabella Nogues, Jianhua Yao, Daniel Mollura, Ronald M. Summers. Three Aspects on Using Convolutional Neural Networks for Computer-Aided Detection in Medical Imaging 113-136. [Crossref]

1865. Juan Carlos Figueroa-García, Eduyn López-Santana, Carlos Franco-Franco. A Three-Step Deep Neural Network Methodology for Exchange Rate Forecasting 786-795. [Crossref]

1866. Zheng Wang, Qingbiao Wu. 2017. Shape Completion Using Deep Boltzmann Machine. *Computational Intelligence and Neuroscience* **2017**, 1-10. [Crossref]

1867. Yan Zhou, Heming Zhao, Li Shang. Lying Speech Characteristic Extraction Based on SSAE Deep Learning Model 672-681. [Crossref]

1868. Taiwo Adetiloye, Anjali Awasthi. Predicting Short-Term Congested Traffic Flow on Urban Motorway Networks 145-165. [Crossref]

1869. Lei Zhu, Guodong Zhu, Lei Han, Nan Wang. 2017. The Application of Deep Learning in Airport Visibility Forecast. *Atmospheric and Climate Sciences* **07**:03, 314-322. [Crossref]

1870. Xudie Ren, Haonan Guo, Shenghong Li, Shilin Wang, Jianhua Li. A Novel Image Classification Method with CNN-XGBoost Model 378-390. [Crossref]

1871. Amirhossein Gharib, Ali Ghorbani. DNA-Droid: A Real-Time Android Ransomware Detection Framework 184-198. [Crossref]

1872. Leandro A. Passos Júnior, Kelton A. P. Costa, João P. Papa. Deep Boltzmann Machines Using Adaptive Temperatures 172-183. [Crossref]

1873. Guoxin Zhang, Zengcai Wang, Lei Zhao, Yazhou Qi, Jinshan Wang. 2017. Coal-Rock Recognition in Top Coal Caving Using Bimodal Deep Learning and Hilbert-Huang Transform. *Shock and Vibration* **2017**, 1-13. [Crossref]

1874. Zheng Yi Wu, Atiqur Rahman. 2017. Optimized Deep Learning Framework for Water Distribution Data-Driven Modeling. *Procedia Engineering* **186**, 261-268. [Crossref]

1875. Olav Zimmermann. Backbone Dihedral Angle Prediction 65-82. [Crossref]

1876. Yuhan Jia, Jianping Wu, Ming Xu. 2017. Traffic Flow Prediction with Rainfall Impact Using a Deep Learning Method. *Journal of Advanced Transportation* **2017**, 1-10. [Crossref]

1877. QingZeng Song, Lei Zhao, XingKe Luo, XueChen Dou. 2017. Using Deep Learning for Classification of Lung Nodules on Computed Tomography Images. *Journal of Healthcare Engineering* **2017**, 1-7. [Crossref]

1878. Philippe Desjardins-Proulx, Idaline Laigle, Timothée Poisot, Dominique Gravel. 2017. Ecological interactions and the Netflix problem. *PeerJ* **5**, e3644. [Crossref]

1879. Sheng Li, Yun Fu. Robust Representations for Collaborative Filtering 123-146. [Crossref]

1880. Markus Müller, Sebastian Stüker, Alex Waibel. Language Adaptive Multilingual CTC Speech Recognition 473-482. [Crossref]

1881. Adrian Carrio, Carlos Sampedro, Alejandro Rodriguez-Ramos, Pascual Campoy. 2017. A Review of Deep Learning Methods and Applications for Unmanned Aerial Vehicles. *Journal of Sensors* **2017**, 1-13. [Crossref]

1882. Jian Wang, Guoling Yang, Bingjie Zhang, Zhanquan Sun, Yusong Liu, Jichao Wang. 2017. Convergence Analysis of Caputo-Type Fractional Order Complex-Valued Neural Networks. *IEEE Access* **5**, 14560-14571. [Crossref]

1883. Johannes Bruder. Infrastructural intelligence: Contemporary entanglements between neuroscience and AI 101-128. [Crossref]

1884. Yuan Xie, Tao Zhang. 2017. Fault Diagnosis for Rotating Machinery Based on Convolutional Neural Network and Empirical Mode Decomposition. *Shock and Vibration* **2017**, 1-12. [Crossref]

1885. Yachun Mao, Dong Xiao, Jinfu Cheng, Defu Che, Batuan Le, Liang Song, Xiaobo Liu. 2017. Multigrades Classification Model of Magnesite Ore Based on SAE and ELM. *Journal of Sensors* **2017**, 1-9. [Crossref]

1886. Soojeong Lee, Joon-Hyuk Chang. 2017. Deep Boltzmann Regression with Mimic Features for Oscillometric Blood Pressure Estimation. *IEEE Sensors Journal* 1-1. [Crossref]

1887. Thierry Bouwmans, Lucia Maddalena, Alfredo Petrosino. 2017. Scene background initialization: A taxonomy. *Pattern Recognition Letters* . [Crossref]

1888. Jaekwon Kim, Ungu Kang, Youngho Lee. 2017. Statistics and Deep Belief Network-Based Cardiovascular Risk Prediction. *Healthcare Informatics Research* **23**:3, 169. [Crossref]

1889. Jie-Zhi Cheng, Chung-Ming Chen, Dinggang Shen. Deep Learning Techniques on Texture Analysis of Chest and Breast Images 247-279. [Crossref]

1890. Xiaodong Jia, Ming Zhao, Yuan Di, Chao Jin, Jay Lee. 2017. Investigation on the kurtosis filter and the derivation of convolutional sparse filter for impulsive signature enhancement. *Journal of Sound and Vibration* **386**, 433-448. [Crossref]

1891. Richard Billingsley, John Billingsley, Peter Gärdenfors, Pavlos Peppas, Henri Prade, David Skillicorn, Mary-Anne Williams. The Altruistic Robot: Do What I Want, Not Just What I Say 149-162. [Crossref]

1892. Masatoshi Hamanaka, Keiji Hirata, Satoshi Tojo. deepGTTM-I&II: Local Boundary and Metrical Structure Analyzer Based on Deep Learning Technique 3-21. [Crossref]

1893. Xiu Huang, Zihao Yang, Yang Yang, Fumin Shen, Ning Xie, Heng Tao Shen. A Deep Approach for Multi-modal User Attribute Modeling 217-230. [Crossref]

1894. Anush Sankaran, Gaurav Goswami, Mayank Vatsa, Richa Singh, Angshul Majumdar. 2017. Class sparsity signature based Restricted Boltzmann Machine. *Pattern Recognition* **61**, 674-685. [Crossref]

1895. Keiller Nogueira, Otávio A.B. Penatti, Jefersson A. dos Santos. 2017. Towards better exploiting convolutional neural networks for remote sensing scene classification. *Pattern Recognition* **61**, 539-556. [Crossref]

1896. Soumya Banerjee, Samia Bouzefrane, Paul Mühlethaler. Mobility Prediction in Vehicular Networks: An Approach Through Hybrid Neural Networks Under Uncertainty 178-194. [Crossref]

1897. Dhanya Bibin, Madhu S. Nair, P. Punitha. 2017. Malaria Parasite Detection From Peripheral Blood Smear Images Using Deep Belief Networks. *IEEE Access* **5**, 9099-9108. [Crossref]

1898. Ruhi Sarikaya. 2017. The Technology Behind Personal Digital Assistants: An overview of the system architecture and key components. *IEEE Signal Processing Magazine* **34**:1, 67-81. [Crossref]

1899. Lei Sun, Jun Du, Li-Rong Dai, Chin-Hui Lee. Multiple-target deep learning for LSTM-RNN based speech enhancement 136-140. [Crossref]

1900. Feng Li, Jacek M. Zurada, Yan Liu, Wei Wu. 2017. Input Layer Regularization of Multilayer Feedforward Neural Networks. *IEEE Access* **5**, 10979-10985. [Crossref]

1901. Daniele Ravi, Charence Wong, Fani Deligianni, Melissa Berthelot, Javier Andreu-Perez, Benny Lo, Guang-Zhong Yang. 2017. Deep Learning for Health Informatics. *IEEE Journal of Biomedical and Health Informatics* **21**:1, 4-21. [Crossref]

1902. Jan Vaněk, Jan Zelinka, Daniel Soutner, Josef Psutka. A Regularization Post Layer: An Additional Way How to Make Deep Neural Networks Robust 204-214. [Crossref]

1903. Jianlong Fu, Yong Rui. 2017. Advances in deep learning approaches for image tagging. *APSIPA Transactions on Signal and Information Processing* **6**. . [Crossref]

1904. Shuqin Wang, Gang Hua, Guosheng Hao, Chunli Xie. 2017. A Cycle Deep Belief Network Model for Multivariate Time Series Classification. *Mathematical Problems in Engineering* **2017**, 1. [Crossref]

1905. Yao Peng, Hujun Yin. Markov Random Field Based Convolutional Neural Networks for Image Classification 387-396. [Crossref]

1906. Baojun Niu, Dongsheng Zou, Yafeng Niu. **729**, 172. [Crossref]

1907. Weipeng Gao, Youchan Zhu. 2017. A Cloud Computing Fault Detection Method Based on Deep Learning. *Journal of Computer and Communications* **05**:12, 24-34. [Crossref]

1908. Yiding Wang, Shan Dong. Dorsal Hand Vein Recognition Based on Improved Bag of Visual Words Model 203-212. [Crossref]

1909. Yunqi Miao, Linna Wang, Chunyu Xie, Baochang Zhang. Gesture Recognition Based on Deep Belief Networks 439-446. [Crossref]

1910. James Ting-Ho Lo, Yichuan Gui, Yun Peng. Solving the Local-Minimum Problem in Training Deep Learning Machines 166-174. [Crossref]

1911. Xi Yang, Kaizhu Huang, Rui Zhang. Deep Mixtures of Factor Analyzers with Common Loadings: A Novel Deep Generative Approach to Clustering 709-719. [Crossref]

1912. Feifei Zhao, Tielin Zhang, Yi Zeng, Bo Xu. Towards a Brain-Inspired Developmental Neural Network by Adaptive Synaptic Pruning 182-191. [Crossref]

1913. Fuxiao Tan, Pengfei Yan, Xinping Guan. **10637**, 475. [Crossref]

1914. Srikanth Cherla, Son N. Tran, Artur d'Avila Garcez, Tillman Weyde. Generalising the Discriminative Restricted Boltzmann Machines 111-119. [Crossref]

1915. Simon Odense, Artur d'Avila Garcez. Extracting M of N Rules from Restricted Boltzmann Machines 120-127. [Crossref]

1916. Ido Cohen, Eli David, Nathan S. Netanyahu, Noa Liscovitch, Gal Chechik. DeepBrain: Functional Representation of Neural In-Situ Hybridization Images for Gene Ontology Classification Using Deep Convolutional Autoencoders 287-296. [Crossref]

1917. Manohar Karki, Robert DiBiano, Saikat Basu, Supratik Mukhopadhyay. Core Sampling Framework for Pixel Classification 617-625. [Crossref]

1918. Qazi Sami Ullah Khan, Jianwu Li, Shuyang Zhao. Training Deep Autoencoder via VLC-Genetic Algorithm 13-22. [Crossref]

1919. Qianli Ma, Lifeng Shen, Ruishi Su, Jieyu Chen. Two-Stage Temporal Multimodal Learning for Speaker and Speech Recognition 64-72. [Crossref]

1920. Mohammad Ahangar Kiasari, Dennis Singh Moirangthem, Minho Lee. Generative Moment Matching Autoencoder with Perceptual Loss 226-234. [Crossref]

1921. Geonmin Kim, Hwaran Lee, Bokyeong Kim, Soo-young Lee. Compositional Sentence Representation from Character Within Large Context Text 674-685. [Crossref]

1922. Sibo Feng, Shijia Li, Ping Guo, Qian Yin. Image Recognition with Histogram of Oriented Gradient Feature and Pseudoinverse Learning AutoEncoders 740-749. [Crossref]

1923. Jie-Hao Chen, Zi-Qian Zhao, Ji-Yun Shi, Chong Zhao. 2017. A New Approach for Mobile Advertising Click-Through Rate Estimation Based on Deep Belief Nets. *Computational Intelligence and Neuroscience* **2017**, 1-8. [Crossref]

1924. Dong Liu, Zhidong Cao, Su Li. Using Deep Learning to Mine the Key Factors of the Cost of AIDS Treatment 280-285. [Crossref]

1925. Aniruddha Parvat, Jai Chavan, Siddhesh Kadam, Souradeep Dev, Vidhi Pathak. A survey of deep-learning frameworks 1-7. [Crossref]

1926. Deepika Singh, Erinc Merdivan, Sten Hanke, Johannes Kropf, Matthieu Geist, Andreas Holzinger. Convolutional and Recurrent Neural Networks for Activity Recognition in Smart Environment 194-205. [Crossref]

1927. Suman Samui, Indrajit Chakrabarti, Soumya K. Ghosh. Improving the Performance of Deep Learning Based Speech Enhancement System Using Fuzzy Restricted Boltzmann Machine 534-542. [Crossref]

1928. Jiasong Wu, Shijie Qiu, Rui Zeng, Lotfi Senhadji, Huazhong Shu. PCANet for Color Image Classification in Various Color Spaces 494-505. [Crossref]

1929. Myroslav Komar, Anatoliy Sachenko, Sergei Bezobrazov, Vladimir Golovko. Intelligent Cyber Defense System Using Artificial Neural Network and Immune System Techniques 36-55. [Crossref]

1930. Hojin Kim, Jungwon Kwak, Chiyoung Jeong, Byungchul Cho. 2017. Institutional Applications of Eclipse Scripting Programming Interface to Clinical Workflows in Radiation Oncology. *Progress in Medical Physics* **28**:3, 122. [Crossref]

1931. Xiaoyu Zhang, Rui Wang, Tao Zhang, Yajie Liu, Yabin Zha. Effect of Transfer Functions in Deep Belief Network for Short-Term Load Forecasting 511-522. [Crossref]

1932. Rafael T. Gonzalez, Jaime A. Riascos, Dante A. C. Barone. How Artificial Intelligence is Supporting Neuroscience Research: A Discussion About Foundations, Methods and Applications 63-77. [Crossref]

1933. Se-Hui Song, Dong Keun Kim. 2017. Development of a Stress Classification Model Using Deep Belief Networks for Stress Monitoring. *Healthcare Informatics Research* **23**:4, 285. [Crossref]

1934. Zhibin Yu, Yubo Wang, Bing Zheng, Haiyong Zheng, Nan Wang, Zhaorui Gu. 2017. Underwater Inherent Optical Properties Estimation Using a Depth Aided Deep Neural Network. *Computational Intelligence and Neuroscience* **2017**, 1-8. [Crossref]

1935. Zhiqiang Ma, Tuya Li, Shuangtao Yang, Li Zhang. A Pipelined Pre-training Algorithm for DBNs 48-59. [Crossref]

1936. Prasenjit Dey, Abhijit Ghosh, Tandra Pal. Regularized Stacked Auto-Encoder Based Pre-training for Generalization of Multi-layer Perceptron 232-242. [Crossref]

1937. Sahar Arshi, Darryl N. Davis. Capturing the Dynamics of Cellular Automata, for the Generation of Synthetic Persian Music, Using Conditional Restricted Boltzmann Machines 72-86. [Crossref]

1938. Md. Moniruzzaman, Syed Mohammed Shamsul Islam, Mohammed Bennamoun, Paul Lavery. Deep Learning on Underwater Marine Object Detection: A Survey 150-160. [Crossref]

1939. Giuseppe Manco, Giuseppe Pirrò. Differential Privacy and Neural Networks: A Preliminary Analysis 23-35. [Crossref]

1940. Wulamu Aziguli, Yuanyu Zhang, Yonghong Xie, Dezheng Zhang, Xiong Luo, Chunmiao Li, Yao Zhang. 2017. A Robust Text Classifier Based on Denoising Deep Neural Network in the Analysis of Big Data. *Scientific Programming* **2017**, 1-10. [Crossref]

1941. Yuxin Li, Yuanyuan Pu, Dan Xu, Wenhua Qian, Lipeng Wang. Image Aesthetic Quality Evaluation Using Convolution Neural Network Embedded Fine-Tune 269-283. [Crossref]

1942. ## #. 2017. A Method of APT Attack Detection Based on DBN-SVDD. *Computer Science and Application* **07**:11, 1146-1155. [Crossref]

1943. Zubair Md. Fadlullah, Fengxiao Tang, Bomin Mao, Nei Kato, Osamu Akashi, Takeru Inoue, Kimihiro Mizutani. 2017. State-of-the-Art Deep Learning: Evolving Machine Intelligence Toward Tomorrow's Intelligent Network Traffic Control Systems. *IEEE Communications Surveys & Tutorials* **19**:4, 2432-2455. [Crossref]

1944. Marius Leordeanu, Rahul Sukthankar. Towards a Visual Story Network Using Multiple Views for Object Recognition at Different Levels of Spatiotemporal Context 573-610. [Crossref]

1945. Yasushi FUKUDA, Zule XU, Takayuki KAWAHARA. 2017. Robustness Evaluation of Restricted Boltzmann Machine against Memory and Logic Error. *IEICE Transactions on Electronics* **E100.C**:12, 1118-1121. [Crossref]

1946. Sebastian Wedeniwski, Stephen Perun. 1. [Crossref]

1947. Yanhui Chen, Kaijian He, Geoffrey K.F. Tso. 2017. Forecasting Crude Oil Prices: a Deep Learning based Model. *Procedia Computer Science* **122**, 300. [Crossref]

1948. Yingfeng Cai, Youguo He, Hai Wang, Xiaoqiang Sun, Long Chen, Haobin Jiang. 2017. Pedestrian detection algorithm in traffic scene based on weakly supervised hierarchical deep model. *International Journal of Advanced Robotic Systems* **14**:1, 172988141769231. [Crossref]

1949. Fei Ye, Wen-Bo Du. 2017. Particle swarm optimization-based automatic parameter selection for deep neural networks and its applications in large-scale and high-dimensional data. *PLOS ONE* **12**:12, e0188746. [Crossref]

1950. Klymash Yulia, Strykhalyuk Bogdan. Increasing the reliability of distribution systems by the use of intrusion detection system based on ricci flows 385-387. [Crossref]

1951. Michalis Vrigkas, Christophoros Nikou, Ioannis A. Kakadiaris. 2017. Identifying Human Behaviors Using Synchronized Audio-Visual Cues. *IEEE Transactions on Affective Computing* **8**:1, 54-66. [Crossref]

1952. Md. Zia Uddin, Mohammad Mehedi Hassan, Ahmad Almogren, Atif Alamri, Majed Alrubaian, Giancarlo Fortino. 2017. Facial Expression Recognition Utilizing Local Direction-Based Robust Features and Deep Belief Network. *IEEE Access* **5**, 4525-4536. [Crossref]

1953. Soojeong Lee, Joon-Hyuk Chang. 2017. Deep Belief Networks Ensemble for Blood Pressure Estimation. *IEEE Access* **5**, 9962-9972. [Crossref]

1954. Yueqi Duan, Jiwen Lu, Jianjiang Feng, Jie Zhou. 2017. Learning Rotation-Invariant Local Binary Descriptor. *IEEE Transactions on Image Processing* 1-1. [Crossref]

1955. Yingfeng Cai, Ze Liu, Xiaoqiang Sun, Long Chen, Hai Wang, Yong Zhang. 2017. Vehicle Detection Based on Deep Dual-Vehicle Deformable Part Models. *Journal of Sensors* **2017**, 1-10. [Crossref]

1956. Hong Liang, Xiao Sun, Yunlei Sun, Yuan Gao. 2017. Text feature extraction based on deep learning: a review. *EURASIP Journal on Wireless Communications and Networking* **2017**:1. . [Crossref]

1957. Mariem Abbes, Zied Kechaou, Adel M. Alimi. Enhanced Deep Learning Models for Sentiment Analysis in Arab Social Media 667-676. [Crossref]

1958. Qing Ma, Reo Kato, Masaki Murata. Category Prediction of Questions Posted in Community-Based Question Answering Services Using Deep Learning Methods 699-709. [Crossref]

1959. Hojin Jang, Sergey M. Plis, Vince D. Calhoun, Jong-Hwan Lee. 2017. Task-specific feature extraction and classification of fMRI volumes using a deep neural network initialized with a deep belief network: Evaluation using sensorimotor tasks. *NeuroImage* **145**, 314-328. [Crossref]

1960. Masayuki HITOKOTO, Masaaki SAKURABA, Yuichi SEI. 2017. DEVELOPMENT OF THE REAL-TIME RIVER STAGE PREDICTION METHOD USING DEEP LEARNING. *Journal of JSCE* **5**:1, 422-429. [Crossref]

1961. Yang Yu, Zhiqiang Gong, Ping Zhong, Jiaxin Shan. Unsupervised Representation Learning with Deep Convolutional Neural Network for Remote Sensing Images 97-108. [Crossref]

1962. Atif Mughees, Linmi Tao. **10668**, 347. [Crossref]

1963. Hiroyuki KANEKO, Toshihiro OSARAGI. 2017. PEDESTRIAN TRAJECTORY CLASSIFICATION METHOD BY MACHINE LEARNING USING DATA OF LASER-SCANNER TRACKING SYSTEM. *Journal of Environmental Engineering (Transactions of AIJ)* **82**:742, 1051-1059. [Crossref]

1964. Md. Zia Uddin, Weria Khaksar, Jim Torresen. 2017. Facial Expression Recognition Using Salient Features and Convolutional Neural Network. *IEEE Access* **5**, 26146-26161. [Crossref]

1965. Fan Zhang, Chen Hu, Qiang Yin, Wei Li, Heng-Chao Li, Wen Hong. 2017. Multi-Aspect-Aware Bidirectional LSTM Networks for Synthetic Aperture Radar Target Recognition. *IEEE Access* **5**, 26880-26891. [Crossref]

1966. Yang Yu, Zhiqiang Gong, Cheng Wang, Ping Zhong. 2017. An Unsupervised Convolutional Feature Fusion Network for Deep Representation of Remote Sensing Images. *IEEE Geoscience and Remote Sensing Letters* 1-5. [Crossref]

1967. Jun Shi, Xiao Zheng, Yan Li, Qi Zhang, Shihui Ying. 2017. Multimodal Neuroimaging Feature Learning with Multimodal Stacked Deep Polynomial Networks for Diagnosis of Alzheimer's Disease. *IEEE Journal of Biomedical and Health Informatics* 1-1. [Crossref]

1968. Hyunseok Oh, Joon Ha Jung, Byung Chul Jeon, Byeng D. Youn. 2017. Scalable and Unsupervised Feature Engineering Using Vibration-Imaging and Deep Learning for Rotor System Diagnosis. *IEEE Transactions on Industrial Electronics* 1-1. [Crossref]

1969. Qiangchang Wang, Yuanjie Zheng, gongping yang, Weidong Jin, Xinjian Chen, yilong yin. 2017. Multi-Scale Rotation-Invariant Convolutional Neural Networks for Lung Texture Classification. *IEEE Journal of Biomedical and Health Informatics* 1-1. [Crossref]

1970. Esther Galbrun, Pauli Miettinen. What Is Redescription Mining 1-23. [Crossref]

1971. Brenden M. Lake, Tomer D. Ullman, Joshua B. Tenenbaum, Samuel J. Gershman. 2017. Building machines that learn and think like people. *Behavioral and Brain Sciences* **40**. . [Crossref]

1972. Yusuke NAKATANI, Masahiro ISHIZAKI, Shuzo NISHIDA. 2017. ESTIMATION OF WATER QUALITY VARIATION IN A TIDAL RIVER BY APPLYING DEEP LEARNING MODELS. *Journal of Japan Society of Civil Engineers, Ser. B1 (Hydraulic Engineering)* **73**:4, I_1141-I_1146. [Crossref]

1973. Longjie Li, Yang Yu, Shenshen Bai, Ying Hou, Xiaoyun Chen. 2017. An effective two-step intrusion detection approach based on binary classification and k-NN. *IEEE Access* 1-1. [Crossref]

1974. Allah Sargano, Plamen Angelov, Zulfiqar Habib. 2017. A Comprehensive Review on Handcrafted and Learning-Based Action Representation Approaches for Human Activity Recognition. *Applied Sciences* **7**:1, 110. [Crossref]

1975. Chunhui Zhao, Xiaoqing Wan, Genping Zhao, Bing Cui, Wu Liu, Bin Qi. 2017. Spectral-Spatial Classification of Hyperspectral Imagery Based on Stacked Sparse Autoencoder and Random Forest. *European Journal of Remote Sensing* **50**:1, 47-63. [Crossref]

1976. Thijs Kooi, Geert Litjens, Bram van Ginneken, Albert Gubern-Mérida, Clara I. Sánchez, Ritse Mann, Ard den Heeten, Nico Karssemeijer. 2017. Large scale deep learning for computer aided detection of mammographic lesions. *Medical Image Analysis* **35**, 303-312. [Crossref]

1977. Gianfranco Basti. The Quantum Field Theory (QFT) Dual Paradigm in Fundamental Physics and the Semantic Information Content and Measure in Cognitive Sciences 177-210. [Crossref]

1978. Theus H. Aspiras, Vijayan K. Asari. 2017. Hierarchical Autoassociative Polynimial Network (HAP Net) for pattern recognition. *Neurocomputing* **222**, 1-10. [Crossref]

1979. Chao Du, Jun Zhu, Bo Zhang. 2017. Learning Deep Generative Models With Doubly Stochastic Gradient MCMC. *IEEE Transactions on Neural Networks and Learning Systems* 1-13. [Crossref]

1980. Daniel Paul Barrett, Scott Alan Bronikowski, Haonan Yu, Jeffrey Mark Siskind. 2017. Driving Under the Influence (of Language). *IEEE Transactions on Neural Networks and Learning Systems* 1-16. [Crossref]

1981. Enrique Romero Merino, Ferran Mazzanti Castrillejo, Jordi Delgado Pin. 2017. Neighborhood-Based Stopping Criterion for Contrastive Divergence. *IEEE Transactions on Neural Networks and Learning Systems* 1-10. [Crossref]

1982. Tsuyoshi Murata, Yohei Onuki, Shun Nukui, Seiya Inagi, Xule Qiu, Masao Watanabe, Hiroshi Okamoto. Predicting Relations Between RDF Entities by Deep Neural Network 343-354. [Crossref]

1983. Mohamed Elleuch, Najiba Tagougui, Monji Kherallah. 2017. Optimization of DBN using Regularization Methods Applied for Recognizing Arabic Handwritten Script. *Procedia Computer Science* **108**, 2292-2297. [Crossref]

1984. Kai Xu, Vladimir G. Kim, Qixing Huang, Evangelos Kalogerakis. 2017. Data-Driven Shape Analysis and Processing. *Computer Graphics Forum* **36**:1, 101-132. [Crossref]

1985. Kieran Greer. 2017. A new oscillating-error technique for classifiers. *Cogent Engineering* **4**:1. . [Crossref]

1986. Fuyong Xing, Yuanpu Xie, Hai Su, Fujun Liu, Lin Yang. 2017. Deep Learning in Microscopy Image Analysis: A Survey. *IEEE Transactions on Neural Networks and Learning Systems* 1-19. [Crossref]

1987. Rei SONOBE, Tomohito SANO, Hideki HORIE. 2017. Estimating leaf chlorophyll contents of shade grown tea using hyperspectral data. *Journal of the Japan society of photogrammetry and remote sensing* **56**:5, 234-243. [Crossref]

1988. Guoyin Wang. Data-Driven Granular Cognitive Computing 13-24. [Crossref]

1989. Yifeng Li, Fang-Xiang Wu, Alioune Ngom. 2016. A review on machine learning principles for multi-view biological data integration. *Briefings in Bioinformatics* bbw113. [Crossref]

1990. Qichang Wu, Wenhui Diao, Fangzheng Dou, Xian Sun, Xinwei Zheng, Kun Fu, Fei Zhao. 2016. Shape-based object extraction in high-resolution remote-sensing images using deep Boltzmann machine. *International Journal of Remote Sensing* **37**:24, 6012-6022. [Crossref]

1991. Junlin Hu, Jiwen Lu, Yap-Peng Tan, Jie Zhou. 2016. Deep Transfer Metric Learning. *IEEE Transactions on Image Processing* **25**:12, 5576-5588. [Crossref]

1992. Lujia Chen, Chunhui Cai, Vicky Chen, Xinghua Lu. 2016. Learning a hierarchical representation of the yeast transcriptomic machinery using an autoencoder model. *BMC Bioinformatics* **17**:S1. . [Crossref]

1993. Gopinath Mahale, Hamsika Mahale, S. K. Nandy, Ranjani Narayan. 2016. REFRESH: REDEFINE for Face Recognition Using SURE Homogeneous Cores. *IEEE Transactions on Parallel and Distributed Systems* **27**:12, 3602-3616. [Crossref]

1994. Milos Cernak, Alexandros Lazaridis, Afsaneh Asaei, Philip N. Garner. 2016. Composition of Deep and Spiking Neural Networks for Very Low Bit Rate Speech Coding. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **24**:12, 2301-2312. [Crossref]

1995. Muhammad Habib ur Rehman, Chee Sun Liew, Assad Abbas, Prem Prakash Jayaraman, Teh Ying Wah, Samee U. Khan. 2016. Big Data Reduction Methods: A Survey. *Data Science and Engineering* **1**:4, 265-284. [Crossref]

1996. YI SU, SHILEI SUN, YUSUF OZTURK, MAO TIAN. 2016. MEASUREMENT OF UPPER LIMB MUSCLE FATIGUE USING DEEP BELIEF NETWORKS. *Journal of Mechanics in Medicine and Biology* **16**:08, 1640032. [Crossref]

1997. Arief Koesdwiady, Ridha Soua, Fakhreddine Karray. 2016. Improving Traffic Flow Prediction With Weather Information in Connected Cars: A Deep Learning Approach. *IEEE Transactions on Vehicular Technology* **65**:12, 9508-9517. [Crossref]

1998. Ehsan Hosseini-Asl, Jacek M. Zurada, Olfa Nasraoui. 2016. Deep Learning of Part-Based Representation of Data Using Sparse Autoencoders With Nonnegativity Constraints. *IEEE Transactions on Neural Networks and Learning Systems* **27**:12, 2486-2498. [Crossref]

1999. Yoonchang Han, Kyogu Lee. 2016. Detecting fingering of overblown flute sound using sparse feature learning. *EURASIP Journal on Audio, Speech, and Music Processing* **2016**:1. . [Crossref]

2000. Tong Zhang, Wenming Zheng, Zhen Cui, Yuan Zong, Jingwei Yan, Keyu Yan. 2016. A Deep Neural Network-Driven Feature Learning Method for Multi-view Facial Expression Recognition. *IEEE Transactions on Multimedia* **18**:12, 2528-2536. [Crossref]

2001. Milad Kharratzadeh, Thomas Shultz. 2016. Neural implementation of probabilistic models of cognition. *Cognitive Systems Research* **40**, 99-113. [Crossref]

2002. Ya Li, Zhanglin Peng, Depeng Liang, Huiyou Chang, Zhaoquan Cai. 2016. Facial age estimation by using stacked feature composition and selection. *The Visual Computer* **32**:12, 1525-1536. [Crossref]

2003. Richard A. Watson, Rob Mills, C. L. Buckley, Kostas Kouvaris, Adam Jackson, Simon T. Powers, Chris Cox, Simon Tudge, Adam Davies, Loizos Kounios, Daniel Power. 2016. Evolutionary Connectionism: Algorithmic Principles Underlying the Evolution of Biological Organisation in Evo-Devo, Evo-Eco and Evolutionary Transitions. *Evolutionary Biology* **43**:4, 553-581. [Crossref]

2004. Yi Fan, Jiquan Chen, Gabriela Shirkey, Ranjeet John, Susie R. Wu, Hogeun Park, Changliang Shao. 2016. Applications of structural equation modeling (SEM) in ecological studies: an updated review. *Ecological Processes* **5**:1. . [Crossref]

2005. Ibrar Yaqoob, Ibrahim Abaker Targio Hashem, Abdullah Gani, Salimah Mokhtar, Ejaz Ahmed, Nor Badrul Anuar, Athanasios V. Vasilakos. 2016. Big data: From beginning to future. *International Journal of Information Management* **36**:6, 1231-1247. [Crossref]

2006. Laisen Nie, Dingde Jiang, Lei Guo, Shui Yu. 2016. Traffic matrix prediction and estimation based on deep learning in large-scale IP backbone networks. *Journal of Network and Computer Applications* **76**, 16-22. [Crossref]

2007. Jia Liu, Maoguo Gong, Jiaojiao Zhao, Hao Li, Licheng Jiao. 2016. Difference representation learning using stacked restricted Boltzmann machines for change detection in SAR images. *Soft Computing* **20**:12, 4645-4657. [Crossref]

2008. Anders G. Buch, Henrik G. Petersen, Norbert Krüger. 2016. Local shape feature fusion for improved matching, pose estimation and 3D object recognition. *SpringerPlus* **5**:1. . [Crossref]

2009. R. Savitha, Kit Yan Chan, Phyo Phyo San, Sai Ho Ling, S. Suresh. A hybrid Deep Boltzmann Functional Link Network for classification problems 1-6. [Crossref]

2010. Tomás H. Maul. 2016. Improving Neuroevolution with Complementarity-Based Selection Operators. *Neural Processing Letters* **44**:3, 887-911. [Crossref]

2011. Zhiyong Wu, Xiangqian Ding, Guangrui Zhang. 2016. A Novel Method for Classification of ECG Arrhythmias Using Deep Belief Networks. *International Journal of Computational Intelligence and Applications* **15**:04, 1650021. [Crossref]

2012. Jian Zhang, Shifei Ding, Nan Zhang, Yu Xue. 2016. Weight Uncertainty in Boltzmann Machine. *Cognitive Computation* **8**:6, 1064-1073. [Crossref]

2013. Manuel Campos-Taberner, Adriana Romero-Soriano, Carlo Gatta, Gustau Camps-Valls, Adrien Lagrange, Bertrand Le Saux, Anne Beaupere, Alexandre Boulch, Adrien Chan-Hon-Tong, Stephane Herbin, Hicham Randrianarivo, Marin Ferecatu, Michal Shimoni, Gabriele Moser, Devis Tuia. 2016. Processing of Extremely High-Resolution LiDAR and RGB Data: Outcome of the 2015 IEEE GRSS Data Fusion Contest–Part A: 2-D Contest. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* **9**:12, 5547-5559. [Crossref]

2014. Mark Stalzer, Chris Mentzel. 2016. A preliminary review of influential works in data-driven discovery. *SpringerPlus* **5**:1. . [Crossref]

2015. Kasiprasad Mannepalli, Panyam Narahari Sastry, Maloji Suman. 2016. FDBN: Design and development of Fractional Deep Belief Networks for speaker emotion recognition. *International Journal of Speech Technology* **19**:4, 779-790. [Crossref]

2016. Marek Wdowiak, Tomasz Markiewicz, Stanislaw Osowski, Janusz Patera, Wojciech Kozlowski. 2016. Novel segmentation algorithm for identification of cell membrane staining in HER2 images. *Pattern Recognition Letters* **84**, 225-231. [Crossref]

2017. Walter H. L. Pinaya, Ary Gadelha, Orla M. Doyle, Cristiano Noto, André Zugman, Quirino Cordeiro, Andrea P. Jackowski, Rodrigo A. Bressan, João R. Sato. 2016. Using deep belief network modelling to characterize differences in brain morphometry in schizophrenia. *Scientific Reports* **6**:1. . [Crossref]

2018. Lean Yu, Zebin Yang, Ling Tang. 2016. A novel multistage deep belief network based extreme learning machine ensemble learning paradigm for credit risk assessment. *Flexible Services and Manufacturing Journal* **28**:4, 576-592. [Crossref]

2019. X.-X. Yin, Y. Zhang, J. Cao, J.-L. Wu, S. Hadjiloucas. 2016. Exploring the complementarity of THz pulse imaging and DCE-MRIs: Toward a unified multi-channel classification and a deep learning framework. *Computer Methods and Programs in Biomedicine* **137**, 87-114. [Crossref]

2020. Haiping Huang, Taro Toyoizumi. 2016. Unsupervised feature learning from finite data by message passing: Discontinuous versus continuous phase transition. *Physical Review E* **94**:6. . [Crossref]

2021. Qi Zhang, Yang Xiao, Wei Dai, Jingfeng Suo, Congzhi Wang, Jun Shi, Hairong Zheng. 2016. Deep learning based classification of breast tumors with shear-wave elastography. *Ultrasonics* **72**, 150-157. [Crossref]

2022. Xiong Xiao, Shengkui Zhao, Duc Hoang Ha Nguyen, Xionghu Zhong, Douglas L. Jones, Eng Siong Chng, Haizhou Li. 2016. Speech dereverberation for enhancement and recognition using dynamic features constrained deep neural networks and feature adaptation. *EURASIP Journal on Advances in Signal Processing* **2016**:1. . [Crossref]

2023. Tian Gao, Jun Du, Yong Xu, Cong Liu, Li-Rong Dai, Chin-Hui Lee. 2016. Joint training of DNNs by incorporating an explicit dereverberation structure for distant speech recognition. *EURASIP Journal on Advances in Signal Processing* **2016**:1. . [Crossref]

2024. Ruwei Li, Yanan Liu, Yongqiang Shi, Liang Dong, Weili Cui. 2016. ILMSAF based speech enhancement with DNN and noise classification. *Speech Communication* **85**, 53-70. [Crossref]

2025. Guoqiang Zhong, Li-Na Wang, Xiao Ling, Junyu Dong. 2016. An overview on data representation learning: From traditional feature learning to recent deep learning. *The Journal of Finance and Data Science* **2**:4, 265-278. [Crossref]

2026. Daniel L. Marino, Kasun Amarasinghe, Milos Manic. Simultaneous generation-classification using LSTM 1-8. [Crossref]

2027. Gihan J. Mendis, Jin Wei, Arjuna Madanayake. Deep learning-based automated modulation classification for cognitive radio 1-6. [Crossref]

2028. Vikas Singh, Nikhil Baranwal, Rahul K. Sevakula, Nishchal K. Verma, Yan Cui. Layerwise feature selection in Stacked Sparse Auto-Encoder for tumor type prediction 1542-1548. [Crossref]

2029. Dimitrios Kollias, Athanasios Tagaris, Andreas Stafylopatis. On line emotion detection using retrainable deep neural networks 1-8. [Crossref]

2030. Hao Li, Kwangyul Kim, Yoan Shin. Discrimination of RF Harmonics Using Classification Restricted Boltzmann Machine 590-593. [Crossref]

2031. Farhang Sahba. Deep Reinforcement Learning for Object Segmentation in Video Sequences 857-860. [Crossref]

2032. Rui Xie, Andrew Quitadamo, Jianlin Cheng, Xinghua Shi. A predictive model of gene expression using a deep learning framework 676-681. [Crossref]

2033. Kenji Kashima. Nonlinear model reduction by deep autoencoder of noise response data 5750-5755. [Crossref]

2034. Zhengqi Wen, Kehuang Li, Jianhua Tao, Chin-Hui Lee. Deep neural network based voice conversion with a large synthesized parallel corpus 1-5. [Crossref]

2035. Soniya, Sandeep Paul, Lotika Singh. Heterogeneous modular deep neural network for diabetic retinopathy detection 1-6. [Crossref]

2036. Khaled Alrawashdeh, Carla Purdy. Toward an Online Anomaly Intrusion Detection System Based on Deep Learning 195-200. [Crossref]

2037. Al Mehdi Saadat Chowdhury, M. Shahidur Rahman. Towards optimal convolutional neural network parameters for bengali handwritten numerals recognition 431-436. [Crossref]

2038. Charles Siegel, Jeff Daily, Abhinav Vishnu. Adaptive neuron apoptosis for accelerating deep learning on large scale systems 753-762. [Crossref]

2039. Hiroshi Dozono, Gen Niina, Satoru Araki. Convolutional Self Organizing Map 767-771. [Crossref]

2040. Mohtashim Baqar, Azfar Ghani, Azeem Aftab, Saira Arbab, Sajid Yasin. Deep belief networks for iris recognition based on contour detection 72-77. [Crossref]

2041. Hoang Minh Nguyen, Sungpil Woo, Janggwan Im, Taejoon Jun, Daeyoung Kim. A Workload Prediction Approach Using Models Stacking Based on Recurrent Neural Network and Autoencoder 929-936. [Crossref]

2042. Wei Xia, Huiyun Li, Baopu Li. A Control Strategy of Autonomous Vehicles Based on Deep Reinforcement Learning 198-201. [Crossref]

2043. Yangyang Zhao, Qi Yu, Xuda Zhou, Xuehai Zhou, Xi Li, Chao Wang. PIE: A Pipeline Energy-Efficient Accelerator for Inference Process in Deep Neural Networks 1067-1074. [Crossref]

2044. Zehua Zhang, Xiangqian Liu, Yan Cui. Multi-phase Offline Signature Verification System Using Deep Convolutional Generative Adversarial Networks 103-107. [Crossref]

2045. Martin Karafiat, Murali Karthick Baskar, Pavel Matejka, Karel Vesely, Frantisek Grezl, Jan Cernocky. Multilingual BLSTM and speaker-specific vector adaptation in 2016 but babel system 637-643. [Crossref]

2046. Hai B. Huang, Xiao R. Huang, Ren X. Li, Teik C. Lim, Wei P. Ding. 2016. Sound quality prediction of vehicle interior noise using deep belief networks. *Applied Acoustics* **113**, 149-161. [Crossref]

2047. Vicent J. Ribas Ripoll, Anna Wojdel, Enrique Romero, Pablo Ramos, Josep Brugada. 2016. ECG assessment based on neural networks with pretraining. *Applied Soft Computing* **49**, 399-406. [Crossref]

2048. Sanghyun Seo, Seongchul Park, Juntae Kim. Improvement of Network Intrusion Detection Accuracy by Using Restricted Boltzmann Machine 413-417. [Crossref]

2049. Stefan Vlaski, Bicheng Ying, Ali H. Sayed. The brain strategy for online learning 1285-1289. [Crossref]

2050. Milad Zafar Nezhad, Dongxiao Zhu, Xiangrui Li, Kai Yang, Phillip Levy. SAFS: A deep feature selection approach for precision medicine 501-506. [Crossref]

2051. Kaida Song, Yi Liu, Rui Wang, Meiting Zhao, Ziyu Hao, Depei Qian. Restricted Boltzmann Machines and Deep Belief Networks on Sunway Cluster 245-252. [Crossref]

2052. Hongcui Wang, Kuntharrgyal Khyuru, Jian Li, Guanyu Li, Jianwu Dang, Lixia Huang. Investigation on acoustic modeling with different phoneme set for continuous Lhasa Tibetan recognition based on DNN method 1-4. [Crossref]

2053. Tiantong Guo, Hojjat S. Mousavi, Vishal Monga. Deep learning based image super-resolution with coupled backpropagation 237-241. [Crossref]

2054. Anzi Ding, Xinmin Zhou. Land-Use Classification with Remote Sensing Image Based on Stacked Autoencoder 145-149. [Crossref]

2055. Le Lv, Dongbin Zhao, Qingqiong Deng. Image clustering based on deep sparse representations 1-6. [Crossref]

2056. Tae Joon Jun, Hyun Ji Park, Nguyen Hoang Minh, Daeyoung Kim, Young-Hak Kim. Premature Ventricular Contraction Beat Detection with Deep Neural Networks 859-864. [Crossref]

2057. Yifu Wu, Gihan J. Mendis, Youbiao He, Jin Wei, Bri-Mathias Hodge. An Attack-Resilient Middleware Architecture for Grid Integration of Distributed Energy Resources 485-491. [Crossref]

2058. Yu-Chieh Ho, Xianming Liu, Jane Yung-Jen Hsu, Thomas S. Huang. Consensus Oriented Recommendation 294-297. [Crossref]

2059. Bo Wu, Kehuang Li, Minglei Yang, Chin-Hui Lee. A study on target feature activation and normalization and their impacts on the performance of DNN based speech dereverberation systems 1-4. [Crossref]

2060. Na Li, Man-Wai Mak, Jen-Tzung Chien. Deep neural network driven mixture of PLDA for robust i-vector speaker verification 186-191. [Crossref]

2061. Al Mehdi Saadat Chowdhury, M. Shahidur Rahman. Towards optimal shallow ANN for recognizing isolated handwritten Bengali numerals 194-197. [Crossref]

2062. Chao Yuan, Amit Chakraborty. Deep Convolutional Factor Analyser for Multivariate Time Series Modeling 1323-1328. [Crossref]

2063. Laisen Nie, Dingde Jiang, Lei Guo, Shui Yu, Houbing Song. Traffic Matrix Prediction and Estimation Based on Deep Learning for Data Center Networks 1-6. [Crossref]

2064. Yingming Gao, Yanlu Xie, Ju Lin, Jinsong Zhang. DNN based detection of pronunciation erroneous tendency in data sparse condition 1-5. [Crossref]

2065. Hanshu Cai, Xiaocong Sha, Xue Han, Shixin Wei, Bin Hu. Pervasive EEG diagnosis of depression using Deep Belief Network with three-electrodes EEG collector 1239-1246. [Crossref]

2066. Akshat Agarwal, Nishchal K. Verma. Generalization ability of majority vote point classifiers for motor fault diagnosis 844-849. [Crossref]

2067. Nian Liu, Jiang-ming Kan. 2016. Improved deep belief networks and multi-feature fusion for leaf identification. *Neurocomputing* **216**, 460-467. [Crossref]

2068. Rui Zeng, Jiasong Wu, Zhuhong Shao, Yang Chen, Beijing Chen, Lotfi Senhadji, Huazhong Shu. 2016. Color image classification via quaternion principal component analysis network. *Neurocomputing* **216**, 416-428. [Crossref]

2069. Adam N. Sanborn, Nick Chater. 2016. Bayesian Brains without Probabilities. *Trends in Cognitive Sciences* **20**:12, 883-893. [Crossref]

2070. Peng Jiang, Zhixin Hu, Jun Liu, Shanen Yu, Feng Wu. 2016. Fault Diagnosis Based on Chemical Sensor Data with an Active Deep Neural Network. *Sensors* **16**:12, 1695. [Crossref]

2071. Carlos De Niz, Raziur Rahman, Xiangyuan Zhao, Ranadip Pal. 2016. Algorithms for Drug Sensitivity Prediction. *Algorithms* **9**:4, 77. [Crossref]

2072. Lucas Pastur-Romay, Francisco Cedrón, Alejandro Pazos, Ana Porto-Pazos. 2016. Deep Artificial Neural Networks and Neuromorphic Chips for Big Data Analysis: Pharmaceutical and Bioinformatics Applications. *International Journal of Molecular Sciences* **17**:12, 1313. [Crossref]

2073. Hyeon-min Shim, Hongsub An, Sanghyuk Lee, Eung Lee, Hong-ki Min, Sangmin Lee. 2016. EMG Pattern Classification by Split and Merge Deep Belief Network. *Symmetry* **8**:12, 148. [Crossref]

2074. Mehdi Sajjadi, Mojtaba Seyedhosseini, Tolga Tasdizen. 2016. Disjunctive normal networks. *Neurocomputing* **218**, 276-285. [Crossref]

2075. Bohan Zhuang, Lijun Wang, Huchuan Lu. 2016. Visual tracking via shallow and deep collaborative model. *Neurocomputing* **218**, 61-71. [Crossref]

2076. Anderson T. Sergio, Tiago P.F. de Lima, Teresa B. Ludermir. 2016. Dynamic selection of forecast combiners. *Neurocomputing* **218**, 37-50. [Crossref]

2077. Zhen Huang, Sabato Marco Siniscalchi, Chin-Hui Lee. 2016. A unified approach to transfer learning of deep neural networks with applications to speaker adaptation in automatic speech recognition. *Neurocomputing* **218**, 448-459. [Crossref]

2078. De-long Feng, Ming-qing Xiao, Ying-xi Liu, Hai-fang Song, Zhao Yang, Ze-wen Hu. 2016. Finite-sensor fault-diagnosis simulation study of gas turbine engine

using information entropy and deep belief networks. *Frontiers of Information Technology & Electronic Engineering* **17**:12, 1287-1304. [Crossref]

2079. Cheoneum Park, Kyoung-Ho Choi, Changki Lee, Soojong Lim. 2016. Korean Coreference Resolution with Guided Mention Pair Model Using Deep Learning. *ETRI Journal* **38**:6, 1207-1217. [Crossref]

2080. Sizhe Huang, Huosheng Xu, Xuezhi Xia. 2016. Active deep belief networks for ship recognition based on BvSB. *Optik - International Journal for Light and Electron Optics* **127**:24, 11688-11697. [Crossref]

2081. Jinhui Tang, Xiangbo Shu, Zechao Li, Guo-Jun Qi, Jingdong Wang. 2016. Generalized Deep Transfer Networks for Knowledge Propagation in Heterogeneous Domains. *ACM Transactions on Multimedia Computing, Communications, and Applications* **12**:4s, 1-22. [Crossref]

2082. C. Bartolozzi, R. Benosman, K. Boahen, G. Cauwenberghs, Tobi Delbrück, Giacomo Indiveri, Shih-Chii Liu, S. Furber, N. Imam, Bernabé Linares-Barranco, Teresa Serrano-Gotarredona, K. Meier, C. Posch, M. Valle. Neuromorphic Systems 1-22. [Crossref]

2083. Tomoyuki Obuchi, Hirokazu Koma, Muneki Yasuda. 2016. Boltzmann-Machine Learning of Prior Distributions of Binarized Natural Images. *Journal of the Physical Society of Japan* **85**:11, 114803. [Crossref]

2084. Luca Simione, Stefano Nolfi. 2016. The Emergence of Selective Attention through Probabilistic Associations between Stimuli and Actions. *PLOS ONE* **11**:11, e0166174. [Crossref]

2085. Timothy P. Lillicrap, Daniel Cownden, Douglas B. Tweed, Colin J. Akerman. 2016. Random synaptic feedback weights support error backpropagation for deep learning. *Nature Communications* **7**, 13276. [Crossref]

2086. Shan Han, Xiaoning Jin, Jianxun Li. 2016. An assessment method for the impact of missing data in the rough set-based decision fusion. *Intelligent Data Analysis* **20**:6, 1267-1284. [Crossref]

2087. Qian Liu, Garibaldi Pineda-García, Evangelos Stromatias, Teresa Serrano-Gotarredona, Steve B. Furber. 2016. Benchmarking Spike-Based Visual Recognition: A Dataset and Evaluation. *Frontiers in Neuroscience* **10**. . [Crossref]

2088. Aleksandra Dedinec, Sonja Filiposka, Aleksandar Dedinec, Ljupco Kocarev. 2016. Deep belief network based electricity load forecasting: An analysis of Macedonian case. *Energy* **115**, 1688-1700. [Crossref]

2089. Nikolaos Sarafianos, Bogdan Boteanu, Bogdan Ionescu, Ioannis A. Kakadiaris. 2016. 3D Human pose estimation: A review of the literature and analysis of covariates. *Computer Vision and Image Understanding* **152**, 1-20. [Crossref]

2090. D. Pickup, X. Sun, P. L. Rosin, R. R. Martin, Z. Cheng, Z. Lian, M. Aono, A. Ben Hamza, A. Bronstein, M. Bronstein, S. Bu, U. Castellani, S. Cheng, V. Garro, A. Giachetti, A. Godil, L. Isaia, J. Han, H. Johan, L. Lai, B. Li, C. Li, H. Li, R. Litman, X. Liu, Z. Liu, Y. Lu, L. Sun, G. Tam, A. Tatsuma, J. Ye. 2016. Shape

Retrieval of Non-rigid 3D Human Models. *International Journal of Computer Vision* **120**:2, 169-193. [Crossref]

2091. Alexandros Iosifidis, Moncef Gabbouj. Hierarchical class-specific kernel discriminant analysis for face verification 1-4. [Crossref]

2092. Aggelos Gkiokas, Vassilis Katsouros, George Carayannis. 2016. Towards Multi-Purpose Spectral Rhythm Features: An Application to Dance Style, Meter and Tempo Estimation. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **24**:11, 1885-1896. [Crossref]

2093. Kai Wang, Jun Zhou, Ning Liu, Xiao Gu. Stereoscopic images quality assessment based on deep learning 1-4. [Crossref]

2094. Hiranmayi Ranganathan, Shayok Chakraborty, Sethuraman Panchanathan. Transfer of multimodal emotion features in deep belief networks 449-453. [Crossref]

2095. Shengchen Fang, Hsiao-Dong Chiang. 2016. Improving supervised wind power forecasting models using extended numerical weather variables and unlabelled data. *IET Renewable Power Generation* **10**:10, 1616-1624. [Crossref]

2096. Weijiang Feng, Naiyang Guan, Zhigang Luo. High-performance audio matching with features learned by convolutional deep belief network 1724-1728. [Crossref]

2097. Mingmin Chi, Antonio Plaza, Jon Atli Benediktsson, Zhongyi Sun, Jinsheng Shen, Yangyong Zhu. 2016. Big Data for Remote Sensing: Challenges and Opportunities. *Proceedings of the IEEE* **104**:11, 2207-2219. [Crossref]

2098. Jiateng Yin, Wentian Zhao. 2016. Fault diagnosis network design for vehicle on-board equipments of high-speed railway: A deep learning approach. *Engineering Applications of Artificial Intelligence* **56**, 250-259. [Crossref]

2099. Milos Cernak, Afsaneh Asaei, Hervé Bourlard. 2016. On structured sparsity of phonological posteriors for linguistic parsing. *Speech Communication* **84**, 36-45. [Crossref]

2100. Haytham Assem, Lei Xu, Teodora Sandra Buda, Declan O'Sullivan. 2016. Machine learning as a service for enabling Internet of Things and People. *Personal and Ubiquitous Computing* **20**:6, 899-914. [Crossref]

2101. Zhizhong Han, Zhenbao Liu, Junwei Han, Chi-Man Vong, Shuhui Bu, Xuelong Li. 2016. Unsupervised 3D Local Feature Learning by Circle Convolutional Restricted Boltzmann Machine. *IEEE Transactions on Image Processing* **25**:11, 5331-5344. [Crossref]

2102. Andrés Ortiz, Jorge Munilla, Juan M. Górriz, Javier Ramírez. 2016. Ensembles of Deep Learning Architectures for the Early Diagnosis of the Alzheimer's Disease. *International Journal of Neural Systems* **26**:07, 1650025. [Crossref]

2103. H.Z. Wang, G.B. Wang, G.Q. Li, J.C. Peng, Y.T. Liu. 2016. Deep belief network based deterministic and probabilistic wind speed forecasting approach. *Applied Energy* **182**, 80-93. [Crossref]

2104. Junlin Hu, Jiwen Lu, Yap-Peng Tan. 2016. Deep Metric Learning for Visual Tracking. *IEEE Transactions on Circuits and Systems for Video Technology* **26**:11, 2056-2068. [Crossref]

2105. Chang-Hung Tsai, Wan-Ju Yu, Wing Hung Wong, Chen-Yi Lee. A 41.3pJ/26.7pJ per neuron weight RBM processor for on-chip learning/inference applications 265-268. [Crossref]

2106. Xin-Qi Bao, Yun-Fang Wu. 2016. A Tensor Neural Network with Layerwise Pretraining: Towards Effective Answer Retrieval. *Journal of Computer Science and Technology* **31**:6, 1151-1160. [Crossref]

2107. Hong Wang, Xicheng Wang, Zheng Li, Keqiu Li. 2016. Kriging-Based Parameter Estimation Algorithm for Metabolic Networks Combined with Single-Dimensional Optimization and Dynamic Coordinate Perturbation. *IEEE/ACM Transactions on Computational Biology and Bioinformatics* **13**:6, 1142-1154. [Crossref]

2108. Yong Jin, Harry Zhang, Donglei Du. Improving Deep Belief Networks via Delta Rule for Sentiment Classification 410-414. [Crossref]

2109. Xiang Li, Ling Peng, Yuan Hu, Jing Shao, Tianhe Chi. 2016. Deep learning architecture for air quality predictions. *Environmental Science and Pollution Research* **23**:22, 22408-22417. [Crossref]

2110. Wanli Ouyang, Xingyu Zeng, Xiaogang Wang. 2016. Partial Occlusion Handling in Pedestrian Detection With a Deep Model. *IEEE Transactions on Circuits and Systems for Video Technology* **26**:11, 2123-2137. [Crossref]

2111. Meng Wang, Jin Xie, Fan Zhu, Yi Fang. 2016. Linear discrimination dictionary learning for shape descriptors. *Pattern Recognition Letters* **83**, 349-356. [Crossref]

2112. Toru Nakashika, Tetsuya Takiguchi, Yasuhiro Minami. 2016. Non-Parallel Training in Voice Conversion Using an Adaptive Restricted Boltzmann Machine. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **24**:11, 2032-2045. [Crossref]

2113. Antonio Martínez-Álvarez, Rubén Crespo-Cano, Ariadna Díaz-Tahoces, Sergio Cuenca-Asensi, José Manuel Ferrández Vicente, Eduardo Fernández. 2016. Automatic Tuning of a Retina Model for a Cortical Visual Neuroprosthesis Using a Multi-Objective Optimization Genetic Algorithm. *International Journal of Neural Systems* **26**:07, 1650021. [Crossref]

2114. B. Chandra, Rajesh K. Sharma. 2016. Deep learning with adaptive learning rate using laplacian score. *Expert Systems with Applications* **63**, 1-7. [Crossref]

2115. Zhijun Fang, Fengchang Fei, Yuming Fang, Changhoon Lee, Naixue Xiong, Lei Shu, Sheng Chen. 2016. Abnormal event detection in crowded scenes based on deep learning. *Multimedia Tools and Applications* **75**:22, 14617-14639. [Crossref]

2116. Chuan Li, Yun Bai, Bo Zeng. 2016. Deep Feature Learning Architectures for Daily Reservoir Inflow Forecasting. *Water Resources Management* **30**:14, 5145-5161. [Crossref]

2117. Massimo Buscema, Pier Luigi Sacco. 2016. MST Fitness Index and implicit data narratives: A comparative test on alternative unsupervised algorithms. *Physica A: Statistical Mechanics and its Applications* **461**, 726-746. [Crossref]

2118. Ali Orkan Bayer, Giuseppe Riccardi. 2016. Semantic language models with deep neural networks. *Computer Speech & Language* **40**, 1-22. [Crossref]

2119. Hongsheng Wen, Zhiqiang Chen, Jianping Gu, Qiangqiang Zhu. Big Data Analysis on Radiographic Image Quality 341-346. [Crossref]

2120. Earnest Paul Ijjina, Krishna Mohan Chalavadi. 2016. Human action recognition using genetic algorithms and convolutional neural networks. *Pattern Recognition* **59**, 199-212. [Crossref]

2121. Jiande Sun, Xiaocui Liu, Wenbo Wan, Jing Li, Dong Zhao, Huaxiang Zhang. 2016. Video hashing based on appearance and attention features fusion via DBN. *Neurocomputing* **213**, 84-94. [Crossref]

2122. Alberto Prieto, Beatriz Prieto, Eva Martinez Ortigosa, Eduardo Ros, Francisco Pelayo, Julio Ortega, Ignacio Rojas. 2016. Neural networks: An overview of early research, current frameworks and new challenges. *Neurocomputing* **214**, 242-268. [Crossref]

2123. Jingyu Gao, Jinfu Yang, Guanghui Wang, Mingai Li. 2016. A novel feature extraction method for scene recognition based on Centered Convolutional Restricted Boltzmann Machines. *Neurocomputing* **214**, 708-717. [Crossref]

2124. Huaqing Yan, Zenghui Zhang, Gang Xiong, Wenxian Yu. Radar HRRP recognition based on sparse denoising autoencoder and multi-layer perceptron deep model 283-288. [Crossref]

2125. Jou-Fan Chen, Wei-Lun Chen, Chun-Ping Huang, Szu-Hao Huang, An-Pin Chen. Financial Time-Series Data Analysis Using Deep Convolutional Neural Networks 87-92. [Crossref]

2126. Chaiyaphum Siripanpornchana, Sooksan Panichpapiboon, Pimwadee Chaovalit. Travel-time prediction with deep learning 1859-1862. [Crossref]

2127. Gihan J. Mendis, Tharindu Randeny, Jin Wei, Arjuna Madanayake. Deep learning based doppler radar for micro UAS detection and classification 924-929. [Crossref]

2128. Hantao Huang, Leibin Ni, Yuhao Wang, Hao Yu, Zongwei Wangl, Yimao Cail, Ru Huangl. A 3D multi-layer CMOS-RRAM accelerator for neural network 1-5. [Crossref]

2129. Kentaro Orimo, Kota Ando, Kodai Ueyoshi, Masayuki Ikebe, Tetsuya Asai, Masato Motomura. FPGA architecture for feed-forward sequential memory network targeting long-term time-series forecasting 1-6. [Crossref]

2130. Pierre Baldi, Peter Sadowski. 2016. A theory of local learning, the learning channel, and the optimality of backpropagation. *Neural Networks* **83**, 51-74. [Crossref]

2131. Shin Kamada, Takumi Ichimura. Fine tuning method by using knowledge acquisition from Deep Belief Network 119-124. [Crossref]

2132. Yuhan Jia, Jianping Wu, Yiman Du. Traffic speed prediction using deep learning method 1217-1222. [Crossref]

2133. Shin Kamada, Takumi Ichimura. An adaptive learning method of Deep Belief Network by layer generation algorithm 2967-2970. [Crossref]

2134. Qi Liu, Tian Tan, Kai Yu. An investigation on deep learning with beta stabilizer 557-561. [Crossref]

2135. Ao Dai, Haijian Zhang, Hong Sun. Automatic modulation classification using stacked sparse auto-encoders 248-252. [Crossref]

2136. Hugo Leonardo Marcolino dos Santos, Bruno Jose Torres Fernandes, Sergio Murilo Maciel Fernandes. An AutoAssociative Neural Network for image segmentation 1-6. [Crossref]

2137. Juanjuan Cai, Nana Wang, Hui Wang, Bing Zhu. Research on the recognition of isolated Chinese lyrics in songs with accompaniment based on deep belief networks 535-540. [Crossref]

2138. Zhi Liu, Chenyang Zhang, Yingli Tian. 2016. 3D-based Deep Convolutional Neural Network for action recognition with depth sequences. *Image and Vision Computing* **55**, 93-100. [Crossref]

2139. Fan Zhu, Ling Shao, Jin Xie, Yi Fang. 2016. From handcrafted to learned representations for human action recognition: A survey. *Image and Vision Computing* **55**, 42-52. [Crossref]

2140. Tianchuan Du, Li Liao, Cathy H. Wu, Bilin Sun. 2016. Prediction of residue-residue contact matrix for protein-protein interaction with Fisher score features and deep learning. *Methods* **110**, 97-105. [Crossref]

2141. Kai Tian, Mingyu Shao, Yang Wang, Jihong Guan, Shuigeng Zhou. 2016. Boosting compound-protein interaction prediction by deep learning. *Methods* **110**, 64-72. [Crossref]

2142. Junghan Baek and, Keemin Sohn. 2016. Deep-Learning Architectures to Forecast Bus Ridership at the Stop and Stop-To-Stop Levels for Dense and Crowded Bus Networks. *Applied Artificial Intelligence* **30**:9, 861-885. [Crossref]

2143. Shabnam Ghaffarzadegan, Hynek Boril, John H. L. Hansen. 2016. Generative Modeling of Pseudo-Whisper for Robust Whispered Speech Recognition. *IEEE/ ACM Transactions on Audio, Speech, and Language Processing* **24**:10, 1705-1720. [Crossref]

2144. Yi Sun, Xiaogang Wang, Xiaoou Tang. 2016. Hybrid Deep Learning for Face Verification. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **38**:10, 1997-2009. [Crossref]

2145. Sun Zhihong. Marine speech cloud design and implementation 53-56. [Crossref]

2146. Hang Su, Yusi Zhang, Jingsong Li, Jie Hu. The shopping assistant Robot design based on ROS and deep learning 173-176. [Crossref]

2147. Sarah M. Erfani, Sutharshan Rajasegarar, Shanika Karunasekera, Christopher Leckie. 2016. High-dimensional and large-scale anomaly detection using a linear one-class SVM with deep learning. *Pattern Recognition* **58**, 121-134. [Crossref]

2148. Yi Jiang, Wei Li, Yuanyuan Zu, Runsheng Liu, Chao Ma. A DNN parameter mask for the binaural reverberant speech segregation 959-963. [Crossref]

2149. Wanli Ouyang, Xingyu Zeng, Xiaogang Wang. 2016. Learning Mutual Visibility Relationship for Pedestrian Detection with a Deep Model. *International Journal of Computer Vision* **120**:1, 14-27. [Crossref]

2150. Dylan Cannisi, Bo Yuan. Design Space Exploration for K-Nearest Neighbors Classification Using Stochastic Computing 321-326. [Crossref]

2151. Giacomo Torlai, Roger G. Melko. 2016. Learning thermodynamics with Boltzmann machines. *Physical Review B* **94**:16. . [Crossref]

2152. Renliang Weng, Jiwen Lu, Yap-Peng Tan, Jie Zhou. 2016. Learning Cascaded Deep Auto-Encoder Networks for Face Alignment. *IEEE Transactions on Multimedia* **18**:10, 2066-2078. [Crossref]

2153. Shengke Wang, Long Chen, Zixi Zhou, Xin Sun, Junyu Dong. 2016. Human fall detection in surveillance video based on PCANet. *Multimedia Tools and Applications* **75**:19, 11603-11613. [Crossref]

2154. Zeng Yu, Ning Yu, Yi Pan, Tianrui Li. A Novel Deep Learning Network Architecture with Cross-Layer Neurons 111-117. [Crossref]

2155. Xiaodong Song, Ganlin Zhang, Feng Liu, Decheng Li, Yuguo Zhao, Jinling Yang. 2016. Modeling spatio-temporal distribution of soil moisture by deep learning-based cellular automata model. *Journal of Arid Land* **8**:5, 734-748. [Crossref]

2156. Iftitahu Ni'mah, Rifki Sadikin. Deep architectures for super-symmetric particle classification with noise labelling 169-174. [Crossref]

2157. Xin Sun, Junyu Shi, Junyu Dong, Xinhua Wang. Fish recognition from low-resolution underwater images 471-476. [Crossref]

2158. Yushi Chen, Hanlu Jiang, Chunyang Li, Xiuping Jia, Pedram Ghamisi. 2016. Deep Feature Extraction and Classification of Hyperspectral Images Based on Convolutional Neural Networks. *IEEE Transactions on Geoscience and Remote Sensing* **54**:10, 6232-6251. [Crossref]

2159. Pedram Ghamisi, Yushi Chen, Xiao Xiang Zhu. 2016. A Self-Improving Convolution Neural Network for the Classification of Hyperspectral Data. *IEEE Geoscience and Remote Sensing Letters* **13**:10, 1537-1541. [Crossref]

2160. Di Fan, Lu Wei, Maoyong Cao. 2016. Extraction of target region in lung immunohistochemical image based on artificial neural network. *Multimedia Tools and Applications* **75**:19, 12227-12244. [Crossref]

2161. Zhengqi Wen, Kehuang Li, Zhen Huang, Jianhua Tao, Chin-Hui Lee. Learning auxiliary categorical information for speech synthesis based on deep and recurrent neural networks 1-5. [Crossref]

2162. Ju Lin, Yanlu Xie, Yingming Gao, Jinsong Zhang. Improving Mandarin tone recognition based on DNN by combining acoustic and articulatory features 1-5. [Crossref]

2163. Zhili Tan, Yingke Zhu, Man-Wai Mak, Brian Kan-Wing Mak. Senone I-vectors for robust speaker verification 1-5. [Crossref]

2164. Shanliang Yang, Zhengyu Xia. A convolutional neural network method for Chinese document sentiment analyzing 308-312. [Crossref]

2165. Hantao Huang, Leibin Ni, Hao Yu. A 3D multi-layer CMOS-RRAM accelerator for multi-layer machine learning 186-188. [Crossref]

2166. Shin Kamada, Takumi Ichimura. An adaptive learning method of Restricted Boltzmann Machine by neuron generation and annihilation algorithm 001273-001278. [Crossref]

2167. J. F. Wu, Y. L. Bao, S. C. Chan, H. C. Wu, L. Zhang, X. G. Wei. Myocardial infarction detection and classification — A new multi-scale deep feature learning approach 309-313. [Crossref]

2168. Shifu Hou, Aaron Saas, Lifei Chen, Yanfang Ye. Deep4MalDroid: A Deep Learning Framework for Android Malware Detection Based on Linux Kernel System Call Graphs 104-111. [Crossref]

2169. Pedro J. Soto Vega, Raul Queiroz Feitosa, Victor H. Ayma Quirita, Patrick Nigri Happ. Single Sample Face Recognition from Video via Stacked Supervised Auto-Encoder 96-103. [Crossref]

2170. Dewa Made Sri Arsa, Grafika Jati, Aprinaldi Jasa Mantau, Ito Wasito. Dimensionality reduction using deep belief network in big data case study: Hyperspectral image classification 71-76. [Crossref]

2171. Chun-Fu Chen, Gwo Giun Lee, Vincent Sritapan, Ching-Yung Lin. Deep Convolutional Neural Network on iOS Mobile Devices 130-135. [Crossref]

2172. Ye Seon Lee, William Hetchily, Joseph Shelton, Dylan Gunn, Kaushik Roy, Albert Esterline, Xiaohong Yuan. Touch based active user authentication using Deep Belief Networks and Random Forests 304-308. [Crossref]

2173. Aldonso Becerra, J. Ismael de la Rosa, Efren Gonzalez. A case study of speech recognition in Spanish: From conventional to deep approach 1-4. [Crossref]

2174. Mazdak Fatahi, Mahmood Ahmadi, Arash Ahmadi, Mahyar Shahsavari, Philippe Devienne. Towards an spiking deep belief network for face recognition application 153-158. [Crossref]

2175. Hardik Sharma, Jongse Park, Divya Mahajan, Emmanuel Amaro, Joon Kyung Kim, Chenkai Shao, Asit Mishra, Hadi Esmaeilzadeh. From high-level deep neural models to FPGAs 1-12. [Crossref]

2176. Tanmay Bhowmik, Shyamal Kumar Das Mandal. Deep neural network based phonological feature extraction for Bengali continuous speech 1-5. [Crossref]

2177. Wei Liu, Shuiping Gou, Wenshuai Chen, Changfeng Zhao, Licheng Jiao. Classification of interferometric synthetic aperture radar image with deep learning approach 1-3. [Crossref]

2178. Hongbo Li, Wei Jing, Yang Bai. Radar emitter recognition based on deep learning architecture 1-5. [Crossref]

2179. Li Zhang, Hongli Gao. A deep learning-based multi-sensor data fusion method for degradation monitoring of ball screws 1-6. [Crossref]

2180. Huang Yi, Sun Shiyu, Duan Xiusheng, Chen Zhigang. A study on Deep Neural Networks framework 1519-1522. [Crossref]

2181. Zhe Xiao, Ruohan Huang, Yi Ding, Tian Lan, RongFeng Dong, Zhiguang Qin, Xinjie Zhang, Wei Wang. A deep learning-based segmentation method for brain tumor in MR images 1-6. [Crossref]

2182. Erick De la Rosa, Wen Yu, Xiaoou Li. Nonlinear system modeling with deep neural networks and autoencoders algorithm 002157-002162. [Crossref]

2183. Masanori Suganuma, Daiki Tsuchiya, Shinichi Shirakawa, Tomoharu Nagao. Hierarchical feature construction for image classification using Genetic Programming 001423-001428. [Crossref]

2184. Tharun Kumar Reddy, Laxmidhar Behera. Online Eye state recognition from EEG data using Deep architectures 000712-000717. [Crossref]

2185. Nana Fan, Jun Du, Li-Rong Dai. A regression approach to binaural speech segregation via deep neural network 1-5. [Crossref]

2186. Yan-Hui Tu, Jun Du, Li-Rong Dai, Chin-Hui Lee. A speaker-dependent deep learning approach to joint speech separation and acoustic modeling for multi-talker automatic speech recognition 1-5. [Crossref]

2187. Li Chen, Song Wang, Wei Fan, Jun Sun, Satoshi Naoi. Cascading Training for Relaxation CNN on Handwritten Character Recognition 162-167. [Crossref]

2188. Aries Fitriawan, Ito Wasito, Arida Ferti Syafiandini, Mukhlis Amien, Arry Yanuar. Multi-label classification using deep belief networks for virtual screening of multi-target drug 102-107. [Crossref]

2189. Reinmar J. Kobler, Reinhold Scherer. Restricted Boltzmann Machines in Sensory Motor Rhythm Brain-Computer Interfacing: A study on inter-subject transfer and co-adaptation 000469-000474. [Crossref]

2190. Xu Cao, Xiaomin Zhang, Yang Yu, Letian Niu. Deep learning-based recognition of underwater target 89-93. [Crossref]

2191. Xinyu Zhao, Jie Wan, Guorui Ren, Jinfu Liu, Juntao Chang, Daren Yu. Multi-scale DBNs regression model and its application in wind speed forecasting 1355-1359. [Crossref]

2192. Tao Ma, Fen Wang, Jianjun Cheng, Yang Yu, Xiaoyun Chen. 2016. A Hybrid Spectral Clustering and Deep Neural Network Ensemble Algorithm for Intrusion Detection in Sensor Networks. *Sensors* **16**:10, 1701. [Crossref]

2193. Feng Zhang, Yuanyuan Wang, Minjie Cao, Xiaoxiao Sun, Zhenhong Du, Renyi Liu, Xinyue Ye. 2016. Deep-Learning-Based Approach for Prediction of Algal Blooms. *Sustainability* **8**:10, 1060. [Crossref]

2194. Pan Liu, Shuping Yi. 2016. New Algorithm for Evaluating the Green Supply Chain Performance in an Uncertain Environment. *Sustainability* **8**:10, 960. [Crossref]

2195. ###, Yi,Kwangoh, Kichun Nam, Koo Min-Mo. 2016. The Frequency based Study of the Applicability of DBN Algorithm on Language Acquisition Modeling. *Korean Journal of Cognitive and Biological Psychology* **28**:4, 617-651. [Crossref]

2196. Shusen Zhou, Hailin Zou, Chanjuan Liu, Mujun Zang, Zhiwang Zhang, Jun Yue. 2016. Deep extractive networks for supervised learning. *Optik* **127**:20, 9008-9019. [Crossref]

2197. Heejo You, Hyungwon Yang, Jaekoo Kang, Youngsun Cho, Sung Hah Hwang, Yeonjung Hong, Yejin Cho, Seohyun Kim, Hosung Nam. 2016. Development of articulatory estimation model using deep neural network. *Phonetics and Speech Sciences* **8**:3, 31-38. [Crossref]

2198. Stanisław Jankowski, Zbigniew Szymański, Uladzimir Dziomin, Vladimir Golovko, Aleksy Barcz. Deep learning classifier based on NPCA and orthogonal feature selection 100315E. [Crossref]

2199. Guirong Liu, Yi Xu, Jinpeng Lan. No-reference face image assessment based on deep features 99711S. [Crossref]

2200. . Bibliography 245-273. [Crossref]

2201. Adam H. Marblestone, Greg Wayne, Konrad P. Kording. 2016. Toward an Integration of Deep Learning and Neuroscience. *Frontiers in Computational Neuroscience* **10**. . [Crossref]

2202. Lenka Zdeborová, Florent Krzakala. 2016. Statistical physics of inference: thresholds and algorithms. *Advances in Physics* **65**:5, 453-552. [Crossref]

2203. Jie Lin, Olivier Morere, Vijay Chandrasekhar, Antoine Veillard, Hanlin Goh. Co-sparsity regularized deep hashing for image instance retrieval 2450-2454. [Crossref]

2204. Kien Nguyen, Clinton Fookes, Sridha Sridharan. Deeper and wider fully convolutional network coupled with conditional random fields for scene labeling 1344-1348. [Crossref]

2205. Jingrui Zhang, Li Zhang, Hai Huang, Xiao Jun Jing. Improved cyclostationary feature detection based on correlation between the signal and noise 611-614. [Crossref]

2206. Youngjune Gwon, Miriam Cha, William Campbell, H. T. Kung, Charlie K. Dagli. Sparse-coded net model and applications 1-6. [Crossref]

2207. Raid Saabni. Recognizing handwritten single digits and digit strings using deep architecture of neural networks 1-6. [Crossref]

2208. Johannes Abel, Maximilian Strake, Tim Fingscheidt. Artificial bandwidth extension using deep neural networks for spectral envelope estimation 1-5. [Crossref]

2209. Catherine Paulin, Sid-Ahmed Selouani, Éric Hervet. 2016. Audio steganalysis using deep belief networks. *International Journal of Speech Technology* **19**:3, 585-591. [Crossref]

2210. Renjie Wu, Sei-ichiro Kamata. A jointly local structured sparse deep learning network for face recognition 3026-3030. [Crossref]

2211. Hui-Jin Lee, Ki-Sang Hong. 2016. Class-specific mid-level feature learning with the Discriminative Group-wise Beta-Bernoulli process restricted Boltzmann machines. *Pattern Recognition Letters* **80**, 8-14. [Crossref]

2212. Xiaoshan Yang, Tianzhu Zhang, Changsheng Xu, Shuicheng Yan, M. Shamim Hossain, Ahmed Ghoneim. 2016. Deep Relative Attributes. *IEEE Transactions on Multimedia* **18**:9, 1832-1842. [Crossref]

2213. N. V. Kartheek Medathati, Heiko Neumann, Guillaume S. Masson, Pierre Kornprobst. 2016. Bio-inspired computer vision: Towards a synergistic approach of artificial and biological vision. *Computer Vision and Image Understanding* **150**, 1-30. [Crossref]

2214. Romain Serizel, Victor Bisot, Slim Essid, Gael Richard. Machine listening techniques as a complement to video image analysis in forensics 948-952. [Crossref]

2215. Xiaoming Zhang, Xia Hu, Senzhang Wang, Yang Yang, Zhoujun Li, Jianshe Zhou. 2016. Learning Geographical Hierarchy Features via a Compositional Model. *IEEE Transactions on Multimedia* **18**:9, 1855-1868. [Crossref]

2216. Xiaorui Ma, Hongyu Wang, Jie Geng. 2016. Spectral–Spatial Classification of Hyperspectral Image Based on Deep Auto-Encoder. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* **9**:9, 4073-4085. [Crossref]

2217. Wenzhi Zhao, Shihong Du. 2016. Scene classification using multi-scale deeply described visual words. *International Journal of Remote Sensing* **37**:17, 4119-4131. [Crossref]

2218. Gang Chen, Yawei Li, Sargur N. Srihari. Joint visual denoising and classification using deep learning 3673-3677. [Crossref]

2219. Shlomo E. Chazan, Sharon Gannot, Jacob Goldberger. A phoneme-based pre-training approach for deep neural network with application to speech enhancement 1-5. [Crossref]

2220. Muhammad Muneeb Saleem, John H.L. Hansen. A discriminative unsupervised method for speaker recognition using deep learning 1-5. [Crossref]

2221. Mehdi Sajjadi, Mehran Javanmardi, Tolga Tasdizen. Mutual exclusivity loss for semi-supervised deep learning 1908-1912. [Crossref]

2222. Gaoyang Li, Mingzhe Rong, Xiaohua Wang, Xi Li, Yunjia Li. Partial discharge patterns recognition with deep Convolutional Neural Networks 324-327. [Crossref]

2223. Xiaobo Chen, Han Zhang, Yue Gao, Chong-Yaw Wee, Gang Li, Dinggang Shen. 2016. High-order resting-state functional connectivity network for MCI classification. *Human Brain Mapping* **37**:9, 3282-3296. [Crossref]

2224. Zhuotun Zhu, Xinggang Wang, Song Bai, Cong Yao, Xiang Bai. 2016. Deep Learning Representation using Autoencoder for 3D Shape Retrieval. *Neurocomputing* **204**, 41-50. [Crossref]

2225. Alexey Potapov, Vita Potapova, Maxim Peterson. 2016. A feasibility study of an autoencoder meta-model for improving generalization capabilities on training sets of small sizes. *Pattern Recognition Letters* **80**, 24-29. [Crossref]

2226. Pavol Bezak. Building recognition system based on deep learning 1-5. [Crossref]

2227. Gang Chen, Yawei Li, Sargur N. Srihari. Word recognition with deep conditional random fields 1928-1932. [Crossref]

2228. Shervin Rahimzadeh Arashloo. 2016. A comparison of deep multilayer networks and Markov random field matching models for face recognition in the wild. *IET Computer Vision* **10**:6, 466-474. [Crossref]

2229. Fang Zhao, Yongzhen Huang, Liang Wang, Tao Xiang, Tieniu Tan. 2016. Learning Relevance Restricted Boltzmann Machine for Unstructured Group Activity and Event Understanding. *International Journal of Computer Vision* **119**:3, 329-345. [Crossref]

2230. João Paulo Papa, Walter Scheirer, David Daniel Cox. 2016. Fine-tuning Deep Belief Networks using Harmony Search. *Applied Soft Computing* **46**, 875-885. [Crossref]

2231. Jun Zhang, Yaozong Gao, Li Wang, Zhen Tang, James J. Xia, Dinggang Shen. 2016. Automatic Craniomaxillofacial Landmark Digitization via Segmentation-Guided Partially-Joint Regression Forest Model and Multiscale Statistical Features. *IEEE Transactions on Biomedical Engineering* **63**:9, 1820-1829. [Crossref]

2232. Brita Elvevåg, Alex S. Cohen, Maria K. Wolters, Heather C. Whalley, Viktoria-Eleni Gountouna, Ksenia A. Kuznetsova, Andrew R. Watson, Kristin K. Nicodemus. 2016. An examination of the language construct in NIMH's research domain criteria: Time for reconceptualization!. *American Journal of Medical Genetics Part B: Neuropsychiatric Genetics* **171**:6, 904-919. [Crossref]

2233. Sirine Taleb, Ahmad Al Sallab, Hazem Hajj, Zaher Dawy, Rahul Khanna, Anil Keshavamurthy. Deep learning with ensemble classification method for sensor sampling decisions 114-119. [Crossref]

2234. Zhu Deli, Chen Bingqi, Yang Yunong. Farmland Scene Classification Based on Convolutional Neural Network 159-162. [Crossref]

2235. Andreas Antoniades, Loukianos Spyrou, Clive Cheong Took, Saeid Sanei. Deep learning for epileptic intracranial EEG data 1-6. [Crossref]

2236. Chong Zhao, Jiyun Shi, Tao Jiang, Junyao Zhao, Jiehao Chen. Application of deep belief nets for collaborative filtering 201-205. [Crossref]

2237. Hiroshi Ohno. 2016. Uniforming the dimensionality of data with neural networks for materials informatics. *Applied Soft Computing* **46**, 17-25. [Crossref]

2238. Ryo Asaoka, Hiroshi Murata, Aiko Iwase, Makoto Araie. 2016. Detecting Preperimetric Glaucoma with Standard Automated Perimetry Using a Deep Learning Classifier. *Ophthalmology* **123**:9, 1974-1980. [Crossref]

2239. Ahmad Salman, Ahsan Jalal, Faisal Shafait, Ajmal Mian, Mark Shortis, James Seager, Euan Harvey. 2016. Fish species classification in unconstrained underwater environments based on deep learning. *Limnology and Oceanography: Methods* **14**:9, 570-585. [Crossref]

2240. Doo Seok Jeong, Kyung Min Kim, Sungho Kim, Byung Joon Choi, Cheol Seong Hwang. 2016. Memristors for Energy-Efficient New Computing Paradigms. *Advanced Electronic Materials* **2**:9, 1600090. [Crossref]

2241. Fabio Vesperini, Paolo Vecchiotti, Emanuele Principi, Stefano Squartini, Francesco Piazza. A neural network based algorithm for speaker localization in a multi-room environment 1-6. [Crossref]

2242. Sheng Li, Yuya Akita, Tatsuya Kawahara. 2016. Semi-Supervised Acoustic Model Training by Discriminative Data Selection From Multiple ASR Systems' Hypotheses. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **24**:9, 1524-1534. [Crossref]

2243. Hamed Ghodrati, A. Ben Hamza. 2016. Deep shape-aware descriptor for nonrigid 3D object retrieval. *International Journal of Multimedia Information Retrieval* **5**:3, 151-164. [Crossref]

2244. Jun Lei, Jun Zhang, Guohui Li, Qiang Guo, Dan Tu. 2016. Continuous action segmentation and recognition using hybrid convolutional neural network-hidden Markov model model. *IET Computer Vision* **10**:6, 537-544. [Crossref]

2245. Mohammad Daneshvar, Hadi Veisi. Persian phoneme recognition using long short-term memory neural network 111-115. [Crossref]

2246. Atif Mughees, Linmi Tao. Efficient Deep Auto-Encoder Learning for the Classification of Hyperspectral Images 44-51. [Crossref]

2247. Eyal Cohen, Dror Malka, Amir Shemer, Asaf Shahmoon, Zeev Zalevsky, Michael London. 2016. Neural networks within multi-core optic fibers. *Scientific Reports* **6**:1. . [Crossref]

2248. Behtash Behin-Aein, Vinh Diep, Supriyo Datta. 2016. A building block for hardware belief networks. *Scientific Reports* **6**:1. . [Crossref]

2249. Zhiquan Qi, Bo Wang, Yingjie Tian, Peng Zhang. 2016. When Ensemble Learning Meets Deep Learning: a New Deep Support Vector Machine for Classification. *Knowledge-Based Systems* **107**, 54-60. [Crossref]

2250. S. Elaiwat, M. Bennamoun, F. Boussaid. 2016. A semantic RBM-based model for image set classification. *Neurocomputing* **205**, 507-518. [Crossref]

2251. Xuanyang Xi, Peijie Yin, Hong Qiao, Yinlin Li, Wensen Feng. 2016. A biologically inspired model mimicking the memory and two distinct pathways of face perception. *Neurocomputing* **205**, 349-359. [Crossref]

2252. Yaqi Lv, Mei Yu, Gangyi Jiang, Feng Shao, Zongju Peng, Fen Chen. 2016. No-reference Stereoscopic Image Quality Assessment Using Binocular Self-similarity and Deep Neural Network. *Signal Processing: Image Communication* **47**, 346-357. [Crossref]

2253. John Kalantari. Unsupervised In-Silico Modeling of Complex Biological Systems 287-292. [Crossref]

2254. Zi Wang, Juecong Cai, Sihua Cheng, Wenjia Li. DroidDeepLearner: Identifying Android malware using deep learning 160-165. [Crossref]

2255. Yuki Sakai, Tetsuya Oda, Makoto Ikeda, Leonard Barolli. Performance Evaluation of an Accessory Category Recognition System Using Deep Neural Network 437-441. [Crossref]

2256. Haiyan Xu, Konstantinos N. Plataniotis. Affective states classification using EEG and semi-supervised deep learning approaches 1-6. [Crossref]

2257. Bo Yuan. Efficient hardware architecture of softmax layer in deep neural network 323-326. [Crossref]

2258. Tanmay Bhowmik, Krishna Dulal Dalapati, Shyamal Kumar Das Mandal. A comparative study on phonological feature detection from continuous speech with respect to variable corpus size 311-316. [Crossref]

2259. Zhichao Wang, Zhiqi Li, Bin Wang, Hong Liu. 2016. Robot grasp detection using multimodal deep convolutional neural networks. *Advances in Mechanical Engineering* **8**:9, 168781401666807. [Crossref]

2260. Yansheng Li, Yongjun Zhang, Chao Tao, Hu Zhu. 2016. Content-Based High-Resolution Remote Sensing Image Retrieval via Unsupervised Feature Learning and Collaborative Affinity Metric Fusion. *Remote Sensing* **8**:9, 709. [Crossref]

2261. Steven Lawrence Fernandes, G. Josemin Bala. 2016. ODROID XU4 based implementation of decision level fusion approach for matching computer generated sketches. *Journal of Computational Science* **16**, 217-224. [Crossref]

2262. Linlin Xu, Ruimin Wang, Zhouwang Yang, Jiansong Deng, Falai Chen, Ligang Liu. 2016. Surface approximation via sparse representation and parameterization optimization. *Computer-Aided Design* **78**, 179-187. [Crossref]

2263. Seyoon Ko, Goo Jun, Joong-Ho Won. 2016. HyperConv: spatio-spectral classication of hyperspectral images with deep convolutional neural networks. *Korean Journal of Applied Statistics* **29**:5, 859-872. [Crossref]

2264. Sejin Lee, Donghyun Kim. 2016. Spherical Signature Description of Environmental Feature Learning b a3seDd Pooni nDt eCelpo uBde alinedf Nets for Urban Structure Classification. *Journal of Korea Robotics Society* **11**:3, 115-126. [Crossref]

2265. Zheng-Wu Yuan, Jun Zhang. Feature extraction and image retrieval based on AlexNet 100330E. [Crossref]

2266. Bo Liu, Lingcheng Kong, Jianghai Zhao, Jinghua Wu, Zhiying Tan. Towards 3D object recognition with contractive autoencoders 100330S. [Crossref]

2267. Shengcai Ke, Yongwei Zhao, Bicheng Li, Zhibing Wu, Xin Liu. Fast image clustering based on convolutional neural network and binary K-means 100332E. [Crossref]

2268. Steve O'Hagan, Douglas B. Kell. 2016. MetMaxStruct: A Tversky-Similarity-Based Strategy for Analysing the (Sub)Structural Similarities of Drugs and Endogenous Metabolites. *Frontiers in Pharmacology* **7**. . [Crossref]

2269. Edward Choi, Andy Schuetz, Walter F Stewart, Jimeng Sun. 2016. Using recurrent neural network models for early detection of heart failure onset. *Journal of the American Medical Informatics Association* ocw112. [Crossref]

2270. Yajun Zhang, Zongtian Liu, Wen Zhou. 2016. Event Recognition Based on Deep Learning in Chinese Texts. *PLOS ONE* **11**:8, e0160147. [Crossref]

2271. Xiaoshan Yang, Tianzhu Zhang, Changsheng Xu. 2016. Semantic Feature Mining for Video Event Understanding. *ACM Transactions on Multimedia Computing, Communications, and Applications* **12**:4, 1-22. [Crossref]

2272. Jun Lei, Guohui Li, Shuohao Li, Dan Tu, Qiang Guo. Continuous action recognition based on hybrid CNN-LDCRF model 63-69. [Crossref]

2273. Jing Sun, Xibiao Cai, Fuming Sun, Jianguo Zhang. Scene image classification method based on Alex-Net model 363-367. [Crossref]

2274. Jun Du, Yanhui Tu, Li-Rong Dai, Chin-Hui Lee. 2016. A Regression Approach to Single-Channel Speech Separation Via High-Resolution Deep Neural Networks. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **24**:8, 1424-1437. [Crossref]

2275. Xue Lin, Lizhi Peng, Guangshun Wei, Xiaofang Wang, Xiuyang Zhao. Clothes classification based on deep belief network 87-92. [Crossref]

2276. Ciprian Adrian Corneanu, Marc Oliu Simon, Jeffrey F. Cohn, Sergio Escalera Guerrero. 2016. Survey on RGB, 3D, Thermal, and Multimodal Approaches for Facial Expression Recognition: History, Trends, and Affect-Related Applications. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **38**:8, 1548-1568. [Crossref]

2277. Bun Theang Ong, Komei Sugiura, Koji Zettsu. 2016. Dynamically pre-trained deep recurrent neural networks using environmental monitoring data for predicting PM2.5. *Neural Computing and Applications* **27**:6, 1553-1566. [Crossref]

2278. Jiachen Li, Lin Qi, Yun Lin. Research on modulation identification of digital signals based on deep learning 402-405. [Crossref]

2279. Hai Wang, Yingfeng Cai, Xiaobo Chen, Long Chen. 2016. Occluded vehicle detection with local connected deep model. *Multimedia Tools and Applications* **75**:15, 9277-9293. [Crossref]

2280. Roneel V. Sharan, Tom J. Moir. 2016. An overview of applications and advancements in automatic sound recognition. *Neurocomputing* **200**, 22-34. [Crossref]

2281. Phyo Phyo San, Sai Ho Ling, Hung T. Nguyen. Deep learning framework for detection of hypoglycemic episodes in children with type 1 diabetes 3503-3506. [Crossref]

2282. Yevgeniy Bodyanskiy, Olena Vynokurova, Iryna Pliss, Galina Setlak, Pavlo Mulesa. Fast learning algorithm for deep evolving GMDH-SVM neural network in data stream mining tasks 257-262. [Crossref]

2283. Qiying Feng, C.L. Philip Chen, Long Chen. Compressed auto-encoder building block for deep learning network 131-136. [Crossref]

2284. Rodolfo C. Cavalcante, Rodrigo C. Brasileiro, Victor L.F. Souza, Jarley P. Nobrega, Adriano L.I. Oliveira. 2016. Computational Intelligence and Financial Markets: A Survey and Future Directions. *Expert Systems with Applications* **55**, 194-211. [Crossref]

2285. Deepjoy Das, Alok Chakrabarty. Emotion recognition from face dataset using deep neural nets 1-6. [Crossref]

2286. Hao Du, Mohammad M. Ghassemi, Mengling Feng. The effects of deep network topology on mortality prediction 2602-2605. [Crossref]

2287. S M Raufun Nahar, Atsuhiko Kai. Robust Voice Activity Detector by combining sequentially trained Deep Neural Networks 1-5. [Crossref]

2288. Di Wu, Lionel Pigou, Pieter-Jan Kindermans, Nam Do-Hoang Le, Ling Shao, Joni Dambre, Jean-Marc Odobez. 2016. Deep Dynamic Neural Networks for Multimodal Gesture Segmentation and Recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **38**:8, 1583-1597. [Crossref]

2289. Luna M. Zhang. A new multifunctional neural network with high performance and low energy consumption 496-504. [Crossref]

2290. Phyo Phyo San, Sai Ho Ling, Rifai Chai, Yvonne Tran, Ashley Craig, Hung Nguyen. EEG-based driver fatigue detection using hybrid deep generic model 800-803. [Crossref]

2291. Sushma Bomma, Neil M Robertson. Deep action classification via matrix completion 1886-1890. [Crossref]

2292. Gonzalo Montes-Atenas, Fabián Seguel, Alvaro Valencia, Sohail Masood Bhatti, Muhammad Salman Khan, Ismael Soto, Néstor Becerra Yoma. 2016. Predicting bubble size and bubble rate data in water and in froth flotation-like slurry from computational fluid dynamics (CFD) by applying deep neural networks (DNN). *International Communications in Heat and Mass Transfer* **76**, 197-201. [Crossref]

2293. Qiuxia Lv, Hongxing Li, C. L. Philip Chen, Degang Wang, Wenyan Song, Hongli Lin. A kernel logistic neural network based on restricted Boltzmann machine 1-6. [Crossref]

2294. Ke Wu, Philip Watters, Malik Magdon-Ismail. Network classification using adjacency matrix embeddings and deep learning 299-306. [Crossref]

2295. Awais Mansoor, Juan J. Cerrolaza, Rabia Idrees, Elijah Biggs, Mohammad A. Alsharid, Robert A. Avery, Marius George Linguraru. 2016. Deep Learning

Guided Partitioned Shape Model for Anterior Visual Pathway Segmentation. *IEEE Transactions on Medical Imaging* **35**:8, 1856-1865. [Crossref]

2296. Yabiao Wang, Zeyu Sun, Chang Liu, Wenbo Peng, Juhua Zhang. MRI image segmentation by fully convolutional networks 1697-1702. [Crossref]

2297. Sreenivas Sremath Tirumala, S Ali, C Phani Ramesh. Evolving deep neural networks: A new prospect 69-74. [Crossref]

2298. Pinyi Li, Wenhui Jiang, Fei Su. Single-channel EEG-based mental fatigue detection based on deep belief network 367-370. [Crossref]

2299. Yoshihiro Hayakawa, Takanori Oonuma, Hideyuki Kobayashi, Akiko Takahashi, Shinji Chiba, Nahomi M. Fujiki. Feature extraction of video using deep neural network 465-470. [Crossref]

2300. Dongshu Wang, Yihai Duan. 2016. Natural Language Acquisition: State Inferring and Thinking. *International Journal on Artificial Intelligence Tools* **25**:04, 1650022. [Crossref]

2301. Jie Chen, Xianbiao Qi, Osmo Tervonen, Olli Silven, Guoying Zhao, Matti Pietikainen. Thorax disease diagnosis using deep convolutional neural network 2287-2290. [Crossref]

2302. Reza Kharghanian, Ali Peiravi, Farshad Moradi. Pain detection from facial images using unsupervised feature learning approach 419-422. [Crossref]

2303. Yajun Liu, Xuan Zhang. Intrusion Detection Based on IDBM 173-177. [Crossref]

2304. Michele Buccoli, Massimiliano Zanoni, Augusto Sarti, Stefano Tubaro, Davide Andreoletti. Unsupervised feature learning for Music Structural Analysis 993-997. [Crossref]

2305. Bruno U. Pedroni, Srinjoy Das, John V. Arthur, Paul A. Merolla, Bryan L. Jackson, Dharmendra S. Modha, Kenneth Kreutz-Delgado, Gert Cauwenberghs. 2016. Mapping Generative Models onto a Network of Digital Spiking Neurons. *IEEE Transactions on Biomedical Circuits and Systems* **10**:4, 837-854. [Crossref]

2306. Rongqiang Qian, Qianyu Liu, Yong Yue, Frans Coenen, Bailing Zhang. Road surface traffic sign detection with hybrid region proposal and fast R-CNN 555-559. [Crossref]

2307. Nils Schaetti, Michel Salomon, Raphael Couturier. Echo State Networks-Based Reservoir Computing for MNIST Handwritten Digits Recognition 484-491. [Crossref]

2308. Nouman Ali, Khalid Bashir Bajwa, Robert Sablatnig, Zahid Mehmood. 2016. Image retrieval by addition of spatial information based on histograms of triangular regions. *Computers & Electrical Engineering* **54**, 539-550. [Crossref]

2309. Lu Liu, Weiwei Sun, Bo Ding. Offline handwritten Chinese character recognition based on DBN fusion model 1807-1811. [Crossref]

2310. Qin Chao, Gao Xiao-Guang, Chen Da-Qing. On Distributed Deep Network for Processing Large-Scale Sets of Complex Data 395-399. [Crossref]

2311. Chengwei Yao, Gencai Chen. Hyperparameters Adaptation for Restricted Boltzmann Machines Based on Free Energy 243-248. [Crossref]

2312. Rui Wang, Ming-Shan Liu, Yuan Zhou, Yan-Qin Xun, Wen-Bo Zhang. A deep belief networks adaptive Kalman filtering algorithm 178-181. [Crossref]

2313. Jian Shu, Weijie Lin, Linlan Liu, Xuyan Luo. Topology Prediction Mechanism for Pocket Switched Network Based on Deep Belief Network 1811-1817. [Crossref]

2314. Toru Nakashika, Yasuhiro Minami. 3WRBM-based speech factor modeling for arbitrary-source and non-parallel voice conversion 607-611. [Crossref]

2315. Yinggan Tang, Chunning Bu, Liying Zhao. Coupled deep auto-encoder with image edge information for image super-resolution 1708-1713. [Crossref]

2316. Yali Qi, Guoshan Zhang, Yali Qi, Yeli Li. Object segmentation based on Gaussian mixture model and conditional random fields 900-904. [Crossref]

2317. Siyu Shao, Wenjun Sun, Peng Wang, Robert X. Gao, Ruqiang Yan. Learning features from vibration signals for induction motor fault diagnosis 71-76. [Crossref]

2318. Gil-Jin Jang. 2016. Audio signal clustering and separation using a stacked autoencoder. *The Journal of the Acoustical Society of Korea* **35**:4, 303-309. [Crossref]

2319. James A. Evans, Pedro Aceves. 2016. Machine Translation: Mining Text for Social Theory. *Annual Review of Sociology* **42**:1, 21-50. [Crossref]

2320. Seonwoo Min, Byunghan Lee, Sungroh Yoon. 2016. Deep learning in bioinformatics. *Briefings in Bioinformatics* bbw068. [Crossref]

2321. Yao Wang, Wan-dong Cai, Peng-cheng Wei. 2016. A deep learning approach for detecting malicious JavaScript code. *Security and Communication Networks* **9**:11, 1520-1534. [Crossref]

2322. Peyman Passban, Qun Liu, Andy Way. 2016. Boosting Neural POS Tagger for Farsi Using Morphological Information. *ACM Transactions on Asian and Low-Resource Language Information Processing* **16**:1, 1-15. [Crossref]

2323. Soowoong Kim, Bogun Park, Bong Seop Song, Seungjoon Yang. 2016. Deep belief network based statistical feature learning for fingerprint liveness detection. *Pattern Recognition Letters* **77**, 58-65. [Crossref]

2324. Ryusuke Hata, Kazuyuki Murase. Multi-valued autoencoders for multi-valued neural networks 4412-4417. [Crossref]

2325. Juyang Weng. Brains as optimal emergent Turing Machines 1817-1824. [Crossref]

2326. Youngwoo Yoo, Se-Young Oh. Fast training of convolutional neural network classifiers through extreme learning machines 1702-1708. [Crossref]

2327. Anna Rakitianskaia, Eduan Bekker, Katherine M. Malan, Andries Engelbrecht. Analysis of error landscapes in multi-layered neural networks for classification 5270-5277. [Crossref]

2328. Huachun Tan, Xuan Xuan, Yuankai Wu, Zhiyu Zhong, Bin Ran. A Comparison of Traffic Flow Prediction Methods Based on DBN 273-283. [Crossref]

2329. Guorong Wu, Minjeong Kim, Qian Wang, Brent C. Munsell, Dinggang Shen. 2016. Scalable High-Performance Image Registration Framework by Unsupervised Deep Feature Representations Learning. *IEEE Transactions on Biomedical Engineering* **63**:7, 1505-1516. [Crossref]

2330. Fuchun Sun, Chunfang Liu, Wenbing Huang, Jianwei Zhang. 2016. Object Classification and Grasp Planning Using Visual and Tactile Sensing. *IEEE Transactions on Systems, Man, and Cybernetics: Systems* **46**:7, 969-979. [Crossref]

2331. Jian-Guo Wang, Jing-Hui Zhao, Tiao Shen, Shi-Wei Ma, Yuan Yao, Tao Chen, Bing Shen, Yi-Ping Wu. Deep learning-based soft-sensing method for operation optimization of coke dry quenching process 9087-9092. [Crossref]

2332. Jeff Orchard, Lin Wang. The evolution of a generalized neural learning rule 4688-4694. [Crossref]

2333. Haiyan Xu, Konstantinos N. Plataniotis. EEG-based affect states classification using Deep Belief Networks 148-153. [Crossref]

2334. Zhipeng Cui, Jie Yang, Yu Qiao. Brain MRI segmentation with patch-based CNN approach 7026-7031. [Crossref]

2335. Mohamed Elleuch, Raouia Mokni, Monji Kherallah. Offline Arabic Handwritten recognition system with dropout applied in Deep networks based-SVMs 3241-3248. [Crossref]

2336. Ridha Soua, Arief Koesdwiady, Fakhri Karray. Big-data-generated traffic flow prediction using deep learning and dempster-shafer theory 3195-3202. [Crossref]

2337. Suwon Suh, Daniel H. Chae, Hyon-Goo Kang, Seungjin Choi. Echo-state conditional variational autoencoder for anomaly detection 1015-1022. [Crossref]

2338. Son N. Tran, Artur d'Avila Garcez. Adaptive Transferred-profile Likelihood Learning 2687-2692. [Crossref]

2339. Hieu Minh Bui, Margaret Lech, Eva Cheng, Katrina Neville, Ian S. Burnett. Using grayscale images for object recognition with convolutional-recursive neural network 321-325. [Crossref]

2340. Fabio Vesperini, Paolo Vecchiotti, Emanuele Principi, Stefano Squartini, Francesco Piazza. Deep neural networks for Multi-Room Voice Activity Detection: Advancements and comparative evaluation 3391-3398. [Crossref]

2341. Hasari Tosun, Ben Mitchell, John Sheppard. Assessing diffusion of spatial features in Deep Belief Networks 1625-1632. [Crossref]

2342. Zhidong Deng, Chengzhi Mao, Xiong Chen. Deep self-organizing reservoir computing model for visual object recognition 1325-1332. [Crossref]

2343. Chong Zhang, Kay Chen Tan, Ruoxu Ren. Training cost-sensitive Deep Belief Networks on imbalance data problems 4362-4367. [Crossref]

2344. Jianwen Lou, Lin Qi, Junyu Dong, Hui Yu, Guoqiang Zhong. Learning perceptual texture similarity and relative attributes from computational features 2540-2546. [Crossref]

2345. Daniel Jiwoong Im, Graham W. Taylor. Learning a metric for class-conditional KNN 1932-1939. [Crossref]

2346. Rahul Rama Varior, Gang Wang, Jiwen Lu, Ting Liu. 2016. Learning Invariant Color Features for Person Reidentification. *IEEE Transactions on Image Processing* **25**:7, 3395-3410. [Crossref]

2347. Yicong Zhou, Yantao Wei. 2016. Learning Hierarchical Spectral–Spatial Features for Hyperspectral Image Classification. *IEEE Transactions on Cybernetics* **46**:7, 1667-1678. [Crossref]

2348. Inyoung Hwang, Hyung-Min Park, Joon-Hyuk Chang. 2016. Ensemble of deep neural networks using acoustic environment classification for statistical model-based voice activity detection. *Computer Speech & Language* **38**, 1-12. [Crossref]

2349. Haoze Sun, Weidi Xu, Chao Deng, Ying Tan. Multi-digit image synthesis using recurrent conditional variational autoencoder 375-380. [Crossref]

2350. Zhen Zuo, Bing Shuai, Gang Wang, Xiao Liu, Xingxing Wang, Bing Wang, Yushi Chen. 2016. Learning Contextual Dependence With Convolutional Hierarchical Recurrent Neural Networks. *IEEE Transactions on Image Processing* **25**:7, 2983-2996. [Crossref]

2351. Eder Santana, Matthew Emigh, Jose C Principe. Information Theoretic-Learning auto-encoder 3296-3301. [Crossref]

2352. Guanglei Qi, Yanfeng Sun, Junbin Gao, Yongli Hu, Jinghua Li. Matrix Variate Restricted Boltzmann Machine 389-395. [Crossref]

2353. Yixing Wang, Meiqin Liu, Zhejing Bao. Deep learning neural network for power system fault diagnosis 6678-6683. [Crossref]

2354. Binbin Tang, Xiao Liu, Jie Lei, Mingli Song, Dapeng Tao, Shuifa Sun, Fangmin Dong. 2016. DeepChart: Combining deep convolutional networks and deep belief networks in chart classification. *Signal Processing* **124**, 156-161. [Crossref]

2355. Yang Wang, Xinggang Wang, Wenyu Liu. 2016. Unsupervised local deep feature for image recognition. *Information Sciences* **351**, 67-75. [Crossref]

2356. James Ting-Ho Lo, Yichuan Gui, Yun Peng. Training deep neural networks with gradual deconvexification 1000-1007. [Crossref]

2357. Mahdi Souzanchi-K, Moein Owhadi-Kareshk, Mohammad-R. Akbarzadeh -T.. Control of elastic joint robot based on electromyogram signal by pre-trained Multi-Layer Perceptron 5234-5240. [Crossref]

2358. Jianlei Zhang, Xumin Zheng, Wenfeng Shen, Dingqian Zhou, Feng Qiu, Huiran Zhang. A MIC-based acceleration model of Deep Learning 608-614. [Crossref]

2359. Xue Sen Lin, Ben Wei Li, Xin Yi Yang. Engine components fault diagnosis using an improved method of deep belief networks 454-459. [Crossref]

2360. Kazuma Matsumoto, Yusuke Tajima, Rei Saito, Masaya Nakata, Hiroyuki Sato, Tim Kovacs, Keiki Takadama. Learning classifier system with deep autoencoder 4739-4746. [Crossref]

2361. Ke Wang, Ping Guo, Qian Yin, A-Li Luo, Xin Xin. A pseudoinverse incremental algorithm for fast training deep neural networks with application to spectra pattern recognition 3453-3460. [Crossref]

2362. Yongtao Yu, Jonathan Li, Haiyan Guan, Cheng Wang. 2016. Automated Detection of Three-Dimensional Cars in Mobile Laser Scanning Point Clouds Using DBM-Hough-Forests. *IEEE Transactions on Geoscience and Remote Sensing* **54**:7, 4130-4142. [Crossref]

2363. Chaoqun Hong, Xuhui Chen, Xiaodong Wang, Chaohui Tang. 2016. Hypergraph regularized autoencoder for image-based 3D human pose recovery. *Signal Processing* **124**, 132-140. [Crossref]

2364. Babajide O. Ayinde, Jacek M. Zurada. Clustering of receptive fields in Autoencoders 1310-1317. [Crossref]

2365. Radu Tanase, Mihai Datcu, Dan Raducanu. A convolutional deep belief network for polarimetric SAR data feature extraction 7545-7548. [Crossref]

2366. Nataliya Sokolovska, Nguyen Thanh Hai, Karine Clement, Jean-Daniel Zucker. Deep Self-Organising Maps for efficient heterogeneous biomedical signatures extraction 5079-5086. [Crossref]

2367. Chao Guo, Yan Yang, Hong Pan, Tianrui Li, Weidong Jin. Fault analysis of High Speed Train with DBN hierarchical ensemble 2552-2559. [Crossref]

2368. Yumeng Tao, Xiaogang Gao, Alexander Ihler, Kuolin Hsu, Soroosh Sorooshian. Deep neural networks for precipitation estimation from remotely sensed information 1349-1355. [Crossref]

2369. Yanjiang Wang, Limiao Deng. 2016. Modeling object recognition in visual cortex using multiple firing k-means and non-negative sparse coding. *Signal Processing* **124**, 198-209. [Crossref]

2370. Youbiao He, Gihan J. Mendis, Qihang Gao, Jin Wei. Towards smarter cities: A self-healing resilient Microgrid Social Network 1-5. [Crossref]

2371. Saikat Basu, Manohar Karki, Supratik Mukhopadhyay, Sangram Ganguly, Ramakrishna Nemani, Robert DiBiano, Shreekant Gayaka. A theoretical analysis of Deep Neural Networks for texture classification 992-999. [Crossref]

2372. Tongshuai Zhang, Wei Wang, Hao Ye, DeXian Huang, Haifeng Zhang, Mingliang Li. Fault detection for ironmaking process based on stacked denoising autoencoders 3261-3267. [Crossref]

2373. Takanori Kudo, Tomotaka Kimura, Yoshiaki Inoue, Hirohisa Aman, Kouji Hirata. Behavior analysis of self-evolving botnets 1-5. [Crossref]

2374. Gibran Felix, Mario Siller, Ernesto Navarro Alvarez. A fingerprinting indoor localization algorithm based deep learning 1006-1011. [Crossref]

2375. Zhipeng Xie, Ian McLoughlin, Haomin Zhang, Yan Song, Wei Xiao. 2016. A new variance-based approach for discriminative feature extraction in machine hearing classification using spectrogram features. *Digital Signal Processing* **54**, 119-128. [Crossref]

2376. Allan Campbell, Vic Ciesielski, A. K. Qin. Node label matching improves classification performance in Deep Belief Networks 1646-1653. [Crossref]

2377. Yubo Tao, Hongkun Chen. A hybrid wind power prediction method 1-5. [Crossref]

2378. Ali H. Al-Fatlawi, Mohammed H. Jabardi, Sai Ho Ling. Efficient diagnosis system for Parkinson's disease using deep belief network 1324-1330. [Crossref]

2379. Yantao Wei, Yicong Zhou. Stacked Tensor Subspace Learning for hyperspectral image classification 1985-1992. [Crossref]

2380. Zhi-bin Yu, Chun-xia Chen, Rong Pang, Tao-wei Chen. Adaptive marginalized stacked denoising autoencoders and its application 4107-4112. [Crossref]

2381. Priyadarshini Panda, Kaushik Roy. Unsupervised regenerative learning of hierarchical features in Spiking Deep Networks for object recognition 299-306. [Crossref]

2382. Yu Luo, Shanbi Wei, Yi Chai, Xiuling Sun. Electronic nose sensor drift compensation based on deep belief network 3951-3955. [Crossref]

2383. Tao Shi, Chunlei Zhang, Hongge Ren, Fujin Li, Weiniin Liu. Aerial image classification based on sparse representation and deep belief network 3484-3489. [Crossref]

2384. Lei Xu, Chunxiao Jiang, Yong Ren, Hsiao-Hwa Chen. 2016. Microblog Dimensionality Reduction—A Deep Learning Approach. *IEEE Transactions on Knowledge and Data Engineering* **28**:7, 1779-1789. [Crossref]

2385. Yuxin Ding, Sheng Chen, Jun Xu. Application of Deep Belief Networks for opcode based malware detection 3901-3908. [Crossref]

2386. Yuanlong Yu, Zhenzhen Sun. A pruning algorithm for extreme learning machine based on sparse coding 2596-2602. [Crossref]

2387. Abdulrahman Altahhan. Self-reflective deep reinforcement learning 4565-4570. [Crossref]

2388. Kunihiko Fukushima. Margined Winner-Take-All: New learning rule for pattern recognition 977-984. [Crossref]

2389. A. Coden, W. S. Lin, K. Houck, M. Tanenblatt, J. Boston, J. E. MacNaught, D. Soroker, J. D. Weisz, S. Pan, J.-H. Lai, J. Lu, S. Wood, Y. Xia, C.-Y. Lin. 2016. Uncovering insider threats from the digital footprints of individuals. *IBM Journal of Research and Development* **60**:4, 8:1-8:11. [Crossref]

2390. Khanittha Phurattanaprapin, Punyaphol Horata. Extended hierarchical extreme learning machine with multilayer perceptron 1-5. [Crossref]

2391. Catherine Paulin, Sid-Ahmed Selouani, Eric Hervet. Speech steganalysis using evolutionary restricted Boltzmann machines 4831-4838. [Crossref]

2392. Hui Li, Wei Dong Jin, Hao Dong Liu, Tao Wei Chen. Work mode identification of airborne phased array radar based on the combination of multi-level modeling and deep learning 7005-7010. [Crossref]

2393. Saptarshi Pal, Srija Chowdhury, Soumya K Ghosh. DCAP: A deep convolution architecture for prediction of urban growth 1812-1815. [Crossref]

2394. Pablo Barros, Cornelius Weber, Stefan Wermter. Learning auditory neural representations for emotion recognition 921-928. [Crossref]

2395. Xiaofan Xu, Alireza Dehghani, David Corrigan, Sam Caulfield, David Moloney. Convolutional Neural Network for 3D object recognition using volumetric representation 1-5. [Crossref]

2396. M. Alam, L. Vidyaratne, K. M. Iftekharuddin. Efficient feature extraction with simultaneous recurrent network for metric learning 1195-1201. [Crossref]

2397. Je-Kang Park, Bae-Keun Kwon, Jun-Hyub Park, Dong-Joong Kang. 2016. Machine learning-based imaging system for surface defect inspection. *International Journal of Precision Engineering and Manufacturing-Green Technology* **3**:3, 303-310. [Crossref]

2398. Dayiheng Liu, Jiancheng Lv, Xiaofeng Qi, Jiangshu Wei. A neural words encoding model 532-536. [Crossref]

2399. Zhun Fan, Jia-Jie Mo. Automated blood vessel segmentation based on de-noising auto-encoder and neural network 849-856. [Crossref]

2400. Wei Xiong, Bo Du, Lefei Zhang, Liangpei Zhang, Dacheng Tao. Denoising auto-encoders toward robust unsupervised feature representation 4721-4728. [Crossref]

2401. Tiemeng Li, Wenjun Hou, Fei Lyu, Yu Lei, Chen Xiao. Face Detection Based on Depth Information Using HOG-LBP 779-784. [Crossref]

2402. V. Golovko, A. Kroshchanka, D. Treadwell. 2016. The nature of unsupervised learning in deep neural networks: A new understanding and novel approach. *Optical Memory and Neural Networks* **25**:3, 127-141. [Crossref]

2403. Jianqing Gao, Jun Du, Changqing Kong, Huaifang Lu, Enhong Chen, Chin-Hui Lee. An experimental study on joint modeling of mixed-bandwidth data via deep neural networks for robust speech recognition 588-594. [Crossref]

2404. Yifeng Li. Advances in multi-view matrix factorizations 3793-3800. [Crossref]

2405. Siyi Chen, Gang Liu, Cong Wu, Zhichen Jiang, Jie Chen. Image classification with stacked restricted boltzmann machines and evolutionary function array classification voter 4599-4606. [Crossref]

2406. Hidenori Ide, Takio Kurita. Low level visual feature extraction by learning of multiple tasks for Convolutional Neural Networks 3620-3627. [Crossref]

2407. Liangjun Chen, Hua Qu, Jihong Zhao. Generalized correntropy induced loss function for deep learning 1428-1433. [Crossref]

2408. Xi Zhou, Junqi Guo, Rongfang Bie. Deep Learning Based Affective Model for Speech Emotion Recognition 841-846. [Crossref]

2409. C. Lee, S. Woo. Performance analyses and improvement of multilayer neural networks 1-3. [Crossref]

2410. Jichen Yang, Qianhua He, Min Cai, Yanxiong Li, Hai Jin. Construction of bottle-body autoencoder and its application to audio signal classification 521-524. [Crossref]

2411. Dan Meng, Guitao Cao, Wenming Cao, Zhihai He. Supervised Feature Learning Network Based on the Improved LLE for face recognition 306-311. [Crossref]

2412. Julius, Gopinath Mahale, T. Sumana, C. S. Adityakrishna. On the modeling of error functions as high dimensional landscapes for weight initialization in learning networks 202-210. [Crossref]

2413. Yuki Sakai, Tetsuya Oda, Makoto Ikeda, Leonard Barolli. A Vegetable Category Recognition System Using Deep Neural Network 189-192. [Crossref]

2414. Chun-Yang Zhang, C.L. Philip Chen, Dewang Chen, Kin Tek NG. 2016. MapReduce based distributed learning algorithm for Restricted Boltzmann Machine. *Neurocomputing* **198**, 4-11. [Crossref]

2415. Payton Lin, Szu-Wei Fu, Syu-Siang Wang, Ying-Hui Lai, Yu Tsao. 2016. Maximum Entropy Learning with Deep Belief Networks. *Entropy* **18**:7, 251. [Crossref]

2416. Diana Turcsany, Andrzej Bargiela, Tomas Maul. 2016. Local receptive field constrained deep networks. *Information Sciences* **349-350**, 229-247. [Crossref]

2417. Sudhir Kumar Sharma, Ximi Hoque, Pravin Chandra. 2016. Sentiment Predictions Using Deep Belief Networks Model for Odd-Even Policy in Delhi. *International Journal of Synthetic Emotions* **7**:2, 1-22. [Crossref]

2418. Jihun Kim, Daesik Lee, Minho Lee. 2016. Lane Detection System using CNN. *IEMEK Journal of Embedded Systems and Applications* **11**:3, 163-171. [Crossref]

2419. Emre O. Neftci, Bruno U. Pedroni, Siddharth Joshi, Maruan Al-Shedivat, Gert Cauwenberghs. 2016. Stochastic Synapses Enable Efficient Brain-Inspired Learning Machines. *Frontiers in Neuroscience* **10**. . [Crossref]

2420. Alshaimaa Abo-alian, Nagwa L. Badr, M. F. Tolba. 2016. Keystroke dynamics-based user authentication service for cloud computing. *Concurrency and Computation: Practice and Experience* **28**:9, 2567-2585. [Crossref]

2421. Martin V. Butz. 2016. Toward a Unified Sub-symbolic Computational Theory of Cognition. *Frontiers in Psychology* **7**. . [Crossref]

2422. Yuji Nozaki, Takamichi Nakamoto. 2016. Odor Impression Prediction from Mass Spectra. *PLOS ONE* **11**:6, e0157030. [Crossref]

2423. Ryuichi Ueda. 2016. Small implementation of decision-making policy for the height task of the Acrobot. *Advanced Robotics* **30**:11-12, 744-757. [Crossref]

2424. Jian Zhang, Zhenjie Hou, Zhuoran Wu, Yongkang Chen, Weikang Li. Research of 3D face recognition algorithm based on deep learning stacked denoising autoencoder theory 663-667. [Crossref]

2425. Samira Ebrahimi Kahou, Xavier Bouthillier, Pascal Lamblin, Caglar Gulcehre, Vincent Michalski, Kishore Konda, Sébastien Jean, Pierre Froumenty, Yann

Dauphin, Nicolas Boulanger-Lewandowski, Raul Chandias Ferrari, Mehdi Mirza, David Warde-Farley, Aaron Courville, Pascal Vincent, Roland Memisevic, Christopher Pal, Yoshua Bengio. 2016. EmoNets: Multimodal deep learning approaches for emotion recognition in video. *Journal on Multimodal User Interfaces* **10**:2, 99-111. [Crossref]

2426. Fang Liu, Licheng Jiao, Biao Hou, Shuyuan Yang. 2016. POL-SAR Image Classification Based on Wishart DBN and Local Spatial Information. *IEEE Transactions on Geoscience and Remote Sensing* **54**:6, 3292-3308. [Crossref]

2427. Liangpei Zhang, Lefei Zhang, Bo Du. 2016. Deep Learning for Remote Sensing Data: A Technical Tutorial on the State of the Art. *IEEE Geoscience and Remote Sensing Magazine* **4**:2, 22-40. [Crossref]

2428. Nauman Ahad, Junaid Qadir, Nasir Ahsan. 2016. Neural networks in wireless networks: Techniques, applications and guidelines. *Journal of Network and Computer Applications* **68**, 1-27. [Crossref]

2429. Satoru Ishikawa, Jorma Laaksonen. Comparing and combining unimodal methods for multimodal recognition 1-6. [Crossref]

2430. Seung Ho Lee, Wissam J. Baddar, Yong Man Ro. 2016. Collaborative expression representation using peak expression and intra class variation face images for practical subject-independent emotion recognition in videos. *Pattern Recognition* **54**, 52-67. [Crossref]

2431. Wen Tang, Ives Rey Otero, Hamid Krim, Liyi Dai. Analysis dictionary learning for scene classification 1-5. [Crossref]

2432. Munender Varshney, Renu Rameshan. Accelerated learning of discriminative spatio-temporal features for action recognition 1-5. [Crossref]

2433. Yingping Huang, Xing Hu, Huanlong Zhang, Hanbing Wu, Shiqiang Hu. 2016. Video anomaly detection using deep incremental slow feature analysis network. *IET Computer Vision* **10**:4, 258-267. [Crossref]

2434. Huaming Chen, Jun Shen, Lei Wang, Jiangning Song. Towards Data Analytics of Pathogen-Host Protein-Protein Interaction: A Survey 377-388. [Crossref]

2435. Yuusuke Kataoka, Takashi Matsubara, Kuniaki Uehara. Image generation using generative adversarial networks and attention mechanism 1-6. [Crossref]

2436. Xiaolu Zhu, Jinglin Li, Zhihan Liu, Shangguang Wang, Fangchun Yang. Learning Transportation Annotated Mobility Profiles from GPS Data for Context-Aware Mobile Services 475-482. [Crossref]

2437. Sangwon Kang, Yaxing Li. 2016. Artificial bandwidth extension using deep neural network-based spectral envelope estimation and enhanced excitation estimation. *IET Signal Processing* **10**:4, 422-427. [Crossref]

2438. Jing Su, Qing Liu, Meilin Wang, Jiangzhong Cao, Wing-Kuen Ling. Design of convolution neural network with frequency selectivity for wearable camera embed glasses based image recognition systems via nonconvex functional inequality constrained sparse optimization approach 1090-1093. [Crossref]

2439. Caoimhe M. Carbery, Adele H. Marshall, Roger Woods. Proposing the Deep Dynamic Bayesian Network as a Future Computer Based Medical System 227-228. [Crossref]

2440. Xiuyuan Cheng, Xu Chen, Stéphane Mallat. 2016. Deep Haar scattering networks. *Information and Inference* **5**:2, 105-133. [Crossref]

2441. Guillaume Alain, Yoshua Bengio, Li Yao, Jason Yosinski, Éric Thibodeau-Laufer, Saizheng Zhang, Pascal Vincent. 2016. GSNs: generative stochastic networks. *Information and Inference* **5**:2, 210-249. [Crossref]

2442. Liangliang Zhao, Jingdong Zhao, Hong Liu. Brain-inspired strategy for the motion planning of hyper-redundant manipulators 267-272. [Crossref]

2443. Yang Lu, Shujuan Yi, Nan Hou, Jingfu Zhu, Tiemin Ma. Deep neural networks for head pose classification 2787-2790. [Crossref]

2444. Jozsef Z. Szabo, Peter Bakucz. Identification of nonlinearity in knocking vibration signals of large gas engine by deep learning 39-44. [Crossref]

2445. Shekoofeh Azizi, Farhad Imani, Sahar Ghavidel, Amir Tahmasebi, Jin Tae Kwak, Sheng Xu, Baris Turkbey, Peter Choyke, Peter Pinto, Bradford Wood, Parvin Mousavi, Purang Abolmaesumi. 2016. Detection of prostate cancer using temporal sequences of ultrasound data: a large clinical feasibility study. *International Journal of Computer Assisted Radiology and Surgery* **11**:6, 947-956. [Crossref]

2446. Puzhao Zhang, Maoguo Gong, Linzhi Su, Jia Liu, Zhizhou Li. 2016. Change detection based on deep feature representation and mapping transformation for multi-spatial-resolution remote sensing images. *ISPRS Journal of Photogrammetry and Remote Sensing* **116**, 24-41. [Crossref]

2447. Hong Hu, Liang Pang, Zhongzhi Shi. 2016. Image matting in the perception granular deep learning. *Knowledge-Based Systems* **102**, 51-63. [Crossref]

2448. Olivier Parisot, Patrik Hitzelberger, Yoanne Didry, Gero Vierke, Helmut Rieder. Text analytics on start-up descriptions 1-2. [Crossref]

2449. Jie Wan, Jinfu Liu, Guorui Ren, Yufeng Guo, Daren Yu, Qinghua Hu. 2016. Day-Ahead Prediction of Wind Speed with Deep Feature Learning. *International Journal of Pattern Recognition and Artificial Intelligence* **30**:05, 1650011. [Crossref]

2450. Xueliang Zhang, Hui Zhang, Shuai Nie, Guanglai Gao, Wenju Liu. 2016. A Pairwise Algorithm Using the Deep Stacking Network for Speech Separation and Pitch Estimation. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **24**:6, 1066-1078. [Crossref]

2451. Yifei Zhao, Jing Wang, Fei-Yue Wang, Xiaobo Shi, Yisheng Lv. Paragraph vector based retrieval model for similar cases recommendation 2220-2225. [Crossref]

2452. Meng Joo Er, Anurag Kashyap, Ning Wang. Deep semi-supervised learning using Multi-Layered Extreme Learning Machines 457-462. [Crossref]

2453. Duc Hoang Ha Nguyen, Xiong Xiao, Eng Siong Chng, Haizhou Li. 2016. Feature Adaptation Using Linear Spectro-Temporal Transform for Robust Speech

Recognition. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **24**:6, 1006-1019. [Crossref]

2454. Jia Song, Sijun Qin, Pengzhou Zhang. Chinese text categorization based on deep belief networks 1-5. [Crossref]

2455. Bo Dong, Xue Wang. Comparison deep learning method to traditional methods using for network intrusion detection 581-585. [Crossref]

2456. Kohei Shiraga, Yasushi Makihara, Daigo Muramatsu, Tomio Echigo, Yasushi Yagi. GEINet: View-invariant gait recognition using a convolutional neural network 1-8. [Crossref]

2457. Mostafa Mehdipour Ghazi, Hazim Kemal Ekenel. A Comprehensive Analysis of Deep Learning Based Representation for Face Recognition 102-109. [Crossref]

2458. Chen-Yu Lee, Simon Osindero. Recursive Recurrent Nets with Attention Modeling for OCR in the Wild 2231-2239. [Crossref]

2459. Hongyuan Zhu, Jean-Baptiste Weibel, Shijian Lu. Discriminative Multi-modal Feature Fusion for RGBD Indoor Scene Recognition 2969-2976. [Crossref]

2460. Christopher Reale, Nasser M. Nasrabadi, Heesung Kwon, Rama Chellappa. Seeing the Forest from the Trees: A Holistic Approach to Near-Infrared Heterogeneous Face Recognition 320-328. [Crossref]

2461. Leslie N. Smith, Emily M. Hand, Timothy Doster. Gradual DropIn of Layers to Train Very Deep Neural Networks 4763-4771. [Crossref]

2462. Andreas Doumanoglou, Rigas Kouskouridas, Sotiris Malassiotis, Tae-Kyun Kim. Recovering 6D Object Pose and Predicting Next-Best-View in the Crowd 3583-3592. [Crossref]

2463. Hua Zhang, Si Liu, Changqing Zhang, Wenqi Ren, Rui Wang, Xiaochun Cao. SketchNet: Sketch Classification with Web Images 1105-1113. [Crossref]

2464. Xu-Die Ren, Hao-Nan Guo, Guan-Chen He, Xu Xu, Chong Di, Sheng-Hong Li. Convolutional Neural Network Based on Principal Component Analysis Initialization for Image Classification 329-334. [Crossref]

2465. Yue Wu, Qiang Ji. Constrained Deep Transfer Feature Learning and Its Applications 5101-5109. [Crossref]

2466. Huan Fu, Chaohui Wang, Dacheng Tao, Michael J. Black. Occlusion Boundary Detection via Deep Exploration of Context 241-250. [Crossref]

2467. Jing Wang, Yu Cheng, Rogerio Schmidt Feris. Walk and Learn: Facial Attribute Representation Learning from Egocentric Video and Contextual Data 2295-2304. [Crossref]

2468. Yingying Zhang, Desen Zhou, Siqin Chen, Shenghua Gao, Yi Ma. Single-Image Crowd Counting via Multi-Column Convolutional Neural Network 589-597. [Crossref]

2469. Stefanos Zafeiriou, Athanasios Papaioannou, Irene Kotsia, Mihalis Nicolaou, Guoying Zhao. Facial Affect "In-the-Wild": A Survey and a New Database 1487-1498. [Crossref]

2470. Max Ehrlich, Timothy J. Shields, Timur Almaev, Mohamed R. Amer. Facial Attributes Classification Using Multi-task Representation Learning 752-760. [Crossref]

2471. Victor Garcia-Font, Carles Garrigues, Helena Rifà-Pous. 2016. A Comparative Study of Anomaly Detection Techniques for Smart City Wireless Sensor Networks. *Sensors* **16**:6, 868. [Crossref]

2472. Chuan Li, René-Vinicio Sánchez, Grover Zurita, Mariela Cerrada, Diego Cabrera. 2016. Fault Diagnosis for Rotating Machinery Using Vibration Measurement Deep Statistical Feature Learning. *Sensors* **16**:6, 895. [Crossref]

2473. Jun Shi, Shichong Zhou, Xiao Liu, Qi Zhang, Minhua Lu, Tianfu Wang. 2016. Stacked deep polynomial network based representation learning for tumor classification with small ultrasound image dataset. *Neurocomputing* **194**, 87-94. [Crossref]

2474. Wei Zhang, Kan Liu, Weidong Zhang, Youmei Zhang, Jason Gu. 2016. Deep Neural Networks for wireless localization in indoor and outdoor environments. *Neurocomputing* **194**, 279-287. [Crossref]

2475. Thomas Welchowski, Matthias Schmid. 2016. A framework for parameter estimation and model selection in kernel deep stacking networks. *Artificial Intelligence in Medicine* **70**, 31-40. [Crossref]

2476. M.M. Al Rahhal, Yakoub Bazi, Haikel AlHichri, Naif Alajlan, Farid Melgani, R.R. Yager. 2016. Deep learning approach for active classification of electrocardiogram signals. *Information Sciences* **345**, 340-354. [Crossref]

2477. Michael Gleicher. 2016. A Framework for Considering Comprehensibility in Modeling. *Big Data* **4**:2, 75-88. [Crossref]

2478. Kisang Kim, Hyung-Il Choi. 2016. Object Detection using Fuzzy Adaboost. *The Journal of the Korea Contents Association* **16**:5, 104-112. [Crossref]

2479. Esam Othman, Yakoub Bazi, Naif Alajlan, Haikel Alhichri, Farid Melgani. 2016. Using convolutional features and a sparse autoencoder for land-use scene classification. *International Journal of Remote Sensing* **37**:10, 2149-2167. [Crossref]

2480. Florin C. Ghesu, Edward Krubasik, Bogdan Georgescu, Vivek Singh, Yefeng Zheng, Joachim Hornegger, Dorin Comaniciu. 2016. Marginal Space Deep Learning: Efficient Architecture for Volumetric Image Parsing. *IEEE Transactions on Medical Imaging* **35**:5, 1217-1228. [Crossref]

2481. Leibin Ni, Hantao Huang, Hao Yu. On-line machine learning accelerator on digital RRAM-crossbar 113-116. [Crossref]

2482. Kodai Ueyoshi, Takao Marukame, Tetsuya Asai, Masato Motomura, Alexandre Schmid. Memory-error tolerance of scalable and highly parallel architecture for restricted Boltzmann machines in Deep Belief Network 357-360. [Crossref]

2483. Liangjun Chen, Hua Qu, Jihong Zhao, Badong Chen, Jose C. Principe. 2016. Efficient and robust deep learning with Correntropy-induced loss function. *Neural Computing and Applications* **27**:4, 1019-1031. [Crossref]

2484. Feng Jia, Yaguo Lei, Jing Lin, Xin Zhou, Na Lu. 2016. Deep neural networks: A promising tool for fault characteristic mining and intelligent diagnosis of rotating machinery with massive data. *Mechanical Systems and Signal Processing* **72-73**, 303-315. [Crossref]

2485. Konstantinos Charalampous, Antonios Gasteratos. 2016. On-line deep learning method for action recognition. *Pattern Analysis and Applications* **19**:2, 337-354. [Crossref]

2486. Tao Shi, Chunlei Zhang, Fujin Li, Weimin Liu, Meijie Huo. Application of alternating deep belief network in image classification 1853-1856. [Crossref]

2487. Nina Odegaard, Atle Onar Knapskog, Christian Cochin, Jean-Christophe Louvigne. Classification of ships using real and simulated data in a convolutional neural network 1-6. [Crossref]

2488. Zhuyun Chen, Xueqiong Zeng, Weihua Li, Guanglan Liao. Machine fault classification using deep belief network 1-6. [Crossref]

2489. Frank Rudzicz, Arvid Frydenlund, Sean Robertson, Patricia Thaine. 2016. Acoustic-articulatory relationships and inversion in sum-product and deep-belief networks. *Speech Communication* **79**, 61-73. [Crossref]

2490. Jinkyu Kim, Heonseok Ha, Byung-Gon Chun, Sungroh Yoon, Sang K. Cha. Collaborative analytics for data silos 743-754. [Crossref]

2491. Feng Shao, Weijun Tian, Weisi Lin, Gangyi Jiang, Qionghai Dai. 2016. Toward a Blind Deep Quality Evaluator for Stereoscopic Images Based on Monocular and Binocular Interactions. *IEEE Transactions on Image Processing* **25**:5, 2059-2074. [Crossref]

2492. Mohammad Abu Alsheikh, Dusit Niyato, Shaowei Lin, Hwee-pink Tan, Zhu Han. 2016. Mobile big data analytics using deep learning and apache spark. *IEEE Network* **30**:3, 22-29. [Crossref]

2493. Yen-Yi Wu, Chun-Ming Tsai. Pedestrian, bike, motorcycle, and vehicle classification via deep learning: Deep belief network and small training set 1-4. [Crossref]

2494. Ruxin Wang, Dacheng Tao. 2016. Non-Local Auto-Encoder With Collaborative Stabilization for Image Restoration. *IEEE Transactions on Image Processing* **25**:5, 2117-2129. [Crossref]

2495. Hoo-Chang Shin, Holger R. Roth, Mingchen Gao, Le Lu, Ziyue Xu, Isabella Nogues, Jianhua Yao, Daniel Mollura, Ronald M. Summers. 2016. Deep Convolutional Neural Networks for Computer-Aided Detection: CNN Architectures, Dataset Characteristics and Transfer Learning. *IEEE Transactions on Medical Imaging* **35**:5, 1285-1298. [Crossref]

2496. Hayit Greenspan, Bram van Ginneken, Ronald M. Summers. 2016. Guest Editorial Deep Learning in Medical Imaging: Overview and Future Promise of an Exciting New Technique. *IEEE Transactions on Medical Imaging* **35**:5, 1153-1159. [Crossref]

2497. Feng Qiu, Bin Zhang, Jun Guo. A deep learning approach for VM workload prediction in the cloud 319-324. [Crossref]

2498. Jean-Frédéric de Pasquale, Pierre Poirier. 2016. Convolution and modal representations in Thagard and Stewart's neural theory of creativity: a critical analysis. *Synthese* **193**:5, 1535-1560. [Crossref]

2499. Francesco Caravelli, Marco Bardoscia, Fabio Caccioli. 2016. Emergence of giant strongly connected components in continuum disk-spin percolation. *Journal of Statistical Mechanics: Theory and Experiment* **2016**:5, 053211. [Crossref]

2500. Tom Brosch, Lisa Y. W. Tang, Youngjin Yoo, David K. B. Li, Anthony Traboulsee, Roger Tam. 2016. Deep 3D Convolutional Encoder Networks With Shortcuts for Multiscale Feature Integration Applied to Multiple Sclerosis Lesion Segmentation. *IEEE Transactions on Medical Imaging* **35**:5, 1229-1239. [Crossref]

2501. Xiantong Zhen, Zhijie Wang, Ali Islam, Mousumi Bhaduri, Ian Chan, Shuo Li. 2016. Multi-scale deep networks and regression forests for direct bi-ventricular volume estimation. *Medical Image Analysis* **30**, 120-129. [Crossref]

2502. Jiewu Leng, Pingyu Jiang. 2016. A deep learning approach for relationship extraction from interaction context in social manufacturing paradigm. *Knowledge-Based Systems* **100**, 188-199. [Crossref]

2503. Ahmed Mohamedou, Aduwati Sali, Borhanuddin Ali, Mohamed Othman. 2016. Dynamical Spectrum Sharing and Medium Access Control for Heterogeneous Cognitive Radio Networks. *International Journal of Distributed Sensor Networks* **12**:5, 3630593. [Crossref]

2504. Yifeng Li, Chih-Yu Chen, Wyeth W. Wasserman. 2016. Deep Feature Selection: Theory and Application to Identify Enhancers and Promoters. *Journal of Computational Biology* **23**:5, 322-336. [Crossref]

2505. Ji-Hun Ha, Yong Hee Lee, Yong-Hyuk Kim. 2016. Forecasting the Precipitation of the Next Day Using Deep Learning. *Journal of Korean Institute of Intelligent Systems* **26**:2, 93-98. [Crossref]

2506. Kobus Barnard. 2016. Computational Methods for Integrating Vision and Language. *Synthesis Lectures on Computer Vision* **6**:1, 1-227. [Crossref]

2507. Yang Lu, Shujuan Yi, Yurong Liu, Yuling Ji. 2016. A novel path planning method for biomimetic robot based on deep learning. *Assembly Automation* **36**:2, 186-191. [Crossref]

2508. Nicholas D. Lane, Sourav Bhattacharya, Petko Georgiev, Claudio Forlivesi, Lei Jiao, Lorena Qendro, Fahim Kawsar. DeepX: A Software Accelerator for Low-Power Deep Learning Inference on Mobile Devices 1-12. [Crossref]

2509. Banafsheh Rekabdar, Monica Nicolescu, Mircea Nicolescu, Mohammad Taghi Saffar, Richard Kelley. 2016. A Scale and Translation Invariant Approach for Early Classification of Spatio-Temporal Patterns Using Spiking Neural Networks. *Neural Processing Letters* **43**:2, 327-343. [Crossref]

2510. Francisco J. Romero-Durán, Nerea Alonso, Matilde Yañez, Olga Caamaño, Xerardo García-Mera, Humberto González-Díaz. 2016. Brain-inspired cheminformatics of drug-target brain interactome, synthesis, and assay of TVP1022 derivatives. *Neuropharmacology* **103**, 270-278. [Crossref]

2511. Hongwei Qin, Xiu Li, Jian Liang, Yigang Peng, Changshui Zhang. 2016. DeepFish: Accurate underwater live fish recognition with a deep architecture. *Neurocomputing* **187**, 49-58. [Crossref]

2512. A. L. Edelen, S. G. Biedron, B. E. Chase, D. Edstrom, S. V. Milton, P. Stabile. 2016. Neural Networks for Modeling and Control of Particle Accelerators. *IEEE Transactions on Nuclear Science* **63**:2, 878-897. [Crossref]

2513. Cristóbal Mackenzie, Karim Pichara, Pavlos Protopapas. 2016. CLUSTERING-BASED FEATURE LEARNING ON VARIABLE STARS. *The Astrophysical Journal* **820**:2, 138. [Crossref]

2514. Peng Jiang, Cheng Chen, Xiao Liu. Time series prediction for evolutions of complex systems: A deep learning approach 1-6. [Crossref]

2515. Jiexiong Tang, Chenwei Deng, Guang-Bin Huang. 2016. Extreme Learning Machine for Multilayer Perceptron. *IEEE Transactions on Neural Networks and Learning Systems* **27**:4, 809-821. [Crossref]

2516. Yi Li, Hong Liu, Wenjun Yang, Dianming Hu, Wei Xu. Inter-data-center network traffic prediction with elephant flows 206-213. [Crossref]

2517. Yanrong Guo, Yaozong Gao, Dinggang Shen. 2016. Deformable MR Prostate Segmentation via Deep Feature Learning and Sparse Patch Matching. *IEEE Transactions on Medical Imaging* **35**:4, 1077-1089. [Crossref]

2518. Manuel Carcenac, Soydan Redif. 2016. A highly scalable modular bottleneck neural network for image dimensionality reduction and image transformation. *Applied Intelligence* **44**:3, 557-610. [Crossref]

2519. Chao Gou, Kunfeng Wang, Yanjie Yao, Zhengxi Li. 2016. Vehicle License Plate Recognition Based on Extremal Regions and Restricted Boltzmann Machines. *IEEE Transactions on Intelligent Transportation Systems* **17**:4, 1096-1107. [Crossref]

2520. Jin Wei, Gihan J. Mendis. A deep learning-based cyber-physical strategy to mitigate false data injection attack in smart grids 1-6. [Crossref]

2521. Simone Bianco, Gianluigi Ciocca, Claudio Cusano. 2016. CURL: Image Classification using co-training and Unsupervised Representation Learning. *Computer Vision and Image Understanding* **145**, 15-29. [Crossref]

2522. Yanming Guo, Yu Liu, Ard Oerlemans, Songyang Lao, Song Wu, Michael S. Lew. 2016. Deep learning for visual understanding: A review. *Neurocomputing* **187**, 27-48. [Crossref]

2523. Yi Jiang, Runsheng Liu. A Binaural Deep Neural Networks Parameter Mask for the Robust Automatic Speech Recognition System 352-356. [Crossref]

2524. Heung-Il Suk, Chong-Yaw Wee, Seong-Whan Lee, Dinggang Shen. 2016. State-space model with deep learning for functional dynamics estimation in resting-state fMRI. *NeuroImage* **129**, 292-307. [Crossref]

2525. Peilei Liu, Jintao Tang, Haichi Liu, Ting Wang. An Adaptive Statistical Neural Network Model 242-246. [Crossref]

2526. Junming Zhang, Yan Wu, Jing Bai, Fuqiang Chen. 2016. Automatic sleep stage classification based on sparse deep belief net and combination of multiple classifiers. *Transactions of the Institute of Measurement and Control* **38**:4, 435-451. [Crossref]

2527. Tarun Sharma, J H M Apoorva, Ramananathan Lakshmanan, Prakruti Gogia, Manoj Kondapaka. NAVI: Navigation aid for the visually impaired 971-976. [Crossref]

2528. Shuyuan Yang, Min Wang, Hezhao Long, Zhi Liu. 2016. Sparse Robust Filters for scene classification of Synthetic Aperture Radar (SAR) images. *Neurocomputing* **184**, 91-98. [Crossref]

2529. Bilwaj Gaonkar, David Hovda, Neil Martin, Luke Macyszyn. Deep learning in the small sample size setting: cascaded feed forward neural networks for medical image segmentation 97852I. [Crossref]

2530. Chako Takahashi, Muneki Yasuda. 2016. Mean-Field Inference in Gaussian Restricted Boltzmann Machine. *Journal of the Physical Society of Japan* **85**:3, 034001. [Crossref]

2531. Jaeju Kim, Hwansoo Han. 2016. Neural Predictive Coding for Text Compression Using GPGPU. *KIISE Transactions on Computing Practices* **22**:3, 127-132. [Crossref]

2532. Argyros Argyridis, Demetre P. Argialas. 2016. Building change detection through multi-scale GEOBIA approach by integrating deep belief networks with fuzzy ontologies. *International Journal of Image and Data Fusion* 1-24. [Crossref]

2533. Kun Yao, John Parkhill. 2016. Kinetic Energy of Hydrocarbons as a Function of Electron Density and Convolutional Neural Networks. *Journal of Chemical Theory and Computation* **12**:3, 1139-1147. [Crossref]

2534. Paul Mario Koola, Satheesh Ramachandran, Kalyan Vadakkeveedu. 2016. How do we train a stone to think? A review of machine intelligence and its implications. *Theoretical Issues in Ergonomics Science* **17**:2, 211-238. [Crossref]

2535. Chia-Ping Chen, Po-Yuan Shih, Wei-Bin Liang. Integration of orthogonal feature detectors in parameter learning of artificial neural networks to improve robustness and the evaluation on hand-written digit recognition tasks 2354-2358. [Crossref]

2536. Adriana Romero, Carlo Gatta, Gustau Camps-Valls. 2016. Unsupervised Deep Feature Extraction for Remote Sensing Image Classification. *IEEE Transactions on Geoscience and Remote Sensing* **54**:3, 1349-1362. [Crossref]

2537. Lei Zhang, Yangyang Feng, Jiqing Han, Xiantong Zhen. Realistic human action recognition: When deep learning meets VLAD 1352-1356. [Crossref]

2538. Zhuo Chen, Lin Ma, Long Xu, Chengming Tan, Yihua Yan. 2016. Imaging and representation learning of solar radio spectrums for classification. *Multimedia Tools and Applications* **75**:5, 2859-2875. [Crossref]

2539. Yu Chen, Ling Cai, Yuming Zhao, Fuqiao Hu. Multiple instance learning for model ensemble and meta data transfer 1856-1860. [Crossref]

2540. Jun Ying, Joyita Dutta, Ning Guo, Lei Xia, Arkadiusz Sitek, Quanzheng Li, Quanzheng Li. Gold classification of COPDGene cohort based on deep learning 2474-2478. [Crossref]

2541. Bojun Xie, Yi Liu, Hui Zhang, Jian Yu. 2016. A novel supervised approach to learning efficient kernel descriptors for high accuracy object recognition. *Neurocomputing* **182**, 94-101. [Crossref]

2542. David Carlson, Ya-Ping Hsieh, Edo Collins, Lawrence Carin, Volkan Cevher. 2016. Stochastic Spectral Descent for Discrete Graphical Models. *IEEE Journal of Selected Topics in Signal Processing* **10**:2, 296-311. [Crossref]

2543. Meng Cai, Jia Liu. 2016. Maxout neurons for deep convolutional and LSTM neural networks in speech recognition. *Speech Communication* **77**, 53-64. [Crossref]

2544. J. Bortnik, W. Li, R. M. Thorne, V. Angelopoulos. 2016. A unified approach to inner magnetospheric state prediction. *Journal of Geophysical Research: Space Physics* **121**:3, 2423-2430. [Crossref]

2545. Jinhwan Park, Wonyong Sung. FPGA based implementation of deep neural networks using on-chip memory only 1011-1015. [Crossref]

2546. Toru Nakashika, Tetsuya Takiguchi, Yasuo Ariki. Modeling deep bidirectional relationships for image classification and generation 1327-1331. [Crossref]

2547. Leonardo Badino, Claudia Canevari, Luciano Fadiga, Giorgio Metta. 2016. Integrating articulatory data in deep neural network-based acoustic modeling. *Computer Speech & Language* **36**, 173-195. [Crossref]

2548. Suman Ravuri, Steven Wegmann. How neural network features and depth modify statistical properties of HMM acoustic models 5080-5084. [Crossref]

2549. Karel Vesely, Shinji Watanabe, Katerina Zmolikova, Martin Karafiat, Lukas Burget, Jan Honza Cernocky. Sequence summarizing neural network for speaker adaptation 5315-5319. [Crossref]

2550. Shenghua Gao, Lixin Duan, Ivor W. Tsang. 2016. DEFEATnet—A Deep Conventional Image Representation for Image Classification. *IEEE Transactions on Circuits and Systems for Video Technology* **26**:3, 494-505. [Crossref]

2551. Feng Liu, Chao Ren, Hao Li, Pingkun Zhou, Xiaochen Bo, Wenjie Shu. 2016. De novo identification of replication-timing domains in the human genome by deep learning. *Bioinformatics* **32**:5, 641-649. [Crossref]

2552. Pierre Laffitte, David Sodoyer, Charles Tatkeu, Laurent Girin. Deep neural networks for automatic detection of screams and shouted speech in subway trains 6460-6464. [Crossref]

2553. Jeff Heaton. An empirical analysis of feature engineering for predictive modeling 1-6. [Crossref]

2554. Xiaoxia Sun, Nasser M. Nasrabadi, Trac D. Tran. Sparse coding with fast image alignment via large displacement optical flow 2404-2408. [Crossref]

2555. Zhikui Chen, Fangming Zhong, Xu Yuan, Yueming Hu. Framework of integrated big data: A review 1-5. [Crossref]

2556. Sukru Burc Eryilmaz, Siddharth Joshi, Emre Neftci, Weier Wan, Gert Cauwenberghs, H.-S. Philip Wong. Neuromorphic architectures with electronic synapses 118-123. [Crossref]

2557. Abhishek Dey, S. Shahnawazuddin, Deepak K.T., Siddika Imani, S.R.M Prasanna, Rohit Sinha. Enhancements in Assamese spoken query system: Enabling background noise suppression and flexible queries 1-6. [Crossref]

2558. Rui Guo, Liu Liu, Wei Wang, Ali Taalimi, Chi Zhang, Hairong Qi. Deep tree-structured face: A unified representation for multi-task facial biometrics 1-8. [Crossref]

2559. Ya-Jun Hu, Zhen-Hua Ling, Li-Rong Dai. Deep belief network-based post-filtering for statistical parametric speech synthesis 5510-5514. [Crossref]

2560. Gain Han, Keemin Sohn. Clustering the seoul metropolitan area by travel patterns based on a deep belief network 1-6. [Crossref]

2561. Elizabeth L. Ogburn, Scott L. Zeger. 2016. Statistical Reasoning and Methods in Epidemiology to Promote Individualized Health: In Celebration of the 100th Anniversary of the Johns Hopkins Bloomberg School of Public Health. *American Journal of Epidemiology* **183**:5, 427-434. [Crossref]

2562. Yusuke Hioka, Kenta Niwa. Estimating direct-to-reverberant ratio mapped from power spectral density using deep neural network 26-30. [Crossref]

2563. Arghya Pal, B. K. Khonglah, S. Mandal, Himakshi Choudhury, S. R. M. Prasanna, H. L. Rufiner, Vineeth N Balasubramanian. Online Bengali handwritten numerals recognition using Deep Autoencoders 1-6. [Crossref]

2564. Feng-Long Xie, Frank K. Soong, Haifeng Li. A KL divergence and DNN approach to cross-lingual TTS 5515-5519. [Crossref]

2565. Priya Ranjan Muduli, Rakesh Reddy Gunukula, Anirban Mukherjee. A deep learning approach to fetal-ECG signal reconstruction 1-6. [Crossref]

2566. Zhenyu Shu, Chengwu Qi, Shiqing Xin, Chao Hu, Li Wang, Yu Zhang, Ligang Liu. 2016. Unsupervised 3D shape segmentation and co-segmentation via deep learning. *Computer Aided Geometric Design* **43**, 39-52. [Crossref]

2567. Qiang Huang. Simplified learning with binary orthogonal constraints 2747-2751. [Crossref]

2568. Junqi Deng, Yu-Kwong Kwok. Automatic Chord estimation on seventhsbass Chord vocabulary using deep neural network 261-265. [Crossref]

2569. Yumeng Tao, Xiaogang Gao, Kuolin Hsu, Soroosh Sorooshian, Alexander Ihler. 2016. A Deep Neural Network Modeling Framework to Reduce Bias in Satellite Precipitation Products. *Journal of Hydrometeorology* **17**:3, 931-945. [Crossref]

2570. Muhammad Usman Yaseen, Muhammad Sarim Zafar, Ashiq Anjum, Richard Hill. High Performance Video Processing in Cloud Data Centres 152-161. [Crossref]

2571. Zhiyun Lu, Dong Quo, Alireza Bagheri Garakani, Kuan Liu, Avner May, Aurelien Bellet, Linxi Fan, Michael Collins, Brian Kingsbury, Michael Picheny, Fei Sha. A comparison between deep neural nets and kernel acoustic models for speech recognition 5070-5074. [Crossref]

2572. Hiranmayi Ranganathan, Shayok Chakraborty, Sethuraman Panchanathan. Multimodal emotion recognition using deep learning architectures 1-9. [Crossref]

2573. Nicolas Papernot, Patrick McDaniel, Somesh Jha, Matt Fredrikson, Z. Berkay Celik, Ananthram Swami. The Limitations of Deep Learning in Adversarial Settings 372-387. [Crossref]

2574. Tianxing He, Jasha Droppo. Exploiting LSTM structure in deep neural networks for speech recognition 5445-5449. [Crossref]

2575. Ming Li, Jangwon Kim, Adam Lammert, Prasanta Kumar Ghosh, Vikram Ramanarayanan, Shrikanth Narayanan. 2016. Speaker verification based on the fusion of speech acoustics and inverted articulatory signals. *Computer Speech & Language* **36**, 196-211. [Crossref]

2576. Yosuke Kashiwagi, Congying Zhang, Daisuke Saito, Nobuaki Minematsu. Divergence estimation based on deep neural networks and its use for language identification 5435-5439. [Crossref]

2577. Xue Wei, Son Lam Phung, Abdesselam Bouzerdoum. 2016. Visual descriptors for scene categorization: experimental evaluation. *Artificial Intelligence Review* **45**:3, 333-368. [Crossref]

2578. M. Alam, L. Vidyaratne, T. Wash, K. M. Iftekharuddin. Deep SRN for robust object recognition: A case study with NAO humanoid robot 1-7. [Crossref]

2579. Changchen Zhao, Chun-Liang Lin, Weihai Chen. Maximal margin feature mapping via basic image descriptors for image classification 775-780. [Crossref]

2580. Duc Thanh Nguyen, Wanqing Li, Philip O. Ogunbona. 2016. Human detection from images and videos: A survey. *Pattern Recognition* **51**, 148-175. [Crossref]

2581. Kang Hyun Lee, Shin Jae Kang, Woo Hyun Kang, Nam Soo Kim. Two-stage noise aware training using asymmetric deep denoising autoencoder 5765-5769. [Crossref]

2582. Sergey Novoselov, Alexandr Kozlov, Galina Lavrentyeva, Konstantin Simonchik, Vadim Shchemelinin. STC anti-spoofing systems for the ASVspoof 2015 challenge 5475-5479. [Crossref]

2583. Frans Coenen, Bailing Zhang, Chao Yan. 2016. Driving posture recognition by convolutional neural networks. *IET Computer Vision* **10**:2, 103-114. [Crossref]

2584. Pegah Ghahremani, Jasha Droppo, Michael L. Seltzer. Linearly augmented deep neural network 5085-5089. [Crossref]

2585. Ming-Yu Liu, Arun Mallya, Oncel Tuzel, Xi Chen. Unsupervised network pretraining via encoding human design 1-9. [Crossref]

2586. Masayuki Ohzeki. 2016. Stochastic gradient method with accelerated stochastic dynamics. *Journal of Physics: Conference Series* **699**, 012019. [Crossref]

2587. Mahboubeh Farahat, Ramin Halavati. 2016. Noise Robust Speech Recognition Using Deep Belief Networks. *International Journal of Computational Intelligence and Applications* **15**:01, 1650005. [Crossref]

2588. Jen-Chun Lin, Wen-Li Wei, Hsin-Min Wang. DEMV-matchmaker: Emotional temporal course representation and deep similarity matching for automatic music video generation 2772-2776. [Crossref]

2589. Kenta Niwa, Yuma Koizumi, Tomoko Kawase, Kazunori Kobayashi, Yusuke Hioka. Pinpoint extraction of distant sound source based on DNN mapping from multiple beamforming outputs to prior SNR 435-439. [Crossref]

2590. Xiang Yin, Zhen-Hua Ling, Ya-Jun Hu, Li-Rong Dai. Modeling spectral envelopes using deep conditional restricted Boltzmann machines for statistical parametric speech synthesis 5125-5129. [Crossref]

2591. Toru Nakashika, Yasuhiro Minami. Speaker adaptive model based on Boltzmann machine for non-parallel training in voice conversion 5530-5534. [Crossref]

2592. Yanan Liu, Xiaoqing Feng, Zhiguang Zhou. 2016. Multimodal video classification with stacked contractive autoencoders. *Signal Processing* **120**, 761-766. [Crossref]

2593. Wenzhi Zhao, Shihong Du. 2016. Learning multiscale and deep representations for classifying remotely sensed imagery. *ISPRS Journal of Photogrammetry and Remote Sensing* **113**, 155-165. [Crossref]

2594. Elena Mocanu, Phuong H. Nguyen, Wil L. Kling, Madeleine Gibescu. 2016. Unsupervised energy prediction in a Smart Grid context using reinforcement cross-building transfer learning. *Energy and Buildings* **116**, 646-655. [Crossref]

2595. Ahmed M. Abdel-Zaher, Ayman M. Eldeib. 2016. Breast cancer classification using deep belief networks. *Expert Systems with Applications* **46**, 139-144. [Crossref]

2596. Sai Zhang, Jingtian Zhou, Hailin Hu, Haipeng Gong, Ligong Chen, Chao Cheng, Jianyang Zeng. 2016. A deep learning framework for modeling structural features of RNA-binding protein targets. *Nucleic Acids Research* **44**:4, e32-e32. [Crossref]

2597. Seok-Beom Roh, Jihong Wang, Yong-Soo Kim, Tae-Chon Ahn. 2016. Optimization of Fuzzy Learning Machine by Using Particle Swarm Optimization. *Journal of Korean Institute of Intelligent Systems* **26**:1, 87-92. [Crossref]

2598. Quentin J M Huys, Tiago V Maia, Michael J Frank. 2016. Computational psychiatry as a bridge from neuroscience to clinical applications. *Nature Neuroscience* **19**:3, 404-413. [Crossref]

2599. Wenhui Diao, Xian Sun, Xinwei Zheng, Fangzheng Dou, Hongqi Wang, Kun Fu. 2016. Efficient Saliency-Based Object Detection in Remote Sensing Images Using Deep Belief Networks. *IEEE Geoscience and Remote Sensing Letters* **13**:2, 137-141. [Crossref]

2600. Jung-Chao Ban, Chih-Hung Chang. 2016. The Spatial Complexity of Inhomogeneous Multi-layer Neural Networks. *Neural Processing Letters* **43**:1, 31-47. [Crossref]

2601. Junwei Han, Dingwen Zhang, Shifeng Wen, Lei Guo, Tianming Liu, Xuelong Li. 2016. Two-Stage Learning to Predict Human Eye Fixations via SDAEs. *IEEE Transactions on Cybernetics* **46**:2, 487-498. [Crossref]

2602. Bong-Ki Lee, Joon-Hyuk Chang. 2016. Packet Loss Concealment Based on Deep Neural Networks for Digital Speech Transmission. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **24**:2, 378-387. [Crossref]

2603. Bin Liu, Jianhua Tao, Zhengqi Wen, Fuyuan Mo. 2016. Speech Enhancement Based on Analysis–Synthesis Framework with Improved Parameter Domain Enhancement. *Journal of Signal Processing Systems* **82**:2, 141-150. [Crossref]

2604. Jian Zhang, Shifei Ding, Nan Zhang, Zhongzhi Shi. 2016. Incremental extreme learning machine based on deep feature embedded. *International Journal of Machine Learning and Cybernetics* **7**:1, 111-120. [Crossref]

2605. Xian Yang, Shoujue Wang. 2016. Data driven visual tracking via representation learning and online multi-class LPBoost learning. *IET Computer Vision* **10**:1, 28-35. [Crossref]

2606. Fuyong Xing, Yuanpu Xie, Lin Yang. 2016. An Automatic Learning-Based Framework for Robust Nucleus Segmentation. *IEEE Transactions on Medical Imaging* **35**:2, 550-566. [Crossref]

2607. Mohammad Hossein Rafiei, Hojjat Adeli. 2016. A Novel Machine Learning Model for Estimation of Sale Prices of Real Estate Units. *Journal of Construction Engineering and Management* **142**:2, 04015066. [Crossref]

2608. Tuo Zhao, Yunxin Zhao, Xin Chen. 2016. Ensemble Acoustic Modeling for CD-DNN-HMM Using Random Forests of Phonetic Decision Trees. *Journal of Signal Processing Systems* **82**:2, 187-196. [Crossref]

2609. Zhanglin Peng, Ya Li, Zhaoquan Cai, Liang Lin. 2016. Deep Boosting: Joint feature selection and analysis dictionary learning in hierarchy. *Neurocomputing* **178**, 36-45. [Crossref]

2610. Yongbin Gao, Hyo Lee. 2016. Local Tiled Deep Networks for Recognition of Vehicle Make and Model. *Sensors* **16**:2, 226. [Crossref]

2611. Heming Liang, Qi Li. 2016. Hyperspectral Imagery Classification Using Sparse Representations of Convolutional Neural Network Features. *Remote Sensing* **8**:2, 99. [Crossref]

2612. Junhai Luo, Huanbin Gao. 2016. Deep Belief Networks for Fingerprinting Indoor Localization Using Ultrawideband Technology. *International Journal of Distributed Sensor Networks* **12**:1, 5840916. [Crossref]

2613. Viktor Slavkovikj, Steven Verstockt, Wesley De Neve, Sofie Van Hoecke, Rik Van de Walle. 2016. Unsupervised spectral sub-feature learning for hyperspectral image classification. *International Journal of Remote Sensing* **37**:2, 309-326. [Crossref]

2614. Suraj Srinivas, Ravi Kiran Sarvadevabhatla, Konda Reddy Mopuri, Nikita Prabhu, Srinivas S. S. Kruthiventi, R. Venkatesh Babu. 2016. A Taxonomy of Deep Convolutional Neural Nets for Computer Vision. *Frontiers in Robotics and AI* **2**. . [Crossref]

2615. Li-Yun Chang, David C. Plaut, Charles A. Perfetti. 2016. Visual complexity in orthographic learning: Modeling learning across writing system variations. *Scientific Studies of Reading* **20**:1, 64-85. [Crossref]

2616. Dennis Norris, James M. McQueen, Anne Cutler. 2016. Prediction, Bayesian inference and feedback in speech recognition. *Language, Cognition and Neuroscience* **31**:1, 4-18. [Crossref]

2617. Gordana Dodig-Crnkovic. Information, Computation, Cognition. Agency-Based Hierarchies of Levels 141-159. [Crossref]

2618. Ariel Benou, Ronel Veksler, Alon Friedman, Tammy Riklin Raviv. De-noising of Contrast-Enhanced MRI Sequences by an Ensemble of Expert Deep Neural Networks 95-110. [Crossref]

2619. Mario Valerio Giuffrida, Sotirios A. Tsaftaris. Rotation-Invariant Restricted Boltzmann Machine Using Shared Gradient Filters 480-488. [Crossref]

2620. Toshisada Mariyama, Kunihiko Fukushima, Wataru Matsumoto. Automatic Design of Neural Network Structures Using AiS 280-287. [Crossref]

2621. Chao Qiu, Yinhui Zhang, Jieqiong Wang, Zifen He. Pedestrian Detection Aided by Deep Learning Attributes Task 201-210. [Crossref]

2622. Shin Kamada, Takumi Ichimura. A Structural Learning Method of Restricted Boltzmann Machine by Neuron Generation and Annihilation Algorithm 372-380. [Crossref]

2623. Yi Li, Hong Liu, Wenjun Yang, Dianming Hu, Xiaojing Wang, Wei Xu. 2016. Predicting Inter-Data-Center Network Traffic Using Elephant Flow and Sublink Information. *IEEE Transactions on Network and Service Management* 1-1. [Crossref]

2624. Yingfeng Cai, Xiaoqiang Sun, Hai Wang, Long Chen, Haobin Jiang. 2016. Night-Time Vehicle Detection Algorithm Based on Visual Saliency and Deep Learning. *Journal of Sensors* **2016**, 1-7. [Crossref]

2625. Jaime Humberto Niño-Peña, Germán Jairo Hernández-Pérez. Price Direction Prediction on High Frequency Data Using Deep Belief Networks 74-83. [Crossref]

2626. Mehmet Erdal, Markus Kächele, Friedhelm Schwenker. Emotion Recognition in Speech with Deep Learning Architectures 298-311. [Crossref]

2627. Sang-Kyun Kim, Young-Jin Park, Sangmin Lee. 2016. Voice activity detection based on deep belief networks using likelihood ratio. *Journal of Central South University* **23**:1, 145-149. [Crossref]

2628. Daixin Wang, Peng Cui, Wenwu Zhu. Structural Deep Network Embedding 1225-1234. [Crossref]

2629. Fréjus A. A. Laleye, Eugène C. Ezin, Cina Motamed. Speech Phoneme Classification by Intelligent Decision-Level Fusion 63-78. [Crossref]

2630. Akihiro Suzuki, Takashi Morie, Hakaru Tamukoh. FPGA Implementation of Autoencoders Having Shared Synapse Architecture 231-239. [Crossref]

2631. Sansei Hori, Takashi Morie, Hakaru Tamukoh. Restricted Boltzmann Machines Without Random Number Generators for Efficient Digital Hardware Implementation 391-398. [Crossref]

2632. Francisco Ortega-Zamorano, José M. Jerez, Iván Gómez, Leonardo Franco. Deep Neural Network Architecture Implementation on FPGAs Using a Layer Multiplexing Scheme 79-86. [Crossref]

2633. Richard Vogl, Peter Knees. An Intelligent Musical Rhythm Variation Interface 88-91. [Crossref]

2634. Huanhuan Zheng, Yanyun Qu, Kun Zeng. Coupled Autoencoder Network with Joint Regularizations for image super-resolution 114-117. [Crossref]

2635. Omid E. David, Nathan S. Netanyahu. DeepPainter: Painter Classification Using Deep Convolutional Autoencoders 20-28. [Crossref]

2636. Junying Hu, Jiangshe Zhang, Chunxia Zhang, Juan Wang. 2016. A new deep neural network based on a stack of single-hidden-layer feedforward neural networks with randomly fixed hidden neurons. *Neurocomputing* **171**, 63-72. [Crossref]

2637. Wojciech K. Mleczko, Robert K. Nowicki, Rafał Angryk. Rough Restricted Boltzmann Machine – New Architecture for Incomplete Input Data 114-125. [Crossref]

2638. Lei Li, Xiaoyi Feng, Xiaoting Wu, Zhaoqiang Xia, Abdenour Hadid. Kinship Verification from Faces via Similarity Metric Based Convolutional Neural Network 539-548. [Crossref]

2639. Tohru Nitta. On the Singularity in Deep Neural Networks 389-396. [Crossref]

2640. Qiang Lu, Jun Ren, Zhiguang Wang. 2016. Using Genetic Programming with Prior Formula Knowledge to Solve Symbolic Regression Problem. *Computational Intelligence and Neuroscience* **2016**, 1-17. [Crossref]

2641. Liu Ni, Muhammad Ali Abdul Aziz. A robust deep belief network-based approach for recognizing dynamic hand gestures 199-205. [Crossref]

2642. Gustavo Rosa, João Papa, Kelton Costa, Leandro Passos, Clayton Pereira, Xin-She Yang. Learning Parameters in Deep Belief Networks Through Firefly Algorithm 138-149. [Crossref]

2643. Kazuyuki Hara, Daisuke Saitoh, Takumi Kondou, Satoshi Suzuki, Hayaru Shouno. Group Dropout Inspired by Ensemble Learning 66-73. [Crossref]

2644. Yanyu Xu, Shenghua Gao. Bi-Level Multi-column Convolutional Neural Networks for Facial Landmark Point Detection 536-551. [Crossref]

2645. Dongxu Zhang, Tianyi Luo, Dong Wang. Learning from LDA Using Deep Neural Networks 657-664. [Crossref]

2646. Jerome R. Bellegarda, Christof Monz. 2016. State of the art in statistical methods for language and speech processing. *Computer Speech & Language* **35**, 163-184. [Crossref]

2647. Aiguo Wang, Guilin Chen, Cuijuan Shang, Miaofei Zhang, Li Liu. Human Activity Recognition in a Smart Home Environment with Stacked Denoising Autoencoders 29-40. [Crossref]

2648. Li Deng. 2016. Deep learning: from speech recognition to language and multimodal processing. *APSIPA Transactions on Signal and Information Processing* **5**. . [Crossref]

2649. Clayton R. Pereira, Danillo R. Pereira, Joao P. Papa, Gustavo H. Rosa, Xin-She Yang. Convolutional Neural Networks Applied for Parkinson's Disease Identification 377-390. [Crossref]

2650. Věra Kůrková. Lower Bounds on Complexity of Shallow Perceptron Networks 283-294. [Crossref]

2651. Ryotaro Kamimura. 2016. Simplified Information Maximization for Improving Generalization Performance in Multilayered Neural Networks. *Mathematical Problems in Engineering* **2016**, 1-17. [Crossref]

2652. Babajide O. Ayinde, Ehsan Hosseini-Asl, Jacek M. Zurada. Visualizing and Understanding Nonnegativity Constrained Sparse Autoencoder in Deep Learning 3-14. [Crossref]

2653. Mohd Razif Shamsuddin, Shuzlina Abdul-Rahman, Azlinah Mohamed. Shallow Network Performance in an Increasing Image Dimension 3-12. [Crossref]

2654. András Lőrincz, Zoltán Á. Milacski, Balázs Pintér, Anita L. Verő. 2016. Columnar Machine: Fast estimation of structured sparse codes. *Biologically Inspired Cognitive Architectures* **15**, 19-33. [Crossref]

2655. Maoguo Gong, Jiaojiao Zhao, Jia Liu, Qiguang Miao, Licheng Jiao. 2016. Change Detection in Synthetic Aperture Radar Images Based on Deep Neural Networks. *IEEE Transactions on Neural Networks and Learning Systems* **27**:1, 125-138. [Crossref]

2656. Pinle Qin, Meng Li, Qiguang Miao, Chuanpeng Li. Research of the DBN Algorithm Based on Multi-innovation Theory and Application of Social Computing 577-590. [Crossref]

2657. Tiehang Duan, Sargur N. Srihari. Pseudo Boosted Deep Belief Network 105-112. [Crossref]

2658. Chao Wang, Jianhui Wang, Shusheng Gu. 2016. Deep Network Based on Stacked Orthogonal Convex Incremental ELM Autoencoders. *Mathematical Problems in Engineering* **2016**, 1-17. [Crossref]

2659. Kai Xu, Vladimir G. Kim, Qixing Huang, Niloy Mitra, Evangelos Kalogerakis. Data-driven shape analysis and processing 1-38. [Crossref]

2660. Jun Guo, Changhu Wang, Edgar Roman-Rangel, Hongyang Chao, Yong Rui. 2016. Building Hierarchical Representations for Oracle Character and Sketch Recognition. *IEEE Transactions on Image Processing* **25**:1, 104-118. [Crossref]

2661. A.S. Maida. Cognitive Computing and Neural Networks 39-78. [Crossref]

2662. B. Chandra, Rajesh K. Sharma. 2016. Fast learning in Deep Neural Networks. *Neurocomputing* **171**, 1205-1215. [Crossref]

2663. Hui Li, Weidong Jin, Haodong Liu, Kun Zheng. Adaptive Stacked Denoising Autoencoder for Work Mode Identification of Airborne Active Phased Array Radar 227-236. [Crossref]

2664. Yihui Xiong, Renguang Zuo. 2016. Recognition of geochemical anomalies using a deep autoencoder network. *Computers & Geosciences* **86**, 75-82. [Crossref]

2665. Masayuki HITOKOTO, Masaaki SAKURABA, Yuichi SEI. 2016. DEVELOPMENT OF THE REAL-TIME RIVER STAGE PREDICTION METHOD USING DEEP LEARNING. *Journal of Japan Society of Civil Engineers, Ser. B1 (Hydraulic Engineering)* **72**:4, I_187-I_192. [Crossref]

2666. Deepti Ghadiyaram, Alan C. Bovik. 2016. Massive Online Crowdsourced Study of Subjective and Objective Picture Quality. *IEEE Transactions on Image Processing* **25**:1, 372-387. [Crossref]

2667. Ewa Skubalska-Rafajłowicz. Training Neural Networks by Optimizing Random Subspaces of the Weight Space 148-157. [Crossref]

2668. Akinori Hidaka, Takio Kurita. 2016. Randomized and Dimension Reduced Radial Basis Features for Support Vector Machine. *Transactions of the Institute of Systems, Control and Information Engineers* **29**:1, 1-8. [Crossref]

2669. Ya-Jun Hu, Zhen-Hua Ling. 2016. DBN-based Spectral Feature Representation for Statistical Parametric Speech Synthesis. *IEEE Signal Processing Letters* 1-1. [Crossref]

2670. Ying Lin, Jianjun Sun, Chengqi Li, Yan Ma, Yujie Geng, Yufeng Chen. 2016. Deep Learning for Intelligent Substation Device Infrared Fault Image Analysis. *MATEC Web of Conferences* **55**, 03007. [Crossref]

2671. Amin Khatami, Abbas Khosravi, Chee Peng Lim, Saeid Nahavandi. A Wavelet Deep Belief Network-Based Classifier for Medical Images 467-474. [Crossref]

2672. Jonathan Masci, Emanuele Rodolà, Davide Boscaini, Michael M. Bronstein, Hao Li. Geometric deep learning 1-50. [Crossref]

2673. Gábor Gosztolya, Tamás Grósz. 2016. Domain Adaptation of Deep Neural Networks for Automatic Speech Recognition via Wireless Sensors. *Journal of Electrical Engineering* **67**:2. . [Crossref]

2674. David Cárdenas-Peña, Diego Collazos-Huertas, German Castellanos-Dominguez. 2016. Centered Kernel Alignment Enhancing Neural Network Pretraining for MRI-Based Dementia Diagnosis. *Computational and Mathematical Methods in Medicine* **2016**, 1-10. [Crossref]

2675. Simon Fong, Charlie Fang, Neal Tian, Raymond Wong, Bee Wah Yap. Self-Adaptive Parameters Optimization for Incremental Classification in Big Data Using Neural Network 175-196. [Crossref]

2676. Qi Yue, Caiwen Ma. 2016. Deep Learning for Hyperspectral Data Classification through Exponential Momentum Deep Convolution Neural Networks. *Journal of Sensors* **2016**, 1-8. [Crossref]

2677. Wataru Matsumoto, Manabu Hagiwara, Petros T. Boufounos, Kunihiko Fukushima, Toshisada Mariyama, Zhao Xiongxin. A Deep Neural Network Architecture Using Dimensionality Reduction with Sparse Matrices 397-404. [Crossref]

2678. Rongbing Huang, Chang Liu, Guoqi Li, Jiliu Zhou. 2016. Adaptive Deep Supervised Autoencoder Based Image Reconstruction for Face Recognition. *Mathematical Problems in Engineering* **2016**, 1-14. [Crossref]

2679. Wei-Yu Tsai, Xueqing Li, Matthew Jerry, Baihua Xie, Nikhil Shukla, Huichu Liu, Nandhini Chandramoorthy, Matthew Cotter, Arijit Raychowdhury, Donald M. Chiarulli, Steven P. Levitan, Suman Datta, John Sampson, Nagarajan Ranganathan, Vijaykrishnan Narayanan. 2016. Enabling New Computation Paradigms with HyperFET - An Emerging Device. *IEEE Transactions on Multi-Scale Computing Systems* **2**:1, 30-48. [Crossref]

2680. Patrawut Ruangkanokmas, Tiranee Achalakul, Khajonpong Akkarajitsakul. Deep Belief Networks with Feature Selection for Sentiment Classification 9-14. [Crossref]

2681. Erik Barrow, Mark Eastwood, Chrisina Jayne. Selective Dropout for Deep Neural Networks 519-528. [Crossref]

2682. Lenz Belzner, Matthias Hölzl, Nora Koch, Martin Wirsing. Collective Autonomic Systems: Towards Engineering Principles and Their Foundations 180-200. [Crossref]

2683. S. Elaiwat, M. Bennamoun, F. Boussaid. 2016. A spatio-temporal RBM-based model for facial expression recognition. *Pattern Recognition* **49**, 152-161. [Crossref]

2684. Hong Chen, Jungang Xu, Qi Wang, Ben He. A Document Modeling Method Based on Deep Generative Model and Spectral Hashing 402-413. [Crossref]

2685. Gang Chen, Ran Xu, Sargur N. Srihari. Sequential Labeling with Online Deep Learning: Exploring Model Initialization 772-788. [Crossref]

2686. Jie Tao, Yilun Liu, Dalian Yang. 2016. Bearing Fault Diagnosis Based on Deep Belief Network and Multisensor Information Fusion. *Shock and Vibration* **2016**, 1-9. [Crossref]

2687. Anupriya Gogna, Angshul Majumdar. Semi Supervised Autoencoder 82-89. [Crossref]

2688. S. Jothilakshmi, V.N. Gudivada. Large Scale Data Enabled Evolution of Spoken Language Research and Applications 301-340. [Crossref]

2689. Tae Gyoon KANG, Nam Soo KIM. 2016. DNN-Based Voice Activity Detection with Multi-Task Learning. *IEICE Transactions on Information and Systems* **E99.D**:2, 550-553. [Crossref]

2690. Jie Ding, Changyun Wen, Guoqi Li, Chin Seng Chua. 2016. Locality sensitive batch feature extraction for high-dimensional data. *Neurocomputing* **171**, 664-672. [Crossref]

2691. Migel D. Tissera, Mark D. McDonnell. 2016. Deep extreme learning machines: supervised autoencoding architecture for classification. *Neurocomputing* **174**, 42-49. [Crossref]

2692. Saining Xie, Xun Huang, Zhuowen Tu. Top-Down Learning for Structured Labeling with Convolutional Pseudoprior 302-317. [Crossref]

2693. Siqi Nie, Yue Zhao, Qiang Ji. Latent regression Bayesian network for data representation 3494-3499. [Crossref]

2694. Adela-Diana Almási, Stanisław Woźniak, Valentin Cristea, Yusuf Leblebici, Ton Engbersen. 2016. Review of advances in neural networks: Neural design technology stack. *Neurocomputing* **174**, 31-41. [Crossref]

2695. Seong-Wook Park, Junyoung Park, Kyeongryeol Bong, Dongjoo Shin, Jinmook Lee, Sungpill Choi, Hoi-Jun Yoo. 2016. An Energy-Efficient and Scalable Deep Learning/Inference Processor With Tetra-Parallel MIMD Architecture for Big Data Applications. *IEEE Transactions on Biomedical Circuits and Systems* 1-1. [Crossref]

2696. Mo Jamshidi, Barney Tannahill, Maryam Ezell, Yunus Yetis, Halid Kaplan. Applications of Big Data Analytics Tools for Data Management 177-199. [Crossref]

2697. Satoshi TAMURA, Hiroshi NINOMIYA, Norihide KITAOKA, Shin OSUGA, Yurie IRIBE, Kazuya TAKEDA, Satoru HAYAMIZU. 2016. Investigation of DNN-Based Audio-Visual Speech Recognition. *IEICE Transactions on Information and Systems* **E99.D**:10, 2444-2451. [Crossref]

2698. Prasanna Date, James A. Hendler, Christopher D. Carothers. 2016. Design Index for Deep Neural Networks. *Procedia Computer Science* **88**, 131-138. [Crossref]

2699. Mo Jamshidi, Barney Tannahill, Arezou Moussavi. Big Data Analytic Paradigms: From Principle Component Analysis to Deep Learning 79-95. [Crossref]

2700. Ali Ahmadi, Mohammad-Mahdi Bidmeshki, Amit Nahar, Bob Orr, Michael Pas, Yiorgos Makris. A machine learning approach to fab-of-origin attestation 1-6. [Crossref]

2701. M. Tatsuno. Information Geometric Analysis of Neurophysiological Data 19-34. [Crossref]

2702. Diana Inkpen. Text Mining in Social Media for Security Threats 491-517. [Crossref]

2703. Yanxia Zhang, Lu Yang, Binghao Meng, Hong Cheng, Yong Zhang, Qian Wang, Jiadan Zhu. On the Quantitative Analysis of Sparse RBMs 449-458. [Crossref]

2704. Ying Liu, Linzhi Wu. 2016. Geological Disaster Recognition on Optical Remote Sensing Images Using Deep Learning. *Procedia Computer Science* **91**, 566-575. [Crossref]

2705. Javier Pérez-Sianes, Horacio Pérez-Sánchez, Fernando Díaz. Virtual Screening: A Challenge for Deep Learning 13-22. [Crossref]

2706. Jinyu Li, Li Deng, Reinhold Haeb-Umbach, Yifan Gong. Fundamentals of speech recognition 9-40. [Crossref]

2707. Yenumula B. Reddy. GPU-based Design for Fingerprint Matching 1-8. [Crossref]

2708. Lin-peng Jin, Jun Dong. 2016. Ensemble Deep Learning for Biomedical Time Series Classification. *Computational Intelligence and Neuroscience* **2016**, 1-13. [Crossref]

2709. Hai Wang, Yingfeng Cai, Xiaobo Chen, Long Chen. 2016. Night-Time Vehicle Sensing in Far Infrared Image with Deep Learning. *Journal of Sensors* **2016**, 1-8. [Crossref]

2710. Dan Jia, Rui Wang, Chengzhong Xu, Zhibin Yu. QIM: Quantifying Hyperparameter Importance for Deep Learning 180-188. [Crossref]

2711. Qing Li, Wenhao Zhu, Zhiguo Lu. Predicting Abstract Keywords by Word Vectors 185-195. [Crossref]

2712. Andrés Arévalo, Jaime Niño, German Hernández, Javier Sandoval. High-Frequency Trading Strategy Based on Deep Neural Networks 424-436. [Crossref]

2713. Shuanglong Liu, Chao Zhang, Jinwen Ma. Stacked Auto-Encoders for Feature Extraction with Neural Networks 377-384. [Crossref]

2714. Timothy C. Havens, Derek T. Anderson, Kevin Stone, John Becker, Anthony J. Pinar. Computational Intelligence Methods in Forward-Looking Explosive Hazard Detection 13-44. [Crossref]

2715. Li Zhang, Yaping Lu, Zhao Zhang, Bangjun Wang, Fanzhang Li. Sparse Auto-encoder with Smoothed $$l_1$$ Regularization 555-563. [Crossref]

2716. Rahul Duggal, Anubha Gupta, Ritu Gupta, Manya Wadhwa, Chirag Ahuja. Overlapping cell nuclei segmentation in microscopic images using deep belief networks 1-8. [Crossref]

2717. Shifei Ding, Jian Zhang, Nan Zhang, Yanlu Hou. Boltzmann Machine and its Applications in Image Recognition 108-118. [Crossref]

2718. Hui Zou, Ji-Xiang Du, Chuan-Min Zhai, Jing Wang. Deep Learning and Shared Representation Space Learning Based Cross-Modal Multimedia Retrieval 322-331. [Crossref]

2719. Zhilu Chen, Xinming Huang. 2016. Accurate and Reliable Detection of Traffic Lights Using Multiclass Learning and Multiobject Tracking. *IEEE Intelligent Transportation Systems Magazine* **8**:4, 28-42. [Crossref]

2720. Yong Jin, Donglei Du, Harry Zhang. Gaussian Neuron in Deep Belief Network for Sentiment Prediction 46-51. [Crossref]

2721. Tsubasa OCHIAI, Shigeki MATSUDA, Hideyuki WATANABE, Xugang LU, Chiori HORI, Hisashi KAWAI, Shigeru KATAGIRI. 2016. Speaker Adaptive Training Localizing Speaker Modules in DNN for Hybrid DNN-HMM Speech Recognizers. *IEICE Transactions on Information and Systems* **E99.D**:10, 2431-2443. [Crossref]

2722. Kazuyuki Hara, Daisuke Saitoh, Hayaru Shouno. Analysis of Dropout Learning Regarded as Ensemble Learning 72-79. [Crossref]

2723. Manoj Kumar Sharma, Debdoot Sheet, Prabir Kumar Biswas. Abnormality Detecting Deep Belief Network 1-6. [Crossref]

2724. Wei Zheng, Desheng Hu, Jing Wang. 2016. Fault Localization Analysis Based on Deep Neural Network. *Mathematical Problems in Engineering* **2016**, 1-11. [Crossref]

2725. Mujiono Sadikin, Mohamad Ivan Fanany, T. Basaruddin. 2016. A New Data Representation Based on Training Data Characteristics to Extract Drug Name Entity in Medical Text. *Computational Intelligence and Neuroscience* **2016**, 1-16. [Crossref]

2726. Won-Tae Joo, Young-Seob Jeong, KyoJoong Oh. Political orientation detection on Korean newspapers via sentence embedding and deep learning 502-504. [Crossref]

2727. Hua Shen, Xun Liang. A Time Series Forecasting Model Based on Deep Learning Integrated Algorithm with Stacked Autoencoders and SVR for FX Prediction 326-335. [Crossref]

2728. Shifu Hou, Aaron Saas, Yanfang Ye, Lifei Chen. DroidDelver: An Android Malware Detection System Using Deep Belief Network Based on API Call Blocks 54-66. [Crossref]

2729. Luís Costa, Miguel F. Gago, Darya Yelshyna, Jaime Ferreira, Hélder David Silva, Luís Rocha, Nuno Sousa, Estela Bicho. 2016. Application of Machine Learning in Postural Control Kinematics for the Diagnosis of Alzheimer's Disease. *Computational Intelligence and Neuroscience* **2016**, 1-15. [Crossref]

2730. Guanyu Chen, Xiang Li, Ling Liu. A Study on the Recognition and Classification Method of High Resolution Remote Sensing Image Based on Deep Belief Network 362-370. [Crossref]

2731. Zeeshan Tariq, Salaheldin Elkatatny, Mohamed Mahmoud, Abdulazeez Abdulraheem. A Holistic Approach to Develop New Rigorous Empirical Correlation for Static Young's Modulus . [Crossref]

2732. Xugang Ye, Jingjing Li, Zijie Qi, Xiaodong He. Enhancing Retrieval and Ranking Performance for Media Search Engine by Deep Learning 1174-1180. [Crossref]

2733. Yueqing Wang, Zhige Xie, Kai Xu, Yong Dou, Yuanwu Lei. 2016. An efficient and effective convolutional auto-encoder extreme learning machine network for 3d feature learning. *Neurocomputing* **174**, 988-998. [Crossref]

2734. Hyung-Bae Jeon, Soo-Young Lee. Initializing Deep Learning Based on Latent Dirichlet Allocation for Document Classification 634-641. [Crossref]

2735. S.U. Park, J.H. Park, M.A. Al-masni, M.A. Al-antari, Md.Z. Uddin, T.-S. Kim. 2016. A Depth Camera-based Human Activity Recognition via Deep Learning Recurrent Neural Network for Health and Social Care Services. *Procedia Computer Science* **100**, 78-84. [Crossref]

2736. Le-le Cao, Wen-bing Huang, Fu-chun Sun. 2016. Building feature space of extreme learning machine with sparse denoising stacked-autoencoder. *Neurocomputing* **174**, 60-71. [Crossref]

2737. Li Liu, Ling Shao, Xuelong Li, Ke Lu. 2016. Learning Spatio-Temporal Representations for Action Recognition: A Genetic Programming Approach. *IEEE Transactions on Cybernetics* **46**:1, 158-170. [Crossref]

2738. Chongliang Wu, Shangfei Wang, Bowen Pan, Huaping Chen. Facial Expression Recognition with Deep two-view Support Vector Machine 616-620. [Crossref]

2739. Renjun Liu, Tongwei Lu. Character Recognition Based on PCANet 364-367. [Crossref]

2740. Michael McTear, Zoraida Callejas, David Griol. Future Directions 403-418. [Crossref]

2741. Jiezhong Qiu, Jie Tang, Tracy Xiao Liu, Jie Gong, Chenhui Zhang, Qian Zhang, Yufei Xue. Modeling and Predicting Learning Behavior in MOOCs 93-102. [Crossref]

2742. Ralf Schlüter, Patrick Doetsch, Pavel Golik, Markus Kitza, Tobias Menne, Kazuki Irie, Zoltán Tüske, Albert Zeyer. Automatic Speech Recognition Based on Neural Networks 3-17. [Crossref]

2743. Scott Krig. Feature Learning and Deep Learning Architecture Survey 375-514. [Crossref]

2744. Po-Yu Kao, Eduardo Rojas, Jefferson W. Chen, Angela Zhang, B. S. Manjunath. Unsupervised 3-D Feature Learning for Mild Traumatic Brain Injury 282-290. [Crossref]

2745. Hongfu Liu, Ming Shao, Sheng Li, Yun Fu. Infinite Ensemble for Image Clustering 1745-1754. [Crossref]

2746. Scott Krig. Taxonomy of Feature Description Attributes 167-186. [Crossref]

2747. Věra Kůrková, Marcello Sanguineti. 2016. Model complexities of shallow networks representing highly varying functions. *Neurocomputing* **171**, 598-604. [Crossref]

2748. Krzysztof J. Geras, Charles Sutton. Composite Denoising Autoencoders 681-696. [Crossref]

2749. Xinyu Li, Yanyi Zhang, Mengzhu Li, Ivan Marsic, JaeWon Yang, Randall S. Burd. Deep neural network for RFID-based activity recognition 24-26. [Crossref]

2750. Yuanzhang Wei, Jicheng Meng, Zonghui Shen. A new method of deep synergetic neural network for face recognition 1-6. [Crossref]

2751. Xiao Zhang, Youtian Du. Nonlinear PCA Network for Image Classification 449-457. [Crossref]

2752. N. Al-Shorbaji, R. Bellazzi, F. Gonzalez Bernaldo de Quiros, S. Koch, C. A. Kulikowski, N. H. Lovell, V. Maojo, H.-A. Park, F. Sanz, I. N. Sarkar, H. Tanaka. 2016. Discussion of "The New Role of Biomedical Informatics in the Age of Digital Medicine". *Methods of Information in Medicine* **55**:5, 403-421. [Crossref]

2753. Aleksey Prudnikov, Maxim Korenevsky. Training Maxout Neural Networks for Speech Recognition Tasks 443-451. [Crossref]

2754. Ya-Li Qi, Ye-Li Li. Deep Representation Based on Multilayer Extreme Learning Machine 147-152. [Crossref]

2755. Edward Choi, Mohammad Taha Bahadori, Elizabeth Searles, Catherine Coffey, Michael Thompson, James Bost, Javier Tejedor-Sojo, Jimeng Sun. Multi-layer Representation Learning for Medical Concepts 1495-1504. [Crossref]

2756. Liya Zhao, Kebin Jia. 2016. Multiscale CNNs for Brain Tumor Segmentation and Diagnosis. *Computational and Mathematical Methods in Medicine* **2016**, 1-7. [Crossref]

2757. Guangjun Zhao, Xuchu Wang, Yanmin Niu, Liwen Tan, Shao-Xiang Zhang. 2016. Segmenting Brain Tissues from Chinese Visible Human Dataset by Deep-Learned Features with Stacked Autoencoder. *BioMed Research International* **2016**, 1-12. [Crossref]

2758. G. Sanroma, G. Wu, M. Kim, M.A.González Ballester, D. Shen. Multiple-Atlas Segmentation in Medical Imaging 231-257. [Crossref]

2759. M. Korjani, Andrei Popa, Eli Grijalva, Steve Cassidy, I. Ershaghi. A New Approach to Reservoir Characterization Using Deep Learning Neural Networks . [Crossref]

2760. Scott Krig. Ground Truth Data, Content, Metrics, and Analysis 247-271. [Crossref]

2761. Bineng Zhong, Shengnan Pan, Hongbo Zhang, Tian Wang, Jixiang Du, Duansheng Chen, Liujuan Cao. 2016. Convolutional Deep Belief Networks for

Single-Cell/Object Tracking in Computational Biology and Computer Vision. *BioMed Research International* **2016**, 1-14. [Crossref]

2762. Nan Zhang, Shifei Ding, Zhongzhi Shi. 2016. Denoising Laplacian multi-layer extreme learning machine. *Neurocomputing* **171**, 1066-1074. [Crossref]

2763. Chetan Verma, Michael Hart, Sandeep Bhatkar, Aleatha Parker-Wood, Sujit Dey. 2016. Improving Scalability of Personalized Recommendation Systems for Enterprise Knowledge Workers. *IEEE Access* **4**, 204-215. [Crossref]

2764. Petar Palasek, Ioannis Patras. Action Recognition Using Convolutional Restricted Boltzmann Machines 3-8. [Crossref]

2765. Sulagna Gope, Sudeshna Sarkar, Pabitra Mitra, Subimal Ghosh. Early Prediction of Extreme Rainfall Events: A Deep Learning Approach 154-167. [Crossref]

2766. Mahmood Sharif, Sruti Bhagavatula, Lujo Bauer, Michael K. Reiter. Accessorize to a Crime 1528-1540. [Crossref]

2767. Vasileios Sevetlidis, Mario Valerio Giuffrida, Sotirios A. Tsaftaris. Whole Image Synthesis Using a Deep Encoder-Decoder Network 127-137. [Crossref]

2768. Mengyuan Liu, Hong Liu. 2016. Depth Context: a new descriptor for human activity recognition by using sole depth sequences. *Neurocomputing* **175**, 747-758. [Crossref]

2769. Miyuru Dayarathna, Yonggang Wen, Rui Fan. 2016. Data Center Energy Consumption Modeling: A Survey. *IEEE Communications Surveys & Tutorials* **18**:1, 732-794. [Crossref]

2770. Pankaj Mishra, Rafik Hadfi, Takayuki Ito. Multiagent Social Influence Detection Based on Facial Emotion Recognition 148-160. [Crossref]

2771. Jürgen Schmidhuber. Deep Learning 1-11. [Crossref]

2772. Nian Liu, Nayyar A. Zaidi. Artificial Neural Network: Deep or Broad? An Empirical Study 535-541. [Crossref]

2773. Muhammad Ghifary, W. Bastiaan Kleijn, Mengjie Zhang, David Balduzzi, Wen Li. Deep Reconstruction-Classification Networks for Unsupervised Domain Adaptation 597-613. [Crossref]

2774. Maryam M. Najafabadi, Flavio Villanustre, Taghi M. Khoshgoftaar, Naeem Seliya, Randall Wald, Edin Muharemagc. Deep Learning Techniques in Big Data Analytics 133-156. [Crossref]

2775. Biqiao Zhang, Georg Essl, Emily Mower Provost. Automatic recognition of self-reported and perceived emotion: does joint modeling help? 217-224. [Crossref]

2776. Gábor Gosztolya, András Beke, Tilda Neuberger, László Tóth. 2016. Laughter Classification Using Deep Rectifier Neural Networks with a Minimal Feature Subset. *Archives of Acoustics* **41**:4. . [Crossref]

2777. Pijika Watcharapichat, Victoria Lopez Morales, Raul Castro Fernandez, Peter Pietzuch. Ako 84-97. [Crossref]

2778. Viliam Lendel, Lucia Pancikova, Lukas Falat. Advanced Predictive Methods of Artificial Intelligence in Intelligent Transport Systems 165-174. [Crossref]

2779. Erik Gawehn, Jan A. Hiss, Gisbert Schneider. 2016. Deep Learning in Drug Discovery. *Molecular Informatics* **35**:1, 3-14. [Crossref]

2780. Arseny Krasnobaev, Andrey Sozykin. 2016. An Overview of Techniques for Cardiac Left Ventricle Segmentation on Short-Axis MRI. *ITM Web of Conferences* **8**, 01003. [Crossref]

2781. Fan Jiang, Hai-Miao Hu, Jin Zheng, Bo Li. 2016. A hierarchal BoW for image retrieval by enhancing feature salience. *Neurocomputing* **175**, 146-154. [Crossref]

2782. Gregory Morse, Kenneth O. Stanley. Simple Evolutionary Optimization Can Rival Stochastic Gradient Descent in Neural Networks 477-484. [Crossref]

2783. Yifu Huang, Kai Huang, Yang Wang, Hao Zhang, Jihong Guan, Shuigeng Zhou. Exploiting Twitter Moods to Boost Financial Trend Prediction Based on Deep Network Models 449-460. [Crossref]

2784. Shiqing Zhang, Xiaoming Zhao, Yuelong Chuang, Wenping Guo, Ying Chen. Feature Learning via Deep Belief Network for Chinese Speech Emotion Recognition 645-651. [Crossref]

2785. Iván López-Espejo, Antonio M. Peinado, Angel M. Gomez, Juan M. Martín-Doñas. Deep Neural Network-Based Noise Estimation for Robust ASR in Dual-Microphone Smartphones 117-127. [Crossref]

2786. Oleg Kudashev, Sergey Novoselov, Timur Pekhovsky, Konstantin Simonchik, Galina Lavrentyeva. Usage of DNN in Speaker Recognition: Advantages and Problems 82-91. [Crossref]

2787. Nan JIANG, Wenge RONG, Baolin PENG, Yifan NIE, Zhang XIONG. 2016. Modeling Joint Representation with Tri-Modal Deep Belief Networks for Query and Question Matching. *IEICE Transactions on Information and Systems* **E99.D**:4, 927-935. [Crossref]

2788. Long Xu, Ying Weng, Zhuo Chen. Solar Radio Astronomical Big Data Classification 126-133. [Crossref]

2789. Kang-Hao Peng, Heng Zhang. Mutual information-based RBM neural networks 2458-2463. [Crossref]

2790. Chen Xing, Li Ma, Xiaoquan Yang. 2016. Stacked Denoise Autoencoder Based Feature Extraction and Classification for Hyperspectral Images. *Journal of Sensors* **2016**, 1-10. [Crossref]

2791. Juan Yang, Shuqing He. The Optimization of Parallel DBN Based on Spark 157-169. [Crossref]

2792. Andrés Ortiz, Francisco J. Martínez-Murcia, María J. García-Tarifa, Francisco Lozano, Juan M. Górriz, Javier Ramírez. Automated Diagnosis of Parkinsonian Syndromes by Deep Sparse Filtering-Based Features 249-258. [Crossref]

2793. W. Dzwinel, A. Kłusek, O.V. Vasilyev. 2016. Supermodeling in Simulation of Melanoma Progression. *Procedia Computer Science* **80**, 999-1010. [Crossref]

2794. Syed Afaq Ali Shah, Mohammed Bennamoun, Farid Boussaid. 2016. Iterative deep learning for image set based face and object recognition. *Neurocomputing* **174**, 866-874. [Crossref]

2795. Martin Bogdan, Adam Kolany, Ulrike Weber, Romy Elze, Miroslaw Wrobel. Computer Aided Multispectral Ultrasound Diagnostics Brain Health Monitoring System Based on Acoustocerebrography 983-987. [Crossref]

2796. Kodai Ueyoshi, Takao Marukame, Tetsuya Asai, Masato Motomura, Alexandre Schmid. 2016. FPGA Implementation of a Scalable and Highly Parallel Architecture for Restricted Boltzmann Machines. *Circuits and Systems* **07**:09, 2132-2141. [Crossref]

2797. Yan Chen, Xiangnan Yang, Bineng Zhong, Shengnan Pan, Duansheng Chen, Huizhen Zhang. 2016. CNNTracker: Online discriminative object tracking via deep convolutional neural network. *Applied Soft Computing* **38**, 1088-1098. [Crossref]

2798. Yun Bai, Zhiqiang Chen, Jingjing Xie, Chuan Li. 2016. Daily reservoir inflow forecasting using multiscale deep feature learning with hybrid models. *Journal of Hydrology* **532**, 193-206. [Crossref]

2799. Junghoe Kim, Vince D. Calhoun, Eunsoo Shim, Jong-Hwan Lee. 2016. Deep neural network with weight sparsity control and pre-training extracts hierarchical features and enhances classification performance: Evidence from whole-brain resting-state functional connectivity patterns of schizophrenia. *NeuroImage* **124**, 127-146. [Crossref]

2800. Youngjune Gwon, Miriam Cha, H. T. Kung. Deep Sparse-coded Network (DSN) 2610-2615. [Crossref]

2801. Dong-Han Jhuang, Daw-Tung Lin, Chi-Hung Tsai. Face verification with three-dimensional point cloud by using deep belief networks 1430-1435. [Crossref]

2802. Sheikh Waqas Akhtar, Saad Rehman, Mahmood Akhtar, Muazzam A. Khan, Farhan Riaz, Qaiser Chaudry, Rupert Young. 2016. Improving the Robustness of Neural Networks Using K-Support Norm Based Adversarial Training. *IEEE Access* **4**, 9501-9511. [Crossref]

2803. Snigdha Tariyal, Angshul Majumdar, Richa Singh, Mayank Vatsa. 2016. Deep Dictionary Learning. *IEEE Access* **4**, 10096-10109. [Crossref]

2804. Sonam Nahar, Manjunath V. Joshi. Dense disparity estimation based on feature matching and IGMRF regularization 3804-3809. [Crossref]

2805. Ping Zhong, Zhiqiang Gong, Carola-Bibiane Schonlieb. A DBN-crf for spectral-spatial classification of hyperspectral data 1219-1224. [Crossref]

2806. Jui-Yuan Su, Shyi-Chyi Cheng, Jun-Wei Hsieh, Tzu-Hao Hsu. Moment-based symmetry detection for scene modeling and recognition using RGB-D images 3621-3626. [Crossref]

2807. Min Sik Park, Insun Park, Yoon-Sok Kang, Dongmin Im, Seok-Gwang Doo. 2016. A search map for organic additives and solvents applicable in high-voltage rechargeable batteries. *Physical Chemistry Chemical Physics* **18**:38, 26807-26815. [Crossref]

2808. Jong Taek Lee, Kil-Taek Lim, Yunsu Chung. Moving Shadow Detection from Background Image and Deep Learning 299-306. [Crossref]

2809. Yeqing Wang, Yi Li, Fatih Porikli. Finetuning Convolutional Neural Networks for visual aesthetics 3554-3559. [Crossref]

2810. Alexey Dosovitskiy, Jost Springenberg, Maxim Tatarchenko, Thomas Brox. 2016. Learning to Generate Chairs, Tables and Cars with Convolutional Networks. *IEEE Transactions on Pattern Analysis and Machine Intelligence* 1-1. [Crossref]

2811. Ge Wang. 2016. A Perspective on Deep Imaging. *IEEE Access* **4**, 8914-8924. [Crossref]

2812. Chathurdara Sri Nadith Pathirage, Ling Li, Wanquan Liu. Discriminant auto encoders for face recognition with expression and pose variations 3512-3517. [Crossref]

2813. Hengyang Zhang, Renchao Xie, Shixiang Zhu, Tao Huang, Yunjie Liu. 2016. DENA: An Intelligent Content Discovery System Used in Named Data Networking. *IEEE Access* **4**, 9093-9107. [Crossref]

2814. Linyan Gu, Lihua Yang. On the magnitude of parameters of RBMs being universal approximators 2470-2474. [Crossref]

2815. Lieven Lange, Ruben Verhack, Thomas Sikora. Video representation and coding using a sparse steered mixture-of-experts network 1-5. [Crossref]

2816. Scott Krig. Image Pre-Processing 35-74. [Crossref]

2817. Scott Krig. Global and Regional Features 75-114. [Crossref]

2818. Scott Krig. Local Feature Design Concepts 115-166. [Crossref]

2819. Scott Krig. Interest Point Detector and Feature Descriptor Survey 187-246. [Crossref]

2820. Scott Krig. Vision Pipelines and Optimizations 273-317. [Crossref]

2821. Scott Krig. Feature Learning Architecture Taxonomy and Neuroscience Background 319-374. [Crossref]

2822. Song Guo, Changjun Zhou, Bin Wang, Shihua Zhou. **9937**, 212. [Crossref]

2823. Xuesi Ma, Xiaojie Wang. 2016. Average Contrastive Divergence for Training Restricted Boltzmann Machines. *Entropy* **18**:1, 35. [Crossref]

2824. MEDIDA LAKSHMI HARITHA, RAMANI KASARAPU. 2016. Survey on Semantic Indexing of High dimensional Data with Deep Learning Techniques. *i-manager's Journal on Software Engineering* **11**:2, 31. [Crossref]

2825. D. Rodrigues, X.-S. Yang, J.P. Papa. Fine-tuning deep belief networks using cuckoo search 47-59. [Crossref]

2826. T. Brosch, Y. Yoo, L.Y.W. Tang, R. Tam. Deep learning of brain images and its application to multiple sclerosis 69-96. [Crossref]

2827. Yong Chen, Ting-ting Huang, Huan-lin Liu, Di Zhan. 2016. Multi-pose face ensemble classification aided by Gabor features and deep belief nets. *Optik* **127**:2, 946-954. [Crossref]

2828. Carlton Chu, Jeffrey De Fauw, Nenad Tomasev, Bernardino Romera Paredes, Cían Hughes, Joseph Ledsam, Trevor Back, Hugh Montgomery, Geraint Rees, Rosalind Raine, Kevin Sullivan, Syed Moinuddin, Derek D'Souza, Olaf Ronneberger, Ruheena Mendes, Julien Cornebise. 2016. Applying machine learning to automated segmentation of head and neck tumour volumes and organs at risk on radiotherapy planning CT and MRI scans. *F1000Research* **5**, 2104. [Crossref]

2829. Zhaohui Zhang, Anran Liu, Qian Lei. Image super-resolution reconstruction via RBM-based joint dictionary learning and sparse representation 981528. [Crossref]

2830. Tyler Lee, Frédéric Theunissen. 2015. A single microphone noise reduction algorithm based on the detection and reconstruction of spectro-temporal features. *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Science* **471**:2184, 20150309. [Crossref]

2831. Mario Chavez, Eduardo Cabrera, Silvia Garcia, Erik Chavez, Mike Ashworth, Narciso Perea, Alejandro Salazar. Extreme Magnitude Earthquakes and Their Direct Economic Impacts 219-302. [Crossref]

2832. Jiwen Lu, Venice Erin Liong, Jie Zhou. 2015. Cost-Sensitive Local Binary Feature Learning for Facial Age Estimation. *IEEE Transactions on Image Processing* **24**:12, 5356-5368. [Crossref]

2833. Haytham Assem, Declan O'Sullivan. Towards Bridging the Gap between Machine Learning Researchers and Practitioners 702-708. [Crossref]

2834. Mortaza Doulaty, Oscar Saz, Raymond W. M. Ng, Thomas Hain. Latent Dirichlet Allocation based organisation of broadcast media archives for deep neural network adaptation 130-136. [Crossref]

2835. Rula Sayaf, Soren Preibusch, Dave Clarke. Contextual Healing: Privacy through Interpretation Management 360-365. [Crossref]

2836. Maryam M Najafabadi, Flavio Villanustre, Taghi M Khoshgoftaar, Naeem Seliya, Randall Wald, Edin Muharemagic. 2015. Deep learning applications and challenges in big data analytics. *Journal of Big Data* **2**:1. . [Crossref]

2837. Masato Mimura, Shinsuke Sakai, Tatsuya Kawahara. 2015. Reverberant speech recognition combining deep neural networks and deep autoencoders augmented with a phone-class feature. *EURASIP Journal on Advances in Signal Processing* **2015**:1. . [Crossref]

2838. Erick De la Rosa, Wen Yu. Restricted Boltzmann Machine for Nonlinear System Modeling 443-446. [Crossref]

2839. Van Hai Do, Xiong Xiao, Eng Siong Chng, Haizhou Li. Distance metric learning for kernel density-based acoustic model under limited training data conditions 54-58. [Crossref]

2840. R. Raghavendra, Christoph Busch. 2015. Texture based features for robust palmprint recognition: a comparative study. *EURASIP Journal on Information Security* **2015**:1. . [Crossref]

2841. Tianchuan Du, Li Liao. Deep Neural Networks with Parallel Autoencoders for Learning Pairwise Relations: Handwritten Digits Subtraction 582-587. [Crossref]

2842. Andros Tjandra, Sakriani Sakti, Satoshi Nakamura, Mirna Adriani. Stochastic Gradient Variational Bayes for deep learning-based ASR 175-180. [Crossref]

2843. Suman Ravuri. Hybrid DNN-Latent structured SVM acoustic models for continuous speech recognition 37-44. [Crossref]

2844. Sankar Das Sarma, Michael Freedman, Chetan Nayak. 2015. Majorana zero modes and topological quantum computation. *npj Quantum Information* **1**:1. . [Crossref]

2845. Arjun Raj Rajanna, Kamelia Aryafar, Ali Shokoufandeh, Raymond Ptucha. Deep Neural Networks: A Case Study for Music Genre Classification 655-660. [Crossref]

2846. Ofir Levy, Lior Wolf. Live Repetition Counting 3020-3028. [Crossref]

2847. Ran Yang, Huarui Yin, Xiaohui Chen. License Plate Detection Based on Sparse Auto-Encoder 465-469. [Crossref]

2848. Soham Jayesh Desai, Mohammed Shoaib, Arijit Raychowdhury. 2015. An Ultra-Low Power, "Always-On" Camera Front-End for Posture Detection in Body Worn Cameras Using Restricted Boltzman Machines. *IEEE Transactions on Multi-Scale Computing Systems* **1**:4, 187-194. [Crossref]

2849. Mingxi Cheng. The cross-field DBN for image recognition 83-86. [Crossref]

2850. Luca Iocchi, Dirk Holz, Javier Ruiz-del-Solar, Komei Sugiura, Tijn van der Zant. 2015. RoboCup@Home : Analysis and results of evolving competitions for domestic and service robots. *Artificial Intelligence* **229**, 258-281. [Crossref]

2851. Tianjun Wu, Jiancheng Luo, Liegang Xia, Zhanfeng Shen, Xiaodong Hu. 2015. Prior Knowledge-Based Automatic Object-Oriented Hierarchical Classification for Updating Detailed Land Cover Maps. *Journal of the Indian Society of Remote Sensing* **43**:4, 653-669. [Crossref]

2852. C. L. Philip Chen, Chun-Yang Zhang, Long Chen, Min Gan. 2015. Fuzzy Restricted Boltzmann Machine for the Enhancement of Deep Learning. *IEEE Transactions on Fuzzy Systems* **23**:6, 2163-2173. [Crossref]

2853. Yan Huang, Wei Wang, Liang Wang. Conditional High-Order Boltzmann Machine: A Supervised Learning Model for Relation Learning 4265-4273. [Crossref]

2854. Christoph Jansen, Radek Mackowiak, Nico Hezel, Moritz Ufer, Gregor Altstadt, Kai Uwe Barthel. Reconstructing Missing Areas in Facial Images 323-326. [Crossref]

2855. Zuhe Li, Yangyu Fan, Weihua Liu. 2015. The effect of whitening transformation on pooling operations in convolutional autoencoders. *EURASIP Journal on Advances in Signal Processing* **2015**:1. . [Crossref]

2856. Chihiro Yoshimura, Masanao Yamaoka, Masato Hayashi, Takuya Okuyama, Hidetaka Aoki, Ken-ichi Kawarabayashi, Hiroyuki Mizuno. 2015. Uncertain behaviours of integrated circuits improve computational performance. *Scientific Reports* **5**:1. . [Crossref]

2857. Soniya, Sandeep Paul, Lotika Singh. A review on advances in deep learning 1-6. [Crossref]

2858. M. Fagiani, S. Squartini, L. Gabrielli, S. Spinsante, F. Piazza. 2015. A review of datasets and load forecasting techniques for smart natural gas and water grids: Analysis and experiments. *Neurocomputing* **170**, 448-465. [Crossref]

2859. Nikolay Burlutskiy, Andrew Fish, Nour Ali, Miltos Petridis. Prediction of Users' Response Time in Q&A Communities 618-623. [Crossref]

2860. Hien V. Nguyen, Huy Tho Ho, Vishal M. Patel, Rama Chellappa. 2015. DASH-N: Joint Hierarchical Domain Adaptation and Feature Learning. *IEEE Transactions on Image Processing* **24**:12, 5479-5491. [Crossref]

2861. Shuo Wang, Yizhou Wang, Song-Chun Zhu. 2015. Learning Hierarchical Space Tiling for Scene Modeling, Parsing and Attribute Tagging. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **37**:12, 2478-2491. [Crossref]

2862. Xiangang Li, Yuning Yang, Zaihu Pang, Xihong Wu. 2015. A comparative study on selecting acoustic modeling units in deep neural networks based large vocabulary Chinese speech recognition. *Neurocomputing* **170**, 251-256. [Crossref]

2863. Pablo Barros, Doreen Jirak, Cornelius Weber, Stefan Wermter. 2015. Multimodal emotional state recognition using sequence-dependent deep hierarchical features. *Neural Networks* **72**, 140-151. [Crossref]

2864. Dong Wang, Thomas Fang Zheng. Transfer learning for speech and language processing 1225-1237. [Crossref]

2865. Chengwei Yao, Jianfen Shen, Gencai Chen. Automatic Document Summarization via Deep Neural Networks 291-296. [Crossref]

2866. Yasser Roudi, Graham Taylor. 2015. Learning with hidden variables. *Current Opinion in Neurobiology* **35**, 110-118. [Crossref]

2867. Sheng-hua Zhong, Yan Liu, Kien A. Hua, Songtao Wu. Is noise always harmful? Visual learning from weakly-related data 181-184. [Crossref]

2868. Wang Xinshao, Cai Cheng. Weed seeds classification based on PCANet deep learning baseline 408-415. [Crossref]

2869. Licheng Zhang, Xihong Wu, Dingsheng Luo. Recognizing Human Activities from Raw Accelerometer Data Using Deep Neural Networks 865-870. [Crossref]

2870. Xiaoying Song, Wenqiang Zhang, Juyang Weng. 2015. Types, Locations, and Scales from Cluttered Natural Video and Actions. *IEEE Transactions on Autonomous Mental Development* **7**:4, 273-286. [Crossref]

2871. Takuya Yoshioka, Nobutaka Ito, Marc Delcroix, Atsunori Ogawa, Keisuke Kinoshita, Masakiyo Fujimoto, Chengzhu Yu, Wojciech J. Fabian, Miquel Espi, Takuya Higuchi, Shoko Araki, Tomohiro Nakatani. The NTT CHiME-3 system: Advances in speech enhancement and recognition for mobile multi-microphone devices 436-443. [Crossref]

2872. James Brofos, Rui Shu. Parallelization of Minimum Probability Flow on Binary Markov Random Fields 347-350. [Crossref]

2873. Yifeng Li, Chih-yu Chen, Alice M. Kaye, Wyeth W. Wasserman. 2015. The identification of cis-regulatory elements: A review from a machine learning perspective. *Biosystems* **138**, 6-17. [Crossref]

2874. Toru Nakashika, Tetsuya Takiguchi, Yasuo Ariki. 2015. Voice conversion using speaker-dependent conditional restricted Boltzmann machine. *EURASIP Journal on Audio, Speech, and Music Processing* **2015**:1. . [Crossref]

2875. Wanjun Yu, Chao Gan, Wenjing Lu. Research on Gas Recognition Based on Stacked Denoising Autoencoders 301-304. [Crossref]

2876. Tsung-Han Chan, Kui Jia, Shenghua Gao, Jiwen Lu, Zinan Zeng, Yi Ma. 2015. PCANet: A Simple Deep Learning Baseline for Image Classification?. *IEEE Transactions on Image Processing* **24**:12, 5017-5032. [Crossref]

2877. Zhaofeng Zhang, Longbiao Wang, Atsuhiko Kai, Takanori Yamada, Weifeng Li, Masahiro Iwahashi. 2015. Deep neural network-based bottleneck feature and denoising autoencoder-based dereverberation for distant-talking speaker identification. *EURASIP Journal on Audio, Speech, and Music Processing* **2015**:1. . [Crossref]

2878. Yongliang Chen. 2015. Mineral potential mapping with a restricted Boltzmann machine. *Ore Geology Reviews* **71**, 749-760. [Crossref]

2879. Xiaorui Ma, Jie Geng, Hongyu Wang. 2015. Hyperspectral image classification via contextual deep learning. *EURASIP Journal on Image and Video Processing* **2015**:1. . [Crossref]

2880. Yajie Miao, Mohammad Gowayyed, Florian Metze. EESEN: End-to-end speech recognition using deep RNN models and WFST-based decoding 167-174. [Crossref]

2881. Pouya Bashivan, Mohammed Yeasin, Gavin M. Bidelman. Single trial prediction of normal and excessive cognitive load through EEG feature fusion 1-5. [Crossref]

2882. Jin Wei. A data-driven cyber-physical detection and defense strategy against data integrity attacks in smart grid systems 667-671. [Crossref]

2883. Sotirios P. Chatzis, Dimitrios Kosmopoulos. A Nonparametric Bayesian Approach toward Stacked Convolutional Independent Component Analysis 2803-2811. [Crossref]

2884. Rajendra Kumar Roul, Shashank Gugnani, Shah Mit Kalpeshbhai. Clustering based feature selection using Extreme Learning Machines for text classification 1-6. [Crossref]

2885. Maoguo Gong, Jia Liu, Hao Li, Qing Cai, Linzhi Su. 2015. A Multiobjective Sparse Feature Learning Model for Deep Neural Networks. *IEEE Transactions on Neural Networks and Learning Systems* **26**:12, 3263-3277. [Crossref]

2886. Chun-Fu Richard Chen, Gwo Giun Chris Lee, Yinglong Xia, W. Sabrina Lin, Toyotaro Suzumura, Ching-Yung Lin. Efficient Multi-training Framework of Image Deep Learning on GPU Cluster 489-494. [Crossref]

2887. Like Hui, Meng Cai, Cong Guo, Liang He, Wei-Qiang Zhang, Jia Liu. Convolutional maxout neural networks for speech separation 24-27. [Crossref]

2888. Carl Doersch, Abhinav Gupta, Alexei A. Efros. Unsupervised Visual Representation Learning by Context Prediction 1422-1430. [Crossref]

2889. Hoon Kang, Joonsoo Ha. 2015. Projection spectral analysis. *International Journal of Control, Automation and Systems* **13**:6, 1530-1537. [Crossref]

2890. Van Hai Do, Xiong Xiao, Haihua Xu, Eng Siong Chng, Haizhou Li. Multilingual exemplar-based acoustic model for the NIST Open KWS 2015 evaluation 594-98. [Crossref]

2891. Niko Moritz, Stephan Gerlach, Kamil Adiloglu, Jorn Anemulle, Birger Kollmeier, Stefan Goetze. A CHiME-3 challenge system: Long-term acoustic features for noise robust automatic speech recognition 468-474. [Crossref]

2892. Hsin-Te Hwang, Yu Tsao, Hsin-Min Wang, Yih-Ru Wang, Sin-Horng Chen. A probabilistic interpretation for artificial neural network-based voice conversion 552-558. [Crossref]

2893. Ryota Konno, Kazunori Kojima, Kazuyo Tanaka, Shi-wook Lee, Yoshiaki Itoh. Rescoring by a deep neural network for spoken term detection 1207-1211. [Crossref]

2894. Qianqian Hao, Hua Zhang, Jinkou Ding. The hidden layer design for staked denoising autoencoder 150-153. [Crossref]

2895. Wei Han, Xiongwei Zhang, Gang Min, Xingyu Zhou. A novel single channel speech enhancement based on joint Deep Neural Network and Wiener Filter 163-167. [Crossref]

2896. Salima Hassairi, Ridha Ejbali, Mourad Zaied. A deep convolutional neural wavelet network to supervised Arabic letter image classification 207-212. [Crossref]

2897. Satoshi Tamura, Hiroshi Ninomiya, Norihide Kitaoka, Shin Osuga, Yurie Iribe, Kazuya Takeda, Satoru Hayamizu. Audio-visual speech recognition using deep bottleneck features and high-performance lipreading 575-582. [Crossref]

2898. Yi-Hsiu Liao, Hung-yi Lee, Lin-shan Lee. Towards structured deep neural network for automatic speech recognition 137-144. [Crossref]

2899. Zhili Tan, Man-Wai Mak. Bottleneck features from SNR-adaptive denoising deep classifier for speaker identification 1035-1040. [Crossref]

2900. Matthias Zohrer, Robert Peharz, Franz Pernkopf. 2015. Representation Learning for Single-Channel Source Separation and Bandwidth Extension. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **23**:12, 2398-2409. [Crossref]

2901. Bo Ren, Longbiao Wang, Atsuhiko Kai, Zhaofeng Zhang. Speech selection and environmental adaptation for asynchronous speech recognition 119-124. [Crossref]

2902. Yun Zhang, David Lo, Xin Xia, Bowen Xu, Jianling Sun, Shanping Li. Combining Software Metrics and Text Features for Vulnerable File Prediction 40-49. [Crossref]

2903. Taeho Jo, Jie Hou, Jesse Eickholt, Jianlin Cheng. 2015. Improving Protein Fold Recognition by Deep Learning Networks. *Scientific Reports* **5**:1. . [Crossref]

2904. Gang Luo, Bryan L. Stone, Bernhard Fassl, Christopher G. Maloney, Per H. Gesteland, Sashidhar R. Yerram, Flory L. Nkoy. 2015. Predicting asthma control deterioration in children. *BMC Medical Informatics and Decision Making* **15**:1. . [Crossref]

2905. Tomasz Hachaj, Marek Ogiela, Katarzyna Koptyra. 2015. Application of Assistive Computer Vision Methods to Oyama Karate Techniques Recognition. *Symmetry* **7**:4, 1670-1698. [Crossref]

2906. Zixuan Cang, Lin Mu, Kedi Wu, Kristopher Opron, Kelin Xia, Guo-Wei Wei. 2015. A topological approach for protein classification. *Computational and Mathematical Biophysics* **3**:1. . [Crossref]

2907. Michalis Vrigkas, Christophoros Nikou, Ioannis A. Kakadiaris. 2015. A Review of Human Activity Recognition Methods. *Frontiers in Robotics and AI* **2**. . [Crossref]

2908. Hayley P. Ellis, Mark Greenslade, Ben Powell, Inmaculada Spiteri, Andrea Sottoriva, Kathreena M. Kurian. 2015. Current Challenges in Glioblastoma: Intratumour Heterogeneity, Residual Disease, and Models to Predict Disease Recurrence. *Frontiers in Oncology* **5**. . [Crossref]

2909. Hyunsun Hwang, Changki Lee. 2015. Error Correction in Korean Morpheme Recovery using Deep Learning. *Journal of KIISE* **42**:11, 1452-1458. [Crossref]

2910. David Kappel, Stefan Habenschuss, Robert Legenstein, Wolfgang Maass. 2015. Network Plasticity as Bayesian Inference. *PLOS Computational Biology* **11**:11, e1004485. [Crossref]

2911. Joseph G. Makin, Benjamin K. Dichter, Philip N. Sabes. 2015. Learning to Estimate Dynamical State with Probabilistic Population Codes. *PLOS Computational Biology* **11**:11, e1004554. [Crossref]

2912. Xiaoyi Li, Xiaowei Jia, Hui Li, Houping Xiao, Jing Gao, Aidong Zhang. DRN: Bringing Greedy Layer-Wise Training into Time Dimension 859-864. [Crossref]

2913. Peng Zhou, Xiaojing Gu, Jie Zhang, Minrui Fei. 2015. A priori trust inference with context-aware stereotypical deep learning. *Knowledge-Based Systems* **88**, 97-106. [Crossref]

2914. Meiyin Wu, Li Chen. Image recognition based on deep learning 542-546. [Crossref]

2915. Min Wu, Hong Cao, Jianneng Cao, Hai-Long Nguyen, Joao Bartolo Gomes, Shonali Priyadarsini Krishnaswamy. 2015. An overview of state-of-the-art partial discharge analysis techniques for condition monitoring. *IEEE Electrical Insulation Magazine* **31**:6, 22-35. [Crossref]

2916. Yan Huang, Wei Wang, Liang Wang. 2015. Unconstrained Multimodal Multi-Label Learning. *IEEE Transactions on Multimedia* **17**:11, 1923-1935. [Crossref]

2917. Shicao Luo, Yongsheng Ding, Kuangrong Hao. Multistage committees of deep feedforward convolutional sparse denoise autoencoder for object recognition 565-570. [Crossref]

2918. Chang-Hung Tsai, Yu-Ting Chih, Wing Hung Wong, Chen-Yi Lee. 2015. A Hardware-Efficient Sigmoid Function With Adjustable Precision for a Neural Network System. *IEEE Transactions on Circuits and Systems II: Express Briefs* **62**:11, 1073-1077. [Crossref]

2919. Hyunsung Park, Daijin Kim. Gaze classification on a mobile device by using deep belief networks 685-689. [Crossref]

2920. Noah Stier, Nicholas Vincent, David Liebeskind, Fabien Scalzo. Deep learning of tissue fate features in acute ischemic stroke 1316-1321. [Crossref]

2921. Zhaohui Liang, Gang Zhang, Jimmy Xiangji Huang. Discovery of the relations between genetic polymorphism and adverse drug reactions 543-548. [Crossref]

2922. Sankha S. Mukherjee, Neil Martin Robertson. 2015. Deep Head Pose: Gaze-Direction Estimation in Multimodal Video. *IEEE Transactions on Multimedia* **17**:11, 2094-2107. [Crossref]

2923. Chuang Ding, Lei Xie, Pengcheng Zhu. 2015. Head motion synthesis from speech using deep neural networks. *Multimedia Tools and Applications* **74**:22, 9871-9888. [Crossref]

2924. Qin Zou, Lihao Ni, Tong Zhang, Qian Wang. 2015. Deep Learning Based Feature Selection for Remote Sensing Scene Classification. *IEEE Geoscience and Remote Sensing Letters* **12**:11, 2321-2325. [Crossref]

2925. Salima Hassairi, Ridha Ejbali, Mourad Zaied. Supervised Image Classification Using Deep Convolutional Wavelets Network 265-271. [Crossref]

2926. Xiaojia Zhao, Yuxuan Wang, DeLiang Wang. 2015. Cochannel Speaker Identification in Anechoic and Reverberant Conditions. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **23**:11, 1727-1736. [Crossref]

2927. Simon Thomas, Clément Chatelain, Laurent Heutte, Thierry Paquet, Yousri Kessentini. 2015. A deep HMM model for multiple keywords spotting in

handwritten documents. *Pattern Analysis and Applications* **18**:4, 1003-1015. [Crossref]

2928. Hans Lobel, Rene Vidal, Alvaro Soto. 2015. Learning Shared, Discriminative, and Compact Representations for Visual Recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **37**:11, 2218-2231. [Crossref]

2929. Lei Liu, Jianlu Luo, Xiaoyan Deng, Sikun Li. FPGA-based Acceleration of Deep Neural Networks Using High Level Method 824-827. [Crossref]

2930. Dan Hu, Xingshe Zhou, Xiaohao Yu, Zhiqiang Hou. Study on Deep Learning and Its Application in Visual Tracking 240-246. [Crossref]

2931. Chen Lyu, Yanan Lu, Donghong Ji, Bo Chen. Deep Learning for Textual Entailment Recognition 154-161. [Crossref]

2932. P. Drotár, J. Gazda, Z. Smékal. 2015. An experimental comparison of feature selection methods on two-class biomedical datasets. *Computers in Biology and Medicine* **66**, 1-10. [Crossref]

2933. Furao Shen, Jing Chao, Jinxi Zhao. 2015. Forecasting exchange rate using deep belief networks and conjugate gradient method. *Neurocomputing* **167**, 243-253. [Crossref]

2934. Hasan F. M. Zaki, Faisal Shafait, Ajmal Mian. Localized Deep Extreme Learning Machines for Efficient RGB-D Object Recognition 1-8. [Crossref]

2935. Quanshui Wei, Huaxiong Li, Xianzhong Zhou. The Appropriate Hidden Layers of Deep Belief Networks for Speech Recognition 397-402. [Crossref]

2936. Qiying Feng, Long Chen, C. L. Philip Chen. Optimize real-valued RBM with Bidirectional Autoencoder 22-27. [Crossref]

2937. Min Li, Zhenjiang Miao, Cong Ma. Feature extraction with convolutional restricted boltzmann machine for audio classification 791-795. [Crossref]

2938. Zhiyong Wu, Kai Zhao, Xixin Wu, Xinyu Lan, Helen Meng. 2015. Acoustic to articulatory mapping with deep neural network. *Multimedia Tools and Applications* **74**:22, 9889-9907. [Crossref]

2939. Frank Hutter, Jörg Lücke, Lars Schmidt-Thieme. 2015. Beyond Manual Tuning of Hyperparameters. *KI - Künstliche Intelligenz* **29**:4, 329-337. [Crossref]

2940. Bin Liu, Junjie Chen, Xiaolong Wang. 2015. Application of learning to rank to protein remote homology detection. *Bioinformatics* **31**:21, 3492-3498. [Crossref]

2941. Sheng-hua Zhong, Yan Liu, Bin Li, Jing Long. 2015. Query-oriented unsupervised multi-document summarization via deep learning model. *Expert Systems with Applications* **42**:21, 8146-8155. [Crossref]

2942. A. M. Nickfarjam, H. Ebrahimpour-komleh. Multi-input topology of deep belief networks for image segmentation 482-485. [Crossref]

2943. Wei Ye, Yibiao Yu. Voice conversion using deep neural network in super-frame feature space 465-468. [Crossref]

2944. Anran Wang, Jiwen Lu, Jianfei Cai, Tat-Jen Cham, Gang Wang. 2015. Large-Margin Multi-Modal Deep Learning for RGB-D Object Recognition. *IEEE Transactions on Multimedia* **17**:11, 1887-1898. [Crossref]

2945. Dirk Kraft, Wail Mustafa, Mila Popović, Jeppe Barsøe Jessen, Anders Glent Buch, Thiusius Rajeeth Savarimuthu, Nicolas Pugeault, Norbert Krüger. 2015. Using surfaces and surface relations in an Early Cognitive Vision system. *Machine Vision and Applications* **26**:7-8, 933-954. [Crossref]

2946. Yajun Zhang, Zongtian Liu, Wen Zhou, Yalan Zhang. Object Recognition Base on Deep Belief Network 268-273. [Crossref]

2947. Jingwei Qiu, Wei Liang, Laibin Zhang, Xuchao Yu, Meng Zhang. 2015. The early-warning model of equipment chain in gas pipeline based on DNN-HMM. *Journal of Natural Gas Science and Engineering* **27**, 1710-1722. [Crossref]

2948. Yifei Zhao, Jing Wang, Feiyue Wang. Word embedding based retrieval model for similar cases recommendation 2268-2272. [Crossref]

2949. Anderson Tenorio Sergio, Teresa B. Ludermir. Deep Learning for Wind Speed Forecasting in Northeastern Region of Brazil 322-327. [Crossref]

2950. Songhao Zhu, Zhe Shi, Chengjian Sun, Shuhan Shen. 2015. Deep neural network based image annotation. *Pattern Recognition Letters* **65**, 103-108. [Crossref]

2951. Yifeng Li, Alioune Ngom. Data integration in machine learning 1665-1671. [Crossref]

2952. Xin Lu, Zhe Lin, Hailin Jin, Jianchao Yang, James. Z. Wang. 2015. Rating Image Aesthetics Using Deep Learning. *IEEE Transactions on Multimedia* **17**:11, 2021-2034. [Crossref]

2953. Yingjie Xia, Luming Zhang, Weiwei Xu, Zhenyu Shan, Yuncai Liu. 2015. Recognizing multi-view objects with occlusions using a deep architecture. *Information Sciences* **320**, 333-345. [Crossref]

2954. Young-Kyu Park, Je-Kang Park, Han-Ik On, Dong-Joong Kang. 2015. Convolutional Neural Network-based System for Vehicle Front-Side Detection. *Journal of Institute of Control, Robotics and Systems* **21**:11, 1008-1016. [Crossref]

2955. Aman Gupta, Haohan Wang, Madhavi Ganapathiraju. Learning structure in gene expression data using deep architectures, with an application to gene clustering 1328-1335. [Crossref]

2956. Hongsub An, Hyeon-min Shim, Sang-il Na, Sangmin Lee. 2015. Split and merge algorithm for deep learning and its application for additional classes. *Pattern Recognition Letters* **65**, 137-144. [Crossref]

2957. Anran Wang, Jiwen Lu, Jianfei Cai, Gang Wang, Tat-Jen Cham. 2015. Unsupervised Joint Feature Learning and Encoding for RGB-D Scene Labeling. *IEEE Transactions on Image Processing* **24**:11, 4459-4473. [Crossref]

2958. Haibin Yan, Jiwen Lu, Xiuzhuang Zhou. 2015. Prototype-Based Discriminative Feature Learning for Kinship Verification. *IEEE Transactions on Cybernetics* **45**:11, 2535-2545. [Crossref]

2959. Lei Zhao, Qinghua Hu, Wenwu Wang. 2015. Heterogeneous Feature Selection With Multi-Modal Deep Neural Networks and Sparse Group LASSO. *IEEE Transactions on Multimedia* **17**:11, 1936-1948. [Crossref]

2960. Juncen Li, Sheng Gao, Ning Han, Zhou Fang, Jianxin Liao. Music Mood Classification via Deep Belief Network 1241-1245. [Crossref]

2961. Jie Geng, Jianchao Fan, Hongyu Wang, Xiaorui Ma, Baoming Li, Fuliang Chen. 2015. High-Resolution SAR Image Classification via Deep Convolutional Autoencoders. *IEEE Geoscience and Remote Sensing Letters* **12**:11, 2351-2355. [Crossref]

2962. Youjun Xu, Ziwei Dai, Fangjin Chen, Shuaishi Gao, Jianfeng Pei, Luhua Lai. 2015. Deep Learning for Drug-Induced Liver Injury. *Journal of Chemical Information and Modeling* **55**:10, 2085-2093. [Crossref]

2963. Fangxiang Feng, Xiaojie Wang, Ruifan Li, Ibrar Ahmad. 2015. Correspondence Autoencoders for Cross-Modal Retrieval. *ACM Transactions on Multimedia Computing, Communications, and Applications* **12**:1s, 1-22. [Crossref]

2964. Kathleen C. Fraser, Jed A. Meltzer, Frank Rudzicz. 2015. Linguistic Features Identify Alzheimer's Disease in Narrative Speech. *Journal of Alzheimer's Disease* **49**:2, 407-422. [Crossref]

2965. Rory Finnegan, Suzanna Becker. 2015. Neurogenesis paradoxically decreases both pattern separation and memory interference. *Frontiers in Systems Neuroscience* **9**. . [Crossref]

2966. Wenhui Diao, Xian Sun, Fangzheng Dou, Menglong Yan, Hongqi Wang, Kun Fu. 2015. Object recognition in remote sensing images using sparse deep belief networks. *Remote Sensing Letters* **6**:10, 745-754. [Crossref]

2967. Ryotaro Kamimura. Self-Organized Mutual Information Maximization Learning for Improved Generalization Performance 1613-1618. [Crossref]

2968. Zhige Xie, Kai Xu, Wen Shan, Ligang Liu, Yueshan Xiong, Hui Huang. 2015. Projective Feature Learning for 3D Shapes with Multi-View Depth Images. *Computer Graphics Forum* **34**:7, 1-11. [Crossref]

2969. Zhikui Chen, Siqian Liu, Kunyou Jiang, Han Xu, Xinru Cheng. A Data Imputation Method Based on Deep Belief Network 1238-1243. [Crossref]

2970. Joshua Saxe, Konstantin Berlin. Deep neural network based malware detection using two dimensional binary program features 11-20. [Crossref]

2971. Ryotaro Kamimura. Self-Organizing Selective Potentiality Learning to Detect Important Input Neurons 1619-1626. [Crossref]

2972. Lu Zhang, Zhenwei Shi, Jun Wu. 2015. A Hierarchical Oil Tank Detector With Deep Surrounding Features for High-Resolution Optical Satellite Imagery. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* **8**:10, 4895-4909. [Crossref]

2973. Bo Ryu, Nadeesha Ranasinghe, Wei-Min Shen, Kurt Turck, Michael Muccio. BioAIM: Bio-inspired Autonomous Infrastructure Monitoring 780-785. [Crossref]

2974. Jindan Zhu, Amit Pande, Prasant Mohapatra, Jay J. Han. Using Deep Learning for Energy Expenditure Estimation with wearable sensors 501-506. [Crossref]

2975. Martin Wistuba, Nicolas Schilling, Lars Schmidt-Thieme. Learning hyperparameter optimization initializations 1-10. [Crossref]

2976. Corey Kereliuk, Bob L. Sturm, Jan Larsen. Deep learning, audio adversaries, and music content analysis 1-5. [Crossref]

2977. Chao Yan, Huiying Jiang, Bailing Zhang, Frans Coenen. Recognizing driver inattention by convolutional neural networks 680-685. [Crossref]

2978. Chaoyun Zhang, Pan Zhou, Chenghua Li, Lijun Liu. A Convolutional Neural Network for Leaves Recognition Using Data Augmentation 2143-2150. [Crossref]

2979. Hui Wu, Hui Zhang, Jinfang Zhang, Fanjiang Xu. Typical Target Detection in Satellite Images Based on Convolutional Neural Networks 2956-2961. [Crossref]

2980. Afan Galih Salman, Bayu Kanigoro, Yaya Heryadi. Weather forecasting using deep learning techniques 281-285. [Crossref]

2981. Tianyang Xu, Xiaojun Wu. Visual object tracking via deep neural network 1-6. [Crossref]

2982. Yang Gu, Yiqiang Chen, Junfa Liu, Xinlong Jiang. 2015. Semi-supervised deep extreme learning machine for Wi-Fi based localization. *Neurocomputing* **166**, 282-293. [Crossref]

2983. Jung-Chao Ban, Chih-Hung Chang. 2015. Realization problem of multi-layer cellular neural networks. *Neural Networks* **70**, 9-17. [Crossref]

2984. Yuan Liu, Yanmin Qian, Nanxin Chen, Tianfan Fu, Ya Zhang, Kai Yu. 2015. Deep feature for text-dependent speaker verification. *Speech Communication* **73**, 1-13. [Crossref]

2985. Yu Hu, Zenghai Chen, Zheru Chi, Hong Fu. Learning to Detect Saliency with Deep Structure 1770-1775. [Crossref]

2986. Saaed Mehrabi, Sunghwan Sohn, Dingheng Li, Joshua J. Pankratz, Terry Therneau, Jennifer L. St. Sauver, Hongfang Liu, Mathew Palakal. Temporal Pattern and Association Discovery of Diagnosis Codes Using Deep Learning 408-416. [Crossref]

2987. Xueyi Ye, Xueting Chen, Huahua Chen, Yafeng Gu, Qiuyun Lv. Deep learning network for face detection 504-509. [Crossref]

2988. Qiongjie Yao, Xiaofei Liao, Hai Jin. A Map-Reduce Method for Training Autoencoders on Xeon Phi 1330-1337. [Crossref]

2989. Manan Suri, Vivek Parmar, Ashwani Kumar, Damien Querlioz, Fabien Alibart. Neuromorphic hybrid RRAM-CMOS RBM architecture 1-6. [Crossref]

2990. Chong Zhang, Jia Hui Sun, Kay Chen Tan. Deep Belief Networks Ensemble with Multi-objective Optimization for Failure Diagnosis 32-37. [Crossref]

2991. Chih-Hung Chang. 2015. Deep and Shallow Architecture of Multilayer Neural Networks. *IEEE Transactions on Neural Networks and Learning Systems* **26**:10, 2477-2486. [Crossref]

2992. Yuan Yuan, Lichao Mou, Xiaoqiang Lu. 2015. Scene Recognition by Manifold Regularized Deep Learning Architecture. *IEEE Transactions on Neural Networks and Learning Systems* **26**:10, 2222-2233. [Crossref]

2993. Raunaq Vohra, Kratarth Goel, J. K. Sahoo. Modeling temporal dependencies in data using a DBN-LSTM 1-4. [Crossref]

2994. Shin Kamada, Takumi Ichimura. A Generation Method of Immunological Memory in Clonal Selection Algorithm by Using Restricted Boltzmann Machines 2660-2665. [Crossref]

2995. Shenghua Gao, Yuting Zhang, Kui Jia, Jiwen Lu, Yingying. Zhang. 2015. Single Sample Face Recognition via Learning Deep Supervised Autoencoders. *IEEE Transactions on Information Forensics and Security* **10**:10, 2108-2118. [Crossref]

2996. Chun-Yang Zhang, C. L. Philip Chen, Min Gan, Long Chen. 2015. Predictive Deep Boltzmann Machine for Multiperiod Wind Speed Forecasting. *IEEE Transactions on Sustainable Energy* **6**:4, 1416-1425. [Crossref]

2997. Chao Yan, Bailing Zhang, Frans Coenen. Multi-attributes gait identification by convolutional neural networks 642-647. [Crossref]

2998. Lin Han, Richard C. Wilson, Edwin R. Hancock. 2015. Generative Graph Prototypes from Information Theory. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **37**:10, 2013-2027. [Crossref]

2999. Hyun Ah Song, Bo-Kyeong Kim, Thanh Luong Xuan, Soo-Young Lee. 2015. Hierarchical feature extraction by multi-layer non-negative matrix factorization network for classification task. *Neurocomputing* **165**, 63-74. [Crossref]

3000. Jordi Mansanet, Alberto Albiol, Roberto Paredes, Antonio Albiol. 2015. Mask selective regularization for restricted Boltzmann machines. *Neurocomputing* **165**, 375-383. [Crossref]

3001. Moein Owhadi-Kareshk, Mohammad-R. Akbarzadeh-T.. Representation learning by Denoising Autoencoders for Clustering-based Classification 228-233. [Crossref]

3002. Xiaowei Jia, Aosen Wang, Xiaoyi Li, Guangxu Xun, Wenyao Xu, Aidong Zhang. Multi-modal learning for video recommendation based on mobile application usage 837-842. [Crossref]

3003. Olarik Surinta, Mahir F. Karaaba, Lambert R.B. Schomaker, Marco A. Wiering. 2015. Recognition of handwritten characters using local gradient feature descriptors. *Engineering Applications of Artificial Intelligence* **45**, 405-414. [Crossref]

3004. Cui Hongliang, Qin Xiaona. The Video Recommendation System Based on DBN 1016-1021. [Crossref]

3005. Xiaoyi Li, Xiaowei Jia, Guangxu Xun, Aidong Zhang. Improving EEG feature learning via synchronized facial video 843-848. [Crossref]

3006. Mengyin Wang, Zechao Li, Xiangbo Shu, Jingdong, Jinhui Tang. Deep kinship verification 1-6. [Crossref]

3007. Vasu Sharma. A Deep Neural Network based approach for vocal extraction from songs 116-121. [Crossref]

3008. Jongmin Yu, Jeonghwan Gwak, Sejeong Lee, Moongu Jeon. An incremental learning approach for restricted boltzmann machines 113-117. [Crossref]

3009. Tianqiang Peng, Yongwei Zhao, Shengcai Ke. Image retrieval based on convolutional neural network and kernel-based supervised hashing 544-549. [Crossref]

3010. Ke Li, Quanxin Wang. Study on signal recognition and diagnosis for spacecraft based on deep learning method 1-5. [Crossref]

3011. Jiwen Lu, Venice Erin Liong, Xiuzhuang Zhou, Jie Zhou. 2015. Learning Compact Binary Face Descriptor for Face Recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **37**:10, 2041-2056. [Crossref]

3012. Joe Lemieux, Yuan Ma. Vehicle Speed Prediction Using Deep Learning 1-5. [Crossref]

3013. Sangwook Kim, Yonghwa Choi, Minho Lee. 2015. Deep learning with support vector data description. *Neurocomputing* **165**, 111-117. [Crossref]

3014. Zhen Zuo, Gang Wang, Bing Shuai, Lifan Zhao, Qingxiong Yang. 2015. Exemplar based Deep Discriminative and Shareable Feature Learning for scene image classification. *Pattern Recognition* **48**:10, 3004-3015. [Crossref]

3015. Fayao Liu, Guosheng Lin, Chunhua Shen. 2015. CRF learning with CNN features for image segmentation. *Pattern Recognition* **48**:10, 2983-2992. [Crossref]

3016. Taemin Jo, Jee-Hyong Lee. 2015. Latent Keyphrase Extraction Using Deep Belief Networks. *The International Journal of Fuzzy Logic and Intelligent Systems* **15**:3, 153-158. [Crossref]

3017. Jiliang Tang, Huan Liu. 2015. Trust in Social Media. *Synthesis Lectures on Information Security, Privacy, and Trust* **10**:1, 1-129. [Crossref]

3018. Lujia Chen, Chunhui Cai, Vicky Chen, Xinghua Lu. 2015. Trans-species learning of cellular signaling systems with bimodal deep belief networks. *Bioinformatics* **31**:18, 3008-3015. [Crossref]

3019. Xiantong Zhen, Ling Shao. Introduction to Human Action Recognition 1-11. [Crossref]

3020. Marcin Wolter. Machine learning: how to get more out of HEP data and the Higgs Boson Machine Learning Challenge 96622I. [Crossref]

3021. Jonas Kalderstam, Patrik Edén, Mattias Ohlsson. 2015. Finding Risk Groups by Optimizing Artificial Neural Networks on the Area under the Survival Curve Using Genetic Algorithms. *PLOS ONE* **10**:9, e0137597. [Crossref]

3022. Xiaoming Zhao, Xugan Shi, Shiqing Zhang. 2015. Facial Expression Recognition via Deep Learning. *IETE Technical Review* **32**:5, 347-355. [Crossref]

3023. P. Rozycki, J. Kolbusz, B.M. Wilamowski. Dedicated deep neural network architectures and methods for their training 73-78. [Crossref]

3024. Xuan Li, Chunsheng Li, Pengbo Wang, Zhirong Men, Huaping Xu. SAR ATR based on dividing CNN into CAE and SNN 676-679. [Crossref]

3025. Shamima Najnin, Bonny Banerjee. 2015. Improved speech inversion using general regression neural network. *The Journal of the Acoustical Society of America* **138**:3, EL229-EL235. [Crossref]

3026. Olivier Morere, Hanlin Goh, Antoine Veillard, Vijay Chandrasekhar, Jie Lin. Co-regularized deep representations for video summarization 3165-3169. [Crossref]

3027. Yaqi Lv, Gangyi Jiang, Mei Yu, Haiyong Xu, Feng Shao, Shanshan Liu. Difference of Gaussian statistical features based blind image quality assessment: A deep learning approach 2344-2348. [Crossref]

3028. Dan Zhao, Baolong Guo, Jinfu Wu, Weikang Ning, Yunyi Yan. Robust feature learning by improved auto-encoder from non-Gaussian noised images 1-5. [Crossref]

3029. Daixin Wang, Peng Cui, Mingdong Ou, Wenwu Zhu. 2015. Learning Compact Hash Codes for Multimodal Representations Using Orthogonal Deep Structure. *IEEE Transactions on Multimedia* **17**:9, 1404-1416. [Crossref]

3030. Ya Li, Jianhua Tao, Keikichi Hirose, Xiaoying Xu, Wei Lai. 2015. Hierarchical stress modeling and generation in mandarin for expressive Text-to-Speech. *Speech Communication* **72**, 59-73. [Crossref]

3031. Feng Li, Loc Tran, Kim-Han Thung, Shuiwang Ji, Dinggang Shen, Jiang Li. 2015. A Robust Deep Model for Improved Classification of AD/MCI Patients. *IEEE Journal of Biomedical and Health Informatics* **19**:5, 1610-1616. [Crossref]

3032. Jianwen Xie, Wenze Hu, Song-Chun Zhu, Ying Nian Wu. 2015. Learning Sparse FRAME Models for Natural Image Patterns. *International Journal of Computer Vision* **114**:2-3, 91-112. [Crossref]

3033. Matthew Nokleby, Ahmad Beirami, Robert Calderbank. A rate-distortion framework for supervised learning 1-6. [Crossref]

3034. Dan Wang, Qing Shao, Xiaoqiang Li. A new unsupervised model of action recognition 1160-1164. [Crossref]

3035. Chongjing Wang, Xu Zhao, Zheng Shou, Yi Zhou, Yuncai Liu. A discriminative tracklets representation for crowd analysis 1805-1809. [Crossref]

3036. Thomas Trappenberg, Paul Hollensen, Pitoyo Hartono. Classifier with hierarchical topographical maps as internal representation 341-345. [Crossref]

3037. Weichen Sun, Fei Su. Regularization of deep neural networks using a novel companion objective function 2865-2869. [Crossref]

3038. Yelin Kim, Emily Mower Provost. Leveraging inter-rater agreement for audio-visual emotion recognition 553-559. [Crossref]

3039. Konstantinos Makantasis, Eftychios Protopapadakis, Anastasios Doulamis, Nikolaos Doulamis, Constantinos Loupos. Deep Convolutional Neural Networks for efficient vision based tunnel inspection 335-342. [Crossref]

3040. Yandong Li, Ferdous Sohel, Mohammed Bennamoun, Hang Lei. Outdoor scene labelling with learned features and region consistency activation 1374-1378. [Crossref]

3041. Zhengping Ji, Juyang Weng. 2015. A developmental where–what network for concurrent and interactive visual attention and recognition. *Robotics and Autonomous Systems* **71**, 35-48. [Crossref]

3042. Vladimir Golovko, Aliaksandr Kroshchanka, Volodymyr Turchenko, Stanislaw Jankowski, Douglas Treadwell. A new technique for restricted Boltzmann machine learning 182-186. [Crossref]

3043. Marcelo Cicconet, Davi Geiger, Michael Werman. Complex-valued hough transforms for circles 2801-2804. [Crossref]

3044. Jinhui Tang, Zechao Li, Meng Wang, Ruizhen Zhao. 2015. Neighborhood Discriminant Hashing for Large-Scale Image Retrieval. *IEEE Transactions on Image Processing* **24**:9, 2827-2840. [Crossref]

3045. Rakesh Chalasani, Jose C. Principe. 2015. Context Dependent Encoding Using Convolutional Dynamic Networks. *IEEE Transactions on Neural Networks and Learning Systems* **26**:9, 1992-2004. [Crossref]

3046. Junnan Li, Edmund Y. Lam. Facial expression recognition using deep neural networks 1-6. [Crossref]

3047. Hongming Zhou, Guang-Bin Huang, Zhiping Lin, Han Wang, Yeng Chai Soh. 2015. Stacked Extreme Learning Machines. *IEEE Transactions on Cybernetics* **45**:9, 2013-2025. [Crossref]

3048. Omar Y. Al-Jarrah, Paul D. Yoo, Sami Muhaidat, George K. Karagiannidis, Kamal Taha. 2015. Efficient Machine Learning for Big Data: A Review. *Big Data Research* **2**:3, 87-93. [Crossref]

3049. Bogdan M. Wilamowski, Janusz Korniak. Learning architectures with enhanced capabilities and easier training 21-29. [Crossref]

3050. Sankha S. Mukherjee, Rolf H. Baxter, Neil M. Robertson. Instantaneous real-time head pose at a distance 3471-3475. [Crossref]

3051. Yao Ju, Jun Guo, Shuchun Liu. A Deep Learning Method Combined Sparse Autoencoder with SVM 257-260. [Crossref]

3052. Meijun Sun, Dong Zhang, Jinchang Ren, Zheng Wang, Jesse S. Jin. Brushstroke based sparse hybrid convolutional neural networks for author classification of Chinese ink-wash paintings 626-630. [Crossref]

3053. Quan Gan, Chongliang Wu, Shangfei Wang, Qiang Ji. Posed and spontaneous facial expression differentiation using deep Boltzmann machines 643-648. [Crossref]

3054. Jinzhuo Wang, Wenmin Wang, Ronggang Wang, Wen Gao. Image classification using RBM to encode local descriptors with group sparse learning 912-916. [Crossref]

3055. M. Chevalier, N. Thome, M. Cord, J. Fournier, G. Henaff, E. Dusch. LR-CNN for fine-grained classification with varying resolution 3101-3105. [Crossref]

3056. Wei-Long Zheng, Bao-Liang Lu. 2015. Investigating Critical Frequency Bands and Channels for EEG-Based Emotion Recognition with Deep Neural Networks. *IEEE Transactions on Autonomous Mental Development* **7**:3, 162-175. [Crossref]

3057. Yossi Adi, Joseph Keshet, Matthew Goldrick. Vowel duration measurement using deep neural networks 1-6. [Crossref]

3058. Kazuya Ueki, Tetsunori Kobayashi. Multi-layer feature extractions for image classification — Knowledge from deep CNNs 9-12. [Crossref]

3059. Kien Nguyen, Clinton Fookes, Sridha Sridharan. Improving deep convolutional neural networks with unsupervised feature learning 2270-2274. [Crossref]

3060. Gregory Ditzler, Robi Polikar, Gail Rosen. 2015. Multi-Layer and Recursive Neural Networks for Metagenomic Classification. *IEEE Transactions on NanoBioscience* **14**:6, 608-616. [Crossref]

3061. J. Lerouge, R. Herault, C. Chatelain, F. Jardin, R. Modzelewski. 2015. IODA: An input/output deep architecture for image labeling. *Pattern Recognition* **48**:9, 2847-2858. [Crossref]

3062. Carlo Baldassi, Alessandro Ingrosso, Carlo Lucibello, Luca Saglietti, Riccardo Zecchina. 2015. Subdominant Dense Clusters Allow for Simple Learning and High Computational Performance in Neural Networks with Discrete Synapses. *Physical Review Letters* **115**:12. . [Crossref]

3063. Haiping Huang. 2015. Effects of hidden nodes on network structure inference. *Journal of Physics A: Mathematical and Theoretical* **48**:35, 355002. [Crossref]

3064. Mark D. McDonnell, Migel D. Tissera, Tony Vladusich, André van Schaik, Jonathan Tapson. 2015. Fast, Simple and Accurate Handwritten Digit Classification by Training Shallow Neural Network Classifiers with the 'Extreme Learning Machine' Algorithm. *PLOS ONE* **10**:8, e0134254. [Crossref]

3065. Yongjin Park, Manolis Kellis. 2015. Deep learning for regulatory genomics. *Nature Biotechnology* **33**:8, 825-826. [Crossref]

3066. Jing Liu, Bingyuan Liu, Hanqing Lu. 2015. Detection guided deconvolutional network for hierarchical feature learning. *Pattern Recognition* **48**:8, 2645-2655. [Crossref]

3067. Alessandro Di Nuovo, Vivian M. De La Cruz, Angelo Cangelosi. A Deep Learning Neural Network for Number Cognition: A bi-cultural study with the iCub 320-325. [Crossref]

3068. Yu Hu, Zhen Liang, Zheru Chi, Hong Fu. A combined convolutional neural network and potential region-of-interest model for saliency detection 154-158. [Crossref]

3069. Licheng Zhang, Xihong Wu, Dingsheng Luo. Real-Time Activity Recognition on Smartphones Using Deep Neural Networks 1236-1242. [Crossref]

3070. Shufen Liang, Xiangqun Liang, Min Guo. Smile recognition based on deep Auto-Encoders 176-181. [Crossref]

3071. Yue Huang, Ruiwen Wu, Ye Sun, Wei Wang, Xinghao Ding. 2015. Vehicle Logo Recognition System Based on Convolutional Neural Networks With a Pretraining Strategy. *IEEE Transactions on Intelligent Transportation Systems* **16**:4, 1951-1960. [Crossref]

3072. Baptiste Wicht, Jean Henneberty. Mixed handwritten and printed digit recognition in Sudoku with Convolutional Deep Belief Network 861-865. [Crossref]

3073. Hang Liu, Renzhi Chu, Jian Ran, Jinhui Xia. Long-term drift compensation algorithms based on the kernel-orthogonal signal correction in electronic nose systems 1583-1587. [Crossref]

3074. Yohan Petetin, Cyrille Laroche, Aurelien Mayoue. Deep neural networks for audio scene recognition 125-129. [Crossref]

3075. Rui Zhao, Kezhi Mao. 2015. Semi-Random Projection for Dimensionality Reduction and Extreme Learning Machine in High-Dimensional Space. *IEEE Computational Intelligence Magazine* **10**:3, 30-41. [Crossref]

3076. Qiangpeng Yang, Yu Zhou, Yao Yu, Jie Yuan, Xianglei Xing, Sidan Du. 2015. Multi-step-ahead host load prediction using autoencoder and echo state networks in cloud computing. *The Journal of Supercomputing* **71**:8, 3037-3053. [Crossref]

3077. Dawei Weng, Yunhong Wang, Mingming Gong, Dacheng Tao, Hui Wei, Di Huang. 2015. DERF: Distinctive Efficient Robust Features From the Biological Modeling of the P Ganglion Cells. *IEEE Transactions on Image Processing* **24**:8, 2287-2302. [Crossref]

3078. Meiping Tao, Li Ma. A Hand Gesture Recognition Model Based on Semi-supervised Learning 43-46. [Crossref]

3079. Yizhang Xia, Bailing Zhang, Frans Coenen. Face occlusion detection based on multi-task convolution neural network 375-379. [Crossref]

3080. Licheng Zhang, Xihong Wu, Dingsheng Luo. Improving activity recognition with context information 1241-1246. [Crossref]

3081. Pooyan Safari, Omid Ghahabi, Javier Hernando. Feature classification by means of deep belief networks for speaker recognition 2117-2121. [Crossref]

3082. Zili Li, Li Zeng. A Hybrid Vertex Outlier Detection Method Based on Distributed Representation and Local Outlier Factor 512-516. [Crossref]

3083. Yusuf Ziya Isik, Hakan Erdogan, Ruhi Sarikaya. S-vector: A discriminative representation derived from i-vector for speaker verification 2097-2101. [Crossref]

3084. Johannes Hennrich, Christian Herff, Dominic Heger, Tanja Schultz. Investigating deep learning for fNIRS based BCI 2844-2847. [Crossref]

3085. Adriana Romero, Petia Radeva, Carlo Gatta. 2015. Meta-Parameter Free Unsupervised Sparse Feature Learning. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **37**:8, 1716-1722. [Crossref]

3086. Weishan Zhang, Pengcheng Duan. Towards a Deep Belief Network-Based Cloud Resource Demanding Prediction 1043-1048. [Crossref]

3087. Weishan Zhang, Pengcheng Duan, Licheng Chen. An In-Depth Context-Awareness Framework for Pervasive Video Cloud 543-549. [Crossref]

3088. Xinli Yang, David Lo, Xin Xia, Yun Zhang, Jianling Sun. Deep Learning for Just-in-Time Defect Prediction 17-26. [Crossref]

3089. Erick de la Rosa, Wen Yu, Xiaoou Li. Nonlinear system identification using deep learning and randomized algorithms 274-279. [Crossref]

3090. Md. Zaigham Zaheer, Jin Young Kim, Hyoung-Gook Kim, Seung You Na. A Preliminary Study on Deep-Learning Based Screaming Sound Detection 1-4. [Crossref]

3091. Minjun Chen, Ayako Suzuki, Jürgen Borlak, Raúl J. Andrade, M Isabel Lucena. 2015. Drug-induced liver injury: Interactions between drug properties and host factors. *Journal of Hepatology* **63**:2, 503-514. [Crossref]

3092. Siqing Nie, Jinhua Yu, Ping Chen, Jianqiu Zhang, Yuanyuan Wang. A novel method with a deep network and directional edges for automatic detection of a fetal head 654-658. [Crossref]

3093. Qiaoli Huang, Zhixing Huang, Yanhong Yuan, Mei Tian. A New Method Based on Deep Belief Networks for Learning Features from Symbolic Music 231-234. [Crossref]

3094. Wojciech Marian Czarnecki, Jacek Tabor. 2015. Multithreshold Entropy Linear Classifier: Theory and applications. *Expert Systems with Applications* **42**:13, 5591-5606. [Crossref]

3095. Dakun Tan, Rui Zhao, Jinbo Sun, Wei Qin. Sleep spindle detection using deep learning: A validation study based on crowdsourcing 2828-2831. [Crossref]

3096. Li Chen, Song Wang, Wei Fan, Jun Sun, Naoi Satoshi. Reconstruction combined training for convolutional neural networks on character recognition 431-435. [Crossref]

3097. Theodore Bluche, Hermann Ney, Christopher Kermorvant. The LIMSI handwriting recognition system for the HTRtS 2014 contest 86-90. [Crossref]

3098. Yuki Takashima, Toru Nakashika, Tetsuya Takiguchi, Yasuo Ariki. Feature extraction using pre-trained convolutive bottleneck nets for dysarthric speech recognition 1411-1415. [Crossref]

3099. Anupama Ray, Sai Rajeswar, Santanu Chaudhury. A hypothesize-and-verify framework for text recognition using deep recurrent neural networks 936-940. [Crossref]

3100. Joseph Futoma, Jonathan Morris, Joseph Lucas. 2015. A comparison of models for predicting early hospital readmissions. *Journal of Biomedical Informatics* **56**, 229-238. [Crossref]

3101. Rongqiang Qian, Bailing Zhang, Yong Yue, Zhao Wang, Frans Coenen. Robust chinese traffic sign detection and recognition with deep convolutional neural network 791-796. [Crossref]

3102. Xiaoping Sun, Xiangfeng Luo, Jin Liu, Xiaorui Jiang, Junsheng Zhang. Semantics in Deep Neural-Network Computing 81-88. [Crossref]

3103. Qihe Liu, Xiaonan Hu, Mao Ye, Xianqiong Cheng, Fan Li. 2015. Gas Recognition under Sensor Drift by Using Deep Learning. *International Journal of Intelligent Systems* **30**:8, 907-922. [Crossref]

3104. Li Chen, Song Wang, Wei Fan, Jun Sun, Naoi Satoshi. Deep learning based language and orientation recognition in document analysis 436-440. [Crossref]

3105. Chenglu Wen, Daoxi Wu, Huosheng Hu, Wei Pan. 2015. Pose estimation-dependent identification method for field moth images using deep learning architecture. *Biosystems Engineering* **136**, 117-128. [Crossref]

3106. Xiao Liu, Binbin Tang, Zhenyang Wang, Xianghua Xu, Shiliang Pu, Dapeng Tao, Mingli Song. Chart classification by combining deep convolutional networks and deep belief networks 801-805. [Crossref]

3107. Alireza S. Mahani, Mansour T.A. Sharabiani. 2015. SIMD parallel MCMC sampling with applications for big-data Bayesian analytics. *Computational Statistics & Data Analysis* **88**, 75-99. [Crossref]

3108. Kai Sun, Yuanlong Yu, Zhiyong Huang. A generalized pruning algorithm for extreme learning machine 1431-1436. [Crossref]

3109. Qian Guo, Xiaofeng Wu, Juyang Weng. Cross-domain and within-domain synaptic maintenance for autonomous development of visual areas 78-83. [Crossref]

3110. Giacomo Indiveri, Shih-Chii Liu. 2015. Memory and Information Processing in Neuromorphic Systems. *Proceedings of the IEEE* **103**:8, 1379-1397. [Crossref]

3111. Jingyu Gao, Jinfu Yang, Jizhao Zhang, Mingai Li. Natural scene recognition based on Convolutional Neural Networks and Deep Boltzmannn Machines 2369-2374. [Crossref]

3112. Mohammad Ali Keyvanrad, Mohammad Mehdi Homayounpour. 2015. Deep Belief Network Training Improvement Using Elite Samples Minimizing Free Energy. *International Journal of Pattern Recognition and Artificial Intelligence* **29**:05, 1551006. [Crossref]

3113. Chao Yan, Bailing Zhang, Frans Coenen. Driving posture recognition by convolutional neural networks 680-685. [Crossref]

3114. Dongwei Guo, Yunsheng Hao, Miao Liu. An Associative Generated Model for Multi-signals Based on Deep Learning 280-283. [Crossref]

3115. Pavel P. Kuksa, Martin Renqiang Min, Rishabh Dugar, Mark Gerstein. 2015. High-order neural networks and kernel methods for peptide-MHC binding prediction. *Bioinformatics* btv371. [Crossref]

3116. Rafael Yuste. 2015. From the neuron doctrine to neural networks. *Nature Reviews Neuroscience* **16**:8, 487-497. [Crossref]

3117. Minju Jung, Jungsik Hwang, Jun Tani. 2015. Self-Organization of Spatio-Temporal Hierarchy via Learning of Dynamic Visual Image Patterns on Action Sequences. *PLOS ONE* **10**:7, e0131214. [Crossref]

3118. Baozhi Jia, Ming Zhu. A method of face detection with deep models for patrol videos 96311B. [Crossref]

3119. Bin Liao, Jungang Xu, Jintao Lv, Shilong Zhou. 2015. An Image Retrieval Method for Binary Images Based on DBN and Softmax Classifier. *IETE Technical Review* **32**:4, 294-303. [Crossref]

3120. Jayashree Padmanabhan, Melvin Jose Johnson Premkumar. 2015. Machine Learning in Automatic Speech Recognition: A Survey. *IETE Technical Review* **32**:4, 240-251. [Crossref]

3121. Wenzhi Zhao, Zhou Guo, Jun Yue, Xiuyuan Zhang, Liqun Luo. 2015. On combining multiscale deep learning features for the classification of hyperspectral remote sensing imagery. *International Journal of Remote Sensing* **36**:13, 3368-3379. [Crossref]

3122. Jie Huang, Wengang Zhou, Houqiang Li, Weiping Li. Sign language recognition using real-sense 166-170. [Crossref]

3123. Banafsheh Rekabdar, Monica Nicolescu, Mircea Nicolescu, Richard Kelley. Scale and translation invariant learning of spatio-temporal patterns using longest common subsequences and spiking neural networks 1-7. [Crossref]

3124. Licheng Zhang, Xihong Wu, Dingsheng Luo. Human activity recognition with HMM-DNN model 192-197. [Crossref]

3125. Nan Liu, Jinjun Wang, Yihong Gong. Deep Self-Organizing Map for visual classification 1-6. [Crossref]

3126. Li Zhang, Yaping Lu. Comparison of auto-encoders with different sparsity regularizers 1-5. [Crossref]

3127. Baoyuan Wu, Siwei Lyu, Bao-Gang Hu, Qiang Ji. 2015. Multi-label learning with missing labels for image annotation and facial action unit recognition. *Pattern Recognition* **48**:7, 2279-2289. [Crossref]

3128. Yongbin You, Yanmin Qian, Kai Yu. Local trajectory based speech enhancement for robust speech recognition with deep neural network 5-9. [Crossref]

3129. Mehdi Hajinoroozi, Tzyy-Ping Jung, Chin-Teng Lin, Yufei Huang. Feature extraction with deep belief networks for driver's cognitive states prediction from EEG data 812-815. [Crossref]

3130. Kunihiko Fukushima, Hayaru Shouno. Deep convolutional network neocognitron: Improved Interpolating-Vector 1-8. [Crossref]

3131. Haobin Dou, Xihong Wu. Coarse-to-fine trained multi-scale Convolutional Neural Networks for image classification 1-7. [Crossref]

3132. Biao Hou, Xiaohuan Luo, Shuang Wang, Licheng Jiao, Xiangrong Zhang. Polarimetric SAR images classification using deep belief networks with learning features 2366-2369. [Crossref]

3133. Jiwen Lu, Venice Erin Liong, Gang Wang, Pierre Moulin. 2015. Joint Feature Learning for Face Recognition. *IEEE Transactions on Information Forensics and Security* **10**:7, 1371-1383. [Crossref]

3134. A. I. Kukharenko, A. S. Konushin. 2015. Simultaneous classification of several features of a person's appearance using a deep convolutional neural network. *Pattern Recognition and Image Analysis* **25**:3, 461-465. [Crossref]

3135. Chunjie Zhang, Jian Cheng, Yifan Zhang, Jing Liu, Chao Liang, Junbiao Pang, Qingming Huang, Qi Tian. 2015. Image classification using boosted local features with random orientation and location selection. *Information Sciences* **310**, 118-129. [Crossref]

3136. Omid E. David, Nathan S. Netanyahu. DeepSign: Deep learning for automatic malware signature generation and classification 1-8. [Crossref]

3137. Mohammad Ali Keyvanrad, Mohammad Mehdi Homayounpour. Normal sparse Deep Belief Network 1-7. [Crossref]

3138. Amedeo Buonanno, Francesco A.N. Palmieri. Two-dimensional multi-layer Factor Graphs in Reduced Normal Form 1-6. [Crossref]

3139. Hasham Burhani, Wenying Feng, Gongzhu Hu. Denoising AutoEncoder in Neural Networks with Modified Elliott Activation Function and Sparsity-Favoring Cost Function 343-348. [Crossref]

3140. Shaunak De, Avik Bhattacharya. Urban classification using PolSAR data and deep learning 353-356. [Crossref]

3141. Biao Leng, Shuang Guo, Xiangyang Zhang, Zhang Xiong. 2015. 3D object retrieval with stacked local convolutional autoencoder. *Signal Processing* **112**, 119-128. [Crossref]

3142. Stephen Ashmore, Michael Gashler. A method for finding similarity between multi-layer perceptrons by Forward Bipartite Alignment 1-7. [Crossref]

3143. Girish Kumar, Jian Min Sim, Eng Yeow Cheu, Xiaoli Li. Stochastic least squares learning for deep architectures 1-7. [Crossref]

3144. Kui Jia, Lin Sun, Shenghua Gao, Zhan Song, Bertram E. Shi. 2015. Laplacian Auto-Encoders: An explicit learning of nonlinear data manifold. *Neurocomputing* **160**, 250-260. [Crossref]

3145. Ryotaro Kamimura. Simplified and gradual information control for improving generalization performance of multi-layered neural networks 1-7. [Crossref]

3146. Carlos Bentes, Domenico Velotto, Susanne Lehner. Target classification in oceanographic SAR images with deep neural networks: Architecture and initial results 3703-3706. [Crossref]

3147. Mohammad Taghi Saffar, Banafsheh Rekabdar, Sushil Louis, Mircea Nicolescu. Face recognition in unconstrained environments 1-7. [Crossref]

3148. Niki Martinel, Christian Micheloni, Gian Luca Foresti. 2015. The Evolution of Neural Learning Systems: A Novel Architecture Combining the Strengths of NTs, CNNs, and ELMs. *IEEE Systems, Man, and Cybernetics Magazine* **1**:3, 17-26. [Crossref]

3149. Liu Qiao Qiao, Li Jian Xun. State of health estimation combining robust deep feature learning with support vector regression 6207-6212. [Crossref]

3150. Bin Xia, Qianyun Li, Jie Jia, Jingyi Wang, Ujwal Chaudhary, Ander Ramos-Murguialday, Niels Birbaumer. Electrooculogram based sleep stage classification using deep belief network 1-5. [Crossref]

3151. Ming Luo, Heng-Chao Yan, Bin Hu, Jun-Hong Zhou, Chee Khiang Pang. 2015. A data-driven two-stage maintenance framework for degradation prediction in semiconductor manufacturing industries. *Computers & Industrial Engineering* **85**, 414-422. [Crossref]

3152. Muxuan Liang, Zhizhong Li, Ting Chen, Jianyang Zeng. 2015. Integrative Data Analysis of Multi-Platform Cancer Data with a Multimodal Deep Learning Approach. *IEEE/ACM Transactions on Computational Biology and Bioinformatics* **12**:4, 928-937. [Crossref]

3153. Juyang Weng. Brains as naturally emerging turing machines 1-8. [Crossref]

3154. Giacomo Ferroni, Roberto Bonfigli, Emanuele Principi, Stefano Squartini, Francesco Piazza. A Deep Neural Network approach for Voice Activity Detection in multi-room domestic scenarios 1-8. [Crossref]

3155. Dennis Hamester, Pablo Barros, Stefan Wermter. Face expression recognition with a 2-channel Convolutional Neural Network 1-8. [Crossref]

3156. Bingyuan Liu, Jing Liu, Hanqing Lu. 2015. Learning representative and discriminative image representation by deep appearance and spatial coding. *Computer Vision and Image Understanding* **136**, 23-31. [Crossref]

3157. Fabrício O. de França, André L.V. Coelho. 2015. A biclustering approach for classification with mislabeled data. *Expert Systems with Applications* **42**:12, 5065-5075. [Crossref]

3158. Ben Mitchell, Hasari Tosun, John Sheppard. Deep learning using partitioned data vectors 1-8. [Crossref]

3159. Siqin Tao, Tao Zhang, Jun Yang, Xueqian Wang, Weining Lu. Bearing fault diagnosis method based on stacked autoencoder and softmax regression 6331-6335. [Crossref]

3160. Yanmin Qian, Tianxing He, Wei Deng, Kai Yu. Automatic model redundancy reduction for fast back-propagation for deep neural networks in speech recognition 1-6. [Crossref]

3161. Yujun Lin, Weiwu Yan. Study of soft sensor modeling based on deep learning 5830-5835. [Crossref]

3162. Min Fu, Yuan Yuan, Xiaoqiang Lu. Unsupervised feature learning for scene classification of high resolution remote sensing image 206-210. [Crossref]

3163. Abdulrahman Altahhan. Towards a deep feature-action architecture for robot homing 205-209. [Crossref]

3164. Sangwook Kim, Minho Lee, Jixiang Shen. A novel deep learning by combining discriminative model with generative model 1-6. [Crossref]

3165. Essam Othman, Yakoub Bazi, Haikel AlHichri, Naif Alajlan. A deep learning approach for unsupervised domain adaptation in multitemporal remote sensing images 2401-2404. [Crossref]

3166. Zhenzhen Li, Lianwen Jin, Chunlin Yang, Zhuoyao Zhong. Hyperparameter search for deep convolutional neural network using effect factors 782-786. [Crossref]

3167. Junying Gan, Lei Zhou, Yikui Zhai. A study for facial beauty prediction model 8-13. [Crossref]

3168. Evangelos Stromatias, Daniel Neil, Francesco Galluppi, Michael Pfeiffer, Shih-Chii Liu, Steve Furber. Scalable energy-efficient, low-latency implementations of trained spiking Deep Belief Networks on SpiNNaker 1-8. [Crossref]

3169. David Cittern, Abbas Edalat. Towards a neural model of bonding in self-attachment 1-8. [Crossref]

3170. Nan Jiang, Wenge Rong, Baolin Peng, Yifan Nie, Zhang Xiong. An empirical analysis of different sparse penalties for autoencoder in unsupervised feature learning 1-8. [Crossref]

3171. Chenghao Cai, Dengfeng Ke, Yanyan Xu, Kaile Su. A Combination of Multi-state Activation Functions, Mean-normalisation and Singular Value Decomposition for learning Deep Neural Networks 1-8. [Crossref]

3172. Son N. Tran, Artur d'Avila Garcez. Efficient representation ranking for transfer learning 1-8. [Crossref]

3173. Yongbin You, Yanmin Qian, Tianxing He, Kai Yu. An investigation on DNN-derived bottleneck features for GMM-HMM based robust speech recognition 30-34. [Crossref]

3174. Kazuyuki Hara, Daisuke Saito, Hayaru Shouno. Analysis of function of rectified linear unit used in deep learning 1-8. [Crossref]

3175. Zheng-Chen Liu, Zhen-Hua Ling, Li-Rong Dai. LIP movement generation using restricted Boltzmann machines for visual speech synthesis 606-610. [Crossref]

3176. Konstantinos Makantasis, Konstantinos Karantzalos, Anastasios Doulamis, Nikolaos Doulamis. Deep supervised learning for hyperspectral data classification through convolutional neural networks 4959-4962. [Crossref]

3177. Yuexian Zou, Lei Li, Yi Wang, Jiasheng Yu, Yi Li, W. J. Deng. Classifying digestive organs in wireless capsule endoscopy images based on deep convolutional neural network 1274-1278. [Crossref]

3178. B. Kryzhanovsky, L. Litinskii. 2015. Generalized approach to description of energy distribution of spin system. *Optical Memory and Neural Networks* **24**:3, 165-185. [Crossref]

3179. Yanhe Guo, Shuang Wang, Chenqiong Gao, Danrong Shi, Donghui Zhang, Biao Hou. Wishart RBM based DBN for polarimetric synthetic radar data classification 1841-1844. [Crossref]

3180. Wenhao Huang, Haikun Hong, Kaigui Bian, Xiabing Zhou, Guojie Song, Kunqing Xie. Improving deep neural network ensembles using reconstruction error 1-7. [Crossref]

3181. Michael S. Gashler, Zachariah Kindle, Michael R. Smith. A minimal architecture for general cognition 1-8. [Crossref]

3182. Jim O' Donoghue, Mark Roantree, Martin Van Boxtel. A Configurable Deep Network for high-dimensional clinical trial data 1-8. [Crossref]

3183. Andrea Censi, Richard M. Murray. 2015. Bootstrapping bilinear models of Simple Vehicles. *The International Journal of Robotics Research* **34**:8, 1087-1113. [Crossref]

3184. Sander Dieleman, Kyle W. Willett, Joni Dambre. 2015. Rotation-invariant convolutional neural networks for galaxy morphology prediction. *Monthly Notices of the Royal Astronomical Society* **450**:2, 1441-1459. [Crossref]

3185. Shuhan Shen, Xiangxiang Li, Songhao Zhu. 2015. Multimodal deep network learning-based image annotation. *Electronics Letters* **51**:12, 905-906. [Crossref]

3186. Andrew Floren, Bruce Naylor, Risto Miikkulainen, David Ress. 2015. Accurately decoding visual information from fMRI data obtained in a realistic virtual environment. *Frontiers in Human Neuroscience* **9**. . [Crossref]

3187. Ziyong Feng, Lianwen Jin, Dapeng Tao, Shuangping Huang. 2015. DLANet: A manifold-learning-based discriminative feature learning network for scene classification. *Neurocomputing* **157**, 11-21. [Crossref]

3188. Alexey Dosovitskiy, Jost Tobias Springenberg, Thomas Brox. Learning to generate chairs with convolutional neural networks 1538-1546. [Crossref]

3189. Yu H. Chen, Se Un Park, Dennis Wei, Greg Newstadt, Michael A. Jackson, Jeff P. Simmons, Marc De Graef, Alfred O. Hero. 2015. A Dictionary Approach to Electron Backscatter Diffraction Indexing. *Microscopy and Microanalysis* **21**:03, 739-752. [Crossref]

3190. Tejas D Kulkarni, Pushmeet Kohli, Joshua B Tenenbaum, Vikash Mansinghka. Picture: A probabilistic programming language for scene perception 4390-4399. [Crossref]

3191. Md. Zahangir Alom, VenkataRamesh Bontupalli, Tarek M. Taha. Intrusion detection using deep belief networks 339-344. [Crossref]

3192. Kun Han, Yuxuan Wang, DeLiang Wang, William S. Woods, Ivo Merks, Tao Zhang. 2015. Learning Spectral Mapping for Speech Dereverberation and Denoising. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **23**:6, 982-992. [Crossref]

3193. Tairui Chen, Zhilu Chen, Quan Shi, Xinming Huang. Road marking detection and classification using machine learning algorithms 617-621. [Crossref]

3194. De-Rong Liu, Hong-Liang Li, Ding Wang. 2015. Feature selection and feature learning for high-dimensional batch reinforcement learning: A survey. *International Journal of Automation and Computing* **12**:3, 229-242. [Crossref]

3195. Marco Fagiani, Stefano Squartini, Roberto Bonfigli, Francesco Piazza. Short-term load forecasting for smart water and gas grids: A comparative evaluation 1198-1203. [Crossref]

3196. Yanhui Xiao, Zhenfeng Zhu, Yao Zhao, Yunchao Wei, Shikui Wei. 2015. Kernel Reconstruction ICA for Sparse Representation. *IEEE Transactions on Neural Networks and Learning Systems* **26**:6, 1222-1232. [Crossref]

3197. Xiaoyang Wang, Qiang Ji. Video event recognition with deep hierarchical context model 4418-4427. [Crossref]

3198. Toru Nakashika, Tetsuya Takiguchi, Yasuo Ariki. Sparse nonlinear representation for voice conversion 1-6. [Crossref]

3199. Junlin Hu, Jiwen Lu, Yap-Peng Tan. Deep transfer metric learning 325-333. [Crossref]

3200. Zhen Zuo, Bing Shuai, Gang Wang, Xiao Liu, Xingxing Wang, Bing Wang, Yushi Chen. Convolutional recurrent neural networks: Learning spatial dependencies for image representation 18-26. [Crossref]

3201. Andreas, Mauridhi Hery Purnomo, Mochamad Hariadi. Controlling the hidden layers' output to optimizing the training process in the Deep Neural Network algorithm 1028-1032. [Crossref]

3202. Zhaoquan Yuan, Changsheng Xu, Jitao Sang, Shuicheng Yan, M. Shamim Hossain. 2015. Learning Feature Hierarchies: A Layer-Wise Tag-Embedded Approach. *IEEE Transactions on Multimedia* **17**:6, 816-827. [Crossref]

3203. Yuanhua Tan, Chaolin Zhang, Yici Mao, Guohui Qian. Semantic presentation and fusion framework of unstructured data in smart cites 897-901. [Crossref]

3204. Zara Ghodsi, Emmanuel Sirimal Silva, Hossein Hassani. 2015. Bicoid Signal Extraction with a Selection of Parametric and Nonparametric Signal Processing Techniques. *Genomics, Proteomics & Bioinformatics* **13**:3, 183-191. [Crossref]

3205. Yushi Chen, Xing Zhao, Xiuping Jia. 2015. Spectral–Spatial Classification of Hyperspectral Data Based on Deep Belief Network. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* **8**:6, 2381-2392. [Crossref]

3206. Zhirong Wu, Shuran Song, Aditya Khosla, Fisher Yu, Linguang Zhang, Xiaoou Tang, Jianxiong Xiao. 3D ShapeNets: A deep representation for volumetric shapes 1912-1920. [Crossref]

3207. András Lőrincz. 2015. Revolution in Health and Wellbeing. *KI - Künstliche Intelligenz* **29**:2, 219-222. [Crossref]

3208. Weilong Hou, Xinbo Gao, Dacheng Tao, Xuelong Li. 2015. Blind Image Quality Assessment via Deep Learning. *IEEE Transactions on Neural Networks and Learning Systems* **26**:6, 1275-1286. [Crossref]

3209. Yaniv Taigman, Ming Yang, Marc'Aurelio Ranzato, Lior Wolf. Web-scale training for face identification 2746-2754. [Crossref]

3210. Hossein Rahmani, Ajmal Mian. Learning a non-linear knowledge transfer model for cross-view action recognition 2458-2466. [Crossref]

3211. Yonglin Ma, Yuanhua Tan, Chaolin Zhang, Yici Mao. A data mining model of knowledge discovery based on the deep learning 1212-1216. [Crossref]

3212. Bojun Xie, Yi Liu, Hui Zhang, Jian Yu. 2015. Efficient image representation for object recognition via pivots selection. *Frontiers of Computer Science* **9**:3, 383-391. [Crossref]

3213. Jiwen Lu, Gang Wang, Weihong Deng, Pierre Moulin, Jie Zhou. Multi-manifold deep metric learning for image set classification 1137-1145. [Crossref]

3214. John Arevalo, Angel Cruz-Roa, Viviana Arias, Eduardo Romero, Fabio A. González. 2015. An unsupervised feature learning framework for basal cell carcinoma image analysis. *Artificial Intelligence in Medicine* **64**:2, 131-145. [Crossref]

3215. Yann LeCun, Yoshua Bengio, Geoffrey Hinton. 2015. Deep learning. *Nature* **521**:7553, 436-444. [Crossref]

3216. Helge Voss. 2015. Successes, Challenges and Future Outlook of Multivariate Analysis In HEP. *Journal of Physics: Conference Series* **608**, 012058. [Crossref]

3217. Zhengping Ji, Ilia Ovsiannikov, Yibing Wang, Lilong Shi, Qiang Zhang. Reducing weight precision of convolutional neural networks towards large-scale on-chip image recognition 94960A. [Crossref]

3218. Masayuki Ohzeki. 2015. L 1 -Regularized Boltzmann Machine Learning Using Majorizer Minimization. *Journal of the Physical Society of Japan* **84**:5, 054801. [Crossref]

3219. David A. E. Morgan. Deep convolutional neural networks for ATR from SAR imagery 94750F. [Crossref]

3220. Hyeon-min Shim, Sangmin Lee. 2015. Multi-channel electromyography pattern classification using deep belief networks for enhanced user experience. *Journal of Central South University* **22**:5, 1801-1808. [Crossref]

3221. Sun Chengjian, Songhao Zhu, Zhe Shi. Image annotation via deep neural network 518-521. [Crossref]

3222. Iti Chaturvedi, Yew-Soon Ong, Rajesh Vellore Arumugam. 2015. Deep transfer learning for classification of time-delayed Gaussian networks. *Signal Processing* **110**, 250-262. [Crossref]

3223. S. Ananiadou, P. Thompson, R. Nawaz, J. McNaught, D. B. Kell. 2015. Event-based text mining for biology and functional genomics. *Briefings in Functional Genomics* **14**:3, 213-230. [Crossref]

3224. Rolf H. Baxter, Michael J. V. Leach, Sankha S. Mukherjee, Neil M. Robertson. 2015. An Adaptive Motion Model for Person Tracking with Instantaneous Head-Pose Features. *IEEE Signal Processing Letters* **22**:5, 578-582. [Crossref]

3225. Ke Zhang, Jianhuan Liu, Yi Chai, Kun Qian. An optimized dimensionality reduction model for high-dimensional data based on Restricted Boltzmann Machines 2939-2944. [Crossref]

3226. Qi Yu, Chao Wang, Xiang Ma, Xi Li, Xuehai Zhou. A Deep Learning Prediction Process Accelerator Based FPGA 1159-1162. [Crossref]

3227. Merve Ayyuce Kizrak, Bulent Bolat. Classification of Classic Turkish Music Makams by using Deep Belief Networks 527-530. [Crossref]

3228. Qingyang Xu, Li Zhang. The effect of different hidden unit number of sparse autoencoder 2464-2467. [Crossref]

3229. Alexandros Agapitos, Michael O'Neill, Miguel Nicolau, David Fagan, Ahmed Kattan, Anthony Brabazon, Kathleen Curran. Deep evolution of image representations for handwritten digit recognition 2452-2459. [Crossref]

3230. Farnaz Abtahi, Zhigang Zhu, Aaron M. Burry. A deep reinforcement learning approach to character segmentation of license plate images 539-542. [Crossref]

3231. Zhen-Hua Ling, Shi-Yin Kang, Heiga Zen, Andrew Senior, Mike Schuster, Xiao-Jun Qian, Helen M. Meng, Li Deng. 2015. Deep Learning for Acoustic Modeling in Parametric Speech Generation: A systematic review of existing techniques and future trends. *IEEE Signal Processing Magazine* **32**:3, 35-52. [Crossref]

3232. Kiran B. Raja, R. Raghavendra, Vinay Krishna Vemuri, Christoph Busch. 2015. Smartphone based visible iris recognition using deep sparse filtering. *Pattern Recognition Letters* **57**, 33-42. [Crossref]

3233. Yongqiang Cao, Yang Chen, Deepak Khosla. 2015. Spiking Deep Convolutional Neural Networks for Energy-Efficient Object Recognition. *International Journal of Computer Vision* **113**:1, 54-66. [Crossref]

3234. Miho Ohsaki, Kenji Matsuda, Peng Wang, Shigeru Katagiri, Hideyuki Watanabe. Formulation of the kernel logistic regression based on the confusion matrix 2327-2334. [Crossref]

3235. Vishal M Patel, Raghuraman Gopalan, Ruonan Li, Rama Chellappa. 2015. Visual Domain Adaptation: A survey of recent advances. *IEEE Signal Processing Magazine* **32**:3, 53-69. [Crossref]

3236. Ali Caner Turkmen, Ali Taylan Cemgil. An application of deep learning for trade signal prediction in financial markets 2521-2524. [Crossref]

3237. Guang Chen, Daniel Clarke, Manuel Giuliani, Andre Gaschler, Alois Knoll. 2015. Combining unsupervised learning and discrimination for 3D action recognition. *Signal Processing* **110**, 67-81. [Crossref]

3238. Srinjoy Das, Bruno Umbria Pedroni, Paul Merolla, John Arthur, Andrew S. Cassidy, Bryan L. Jackson, Dharmendra Modha, Gert Cauwenberghs, Ken Kreutz-Delgado. Gibbs sampling with low-power spiking digital neurons 2704-2707. [Crossref]

3239. Haiping Huang, Taro Toyoizumi. 2015. Advanced mean-field theory of the restricted Boltzmann machine. *Physical Review E* **91**:5. . [Crossref]

3240. Dennis Mund, Rudolph Triebel, Daniel Cremers. Active online confidence boosting for efficient object classification 1367-1373. [Crossref]

3241. Tan Junbo, Lu Weining, An Juneng, Wan Xueqian. Fault diagnosis method study in roller bearing based on wavelet transform and stacked auto-encoder 4608-4613. [Crossref]

3242. Chen Qian, Yan Wang, Gang Hu, Lei Guo. A novel method based on data visual autoencoding for time series similarity matching 2551-2555. [Crossref]

3243. Bo Tang, Haibo He. KernelADASYN: Kernel based adaptive synthetic data generation for imbalanced learning 664-671. [Crossref]

3244. D. E. Wright, S. J. Smartt, K. W. Smith, P. Miller, R. Kotak, A. Rest, W. S. Burgett, K. C. Chambers, H. Flewelling, K. W. Hodapp, M. Huber, R. Jedicke, N. Kaiser, N. Metcalfe, P. A. Price, J. L. Tonry, R. J. Wainscoat, C. Waters. 2015. Machine learning for transient discovery in Pan-STARRS1 difference imaging. *Monthly Notices of the Royal Astronomical Society* **449**:1, 451-466. [Crossref]

3245. Marc F. Joanisse, James L. McClelland. 2015. Connectionist perspectives on language learning, representation and processing. *Wiley Interdisciplinary Reviews: Cognitive Science* **6**:3, 235-247. [Crossref]

3246. Hongpeng Yin, Xuguo Jiao, Yi Chai, Bin Fang. 2015. Scene classification based on single-layer SAE and SVM. *Expert Systems with Applications* **42**:7, 3368-3380. [Crossref]

3247. Jie Tang, Juanzi Li. 2015. Semantic Mining of Social Networks. *Synthesis Lectures on the Semantic Web: Theory and Technology* **5**:2, 1-205. [Crossref]

3248. Eric Vatikiotis-Bateson, Kevin G. Munhall. Auditory-Visual Speech Processing 178-199. [Crossref]

3249. Ruslan Salakhutdinov. 2015. Learning Deep Generative Models. *Annual Review of Statistics and Its Application* **2**:1, 361-385. [Crossref]

3250. Maria Schuld, Ilya Sinayskiy, Francesco Petruccione. 2015. An introduction to quantum machine learning. *Contemporary Physics* **56**:2, 172-185. [Crossref]

3251. Ruchir Srivastava, Jun Cheng, Damon W. K. Wong, Jiang Liu. Using deep learning for robustness to parapapillary atrophy in optic disc segmentation 768-771. [Crossref]

3252. R. Raghavendra, Christoph Busch. 2015. Robust Scheme for Iris Presentation Attack Detection Using Multiscale Binarized Statistical Image Features. *IEEE Transactions on Information Forensics and Security* **10**:4, 703-715. [Crossref]

3253. Aggelos Pikrakis, Yannis Kopsinis, Symeon Chouvardas, Sergios Theodoridis. Pattern classification formulated as a missing data task: The audio genre classification case 2026-2030. [Crossref]

3254. Petr Fousek, Pierre Dognin, Vaibhava Goel. Evaluating Deep Scattering Spectra with deep neural networks on large scale spontaneous speech task 4550-4554. [Crossref]

3255. Moritz Helmstaedter. 2015. The Mutual Inspirations of Machine Learning and Neuroscience. *Neuron* **86**:1, 25-28. [Crossref]

3256. Mingyuan Jiu, Hichem Sahbi. Semi supervised deep kernel design for image annotation 1156-1160. [Crossref]

3257. Mathias Berglund, Tapani Raiko, Kyunghyun Cho. 2015. Measuring the usefulness of hidden units in Boltzmann machines with mutual information. *Neural Networks* **64**, 12-18. [Crossref]

3258. Yan-Hui Tu, Jun Du, Li-Rong Dai, Chin-Hui Lee. Speech Separation based on signal-noise-dependent deep neural networks for robust speech recognition 61-65. [Crossref]

3259. S. Elfwing, E. Uchibe, K. Doya. 2015. Expected energy-based restricted Boltzmann machine for classification. *Neural Networks* **64**, 29-38. [Crossref]

3260. Jian Kang, Cheng Lu, Meng Cai, Wei-Qiang Zhang, Jia Liu. Neuron sparseness versus connection sparseness in deep neural network for large vocabulary speech recognition 4954-4958. [Crossref]

3261. Dimitri Palaz, Mathew Magimai.-Doss, Ronan Collobert. Convolutional Neural Networks-based continuous speech recognition using raw speech signal 4295-4299. [Crossref]

3262. Omid Ghahabi, Javier Hernando. Restricted Boltzmann Machine supervectors for speaker recognition 4804-4808. [Crossref]

3263. Xue Feng, Brigitte Richardson, Scott Amman, James Glass. On using heterogeneous data for vehicle-based speech recognition: A DNN-based approach 4385-4389. [Crossref]

3264. Tian Gao, Jun Du, Li-Rong Dai, Chin-Hui Lee. Joint training of front-end and back-end deep neural networks for robust speech recognition 4375-4379. [Crossref]

3265. Munawar Hayat, Mohammed Bennamoun, Senjian An. 2015. Deep Reconstruction Models for Image Set Classification. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **37**:4, 713-727. [Crossref]

3266. Lifa Sun, Shiyin Kang, Kun Li, Helen Meng. Voice conversion using deep Bidirectional Long Short-Term Memory based Recurrent Neural Networks 4869-4873. [Crossref]

3267. Christian Koch, Kristina Georgieva, Varun Kasireddy, Burcu Akinci, Paul Fieguth. 2015. A review on computer vision based defect detection and condition assessment of concrete and asphalt civil infrastructure. *Advanced Engineering Informatics* **29**:2, 196-210. [Crossref]

3268. Siqi Liu, Sidong Liu, Weidong Cai, Hangyu Che, Sonia Pujol, Ron Kikinis, Dagan Feng, Michael J. Fulham, ADNI. 2015. Multimodal Neuroimaging Feature Learning for Multiclass Diagnosis of Alzheimer's Disease. *IEEE Transactions on Biomedical Engineering* **62**:4, 1132-1140. [Crossref]

3269. Andros Tjandra, Sakriani Sakti, Graham Neubig, Tomoki Toda, Mirna Adriani, Satoshi Nakamura. Combination of two-dimensional cochleogram and spectrogram features for deep learning-based ASR 4525-4529. [Crossref]

3270. Yong Wang, Shiqiang Hu. 2015. Exploiting high level feature for dynamic textures recognition. *Neurocomputing* **154**, 217-224. [Crossref]

3271. Fangxiang Feng, Ruifan Li, Xiaojie Wang. 2015. Deep correspondence restricted Boltzmann machine for cross-modal retrieval. *Neurocomputing* **154**, 50-60. [Crossref]

3272. Yoshua Bengio, Honglak Lee. 2015. Editorial introduction to the Neural Networks special issue on Deep Learning of Representations. *Neural Networks* **64**, 1-3. [Crossref]

3273. Li-Juan Liu, Ling-Hui Chen, Zhen-Hua Ling, Li-Rong Dai. Spectral conversion using deep neural networks trained with multi-source speakers 4849-4853. [Crossref]

3274. Pan Zhou, Hui Jiang, Li-Rong Dai, Yu Hu, Qing-Feng Liu. 2015. State-Clustering Based Multiple Deep Neural Networks Modeling Approach for Speech Recognition. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **23**:4, 631-642. [Crossref]

3275. Sangwook Kim, Zhibin Yu, Rhee Man Kil, Minho Lee. 2015. Deep learning of support vector machines with class probability output networks. *Neural Networks* **64**, 19-28. [Crossref]

3276. Yude Bu, Gang Zhao, A-li Luo, Jingchang Pan, Yuqin Chen. 2015. Restricted Boltzmann machine: a non-linear substitute for PCA in spectral processing. *Astronomy & Astrophysics* **576**, A96. [Crossref]

3277. Wenge Rong, Baolin Peng, Yuanxin Ouyang, Chao Li, Zhang Xiong. 2015. Structural information aware deep semi-supervised recurrent neural network for sentiment analysis. *Frontiers of Computer Science* **9**:2, 171-184. [Crossref]

3278. Wei-Long Zheng, Hao-Tian Guo, Bao-Liang Lu. Revealing critical channels and frequency bands for emotion recognition from EEG with deep belief network 154-157. [Crossref]

3279. W. Q. Zheng, Y. X. Zou, C. Ritz. Spectral mask estimation using deep neural networks for inter-sensor data ratio model based robust DOA estimation 325-329. [Crossref]

3280. Peter Bell, Steve Renals. Regularization of context-dependent deep neural networks with context-independent multi-task training 4290-4294. [Crossref]

3281. Muhammad Muneeb Saleem, Gang Liu, John H.L. Hansen. Weighted training for speech under Lombard Effect for speaker recognition 4350-4354. [Crossref]

3282. Weilong Hou, Xinbo Gao. 2015. Saliency-Guided Deep Framework for Image Quality Assessment. *IEEE MultiMedia* **22**:2, 46-55. [Crossref]

3283. Milos Cernak, Blaise Potard, Philip N. Garner. Phonological vocoding using artificial neural networks 4844-4848. [Crossref]

3284. Li Wang, Ting Liu, Gang Wang, Kap Luk Chan, Qingxiong Yang. 2015. Video Tracking Using Learned Hierarchical Features. *IEEE Transactions on Image Processing* **24**:4, 1424-1435. [Crossref]

3285. Feng Liu, Bingquan Liu, Chengjie Sun, Ming Liu, Xiaolong Wang. 2015. Deep Belief Network-Based Approaches for Link Prediction in Signed Social Networks. *Entropy* **17**:4, 2140-2169. [Crossref]

3286. Ao Tang, Ke Lu, Yufei Wang, Jie Huang, Houqiang Li. 2015. A Real-Time Hand Posture Recognition System Using Deep Neural Networks. *ACM Transactions on Intelligent Systems and Technology* **6**:2, 1-23. [Crossref]

3287. Max Berniker, Konrad P. Kording. 2015. Deep networks for motor control functions. *Frontiers in Computational Neuroscience* **9**. . [Crossref]

3288. Muneki Yasuda. 2015. Monte Carlo Integration Using Spatial Structure of Markov Random Field. *Journal of the Physical Society of Japan* **84**:3, 034001. [Crossref]

3289. Masayuki Ohzeki. 2015. Statistical-Mechanical Analysis of Pre-training and Fine Tuning in Deep Learning. *Journal of the Physical Society of Japan* **84**:3, 034003. [Crossref]

3290. Jungang Xu, Hui Li, Shilong Zhou. 2015. An Overview of Deep Generative Models. *IETE Technical Review* **32**:2, 131-139. [Crossref]

3291. Yinlong Qian, Jing Dong, Wei Wang, Tieniu Tan. Deep learning for steganalysis via convolutional neural networks 94090J. [Crossref]

3292. Hao Liu, Bingpeng Ma, Lei Qin, Junbiao Pang, Chunjie Zhang, Qingming Huang. 2015. Set-label modeling and deep metric learning on person re-identification. *Neurocomputing* **151**, 1283-1292. [Crossref]

3293. Heung-Il Suk, Seong-Whan Lee, Dinggang Shen. 2015. Latent feature representation with stacked auto-encoder for AD/MCI diagnosis. *Brain Structure and Function* **220**:2, 841-859. [Crossref]

3294. Lin Zhao, Xinbo Gao, Dacheng Tao, Xuelong Li. 2015. A deep structure for human pose estimation. *Signal Processing* **108**, 36-45. [Crossref]

3295. Ian McLoughlin, Haomin Zhang, Zhipeng Xie, Yan Song, Wei Xiao. 2015. Robust Sound Event Classification Using Deep Neural Networks. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **23**:3, 540-552. [Crossref]

3296. Gregoire Mesnil, Yann Dauphin, Kaisheng Yao, Yoshua Bengio, Li Deng, Dilek Hakkani-Tur, Xiaodong He, Larry Heck, Gokhan Tur, Dong Yu, Geoffrey Zweig. 2015. Using Recurrent Neural Networks for Slot Filling in Spoken Language Understanding. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **23**:3, 530-539. [Crossref]

3297. Biao Leng, Xiangyang Zhang, Ming Yao, Zhang Xiong. 2015. A 3D model recognition mechanism based on deep Boltzmann machines. *Neurocomputing* **151**, 593-602. [Crossref]

3298. Hsing-Kuo Pao, Yuh-Jye Lee, Chun-Ying Huang. 2015. Rejoinder to 'Statistical learning methods for information security: fundamentals and case studies'. *Applied Stochastic Models in Business and Industry* **31**:2, 119-121. [Crossref]

3299. Toru Nakashika, Tetsuya Takiguchi, Yasuo Ariki. 2015. Voice Conversion Using RNN Pre-Trained by Recurrent Temporal Restricted Boltzmann Machines. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **23**:3, 580-587. [Crossref]

3300. Jiexiong Tang, Chenwei Deng, Guang-Bin Huang, Baojun Zhao. 2015. Compressed-Domain Ship Detection on Spaceborne Optical Image Using Deep Neural Network and Extreme Learning Machine. *IEEE Transactions on Geoscience and Remote Sensing* **53**:3, 1174-1185. [Crossref]

3301. Fuhao Zou, Yunfei Wang, Yang Yang, Ke Zhou, Yunpeng Chen, Jingkuan Song. 2015. Supervised feature learning via l2-norm regularized logistic regression for 3D object recognition. *Neurocomputing* **151**, 603-611. [Crossref]

3302. Mohamed Elleuch, Najiba Tagougui, Monji Kherallah. Arabic handwritten characters recognition using Deep Belief Neural Networks 1-5. [Crossref]

3303. Mohsen A. A. Rashwan, Ahmad A. Al Sallab, Hazem M. Raafat, Ahmed Rafea. 2015. Deep Learning Framework with Confused Sub-Set Resolution Architecture for Automatic Arabic Diacritization. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **23**:3, 505-516. [Crossref]

3304. Maria Schuld, Ilya Sinayskiy, Francesco Petruccione. 2015. Simulating a perceptron on a quantum computer. *Physics Letters A* **379**:7, 660-663. [Crossref]

3305. In-Jung Kim, Xiaohui Xie. 2015. Handwritten Hangul recognition using deep convolutional neural networks. *International Journal on Document Analysis and Recognition (IJDAR)* **18**:1, 1-13. [Crossref]

3306. Wenping Hu, Yao Qian, Frank K. Soong, Yong Wang. 2015. Improved mispronunciation detection with deep neural network trained acoustic models and transfer learning based logistic regression classifiers. *Speech Communication* **67**, 154-166. [Crossref]

3307. Kayode Sanni, Guillaume Garreau, Jamal Lottier Molin, Andreas G. Andreou. FPGA implementation of a Deep Belief Network architecture for character recognition using stochastic computation 1-5. [Crossref]

3308. Shao-Zi Li, Bin Yu, Wei Wu, Song-Zhi Su, Rong-Rong Ji. 2015. Feature learning based on SAE–PCA network for human gesture recognition in RGBD images. *Neurocomputing* **151**, 565-573. [Crossref]

3309. Hyeon-Joong Yoo. 2015. Deep Convolution Neural Networks in Computer Vision: a Review. *IEIE Transactions on Smart Processing and Computing* **4**:1, 35-43. [Crossref]

3310. Hoon Kang, Joonsoo Ha, Jangbeom Shin, Hong Gi Lee, Yang Wang. 2015. Unsupervised Incremental Learning of Associative Cubes with Orthogonal Kernels. *Journal of Korean Institute of Intelligent Systems* **25**:1, 97-104. [Crossref]

3311. Junshui Ma, Robert P. Sheridan, Andy Liaw, George E. Dahl, Vladimir Svetnik. 2015. Deep Neural Nets as a Method for Quantitative Structure–Activity Relationships. *Journal of Chemical Information and Modeling* **55**:2, 263-274. [Crossref]

3312. Wei Xiong, Jierong Cheng, Ying Gu, Shimiao Li, Joo-Hwee Lim. Overview of Biomedical Image Understanding Methods 1-45. [Crossref]

3313. Tae Gyoon Kang, Kisoo Kwon, Jong Won Shin, Nam Soo Kim. 2015. NMF-based Target Source Separation Using Deep Neural Network. *IEEE Signal Processing Letters* **22**:2, 229-233. [Crossref]

3314. Alessandro Montalto, Giovanni Tessitore, Roberto Prevete. 2015. A linear approach for sparse coding by a two-layer neural network. *Neurocomputing* **149**, 1315-1323. [Crossref]

3315. İlkay Atıl, Sinan Kalkan. 2015. Towards an Embodied Developing Vision System. *KI - Künstliche Intelligenz* **29**:1, 41-50. [Crossref]

3316. Yongtao Yu, Jonathan Li, Haiyan Guan, Fukai Jia, Cheng Wang. 2015. Learning Hierarchical Features for Automated Extraction of Road Markings From 3-D Mobile LiDAR Point Clouds. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* **8**:2, 709-726. [Crossref]

3317. Wei Shen, Jianyong Wang, Jiawei Han. 2015. Entity Linking with a Knowledge Base: Issues, Techniques, and Solutions. *IEEE Transactions on Knowledge and Data Engineering* **27**:2, 443-460. [Crossref]

3318. Dominique Fohr, Irina Illina. Neural networks for proper name retrieval in the framework of automatic speech recognition 25-30. [Crossref]

3319. Tanmay Bhowmik, Sankar Mukherjee, Shyamal Kumar Das Mandal. Detection of attributes for Bengali phoneme in continuous speech using deep neural network 103-108. [Crossref]

3320. Martin Längkvist, Amy Loutfi. 2015. Learning Feature Representations with a Cost-Relevant Sparse Autoencoder. *International Journal of Neural Systems* **25**:01, 1450034. [Crossref]

3321. Norbert Krüger, Michael Zillich, Peter Janssen, Anders Glent Buch. 2015. What We Can Learn From the Primate's Visual System. *KI - Künstliche Intelligenz* **29**:1, 9-18. [Crossref]

3322. Yue Shang, Wanying Ding, Mengwen Liu, Xiaoli Song, Tony Hu, Yuan An, Haohong Wang, Lifan Guo. Scalable user intent mining using a multimodal Restricted Boltzmann Machine 618-624. [Crossref]

3323. Seongwook Park, Kyeongryeol Bong, Dongjoo Shin, Jinmook Lee, Sungpill Choi, Hoi-Jun Yoo. 4.6 A1.93TOPS/W scalable deep learning/inference processor with tetra-parallel MIMD architecture for big-data applications 1-3. [Crossref]

3324. Antonio Rodríguez-Sánchez, Heiko Neumann, Justus Piater. 2015. Beyond Simple and Complex Neurons: Towards Intermediate-level Representations of Shapes and Objects. *KI - Künstliche Intelligenz* **29**:1, 19-29. [Crossref]

3325. Tomasz Maniak, Chrisina Jayne, Rahat Iqbal, Faiyaz Doctor. 2015. Automated intelligent system for sound signalling device quality assurance. *Information Sciences* **294**, 600-611. [Crossref]

3326. Shuhui Bu, Pengcheng Han, Zhenbao Liu, Junwei Han, Hongwei Lin. 2015. Local deep feature learning framework for 3D shape. *Computers & Graphics* **46**, 117-129. [Crossref]

3327. ChenWei Deng, GuangBin Huang, Jia Xu, JieXiong Tang. 2015. Extreme learning machines: new trends and applications. *Science China Information Sciences* **58**:2, 1-16. [Crossref]

3328. Yi Wang, Jun-an Yang, Jun Lu, Hui Liu, Lun-wu Wang. 2015. Hierarchical deep belief networks based point process model for keywords spotting in continuous speech. *International Journal of Communication Systems* **28**:3, 483-496. [Crossref]

3329. BÃ©rÃ©nice Mettler, Zhaodan Kong, Bin Li, Jonathan Andersh. 2015. Systems view on spatial planning and perception based on invariants in agent-environment dynamics. *Frontiers in Neuroscience* **8**. . [Crossref]

3330. Hongming Chen, Susanne Winiwarter, Ola Engkvist. In Silico Tools for Predicting Brain Exposure of Drugs 167-187. [Crossref]

3331. Tom Brosch, Roger Tam. 2015. Efficient Training of Convolutional Deep Belief Networks in the Frequency Domain for Application to High-Resolution 2D and 3D Images. *Neural Computation* **27**:1, 211-227. [Abstract] [Full Text] [PDF] [PDF Plus]

3332. Jürgen Schmidhuber. 2015. Deep learning in neural networks: An overview. *Neural Networks* **61**, 85-117. [Crossref]

3333. Ruifan Li, Fangxiang Feng, Xiaojie Wang, Peng Lu, Bohan Li. 2015. Obtaining Cross Modal Similarity Metric with Deep Neural Architecture. *Mathematical Problems in Engineering* **2015**, 1-9. [Crossref]

3334. Jialei Wang, Ryohei Fujimaki, Yosuke Motohashi. Trading Interpretability for Accuracy 1245-1254. [Crossref]

3335. Xiaoshan Yang, Tianzhu Zhang, Changsheng Xu. 2015. Cross-Domain Feature Learning in Multimedia. *IEEE Transactions on Multimedia* **17**:1, 64-78. [Crossref]

3336. Jack Kelly, William Knottenbelt. Neural NILM 55-64. [Crossref]

3337. Peilin Zhang, Sheng Li, Yu Zhou. 2015. An Algorithm of Quantum Restricted Boltzmann Machine Network Based on Quantum Gates and Its Application. *Shock and Vibration* **2015**, 1-7. [Crossref]

3338. Qiunan Zhao, Maoguo Gong, Hao Li, Tao Zhan, Qian Wang. Three-Class Change Detection in Synthetic Aperture Radar Images Based on Deep Belief Network 696-705. [Crossref]

3339. Gautam Prasad, Shantanu H. Joshi, Talia M. Nir, Arthur W. Toga, Paul M. Thompson. 2015. Brain connectivity and novel network measures for Alzheimer's disease classification. *Neurobiology of Aging* **36**, S121-S131. [Crossref]

3340. Qing Ma, Ibuki Tanigawa, Masaki Murata. 2015. Retrieval Term Prediction Using Deep Belief Networks. *Journal of Natural Language Processing* **22**:4, 225-250. [Crossref]

3341. Zheng Yi Wu, Mahmoud El-Maghraby, Sudipta Pathak. 2015. Applications of Deep Learning for Smart Water Networks. *Procedia Engineering* **119**, 479-485. [Crossref]

3342. Yuming Hua, Junhai Guo, Hua Zhao. Deep Belief Networks and deep learning 1-4. [Crossref]

3343. Yue Wu, Qiang Ji. Learning the Face Shape Models for Facial Landmark Detection in the Wild 33-45. [Crossref]

3344. Yong Xu, Jun Du, Li-Rong Dai, Chin-Hui Lee. 2015. A Regression Approach to Speech Enhancement Based on Deep Neural Networks. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **23**:1, 7-19. [Crossref]

3345. Bob L. Sturm, Corey Kereliuk, Jan Larsen. ¿El Caballo Viejo? Latin Genre Recognition with Deep Learning and Spectral Periodicity 335-346. [Crossref]

3346. Xiao Sun, Tongda Zhang, Yueting Chai, Yi Liu. 2015. Localized Ambient Solidity Separation Algorithm Based Computer User Segmentation. *Computational Intelligence and Neuroscience* **2015**, 1-16. [Crossref]

3347. Ahmed Hussen Abdelaziz, Steffen Zeiler, Dorothea Kolossa. 2015. Learning Dynamic Stream Weights For Coupled-HMM-based Audio-visual Speech Recognition. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* 1-1. [Crossref]

3348. Chenghao Cai, Yanyan Xu, Dengfeng Ke, Kaile Su. 2015. A Fast Learning Method for Multilayer Perceptrons in Automatic Speech Recognition Systems. *Journal of Robotics* **2015**, 1-7. [Crossref]

3349. Tsvi Achler. 2015. A Localist Paradigm for Big Data. *Procedia Computer Science* **53**, 356-364. [Crossref]

3350. Ke Chen. Deep and Modular Neural Networks 473-494. [Crossref]

3351. Zhong Chen, Shengwu Xiong, Zhixiang Fang, Ruiling Zhang, Xiangzhen Kong, Yi Rong. 2015. Topologically Ordered Feature Extraction Based on Sparse Group Restricted Boltzmann Machines. *Mathematical Problems in Engineering* **2015**, 1-12. [Crossref]

3352. Mingmin Zhao, Tao Ye, Ruipeng Gao, Fan Ye, Yizhou Wang, Guojie Luo. VeTrack 99-112. [Crossref]

3353. Xiangbo Shu, Guo-Jun Qi, Jinhui Tang, Jingdong Wang. Weakly-Shared Deep Transfer Networks for Heterogeneous-Domain Knowledge Propagation 35-44. [Crossref]

3354. Abdulrahman Altahhan. 2015. Navigating a Robot through Big Visual Sensory Data. *Procedia Computer Science* **53**, 478-485. [Crossref]

3355. Phillip Verbancsics, Josh Harguess. Image Classification Using Generative Neuro Evolution for Deep Learning 488-493. [Crossref]

3356. Theodoros Giannakopoulos, Ioannis Foufoulas, Eleftherios Stamatogiannakis, Harry Dimitropoulos, Natalia Manola, Yannis Ioannidis. Visual-Based Classification of Figures from Scientific Literature 1059-1060. [Crossref]

3357. Anupama Ray, Sai Rajeswar, Santanu Chaudhury. Text recognition using deep BLSTM networks 1-6. [Crossref]

3358. Weishan Zhang, Pengcheng Duan, Zhongwei Li, Qinghua Lu, Wenjuan Gong, Su Yang. 2015. A Deep Awareness Framework for Pervasive Video Cloud. *IEEE Access* **3**, 2227-2237. [Crossref]

3359. Qi Lv, Yong Dou, Xin Niu, Jiaqing Xu, Jinbo Xu, Fei Xia. 2015. Urban Land Use and Land Cover Classification Using Remotely Sensed SAR Data through Deep Belief Networks. *Journal of Sensors* **2015**, 1-10. [Crossref]

3360. Quoc Bao Nguyen, Tat Thang Vu, Chi Mai Luong. Improving acoustic model for English ASR System using deep neural network 25-29. [Crossref]

3361. Yandong Li, Ferdous Sohel, Mohammed Bennamoun, Hang Lei. Heterogeneous Multi-column ConvNets with a Fusion Framework for Object Recognition 773-780. [Crossref]

3362. Loris Nanni, Sheryl Brahnam, Stefano Ghidoni, Alessandra Lumini. 2015. Toward a General-Purpose Heterogeneous Ensemble for Pattern Classification. *Computational Intelligence and Neuroscience* **2015**, 1-10. [Crossref]

3363. Matt Spencer, Jesse Eickholt, Jianlin Cheng. 2015. A Deep Learning Network Approach to ab initio Protein Secondary Structure Prediction. *IEEE/ACM Transactions on Computational Biology and Bioinformatics* **12**:1, 103-112. [Crossref]

3364. Mehmet Ersin Yumer, Paul Asente, Radomir Mech, Levent Burak Kara. Procedural Modeling Using Autoencoder Networks 109-118. [Crossref]

3365. Łukasz Brocki, Krzysztof Marasek. 2015. Deep Belief Neural Networks and Bidirectional Long-Short Term Memory Hybrid for Speech Recognition. *Archives of Acoustics* **40**:2. . [Crossref]

3366. Viktor Slavkovikj, Steven Verstockt, Wesley De Neve, Sofie Van Hoecke, Rik Van de Walle. Hyperspectral Image Classification with Convolutional Neural Networks 1159-1162. [Crossref]

3367. Runfeng Zhang, Chunping Li, Daoyuan Jia. 2015. A New Multi-channels Sequence Recognition Framework Using Deep Convolutional Neural Network. *Procedia Computer Science* **53**, 383-390. [Crossref]

3368. Pengjing Zhang, Xiaoqing Zheng, Wenqiang Zhang, Siyan Li, Sheng Qian, Wenqi He, Shangtong Zhang, Ziyuan Wang. A Deep Neural Network for Modeling Music 379-386. [Crossref]

3369. Hui Li, Xiaoyi Li, Murali Ramanathan, Aidong Zhang. 2015. Prediction and Informative Risk Factor Selection of Bone Diseases. *IEEE/ACM Transactions on Computational Biology and Bioinformatics* **12**:1, 79-91. [Crossref]

3370. Piero P. Bonissone. Machine Learning Applications 783-821. [Crossref]

3371. Yan Yan, Xu-Cheng Yin, Sujian Li, Mingyuan Yang, Hong-Wei Hao. 2015. Learning Document Semantic Representation with Hybrid Deep Belief Network. *Computational Intelligence and Neuroscience* **2015**, 1-9. [Crossref]

3372. Dao Lam, Mingzhen Wei, Donald Wunsch. 2015. Clustering Data of Mixed Categorical and Numerical Type With Unsupervised Feature Learning. *IEEE Access* **3**, 1605-1613. [Crossref]

3373. Alejandro H. Toselli, Enrique Vidal. Handwritten Text Recognition Results on the Bentham Collection with Improved Classical N-Gram-HMM methods 15-22. [Crossref]

3374. Aditya Grover, Ashish Kapoor, Eric Horvitz. A Deep Hybrid Model for Weather Forecasting 379-386. [Crossref]

3375. Chenghao Cai, Yanyan Xu, Dengfeng Ke, Kaile Su. 2015. Deep Neural Networks with Multistate Activation Functions. *Computational Intelligence and Neuroscience* **2015**, 1-10. [Crossref]

3376. Xiaona Song, Ting Rui, Zhengjun Zha, Xinqing Wang, Husheng Fang. The AdaBoost algorithm for vehicle detection based on CNN features 1-5. [Crossref]

3377. Zhikai Zhao, Jian Guo, Enjie Ding, Zongwei Zhu, Duan Zhao. Terminal Replacement Prediction Based on Deep Belief Networks 255-258. [Crossref]

3378. Man-Ki Yoon, Lui Sha, Sibin Mohan, Jaesik Choi. Memory heat map 1-6. [Crossref]

3379. Rafael Hrasko, André G.C. Pacheco, Renato A. Krohling. 2015. Time Series Prediction Using Restricted Boltzmann Machines and Backpropagation. *Procedia Computer Science* **55**, 990-999. [Crossref]

3380. Sheng Li, Jaya Kawale, Yun Fu. Deep Collaborative Filtering via Marginalized Denoising Auto-encoder 811-820. [Crossref]

3381. Kun Wang, Kan Cao, Sridhar Hannenhalli. Chromatin and genomic determinants of alternative splicing 345-354. [Crossref]

3382. Prasanna Tamilselvan, Pingfeng Wang. 2015. A tri-fold hybrid classification approach for diagnostics with unexampled faulty states. *Mechanical Systems and Signal Processing* **50-51**, 437-455. [Crossref]

3383. Gabriel Recchia, Magnus Sahlgren, Pentti Kanerva, Michael N. Jones. 2015. Encoding Sequential Information in Semantic Space Models: Comparing Holographic Reduced Representation and Random Permutation. *Computational Intelligence and Neuroscience* **2015**, 1-18. [Crossref]

3384. Janna L. Fierst, Patrick C. Phillips. 2015. Modeling the evolution of complex genetic systems: The gene network family tree. *Journal of Experimental Zoology Part B: Molecular and Developmental Evolution* **324**:1, 1-12. [Crossref]

3385. Mirco Ravanelli, Benjamin Elizalde, Julia Bernd, Gerald Friedland. Insights into Audio-Based Multimedia Event Classification with Neural Networks 19-23. [Crossref]

3386. Thuy Vu, D. Stott Parker. Node Embeddings in Social Network Analysis 326-329. [Crossref]

3387. Sergios Theodoridis. Neural Networks and Deep Learning 875-936. [Crossref]

3388. Zhengping Che, David Kale, Wenzhe Li, Mohammad Taha Bahadori, Yan Liu. Deep Computational Phenotyping 507-516. [Crossref]

3389. Markus Schoeler, Florentin Worgotter, Tomas Kulvicius, Jeremie Papon. Unsupervised Generation of Context-Relevant Training-Sets for Visual Object Recognition Employing Multilinguality 805-812. [Crossref]

3390. Suck-Bum Rho, Sung-Kwun Oh. 2015. Design of Fuzzy k-Nearest Neighbors Classifiers based on Feature Extraction by using Stacked Autoencoder. *The Transactions of The Korean Institute of Electrical Engineers* **64**:1, 113-120. [Crossref]

3391. Nicholas D. Lane, Petko Georgiev. Can Deep Learning Revolutionize Mobile Sensing? 117-122. [Crossref]

3392. Harri Valpola. From neural PCA to deep unsupervised learning 143-171. [Crossref]

3393. Bo Wang, Jichang Guo, Yan Zhang. 2015. An Analysis and Application of Fast Nonnegative Orthogonal Matching Pursuit for Image Categorization in Deep Networks. *Mathematical Problems in Engineering* **2015**, 1-9. [Crossref]

3394. Dongpeng Chen, Brian Mak. 2015. Multi-task Learning of Deep Neural Networks for Low-resource Speech Recognition. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* 1-1. [Crossref]

3395. Qingchen Zhang, Laurence T. Yang, Zhikui Chen. 2015. Deep Computation Model for Unsupervised Feature Learning on Big Data. *IEEE Transactions on Services Computing* 1-1. [Crossref]

3396. Dongjin Jang, Jaehyun Lee, Kwangmin Kim, Doheon Lee. Building Text-mining Framework for Gene-Phenotype Relation Extraction using Deep Leaning 17-17. [Crossref]

3397. Hideaki Itoh, Hisao Fukumoto, Hiroshi Wakuya, Tatsuya Furukawa. 2015. Bottom–Up Learning of Hierarchical Models in a Class of Deterministic Pomdp Environments. *International Journal of Applied Mathematics and Computer Science* **25**:3. . [Crossref]

3398. Stefan Lattner, Maarten Grachten, Kat Agres, Carlos Eduardo Cancino Chacón. Probabilistic Segmentation of Musical Sequences Using Restricted Boltzmann Machines 323-334. [Crossref]

3399. Juha Karhunen, Tapani Raiko, KyungHyun Cho. Unsupervised deep learning 125-142. [Crossref]

3400. Yan Fang, Chet N. Gnegy, Tadashi Shibata, Denver Dash, Donald M. Chiarulli, Steven P. Levitan. 2015. Non-Boolean Associative Processing: Circuits, System Architecture, and Algorithms. *IEEE Journal on Exploratory Solid-State Computational Devices and Circuits* 1, 94-102. [Crossref]

3401. Hao Peng, Lili Mou, Ge Li, Yuxuan Liu, Lu Zhang, Zhi Jin. Building Program Vector Representations for Deep Learning 547-553. [Crossref]

3402. Lin Jiang, Ruimin Hu, Xiaochen Wang, Maosheng Zhang. Low Bitrates Audio Bandwidth Extension Using a Deep Auto-Encoder 528-537. [Crossref]

3403. Heung-Il Suk, Seong-Whan Lee, Dinggang Shen. A Hybrid of Deep Network and Hidden Markov Model for MCI Identification with Resting-State fMRI 573-580. [Crossref]

3404. Chaoqun Hong, Jun Yu, You Jane, Xuhui Chen. Hypergraph Regularized Autoencoder for 3D Human Pose Recovery 66-75. [Crossref]

3405. Mayank Kejriwal, Daniel P. Miranker. Decision-Making Bias in Instance Matching Model Selection 392-407. [Crossref]

3406. Guoyong Cai, Binbin Xia. Convolutional Neural Networks for Multimedia Sentiment Analysis 159-167. [Crossref]

3407. Bing Han, Xinbo Gao, Hui Liu, Ping Wang. Auroral Oval Boundary Modeling Based on Deep Learning Method 96-106. [Crossref]

3408. Olarik Surinta, Mahir F. Karaaba, Tusar K. Mishra, Lambert R. B. Schomaker, Marco A. Wiering. Recognizing Handwritten Characters with Local Descriptors and Bags of Visual Words 255-264. [Crossref]

3409. Juyang Weng. 2015. Brain as an Emergent Finite Automaton: A Theory and Three Theorems. *International Journal of Intelligence Science* 05:02, 112-131. [Crossref]

3410. Tadaaki Niwa, Takashi Kawakami, Ryosuke Ooe, Tamotsu Mitamura, Masahiro Kinoshita, Masaaki Wajima. 2015. An Acoustic Events Recognition for Robotic Systems Based on a Deep Learning Method. *Journal of Computer and Communications* 03:11, 46-51. [Crossref]

3411. Yunfeng Hou, Chaoli Wang, Yunfeng Ji. 2015. The Research of Event Detection and Characterization Technology of Ticket Gate in the Urban Rapid Rail Transit. *Journal of Software Engineering and Applications* 08:01, 6-15. [Crossref]

3412. Chang-you Zhang, Xiao-ya Wang, Jun Feng, Yu Cheng. SiftKeyPre: A Vehicle Recognition Method Based on SIFT Key-Points Preference in Car-Face Image 344-358. [Crossref]

3413. Yang Zhao, Ronggang Wang, Wenmin Wang, Wen Gao. 2015. Multi-level Modified Finite Radon Transform Network for Image Upsampling. *IEEE Transactions on Circuits and Systems for Video Technology* 1-1. [Crossref]

3414. Jer Hayes. Multimedia Big Data: Content Analysis and Retrieval 37-51. [Crossref]

3415. Isidro Cortés-Ciriano, Qurrat Ul Ain, Vigneshwari Subramanian, Eelke B. Lenselink, Oscar Méndez-Lucio, Adriaan P. IJzerman, Gerd Wohlfahrt, Peteris Prusis, Thérèse E. Malliavin, Gerard J. P. van Westen, Andreas Bender. 2015. Polypharmacology modelling using proteochemometrics (PCM): recent methodological developments, applications to target families, and future prospects. *MedChemComm* **6**:1, 24-50. [Crossref]

3416. Xiao-Nan Fan, Shao-Wu Zhang. 2015. lncRNA-MFDL: identification of human long non-coding RNAs by fusing multiple features and using deep learning. *Molecular BioSystems* **11**:3, 892-897. [Crossref]

3417. Xiaoyong Pan, Kai Xiong. 2015. PredcircRNA: computational classification of circular RNA from other long non-coding RNA using hybrid features. *Molecular BioSystems* **11**:8, 2219-2226. [Crossref]

3418. Wojciech K. Mleczko, Tomasz Kapuściński, Robert K. Nowicki. Rough Deep Belief Network - Application to Incomplete Handwritten Digits Pattern Classification 400-411. [Crossref]

3419. Yao Zheng, Bing Wang, Wenjing Lou, Y. Thomas Hou. Privacy-Preserving Link Prediction in Decentralized Online Social Networks 61-80. [Crossref]

3420. Bingyuan Liu, Jing Liu, Zechao Li, Hanqing Lu. Image Representation Learning by Deep Appearance and Spatial Coding 659-672. [Crossref]

3421. Hendrik Vincent Koops, Jan van Balen, Frans Wiering. Automatic Segmentation and Deep Learning of Bird Sounds 261-267. [Crossref]

3422. Erik Barrow, Chrisina Jayne, Mark Eastwood. Deep Dropout Artificial Neural Networks for Recognising Digits and Characters in Natural Images 29-37. [Crossref]

3423. Gerard J. Rinkus. 2014. Sparseyâ„¢: event recognition via deep hierarchical sparse distributed codes. *Frontiers in Computational Neuroscience* **8**. . [Crossref]

3424. Georg Layher, Fabian Schrodt, Martin V. Butz, Heiko Neumann. 2014. Adaptive learning in a compartmental model of visual cortexâ€"how feedback enables stable category learning and refinement. *Frontiers in Psychology* **5**. . [Crossref]

3425. Jin Qi, Zhiyong Yang. 2014. Learning Dictionaries of Sparse Codes of 3D Movements of Body Joints for Real-Time Human Activity Understanding. *PLoS ONE* **9**:12, e114147. [Crossref]

3426. Toktam Ebadi, Ignas Kukenys, Will N. Browne, Mengjie Zhang. 2014. Human-Interpretable Feature Pattern Classification System Using Learning Classifier Systems. *Evolutionary Computation* **22**:4, 629-650. [Abstract] [Full Text] [PDF] [PDF Plus]

3427. Qian Yu, Yuexian Hou, Xiaozhao Zhao, Guochen Cheng. Rényi Divergence Based Generalization for Learning of Classification Restricted Boltzmann Machines 692-697. [Crossref]

3428. Chung H. Lam. Phase Change Memory and its intended applications 29.3.1-29.3.4. [Crossref]

3429. Shuo Zhang, Wuyi Zhang, Kary Kang. Learning high-level features by deep Boltzmann machines for handwriting digits recogintion 243-246. [Crossref]

3430. Shuhui Bu, Zhenbao Liu, Junwei Han, Jun Wu, Rongrong Ji. 2014. Learning High-Level Feature by Deep Belief Networks for 3-D Model Retrieval and Recognition. *IEEE Transactions on Multimedia* **16**:8, 2154-2167. [Crossref]

3431. Kun Han, DeLiang Wang. 2014. Neural Network Based Pitch Tracking in Very Noisy Speech. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **22**:12, 2158-2168. [Crossref]

3432. Davide Del Testa, Matteo Danieletto, Michele Zorzi. Applying Machine Learning Techniques to a Real Cognitive Network: File Transfer ETAs Prediction 1-7. [Crossref]

3433. Melissa N Stolar, Margaret Lech, Ian S Burnett. Optimized multi-channel deep neural network with 2D graphical representation of acoustic speech features for emotion recognition 1-6. [Crossref]

3434. Yoshiki Sakai, Kenji Yamanishi. Data Fusion Using Restricted Boltzmann Machines 953-958. [Crossref]

3435. Sourav Bhattacharya, Petteri Nurmi, Nils Hammerla, Thomas Plötz. 2014. Using unlabeled data in a sparse-coding framework for human activity recognition. *Pervasive and Mobile Computing* **15**, 242-262. [Crossref]

3436. Qiaochu Li, Jian Zhang, Yuhan Wang, Kary Kang. Credit Risk Classification Using Discriminative Restricted Boltzmann Machines 1697-1700. [Crossref]

3437. David Corne, Manjula Dissanayake, Andrew Peacock, Stuart Galloway, Eddie Owens. Accurate localized short term weather prediction for renewables planning 1-8. [Crossref]

3438. Norihide Kitaoka, Tomoki Hayashi, Kazuya Takeda. Noisy speech recognition using blind spatial subtraction array technique and deep bottleneck features 1-5. [Crossref]

3439. Shaofei Xue, Ossama Abdel-Hamid, Hui Jiang, Lirong Dai, Qingfeng Liu. 2014. Fast Adaptation of Deep Neural Network Based on Discriminant Codes for Speech Recognition. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **22**:12, 1713-1725. [Crossref]

3440. Martin Karafiat, Karel Vesely, Igor Szoke, Lukas Burget, Frantisek Grezl, Mirko Hannemann, Jan Cernocky. But ASR system for BABEL Surprise evaluation 2014 501-506. [Crossref]

3441. Hanlin Goh, Nicolas Thome, Matthieu Cord, Joo-Hwee Lim. 2014. Learning Deep Hierarchical Visual Feature Coding. *IEEE Transactions on Neural Networks and Learning Systems* **25**:12, 2212-2225. [Crossref]

3442. Ryotaro Kamimura. Explicit knowledge extraction in information-theoretic supervised multi-layered SOM 78-83. [Crossref]

3443. Matthew Hausknecht, Joel Lehman, Risto Miikkulainen, Peter Stone. 2014. A Neuroevolution Approach to General Atari Game Playing. *IEEE Transactions on Computational Intelligence and AI in Games* **6**:4, 355-366. [Crossref]

3444. Deepti Ghadiyaram, Alan C. Bovik. Blind image quality assessment on real distorted images using deep belief nets 946-950. [Crossref]

3445. Romain Serizel, Diego Giuliani. Vocal tract length normalisation approaches to DNN-based children's and adults' speech recognition 135-140. [Crossref]

3446. Giovani Chiachia, Alexandre X. Falcao, Nicolas Pinto, Anderson Rocha, David Cox. 2014. Learning Person-Specific Representations From Faces in the Wild. *IEEE Transactions on Information Forensics and Security* **9**:12, 2089-2099. [Crossref]

3447. Nishu Garg, P Nikhitha, B. K. Tripathy. Image retrieval using latent feature learning by deep architecture 1-4. [Crossref]

3448. Dewei Li, Yingjie Tian, Honggui Xu. Deep Twin Support Vector Machine 65-73. [Crossref]

3449. Shu Sun, Fang Liu, Jun Liu, Yinan Dou, Hua Yu. Web Classification Using Deep Belief Networks 768-773. [Crossref]

3450. LOVRO ŠUBELJ, SLAVKO ŽITNIK, NELI BLAGUS, MARKO BAJEC. 2014. NODE MIXING AND GROUP STRUCTURE OF COMPLEX SOFTWARE NETWORKS. *Advances in Complex Systems* **17**:07n08, 1450022. [Crossref]

3451. Yi Jiang, DeLiang Wang, RunSheng Liu, ZhenMing Feng. 2014. Binaural Classification for Reverberant Speech Segregation Using Deep Neural Networks. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **22**:12, 2112-2121. [Crossref]

3452. Ping Kuang, Wei-Na Cao, Qiao Wu. Preview on structures and algorithms of deep learning 176-179. [Crossref]

3453. Xueheng Qiu, Le Zhang, Ye Ren, P. Suganthan, Gehan Amaratunga. Ensemble deep learning for regression and time series forecasting 1-6. [Crossref]

3454. Meng Huanhuan, Zhang Yue. Classification of Electrocardiogram Signals with Deep Belief Networks 7-12. [Crossref]

3455. Michele Buccoli, Paolo Bestagini, Massimiliano Zanoni, Augusto Sarti, Stefano Tubaro. Unsupervised feature learning for bootleg detection using deep learning architectures 131-136. [Crossref]

3456. Erte Pan, Zhu Han. Non-parametric Bayesian learning with deep learning structure and its applications in wireless networks 1233-1237. [Crossref]

3457. Xiaowei Guo, Haiying Huang, Jason Zhang. Comparison of different variants of Restricted Boltzmann Machines 239-242. [Crossref]

3458. How Jing, Shou-De Lin. Neural Conditional Energy Models for Multi-label Classification 240-249. [Crossref]

3459. Banriskhem K Khonglah, Biswajit Dev Sarma, S. R. M. Prasanna. Exploration of Deep Belief Networks for Vowel-like regions detection 1-5. [Crossref]

3460. Telmo Amaral, Chetak Kandaswamy, Luis M. Silva, Luis A. Alexandre, Joaquim Marques de Sa, Jorge M. Santos. Improving Performance on Problems with Few Labelled Data by Reusing Stacked Auto-Encoders 367-372. [Crossref]

3461. Yuhuang Hu, Dickson Tze How Neoh, Khairul Salleh Mohamed Sahari, Chu Kiong Loo. Learning sufficient representation for spatio-temporal deep network using information filter 655-658. [Crossref]

3462. Calvin Hung, Zhe Xu, Salah Sukkarieh. 2014. Feature Learning Based Approach for Weed Classification Using High Resolution Aerial Images from a Digital Camera Mounted on a UAV. *Remote Sensing* **6**:12, 12037-12054. [Crossref]

3463. William Black, Poorya Haghi, Kartik Ariyur. 2014. Adaptive Systems: History, Techniques, Problems, and Perspectives. *Systems* **2**:4, 606-660. [Crossref]

3464. Michihito Ueda, Yu Nishitani, Yukihiro Kaneko, Atsushi Omote. 2014. Back-Propagation Operation for Analog Neural Network Hardware with Synapse Components Having Hysteresis Characteristics. *PLoS ONE* **9**:11, e112659. [Crossref]

3465. Seyed-Mahdi Khaligh-Razavi, Nikolaus Kriegeskorte. 2014. Deep Supervised, but Not Unsupervised, Models May Explain IT Cortical Representation. *PLoS Computational Biology* **10**:11, e1003915. [Crossref]

3466. Jesse Eickholt, Suman Karki. Adopting the MapReduce framework to pre-train 1-D and 2-D protein structure predictors with large protein datasets 23-29. [Crossref]

3467. Yadan Lv, Zhiyong Feng, Chao Xu. Facial expression recognition via deep learning 303-308. [Crossref]

3468. Bu Chen, Qian Yin, Ping Guo. A Study of Deep Belief Network Based Chinese Speech Emotion Recognition 180-184. [Crossref]

3469. Jun Lei, GuoHui Li, Dan Tu, Qiang Guo. 2014. Convolutional restricted Boltzmann machines learning for robust visual tracking. *Neural Computing and Applications* **25**:6, 1383-1391. [Crossref]

3470. Junying Gan, Lichen Li, Yikui Zhai, Yinhua Liu. 2014. Deep self-taught learning for facial beauty prediction. *Neurocomputing* **144**, 295-303. [Crossref]

3471. Ron Rubinstein, Michael Elad. 2014. Dictionary Learning for Analysis-Synthesis Thresholding. *IEEE Transactions on Signal Processing* **62**:22, 5962-5972. [Crossref]

3472. Joseph Chrol-Cannon, Yaochu Jin. 2014. Computational modeling of neural plasticity for self-organization of neural networks. *Biosystems* **125**, 43-54. [Crossref]

3473. Heung-Il Suk, Seong-Whan Lee, Dinggang Shen. 2014. Hierarchical feature representation and multimodal fusion with deep learning for AD/MCI diagnosis. *NeuroImage* **101**, 569-582. [Crossref]

3474. Qin Zou, Yu Cao, Qingquan Li, Chuanhe Huang, Song Wang. 2014. Chronological classification of ancient paintings using appearance and shape features. *Pattern Recognition Letters* **49**, 146-154. [Crossref]

3475. Guangsen Wang, Khe Chai Sim. 2014. Regression-Based Context-Dependent Modeling of Deep Neural Networks for Speech Recognition. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **22**:11, 1660-1669. [Crossref]

3476. Konstantinos Charalampous, Antonios Gasteratos. 2014. A tensor-based deep learning framework. *Image and Vision Computing* **32**:11, 916-929. [Crossref]

3477. Yuan Zhang, Yue Cheng, KeBin Jia, AiDong Zhang. 2014. A generative model of identifying informative proteins from dynamic PPI networks. *Science China Life Sciences* **57**:11, 1080-1089. [Crossref]

3478. Ting Li, Xiaoqin Zeng, Shoujing Xu. A Deep Learning Method for Braille Recognition 1092-1095. [Crossref]

3479. Znaonui Liang, Gang Zhang, Jimmy Xiangji Huang, Qmming Vivian Hu. Deep learning for healthcare decision making with EMRs 556-559. [Crossref]

3480. Yan Zhao, Zhimin Gao, Lei Wang, Luping Zhou. Experimental Study of Unsupervised Feature Learning for HEp-2 Cell Images Clustering 1-8. [Crossref]

3481. Jean-Luc Buessler, Philippe Smagghe, Jean-Philippe Urban. 2014. Image receptive fields for artificial neural networks. *Neurocomputing* **144**, 258-270. [Crossref]

3482. Deping Kuang, Lianghua He. Classification on ADHD with Deep Learning 27-32. [Crossref]

3483. I-Hsin Chung, Tara N. Sainath, Bhuvana Ramabhadran, Michael Pichen, John Gunnels, Vernon Austel, Upendra Chauhari, Brian Kingsbury. Parallel Deep Neural Network Training for Big Data on Blue Gene/Q 745-753. [Crossref]

3484. Connie Ko, Gunho Sohn, Tarmo Remmel, John Miller. 2014. Hybrid Ensemble Classification of Tree Genera Using Airborne LiDAR Data. *Remote Sensing* **6**:11, 11225-11243. [Crossref]

3485. Bojun Xie, Yi Liu, Hui Zhang, Jian Yu. 2014. Efficient image representation for object recognition via pivots selection. *Frontiers of Computer Science* **25**. . [Crossref]

3486. Shusen Zhou, Qingcai Chen, Xiaolong Wang. 2014. Deep Adaptive Networks for Visual Data Classification. *Journal of Multimedia* **9**:10. . [Crossref]

3487. Snehasis Mukhopadhyay, Vidya Bhushan Singh, Meghna Babbar-Sebens. User modeling with limited data: Application to stakeholder-driven watershed design 3855-3860. [Crossref]

3488. Lech Szymanski, Brendan McCane. 2014. Deep Networks are Effective Encoders of Periodicity. *IEEE Transactions on Neural Networks and Learning Systems* **25**:10, 1816-1827. [Crossref]

3489. Zhuotun Zhu, Xinggang Wang, Song Bai, Cong Yao, Xiang Bai. Deep learning representation using autoencoder for 3D shape retrieval 279-284. [Crossref]

3490. Zhaoquan Yuan, Jitao Sang, Changsheng Xu, Yan Liu. 2014. A Unified Framework of Latent Feature Learning in Social Media. *IEEE Transactions on Multimedia* **16**:6, 1624-1635. [Crossref]

3491. Orhan Firat, Like Oztekin, Fatos T. Yarman Vural. Deep learning for brain decoding 2784-2788. [Crossref]

3492. Bin Liu, Fuyuan Mo, Jianhua Tao. Speech enhancement based on analysis-synthesis framework with improved pitch estimation and spectral envelope enhancement 461-466. [Crossref]

3493. Li Shen, Gang Sun, Shuhui Wang, Enhua Wu, Qingming Huang. Sharing model with multi-level feature representations 5931-5935. [Crossref]

3494. Zhiyu Wang, Peng Cui, Fangtao Li, Edward Chang, Shiqiang Yang. 2014. A data-driven study of image feature extraction and fusion. *Information Sciences* **281**, 536-558. [Crossref]

3495. Xiantong Zhen, Ling Shao, Xuelong Li. 2014. Action recognition by spatio-temporal oriented energies. *Information Sciences* **281**, 295-309. [Crossref]

3496. Rodrigo Frassetto Nogueira, Roberto de Alencar Lotufo, Rubens Campos Machado. Evaluating software-based fingerprint liveness detection using Convolutional Networks and Local Binary Patterns 22-29. [Crossref]

3497. B. Chandra, Rajesh Kumar Sharma. Fast learning for big data applications using parameterized multilayer perceptron 17-22. [Crossref]

3498. Jan Zahalka, Marcel Worring. Towards interactive, intelligent, and integrated multimedia analytics 3-12. [Crossref]

3499. Ifeoma Nwogu, Yingbo Zhou. Shared features for multiple face-based biometrics 417-422. [Crossref]

3500. Elnaz Barshan, Paul Fieguth. Scalable learning for restricted Boltzmann machines 2754-2758. [Crossref]

3501. Jun Du, Yanhui Tu, Yong Xu, Lirong Dai, Chin-Hui Lee. Speech separation of a target speaker based on deep neural networks 473-477. [Crossref]

3502. Shuhui Bu, Shaoguang Cheng, Zhenbao Liu, Junwei Han. 2014. Multimodal Feature Fusion for 3D Shape Recognition and Retrieval. *IEEE MultiMedia* **21**:4, 38-46. [Crossref]

3503. Ryotaro Kamimura. Information-theoretic multi-layered supervised self-organizing maps for improved prediction performance and explicit internal representation 953-958. [Crossref]

3504. Bun Theang Ong, Komei Sugiura, Koji Zettsu. Dynamic pre-training of Deep Recurrent Neural Networks for predicting environmental monitoring data 760-765. [Crossref]

3505. R. Pradeep, R. Kumaraswamy. Comparison of conventional methods and deep belief networks for isolated word recognition 1-5. [Crossref]

3506. Nima Mohajerin, Steven L. Waslander. Modular deep Recurrent Neural Network: Application to quadrotors 1374-1379. [Crossref]

3507. Jiexiong Tang, Chenwei Deng, Guang-Bin Huang, Junhui Hou. A fast learning algorithm for multi-layer extreme learning machine 175-178. [Crossref]

3508. Takashi Kuremoto, Masanao Obayashi, Kunikazu Kobayashi, Takaomi Hirata, Shingo Mabu. Forecast chaotic time series data by DBNs 1130-1135. [Crossref]

3509. Saleh Aly. 2014. Learning invariant local image descriptor using convolutional Mahalanobis self-organising map. *Neurocomputing* **142**, 239-247. [Crossref]

3510. Chun-Yang Zhang, C. L. Philip Chen. An automatic setting for training restricted boltzmann machine 4037-4041. [Crossref]

3511. Keyu Lu, Jian Li, Xiangjing An, Hangen He. Hierarchical image representation via multi-level sparse coding 4902-4906. [Crossref]

3512. Kyuyeon Hwang, Wonyong Sung. Fixed-point feedforward deep neural network design using weights +1, 0, and −1 1-6. [Crossref]

3513. Yanjie Duan, Yisheng Lv, Wenwen Kang, Yifei Zhao. A deep learning based approach for traffic data imputation 912-917. [Crossref]

3514. Yi Liu, Lei Qin, Zhongwei Cheng, Yanhao Zhang, Weigang Zhang, Qingming Huang. DA-CCD: A novel action representation by Deep Architecture of local depth feature 833-837. [Crossref]

3515. Ke Gu, Guangtao Zhai, Xiaokang Yang, Wenjun Zhang. Deep learning network for blind image quality assessment 511-515. [Crossref]

3516. Yanhui Tu, Jun Du, Yong Xu, Lirong Dai, Chin-Hui Lee. Deep neural network based speech separation for robust speech recognition 532-536. [Crossref]

3517. Hui Wen, Weixin Xie, Jihong Pei. A pre-radical basis function with deep back propagation neural network research 1489-1494. [Crossref]

3518. Wenhao Huang, Guojie Song, Haikun Hong, Kunqing Xie. 2014. Deep Architecture for Traffic Flow Prediction: Deep Belief Networks With Multitask Learning. *IEEE Transactions on Intelligent Transportation Systems* **15**:5, 2191-2201. [Crossref]

3519. Minju Jung, Jungsik Hwang, Jun Tani. Multiple spatio-temporal scales neural network for contextual visual recognition of human actions 235-241. [Crossref]

3520. Xiaoyi Zou, Xiangmin Xu, Chunmei Qing, Xiaofen Xing. High speed deep networks based on Discrete Cosine Transformation 5921-5925. [Crossref]

3521. Chetak Kandaswamy, Luis M. Silva, Luis A. Alexandre, Ricardo Sousa, Jorge M. Santos, Joaquim Marques de Sa. Improving transfer learning accuracy by reusing Stacked Denoising Autoencoders 1380-1387. [Crossref]

3522. Nikolaos Doulamis, Anastasios Doulamis. Semi-supervised deep learning for object tracking and classification 848-852. [Crossref]

3523. Shusen Zhou, Qingcai Chen, Xiaolong Wang. 2014. Active Semi-Supervised Learning Method with Hybrid Deep Belief Networks. *PLoS ONE* **9**:9, e107122. [Crossref]

3524. Sunhyoung Han, Nuno Vasconcelos. 2014. Object recognition with hierarchical discriminant saliency networks. *Frontiers in Computational Neuroscience* **8**. . [Crossref]

3525. Kai Fan, Hongyi Zhang, Songbai Yan, Liwei Wang, Wensheng Zhang, Jufu Feng. 2014. Learning a generative classifier from label proportions. *Neurocomputing* **139**, 47-55. [Crossref]

3526. Yanhui Tu, Jun Du, Yong Xu, Lirong Dai, Chin-Hui Lee. Speech separation based on improved deep neural networks with dual outputs of speech features for both target and interfering speakers 250-254. [Crossref]

3527. Sankar Mukherjee, Shyamal Kumar Das Mandal. F_0 modeling in HMM-based speech synthesis system using Deep Belief Network 1-5. [Crossref]

3528. Norihiro Takamune, Hirokazu Kameoka. Maximum reconstruction probability training of Restricted Boltzmann machines with auxiliary function approach 1-6. [Crossref]

3529. Zhang Hailong, Gan Wenyan, Jiang Bo. Machine Learning and Lexicon Based Methods for Sentiment Classification: A Survey 262-265. [Crossref]

3530. Yannan Wang, Jun Du, Lirong Dai, Chin-Hui Lee. A fusion approach to spoken language identification based on combining multiple phone recognizers and speech attribute detectors 158-162. [Crossref]

3531. Partha Pratim Roy, Youssouf Chherawala, Mohamed Cheriet. Deep-Belief-Network Based Rescoring Approach for Handwritten Word Recognition 506-511. [Crossref]

3532. Joan Andreu Sanchez, Veronica Romero, Alejandro H. Toselli, Enrique Vidal. ICFHR2014 Competition on Handwritten Text Recognition on Transcriptorium Datasets (HTRtS) 785-790. [Crossref]

3533. 2014. Convolutional Neural Networks for Distant Speech Recognition. *IEEE Signal Processing Letters* **21**:9, 1120-1124. [Crossref]

3534. Sanjanaashree P, Anand Kumar M. Joint layer based deep learning framework for bilingual machine transliteration 1737-1743. [Crossref]

3535. Wenping Hu, Yao Qian, Frank K. Soong. A new Neural Network based logistic regression classifier for improving mispronunciation detection of L2 language learners 245-249. [Crossref]

3536. Wenbing Huang, Fuchun Sun. Using hierarchical dirichlet processes to regulate weight parameters of Restricted Boltzmann Machines 1-8. [Crossref]

3537. Long-Long Ma, Jian Wu. A Tibetan Component Representation Learning Method for Online Handwritten Tibetan Character Recognition 317-322. [Crossref]

3538. M. Demetgul, K. Yildiz, S. Taskin, I.N. Tansel, O. Yazicioglu. 2014. Fault diagnosis on material handling system using feature selection and data mining techniques. *Measurement* **55**, 15-24. [Crossref]

3539. Kun Li, Helen Meng. Mispronunciation detection and diagnosis in l2 english speech using multi-distribution Deep Neural Networks 255-259. [Crossref]

3540. Hirokazu Kameoka, Norihiro Takamune. Training Restricted Boltzmann Machines with auxiliary function approach 1-6. [Crossref]

3541. Mirco Ravanelli, Van Hai Do, Adam Janin. TANDEM-bottleneck feature combination using hierarchical Deep Neural Networks 113-117. [Crossref]

3542. Jun Du, Jin-Shui Hu, Bo Zhu, Si Wei, Li-Rong Dai. Writer Adaptation Using Bottleneck Features and Discriminative Linear Regression for Online Handwritten Chinese Character Recognition 311-316. [Crossref]

3543. Jun Du. Irrelevant Variability Normalization via Hierarchical Deep Neural Networks for Online Handwritten Chinese Character Recognition 303-308. [Crossref]

3544. Tamas Grosz, Peter Bodnar, Laszlo Toth, Laszlo G. Nyul. QR code localization using deep neural networks 1-6. [Crossref]

3545. Vince D. Calhoun. 2014. Brain networks: The next steps. *Physics of Life Reviews* **11**:3, 440-441. [Crossref]

3546. Kelvin Poon-Feng, Dong-Yan Huang, Minghui Dong, Haizhou Li. Acoustic emotion recognition based on fusion of multiple feature-dependent deep Boltzmann machines 584-588. [Crossref]

3547. Fu Zhi-Peng, Zhang Yan-Ning, Hou Hai-Yan. Survey of deep learning in face recognition 5-8. [Crossref]

3548. Jungang Xu, Hui Li, Shilong Zhou. 2014. Improving mixing rate with tempered transition for learning restricted Boltzmann machines. *Neurocomputing* **139**, 328-335. [Crossref]

3549. Zhao You, Bo Xu. Investigation of stochastic Hessian-Free optimization in Deep neural networks for speech recognition 450-453. [Crossref]

3550. Hong Qiao, Yinlin Li, Tang Tang, Peng Wang. 2014. Introducing Memory and Association Mechanism Into a Biologically Inspired Visual Model. *IEEE Transactions on Cybernetics* **44**:9, 1485-1496. [Crossref]

3551. Sabato Marco Siniscalchi, Torbjørn Svendsen, Chin-Hui Lee. 2014. An artificial neural network approach to automatic speech processing. *Neurocomputing* **140**, 326-338. [Crossref]

3552. D. Zhu, D. Li, B. Carterette, H. Liu. 2014. Integrating information retrieval with distant supervision for Gene Ontology annotation. *Database* **2014**:0, bau087-bau087. [Crossref]

3553. Javier Snaider, Stan Franklin. 2014. Modular Composite Representation. *Cognitive Computation* **6**:3, 510-527. [Crossref]

3554. Tuo Zhao, Yunxin Zhao, Xin Chen. Building an ensemble of CD-DNN-HMM acoustic model using random forests of phonetic decision trees 98-102. [Crossref]

3555. Aaron Courville, Guillaume Desjardins, James Bergstra, Yoshua Bengio. 2014. The Spike-and-Slab RBM and Extensions to Discrete and Sparse Data Distributions. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **36**:9, 1874-1887. [Crossref]

3556. Gang Chen, Sargur N. Srihari. A Noisy-Or Discriminative Restricted Boltzmann Machine for Recognizing Handwriting Style Development 714-719. [Crossref]

3557. Wei-Wei Liu, Meng Cai, Hua Yuan, Xiao-Bei Shi, Wei-Qiang Zhang, Jia Liu. Phonotactic language recognition based on DNN-HMM acoustic model 153-157. [Crossref]

3558. Jianwei Niu, Yanmin Qian, Kai Yu. Acoustic emotion recognition using deep neural network 128-132. [Crossref]

3559. Nan-Nan Ji, Jiang-She Zhang, Chun-Xia Zhang. 2014. A sparse-response deep belief network based on rate distortion theory. *Pattern Recognition* **47**:9, 3179-3191. [Crossref]

3560. Paolo Frasconi, Ludovico Silvestri, Paolo Soda, Roberto Cortini, Francesco S. Pavone, Giulio Iannello. 2014. Large-scale automated identification of mouse brain cells in confocal light sheet microscopy images. *Bioinformatics* **30**:17, i587-i593. [Crossref]

3561. Chongjia Ni, Nancy F. Chen, Bin Ma. Multiple time-span feature fusion for deep neural network modeling 138-142. [Crossref]

3562. Hailong Liu, Tadahiro Taniguchi. Feature Extraction and Pattern Recognition for Human Motion by a Deep Sparse Autoencoder 173-181. [Crossref]

3563. Dao Xi Wu, Wei Pan, Li Dong Xie, Chao Xi Huang. 2014. An Adaptive Stacked Denoising Auto-Encoder Architecture for Human Action Recognition. *Applied Mechanics and Materials* **631-632**, 403-409. [Crossref]

3564. Li Juan Ma. 2014. Research on the Development and Influence of the Cyberculture. *Advanced Materials Research* **1030-1032**, 2753-2756. [Crossref]

3565. Zhao Yang Xu, Li Na Tang, Chun Peng Tian. 2014. Prediction of Stock Trend Based on Deep Belief Networks. *Applied Mechanics and Materials* **644-650**, 5538-5541. [Crossref]

3566. Sergey M. Plis, Devon R. Hjelm, Ruslan Salakhutdinov, Elena A. Allen, Henry J. Bockholt, Jeffrey D. Long, Hans J. Johnson, Jane S. Paulsen, Jessica A. Turner, Vince D. Calhoun. 2014. Deep learning for neuroimaging: a validation study. *Frontiers in Neuroscience* **8**. . [Crossref]

3567. Umut Güçlü, Marcel A. J. van Gerven. 2014. Unsupervised Feature Learning Improves Prediction of Human Brain Activity in Response to Natural Images. *PLoS Computational Biology* **10**:8, e1003724. [Crossref]

3568. Ping Gan, Juyang Weng. The short-context priority of emergent representations in unsupervised learning 30-35. [Crossref]

3569. Jun Du, Jin-Shui Hu, Bo Zhu, Si Wei, Li-Rong Dai. A Study of Designing Compact Classifiers Using Deep Neural Networks for Online Handwritten Chinese Character Recognition 2950-2955. [Crossref]

3570. Geoffrey Hinton. 2014. Where Do Features Come From?. *Cognitive Science* **38**:6, 1078-1101. [Crossref]

3571. R. Devon Hjelm, Vince D. Calhoun, Ruslan Salakhutdinov, Elena A. Allen, Tulay Adali, Sergey M. Plis. 2014. Restricted Boltzmann machines for neuroimaging: An application in identifying intrinsic networks. *NeuroImage* **96**, 245-260. [Crossref]

3572. Hassan Abbas Abdelbary, Abeer Mohamed ElKorany, Reem Bahgat. Utilizing deep learning for content-based community detection 777-784. [Crossref]

3573. Bingyuan Liu, Jing Liu, Xiao Bai, Hanqing Lu. Regularized Hierarchical Feature Learning with Non-negative Sparsity and Selectivity for Image Classification 4293-4298. [Crossref]

3574. Yi Jiang, Runsheng Liu. Binaural deep neural network for robust speech enhancement 692-695. [Crossref]

3575. Yanhua Cheng, Xin Zhao, Kaiqi Huang, Tieniu Tan. Semi-supervised Learning for RGB-D Object Recognition 2377-2382. [Crossref]

3576. Hiroshi Seki, Kazumasa Yamamoto, Seiichi Nakagawa. Comparison of syllable-based and phoneme-based DNN-HMM in Japanese speech recognition 249-254. [Crossref]

3577. Yue Guo, Heng Zhen Zhang. 2014. Oil spill detection using synthetic aperture radar images and feature selection in shape space. *International Journal of Applied Earth Observation and Geoinformation* **30**, 146-157. [Crossref]

3578. Mathieu N. Galtier, Camille Marini, Gilles Wainrib, Herbert Jaeger. 2014. Relative entropy minimizing noisy non-linear neural network to approximate stochastic processes. *Neural Networks* **56**, 10-21. [Crossref]

3579. Xu-Cheng Yin, Chun Yang, Wei-Yi Pei, Hong-Wei Hao. Shallow Classification or Deep Learning: An Experimental Study 1904-1909. [Crossref]

3580. Alexander Gepperth. 2014. Processing and Transmission of Confidence in Recurrent Neural Hierarchies. *Neural Processing Letters* **40**:1, 75-91. [Crossref]

3581. Sabanadesan Umakanthan, Simon Denman, Clinton Fookes, Sridha Sridharan. Multiple Instance Dictionary Learning for Activity Representation 1377-1382. [Crossref]

3582. Nannan Ji, Jiangshe Zhang, Chunxia Zhang, Lei Wang. 2014. Discriminative restricted Boltzmann machine for invariant pattern recognition with linear transformations. *Pattern Recognition Letters* **45**, 172-180. [Crossref]

3583. Yutaka Hatakeyama, Hiromi Kataoka, Yoshiyasu Okuhara, Shinichi Yoshida. Decoding analysis for fMRI based on Deep Brief Network 268-272. [Crossref]

3584. Baptiste Wicht, Jean Hennebert. Camera-based Sudoku recognition with deep belief network 83-88. [Crossref]

3585. Bo Li, Khe Chai Sim. 2014. A Spectral Masking Approach to Noise-Robust Speech Recognition Using Deep Neural Networks. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **22**:8, 1296-1305. [Crossref]

3586. Lei Nie, Ajay Kumar, Song Zhan. Periocular Recognition Using Unsupervised Convolutional RBM Feature Learning 399-404. [Crossref]

3587. I-Hong Jhuo, D.T. Lee. Video Event Detection via Multi-modality Deep Learning 666-671. [Crossref]

3588. Meng Wang, Youbin Chen, Xingjun Wang. Recognition of Handwritten Characters in Chinese Legal Amounts by Stacked Autoencoders 3002-3007. [Crossref]

3589. Zenghai Chen, Zheru Chi, Hong Fu. A Hybrid Holistic/Semantic Approach for Scene Classification 2299-2304. [Crossref]

3590. Monica Bianchini, Franco Scarselli. 2014. On the Complexity of Neural Network Classifiers: A Comparison Between Shallow and Deep Architectures. *IEEE Transactions on Neural Networks and Learning Systems* **25**:8, 1553-1565. [Crossref]

3591. Pablo Huijse, Pablo A. Estevez, Pavlos Protopapas, Jose C. Principe, Pablo Zegers. 2014. Computational Intelligence Challenges and Applications on Large-Scale Astronomical Time Series Databases. *IEEE Computational Intelligence Magazine* **9**:3, 27-39. [Crossref]

3592. Peihao Huang, Yan Huang, Wei Wang, Liang Wang. Deep Embedding Network for Clustering 1532-1537. [Crossref]

3593. Takayoshi Yamashita, Masayuki Tanaka, Eiji Yoshida, Yuji Yamauchi, Hironobu Fujiyoshii. To Be Bernoulli or to Be Gaussian, for a Restricted Boltzmann Machine 1520-1525. [Crossref]

3594. Maarten Grachten, Florian Krebs. 2014. An Assessment of Learned Score Features for Modeling Expressive Dynamics in Music. *IEEE Transactions on Multimedia* **16**:5, 1211-1218. [Crossref]

3595. Brijnesh Jain. Margin Perceptrons for Graphs 3851-3856. [Crossref]

3596. Bonny Banerjee, Jayanta K. Dutta. 2014. SELP: A general-purpose framework for learning the norms from saliencies in spatiotemporal data. *Neurocomputing* **138**, 41-60. [Crossref]

3597. Takashi Kuremoto, Shinsuke Kimura, Kunikazu Kobayashi, Masanao Obayashi. 2014. Time series forecasting using a deep belief network with restricted Boltzmann machines. *Neurocomputing* **137**, 47-56. [Crossref]

3598. Weiqiang Ren, Yinan Yu, Junge Zhang, Kaiqi Huang. Learning Convolutional Nonlinear Features for K Nearest Neighbor Image Classification 4358-4363. [Crossref]

3599. Ali Yousefi, Alireza A. Dibazar, Theodore W. Berger. 2014. Synaptic dynamics: Linear model and adaptation algorithm. *Neural Networks* **56**, 49-68. [Crossref]

3600. Masayuki Tanaka, Masatoshi Okutomi. A Novel Inference of a Restricted Boltzmann Machine 1526-1531. [Crossref]

3601. Yoshikuni Sato, Kazuki Kozuka, Yoshihide Sawada, Masaki Kiyono. Learning Multiple Complex Features Based on Classification Results 3369-3373. [Crossref]

3602. Hidekazu Yanagimoto. Study on Distributed Representation of Words with Sparse Neural Network Language Model 541-546. [Crossref]

3603. Markus Kachele, Dimitrij Zharkov, Sascha Meudt, Friedhelm Schwenker. Prosodic, Spectral and Voice Quality Feature Selection Using a Long-Term Stopping Criterion for Audio-Based Emotion Recognition 803-808. [Crossref]

3604. C.L. Philip Chen, Chun-Yang Zhang. 2014. Data-intensive applications, challenges, techniques and technologies: A survey on Big Data. *Information Sciences* **275**, 314-347. [Crossref]

3605. Xian-yun Tian, Guang Yu, Peng-yu Li. Spammer detection on Sina Micro-Blog 82-87. [Crossref]

3606. Kaizhi Wu, Xi Chen, Mingyue Ding. 2014. Deep learning based classification of focal liver lesions with contrast-enhanced ultrasound. *Optik - International Journal for Light and Electron Optics* **125**:15, 4057-4063. [Crossref]

3607. P. Baldi, P. Sadowski, D. Whiteson. 2014. Searching for exotic particles in high-energy physics with deep learning. *Nature Communications* **5**. . [Crossref]

3608. Guido F. Montúfar. 2014. Universal Approximation Depth and Errors of Narrow Belief Networks with Discrete Units. *Neural Computation* **26**:7, 1386-1407. [Abstract] [Full Text] [PDF] [PDF Plus]

3609. Guangyuan Pan, Junfei Qiao, Wei Chai, Nikitas Dimopoulos. An improved RBM based on Bayesian Regularization 2935-2939. [Crossref]

3610. Zijing Mao, Vernon Lawhern, Lenis Mauricio Merino, Kenneth Ball, Li Deng, Brent J. Lance, Kay Robbins, Yufei Huang. Classification of non-time-locked rapid serial visual presentation events for brain-computer interaction using deep learning 520-524. [Crossref]

3611. Jipeng Xie, Tianrui Li, Yan Yang, Weidong Jin. Learning features from High Speed Train vibration signals with Deep Belief Networks 2205-2210. [Crossref]

3612. Xiaoyong Gao, Chao Shang, Yongheng Jiang, Dexian Huang, Tao Chen. 2014. Refinery scheduling with varying crude: A deep belief network classification and multimodel approach. *AIChE Journal* **60**:7, 2525-2532. [Crossref]

3613. Wenhao Huang, Haikun Hong, Guojie Song, Kunqing Xie. Deep process neural network for temporal deep learning 465-472. [Crossref]

3614. Yaping Lu, Li Zhang, Bangjun Wang, Jiwen Yang. Feature ensemble learning based on sparse autoencoders for image classification 1739-1745. [Crossref]

3615. Zhujin Liang, Xiaolong Wang, Rui Huang, Liang Lin. An expressive deep model for human action parsing from a single image 1-6. [Crossref]

3616. Son N. Tran, Emmanouil Benetos, Artur d'Avila Garcez. Learning motion-difference features using Gaussian restricted Boltzmann machines for efficient human action recognition 2123-2129. [Crossref]

3617. Bernardete Ribeiro, Noel Lopes, Joao Goncalves. Signature identification via efficient feature selection and GPU-based SVM classifier 1138-1145. [Crossref]

3618. Pei Xu, Mao Ye, Qihe Liu, Xudong Li, Lishen Pei, Jian Ding. Motion detection via a couple of auto-encoder networks 1-6. [Crossref]

3619. Min Jiang, Yulong Ding, Ben Goertzel, Zhongqiang Huang, Changle Zhou, Fei Chao. Improving machine vision via incorporating expectation-maximization into Deep Spatio-Temporal learning 1804-1811. [Crossref]

3620. Khawlah Hussein Ali, Tianjiang Wang. Learning features for action recognition and identity with deep belief networks 129-132. [Crossref]

3621. Yuanfang Ren, Yan Wu. Convolutional deep belief networks for feature extraction of EEG signal 2850-2853. [Crossref]

3622. Mark Eastwood, Chrisina Jayne. Dual Deep Neural Network approach to matching data in different modes 1688-1694. [Crossref]

3623. Aggelos Pikrakis. Unsupervised audio segmentation based on Restricted Boltzmann Machines 311-314. [Crossref]

3624. Zhanglin Peng, Liang Lin, Ruimao Zhang, Jing Xu. Deep boosting: Layered feature mining for general image classification 1-6. [Crossref]

3625. Leonardo Badino, Alessandro D'Ausilio, Luciano Fadiga, Giorgio Metta. 2014. Computational Validation of the Motor Contribution to Speech Perception. *Topics in Cognitive Science* **6**:3, 461-475. [Crossref]

3626. Zihong Cao, Guangjun Zeng, Wing W.Y. Ng, Jincheng Le. Auto-encoder using the bi-firing activation function 271-277. [Crossref]

3627. Huiming Xie, Shuang Wang, Kun Liu, Shaopeng Lin, Biao Hou. Multilayer feature learning for polarimetric synthetic radar data classification 2818-2821. [Crossref]

3628. Hang Shao, Nathalie Japkowicz. Explicit feature mapping via multi-layer perceptron and its application to Mine-Like Objects detection 1055-1062. [Crossref]

3629. Van Tung Tran, Faisal AlThobiani, Andrew Ball. 2014. An approach to fault diagnosis of reciprocating compressor valves using Teager–Kaiser energy operator and deep belief networks. *Expert Systems with Applications* **41**:9, 4113-4122. [Crossref]

3630. Wentao Zhu, Jun Miao, Laiyun Qing. Constrained Extreme Learning Machine: A novel highly discriminative random feedforward neural network 800-807. [Crossref]

3631. Ling Shao, Li Liu, Xuelong Li. 2014. Feature Learning for Image Classification Via Multiobjective Genetic Programming. *IEEE Transactions on Neural Networks and Learning Systems* **25**:7, 1359-1371. [Crossref]

3632. Zhenbao Liu, Shaoguang Chen, Shuhui Bu, Ke Li. High-level semantic feature for 3D shape based on deep belief networks 1-6. [Crossref]

3633. Wei Zhang, Kan Liu, Weidong Zhang, Youmei Zhang, Jason Gu. Wi-Fi positioning based on deep learning 1176-1179. [Crossref]

3634. Ryotaro Kamimura. Information acquisition performance by supervised information-theoretic self-organizing maps 151-157. [Crossref]

3635. Qian Guo, Xiaofeng Wu, Juyang Weng. WWN-9: Cross-domain synaptic maintenance and its application to object groups recognition 716-723. [Crossref]

3636. Mohamad Hasan Bahari, Najim Dehak, Hugo Van hamme, Lukas Burget, Ahmed M. Ali, Jim Glass. 2014. Non-Negative Factor Analysis of Gaussian Mixture Model Weight Adaptation for Language and Dialect Recognition. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **22**:7, 1117-1129. [Crossref]

3637. Weilong Hou, Xinbo Gao. Be natural: A saliency-guided deep framework for image quality 1-6. [Crossref]

3638. Jiaojiao Zhao, Maoguo Gong, Jia Liu, Licheng Jiao. Deep learning to classify difference image for image change detection 411-417. [Crossref]

3639. Dan Wang, Yi Shang. A new active labeling method for deep learning 112-119. [Crossref]

3640. Bing Jiang, Yan Song, Si Wei, Jun-Hua Liu, Ian Vince McLoughlin, Li-Rong Dai. 2014. Deep Bottleneck Features for Spoken Language Identification. *PLoS ONE* **9**:7, e100795. [Crossref]

3641. Tsvi Achler. 2014. Symbolic neural networks for cognitive capacities. *Biologically Inspired Cognitive Architectures* **9**, 71-81. [Crossref]

3642. Nannan Ji, Jiangshe Zhang. Parallel tempering with equi-energy moves for training of restricted boltzmann machines 120-127. [Crossref]

3643. Volodymyr Turchenko, Vladimir Golovko. Parallel batch pattern training algorithm for deep neural network 697-702. [Crossref]

3644. Byungik Ahn. Computation of deep belief networks using special-purpose hardware architecture 141-148. [Crossref]

3645. Wenhao Huang, Ni Zhang, Weisong Hu, Haikun Hong, Guojie Song, Kunqing Xie. Dynamic boosting in deep learning using reconstruction error 473-480. [Crossref]

3646. Jingdong Wang, Jiazhen Zhou, Hao Xu, Tao Mei, Xian-Sheng Hua, Shipeng Li. 2014. Image tag refinement by regularized latent Dirichlet allocation. *Computer Vision and Image Understanding* **124**, 61-70. [Crossref]

3647. Ren Zhang, Furao Shen, Jinxi Zhao. A model with Fuzzy Granulation and Deep Belief Networks for exchange rate forecasting 366-373. [Crossref]

3648. Anthony Knittel, Alan Blair. Coarse and fine learning in deep networks 792-799. [Crossref]

3649. Hongqing Fang, Chen Hu. Recognizing human activity in smart home using deep learning algorithm 4716-4720. [Crossref]

3650. Qi Lv, Yong Dou, Xin Niu, Jiaqing Xu, Baoliang Li. Classification of land cover based on deep belief networks using polarimetric RADARSAT-2 data 4679-4682. [Crossref]

3651. Alessandro Bria, Giulio Iannello, Paolo Soda, Hanchuan Peng, Giovanni Erbacci, Giuseppe Fiameni, Giacomo Mariani, Roberto Mucci, Marco Rorro, Francesco Pavone, Ludovico Silvestri, Paolo Frasconi, Roberto Cortini. A HPC infrastructure for processing and visualizing neuro-anatomical images obtained by Confocal Light Sheet Microscopy 592-599. [Crossref]

3652. Justin Pugh, Andrea Soltoggio, Kenneth Stanley. 2014. Real-time Hebbian Learning from Autoencoder Features for Control Tasks. *Artificial Life Conference Proceedings* 202-209. [Citation] [PDF] [PDF Plus]

3653. Philip Graff, Farhan Feroz, Michael P. Hobson, Anthony Lasenby. 2014. SkyNet: an efficient and robust neural network training tool for machine learning in astronomy. *Monthly Notices of the Royal Astronomical Society* **441**:2, 1741-1759. [Crossref]

3654. Yongxia Zhou, Fang Yu, Timothy Duong. 2014. Multiparametric MRI Characterization and Prediction in Autism Spectrum Disorder Using Graph Theory and Machine Learning. *PLoS ONE* **9**:6, e90405. [Crossref]

3655. Ryan McCoppin, Mateen Rizki. Deep learning for image classification 90790T. [Crossref]

3656. Marcelo Cicconet, Davi Geiger, Kristin C Gunsalus, Michael Werman. Mirror Symmetry Histograms for Capturing Geometric Properties in Images 2981-2986. [Crossref]

3657. Martin Längkvist, Lars Karlsson, Amy Loutfi. 2014. A review of unsupervised feature learning and deep learning for time-series modeling. *Pattern Recognition Letters* **42**, 11-24. [Crossref]

3658. Ling Shao, Xiantong Zhen, Dacheng Tao, Xuelong Li. 2014. Spatio-Temporal Laplacian Pyramid Coding for Action Recognition. *IEEE Transactions on Cybernetics* **44**:6, 817-827. [Crossref]

3659. Vladyslav Sydorov, Mayu Sakurada, Christoph H. Lampert. Deep Fisher Kernels -- End to End Learning of the Fisher Kernel GMM Parameters 1402-1409. [Crossref]

3660. Munawar Hayat, Mohammed Bennamoun, Senjian An. Learning Non-linear Reconstruction Models for Image Set Classification 1915-1922. [Crossref]

3661. Ming Zhu, Yan Wu. A novel deep model for image recognition 373-376. [Crossref]

3662. Tomer Peleg, Michael Elad. 2014. A Statistical Prediction Model Based on Sparse Representations for Single Image Super-Resolution. *IEEE Transactions on Image Processing* **23**:6, 2569-2582. [Crossref]

3663. A. Manju, M. J. Nigam. 2014. Applications of quantum inspired computational intelligence: a survey. *Artificial Intelligence Review* **42**:1, 79-156. [Crossref]

3664. Jianwen Xie, Wenze Hu, Song-Chun Zhu, Ying Nian Wu. Learning Inhomogeneous FRAME Models for Object Patterns 1035-1042. [Crossref]

3665. Wanli Ouyang, Xiao Chu, Xiaogang Wang. Multi-source Deep Learning for Human Pose Estimation 2337-2344. [Crossref]

3666. L'ubor Ladicky, Chris Russell, Pushmeet Kohli, Philip H. S. Torr. 2014. Associative Hierarchical Random Fields. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **36**:6, 1056-1077. [Crossref]

3667. Shaohua Zhang, Hua Yang, Zhouping Yin. Performance evaluation of typical unsupervised feature learning algorithms for visual object recognition 5191-5196. [Crossref]

3668. Huixuan Tang, Neel Joshi, Ashish Kapoor. Blind Image Quality Assessment Using Semi-supervised Rectifier Networks 2877-2884. [Crossref]

3669. Xiaolin Hu, Jianwei Zhang, Peng Qi, Bo Zhang. 2014. Modeling response properties of V2 neurons using a hierarchical K-means model. *Neurocomputing* **134**, 198-205. [Crossref]

3670. Yushi Chen, Zhouhan Lin, Xing Zhao, Gang Wang, Yanfeng Gu. 2014. Deep Learning-Based Classification of Hyperspectral Data. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* **7**:6, 2094-2107. [Crossref]

3671. Afshin Dehghan, Enrique G. Ortiz, Ruben Villegas, Mubarak Shah. Who Do I Look Like? Determining Parent-Offspring Resemblance via Gated Autoencoders 1757-1764. [Crossref]

3672. Nannan Ji, Jiangshe Zhang, Chunxia Zhang, Qingyan Yin. 2014. Enhancing performance of restricted Boltzmann machines via log-sum regularization. *Knowledge-Based Systems* **63**, 82-96. [Crossref]

3673. Lin Sun, Kui Jia, Tsung-Han Chan, Yuqiang Fang, Gang Wang, Shuicheng Yan. DL-SFA: Deeply-Learned Slow Feature Analysis for Action Recognition 2625-2632. [Crossref]

3674. Raqibul Hasan, Tarek M. Taha. Memristor crossbar based low cost classifiers and their applications 75-80. [Crossref]

3675. Mark Rosenstein, Catherine Diaz-Asper, Peter W. Foltz, Brita Elvevåg. 2014. A computational language approach to modeling prose recall in schizophrenia. *Cortex* **55**, 148-166. [Crossref]

3676. Lin Luo, Hongye Su, Lan Ban. Independent component analysis - Based sparse autoencoder in the application of fault diagnosis 1378-1382. [Crossref]

3677. Di Wu, Ling Shao. Leveraging Hierarchical Parametric Networks for Skeletal Joints Based Action Segmentation and Recognition 724-731. [Crossref]

3678. Pingfeng Wang, Prasanna Tamilselvan, Chao Hu. 2014. Health diagnostics using multi-attribute classification fusion. *Engineering Applications of Artificial Intelligence* **32**, 192-202. [Crossref]

3679. Ping Liu, Shizhong Han, Zibo Meng, Yan Tong. Facial Expression Recognition via a Boosted Deep Belief Network 1805-1812. [Crossref]

3680. Junlin Hu, Jiwen Lu, Yap-Peng Tan. Discriminative Deep Metric Learning for Face Verification in the Wild 1875-1882. [Crossref]

3681. Adriana Romero, Carlo Gatta, Gustavo Camps-Valls. Unsupervised deep feature extraction of hyperspectral images 1-4. [Crossref]

3682. Peter J. Gebicke-Haerter. 2014. Engram formation in psychiatric disorders. *Frontiers in Neuroscience* **8**. . [Crossref]

3683. Zhongwan Liu, Xiaojie Wang. Cross-modal associative memory by MultiSOM 1-5. [Crossref]

3684. I-Fan Chen, Sabato Marco Siniscalchi, Chin-Hui Lee. Attribute based lattice rescoring in spontaneous speech recognition 3325-3329. [Crossref]

3685. Siddharth Sigtia, Simon Dixon. Improved music feature learning with deep neural networks 6959-6963. [Crossref]

3686. Steven W. Zucker. 2014. Stereo, Shading, and Surfaces: Curvature Constraints Couple Neural Computations. *Proceedings of the IEEE* **102**:5, 812-829. [Crossref]

3687. Mohamed R. Amer, Behjat Siddiquie, Colleen Richey, Ajay Divakaran. Emotion detection in speech using deep networks 3724-3728. [Crossref]

3688. Emad M. Grais, Mehmet Umut Sen, Hakan Erdogan. Deep neural networks for single channel source separation 3734-3738. [Crossref]

3689. Yue Shi, Martha Larson, Alan Hanjalic. 2014. Collaborative Filtering beyond the User-Item Matrix. *ACM Computing Surveys* **47**:1, 1-45. [Crossref]

3690. Shiliang Zhang, Yebo Bao, Pan Zhou, Hui Jiang, Lirong Dai. Improving deep neural networks for LVCSR using dropout and shrinking structure 6849-6853. [Crossref]

3691. Steve Renals, Pawel Swietojanski. Neural networks for distant speech recognition 172-176. [Crossref]

3692. Hung-Shin Lee, Yu Tso, Yun-Fan Chang, Hsin-Min Wang, Shyh-Kang Jeng. Speaker verification using kernel-based binary classifiers with binary operation derived features 1660-1664. [Crossref]

3693. Muchao Lu, Yan Kang, Xiaoming Han, Gaowei Yan. Soft sensor modeling of mill level based on Deep Belief Network 189-193. [Crossref]

3694. Yan Xu, Tao Mo, Qiwei Feng, Peilin Zhong, Maode Lai, Eric I-Chao Chang. Deep learning of feature representation with multiple instance learning for medical image analysis 1626-1630. [Crossref]

3695. Kun Han, Yuxuan Wang, DeLiang Wang. Learning spectral mapping for speech dereverberation 4628-4632. [Crossref]

3696. Guangsen Wang, Khe Chai Sim. Refinements of regression-based context-dependent modelling of deep neural networks for automatic speech recognition 3022-3026. [Crossref]

3697. Yao Qian, Yuchen Fan, Wenping Hu, Frank K. Soong. On the training aspects of Deep Neural Network (DNN) for parametric TTS synthesis 3829-3833. [Crossref]

3698. Toru Nakashika, Tetsuya Takiguchi, Yasuo Ariki. Voice conversion in time-invariant speaker-independent space 7889-7893. [Crossref]

3699. Josh Bongard, Hod Lipson. 2014. Evolved Machines Shed Light on Robustness and Resilience. *Proceedings of the IEEE* **102**:5, 899-914. [Crossref]

3700. Frank Seide, Hao Fu, Jasha Droppo, Gang Li, Dong Yu. On parallelizability of stochastic gradient descent for speech DNNS 235-239. [Crossref]

3701. Jun Du, Li-Rong Dai, Qiang Huo. Synthesized stereo mapping via deep neural networks for noisy speech recognition 1764-1768. [Crossref]

3702. Sebastian Stuker, Markus Muller, Quoc Bao Nguyen, Alex Waibel. Training time reduction and performance improvements from multilingual techniques on the BABEL ASR task 6374-6378. [Crossref]

3703. Yu Qi, Yueming Wang, Xiaoxiang Zheng, Zhaohui Wu. Robust feature learning by stacked autoencoder with maximum correntropy criterion 6716-6720. [Crossref]

3704. Ragheb Walid, Ali Lasfar. Handwritten digit recognition using sparse deep architectures 1-6. [Crossref]

3705. Dongpeng Chen, Brian Mak, Cheung-Chi Leung, Sunil Sivadas. Joint acoustic modeling of triphones and trigraphemes by multi-task learning deep neural networks for low-resource speech recognition 5592-5596. [Crossref]

3706. Minjae Lee, Kyuyeon Hwang, Wonyong Sung. Fault tolerance analysis of digital feed-forward deep neural networks 5031-5035. [Crossref]

3707. Muhammad Ghifary, W. Bastiaan Kleijn, Mengjie Zhang. Deep hybrid networks with good out-of-sample object recognition 5437-5441. [Crossref]

3708. Marianna Madry, Liefeng Bo, Danica Kragic, Dieter Fox. ST-HMP: Unsupervised Spatio-Temporal feature learning for tactile data 2262-2269. [Crossref]

3709. Michael Hobson, Philip Graff, Farhan Feroz, Anthony Lasenby. 2014. Machine-learning in astronomy. *Proceedings of the International Astronomical Union* **10**:S306, 279-287. [Crossref]

3710. Neville Ryant, Jiahong Yuan, Mark Liberman. Mandarin tone classification without pitch tracking 4868-4872. [Crossref]

3711. Jonghong Kim, Kyuyeon Hwang, Wonyong Sung. X1000 real-time phoneme recognition VLSI using feed-forward deep neural networks 7510-7514. [Crossref]

3712. Masato Mimura, Shinsuke Sakai, Tatsuya Kawahara. Exploring deep neural networks and deep autoencoders in reverberant speech recognition 197-201. [Crossref]

3713. Shusen Zhou, Qingcai Chen, Xiaolong Wang. 2014. Fuzzy deep belief networks for semi-supervised sentiment classification. *Neurocomputing* **131**, 312-322. [Crossref]

3714. Guang Chen, Manuel Giuliani, Daniel Clarke, Andre Gaschler, Alois Knoll. Action recognition using ensemble weighted multi-instance learning 4520-4525. [Crossref]

3715. Wei Deng, Yanmin Qian, Yuchen Fan, Tianfan Fu, Kai Yu. Stochastic data sweeping for fast DNN training 240-244. [Crossref]

3716. Pawel Swietojanski, Jinyu Li, Jui-Ting Huang. Investigation of maxout networks for speech recognition 7649-7653. [Crossref]

3717. Puyang Xu, Ruhi Sarikaya. Contextual domain classification in spoken language understanding systems using recurrent neural network 136-140. [Crossref]

3718. Kun Han, DeLiang Wang. Neural networks for supervised pitch tracking in noise 1488-1492. [Crossref]

3719. Xue Feng, Yaodong Zhang, James Glass. Speech feature denoising and dereverberation via deep autoencoders for noisy reverberant speech recognition 1759-1763. [Crossref]

3720. Wenping Hu, Yao Qian, Frank K. Soong. A DNN-based acoustic modeling of tonal language and its application to Mandarin pronunciation training 3206-3210. [Crossref]

3721. Omid Ghahabi, Javier Hernando. Deep belief networks for i-vector based speaker recognition 1700-1704. [Crossref]

3722. Xiao Guang Li. 2014. Research on the Development and Applications of Computer Science and Technology. *Advanced Materials Research* **926-930**, 2406-2409. [Crossref]

3723. Chao Tian, Jia Liu, Zhao Meng Peng. 2014. Acceleration Strategies for Speech Recognition Based on Deep Neural Networks. *Applied Mechanics and Materials* **556-562**, 5181-5185. [Crossref]

3724. Xiao Guang Li. 2014. Research on the Development and Applications of Artificial Neural Networks. *Applied Mechanics and Materials* **556-562**, 6011-6014. [Crossref]

3725. Anand D. Sarwate, Sergey M. Plis, Jessica A. Turner, Mohammad R. Arbabshirani, Vince D. Calhoun. 2014. Sharing privacy-sensitive access to neuroimaging and genetics data: a review and preliminary validation. *Frontiers in Neuroinformatics* **8**. . [Crossref]

3726. Kirill Makukhin, Scott Bolland. 2014. Dissociable Forms of Repetition Priming: A Computational Model. *Neural Computation* **26**:4, 712-738. [Abstract] [Full Text] [PDF] [PDF Plus]

3727. Guoqiang Zhong, Mohamed Cheriet. 2014. Large Margin Low Rank Tensor Analysis. *Neural Computation* **26**:4, 761-780. [Abstract] [Full Text] [PDF] [PDF Plus] [Supplemental Material]

3728. Arun Narayanan, DeLiang Wang. 2014. Investigation of Speech Separation as a Front-End for Noise Robust Speech Recognition. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **22**:4, 826-835. [Crossref]

3729. Jose C. Principe, Rakesh Chalasani. 2014. Cognitive Architectures for Sensory Processing. *Proceedings of the IEEE* **102**:4, 514-525. [Crossref]

3730. Xin Huang, Qikai Lu, Liangpei Zhang. 2014. A multi-index learning approach for classification of high-resolution remotely sensed images over urban areas. *ISPRS Journal of Photogrammetry and Remote Sensing* **90**, 36-48. [Crossref]

3731. Nick Kelly, John S. Gero. 2014. Interpretation in design: modelling how the situation changes during design activity. *Research in Engineering Design* **25**:2, 109-124. [Crossref]

3732. Dong Liang, Kaijian Weng, Can Wang, Guoyuan Liang, Haoyao Chen, Xinyu Wu. A 3D object recognition and pose estimation system using deep learning method 401-404. [Crossref]

3733. Xiaojia Zhao, Yuxuan Wang, DeLiang Wang. 2014. Robust Speaker Identification in Noisy and Reverberant Conditions. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **22**:4, 836-845. [Crossref]

3734. Ruhi Sarikaya, Geoffrey E. Hinton, Anoop Deoras. 2014. Application of Deep Belief Networks for Natural Language Understanding. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **22**:4, 778-784. [Crossref]

3735. Liefeng Bo, Xiaofeng Ren, Dieter Fox. 2014. Learning hierarchical sparse features for RGB-(D) object recognition. *The International Journal of Robotics Research* **33**:4, 581-599. [Crossref]

3736. Florian Raudies, Eric A. Zilli, Michael E. Hasselmo. 2014. Deep Belief Networks Learn Context Dependent Behavior. *PLoS ONE* **9**:3, e93250. [Crossref]

3737. Akihiro Eguchi, Samuel A. Neymotin, Simon M. Stringer. 2014. Color opponent receptive fields self-organize in a biophysical model of visual cortex via spike-timing dependent plasticity. *Frontiers in Neural Circuits* **8**. . [Crossref]

3738. Z. Zenn Bien, Il Hong Suh. 2014. Intelligent Control: Its Identity and Some Noticeable Techniques. *Journal of Institute of Control, Robotics and Systems* **20**:3, 245-260. [Crossref]

3739. Girija Chetty, Matthew White, Monica Singh, Anurag Mishra. Multimodal activity recognition based on automatic feature discovery 632-637. [Crossref]

3740. Timmy Manning, Roy D Sleator, Paul Walsh. 2014. Biologically inspired intelligent decision making. *Bioengineered* **5**:2, 80-95. [Crossref]

3741. Michal Vavrečka, Igor Farkaš. 2014. A Multimodal Connectionist Architecture for Unsupervised Grounding of Spatial Language. *Cognitive Computation* **6**:1, 101-112. [Crossref]

3742. Chao Shang, Fan Yang, Dexian Huang, Wenxiang Lyu. 2014. Data-driven soft sensor development based on deep learning technique. *Journal of Process Control* **24**:3, 223-233. [Crossref]

3743. Fabian Triefenbach, Kris Demuynck, Jean-Pierre Martens. 2014. Large Vocabulary Continuous Speech Recognition With Reservoir-Based Acoustic Models. *IEEE Signal Processing Letters* **21**:3, 311-315. [Crossref]

3744. Kartik Dwivedi, Kumar Biswaranjan, Amit Sethi. Drowsy driver detection using representation learning 995-999. [Crossref]

3745. Md. Musfiqur Rahman Sazal, Sujan Kumar Biswas, Md. Faijul Amin, Kazuyuki Murase. Bangla handwritten character recognition using deep belief network 1-5. [Crossref]

3746. Zhen Ouyang, Ying Li. 2014. Omp-based multi-band signal reconstruction for ecological sounds recognition. *Journal of Electronics (China)* **31**:1, 50-60. [Crossref]

3747. S.R. Young, A. Davis, A. Mishtal, I. Arel. 2014. Hierarchical spatiotemporal feature extraction using recurrent online clustering. *Pattern Recognition Letters* **37**, 115-123. [Crossref]

3748. Kyo-Joong Oh, Won-Jo Lee, Chae-Gyun Lim, Ho-Jin Choi. Personalized news recommendation using classified keywords to capture user preference 1283-1287. [Crossref]

3749. Jin-Cheng Li, Wing W. Y. Ng, Daniel S. Yeung, Patrick P. K. Chan. 2014. Bi-firing deep neural networks. *International Journal of Machine Learning and Cybernetics* **5**:1, 73-83. [Crossref]

3750. Lok-Won Kim, Sameh Asaad, Ralph Linsker. 2014. A Fully Pipelined FPGA Architecture of a Factored Restricted Boltzmann Machine Artificial Neural Network. *ACM Transactions on Reconfigurable Technology and Systems* **7**:1, 1-23. [Crossref]

3751. Léon Bottou. 2014. From machine learning to machine reasoning. *Machine Learning* **94**:2, 133-149. [Crossref]

3752. Tony J. Prescott. 2014. Editorial. *Connection Science* **26**:1, 1-4. [Crossref]

3753. Hai Wang, Yingfeng Cai, Long Chen. 2014. A Vehicle Detection Algorithm Based on Deep Belief Network. *The Scientific World Journal* **2014**, 1-7. [Crossref]

3754. Aleksey A. Sidnev. Runtime prediction on new architectures 1-7. [Crossref]

3755. Fangxiang Feng, Xiaojie Wang, Ruifan Li. Cross-modal Retrieval with Correspondence Autoencoder 7-16. [Crossref]

3756. Zijing Mao, Chifeng Ma, Tim H-M Huang, Yidong Chen, Yufei Huang. 2014. BIMMER: a novel algorithm for detecting differential DNA methylation regions from MBDCap-seq data. *BMC Bioinformatics* **15**:Suppl 12, S6. [Crossref]

3757. Bing Xu, Xiaogang Wang, Xiaoou Tang. Fusing Music and Video Modalities Using Multi-timescale Shared Representations 1073-1076. [Crossref]

3758. Yuan Zhang, Nan Du, Kang Li, Jinchao Feng, Kebin Jia, Aidong Zhang. 2014. msiDBN: A Method of Identifying Critical Proteins in Dynamic PPI Networks. *BioMed Research International* **2014**, 1-10. [Crossref]

3759. Yue Shi, Alexandros Karatzoglou, Linas Baltrunas, Martha Larson, Alan Hanjalic. CARS2 291-300. [Crossref]

3760. A. V. Savchenko, Ya. I. Khokhlova. 2014. About neural-network algorithms application in viseme classification problem with face video in audiovisual speech recognition systems. *Optical Memory and Neural Networks* **23**:1, 34-42. [Crossref]

3761. Xin Lu, Zhe Lin, Hailin Jin, Jianchao Yang, James Z. Wang. RAPID 457-466. [Crossref]

3762. Călin Enăchescu. 2014. Supervised Learning using an Active Strategy. *Procedia Technology* **12**, 220-228. [Crossref]

3763. Toru NAKASHIKA, Tetsuya TAKIGUCHI, Yasuo ARIKI. 2014. Voice Conversion Based on Speaker-Dependent Restricted Boltzmann Machines. *IEICE Transactions on Information and Systems* **E97.D**:6, 1403-1410. [Crossref]

3764. Kunlei Zhang, Xue-Wen Chen. 2014. Large-Scale Deep Belief Nets With MapReduce. *IEEE Access* **2**, 395-403. [Crossref]

3765. Jong-Myon Bae. 2014. Clinical Decision Analysis using Decision Tree. *Epidemiology and Health* e2014025. [Crossref]

3766. Javier Snaider, Stan Franklin. 2014. Vector LIDA. *Procedia Computer Science* **41**, 188-203. [Crossref]

3767. Xinxi Wang, Ye Wang. Improving Content-based and Hybrid Music Recommendation using Deep Learning 627-636. [Crossref]

3768. Asja Fischer, Christian Igel. 2014. Training restricted Boltzmann machines: An introduction. *Pattern Recognition* **47**:1, 25-39. [Crossref]

3769. Mariusz Kleć, Danijel Koržinek. 2014. Unsupervised Feature Pre-training of the Scattering Wavelet Transform for Musical Genre Recognition. *Procedia Technology* **18**, 133-139. [Crossref]

3770. Hai Wang, Yingfeng Cai. 2014. A Multistep Framework for Vision Based Vehicle Detection. *Journal of Applied Mathematics* **2014**, 1-9. [Crossref]

3771. Weixun GAO, Qiying CAO, Yao QIAN. 2014. Cross-Dialectal Voice Conversion with Neural Networks. *IEICE Transactions on Information and Systems* **E97.D**:11, 2872-2880. [Crossref]

3772. Xueyun Chen, Shiming Xiang, Cheng-Lin Liu, Chun-Hong Pan. 2014. Aircraft Detection by Deep Convolutional Neural Networks. *IPSJ Transactions on Computer Vision and Applications* **7**:0, 10-17. [Crossref]

3773. Chenchen Huang, Wei Gong, Wenlong Fu, Dongyu Feng. 2014. A Research of Speech Emotion Recognition Based on Deep Belief Network and SVM. *Mathematical Problems in Engineering* **2014**, 1-7. [Crossref]

3774. Guo-Ping Liu, Jian-Jun Yan, Yi-Qin Wang, Wu Zheng, Tao Zhong, Xiong Lu, Peng Qian. 2014. Deep Learning Based Syndrome Diagnosis of Chronic Gastritis. *Computational and Mathematical Methods in Medicine* **2014**, 1-8. [Crossref]

3775. Yu Qi, Yueming Wang, Jianmin Zhang, Junming Zhu, Xiaoxiang Zheng. 2014. Robust Deep Network with Maximum Correntropy Criterion for Seizure Detection. *BioMed Research International* **2014**, 1-10. [Crossref]

3776. Mahmoud Nasr, Hoda Farouk Zahran. 2014. Using of pH as a tool to predict salinity of groundwater for irrigation purpose using artificial neural network. *The Egyptian Journal of Aquatic Research* **40**:2, 111-115. [Crossref]

3777. . References 375-379. [Crossref]

3778. Chun-Xia Zhang, Jiang-She Zhang, Nan-Nan Ji, Gao Guo. 2014. Learning ensemble classifiers via restricted Boltzmann machines. *Pattern Recognition Letters* **36**, 161-170. [Crossref]

3779. Bo Han, Bo He, Mengmeng Ma, Tingting Sun, Tianhong Yan, Amaury Lendasse. 2014. RMSE-ELM: Recursive Model Based Selective Ensemble of Extreme Learning Machines for Robustness Improvement. *Mathematical Problems in Engineering* **2014**, 1-12. [Crossref]

3780. Xue-Wen Chen, Xiaotong Lin. 2014. Big Data Deep Learning: Challenges and Perspectives. *IEEE Access* **2**, 514-525. [Crossref]

3781. Yisheng Lv, Yanjie Duan, Wenwen Kang, Zhengxi Li, Fei-Yue Wang. 2014. Traffic Flow Prediction With Big Data: A Deep Learning Approach. *IEEE Transactions on Intelligent Transportation Systems* 1-9. [Crossref]

3782. Takayuki Okatani. 2014. Deep Learning. *The Journal of the Institute of Image Information and Television Engineers* **68**:6, 466-471. [Crossref]

3783. Noel Lopes, Bernardete Ribeiro. 2014. Towards adaptive learning with improved convergence of deep belief networks on graphics processing units. *Pattern Recognition* **47**:1, 114-127. [Crossref]

3784. Long Qian, Xingjian Shi. Denoising predictive sparse decomposition 223-228. [Crossref]

3785. Chen Fuqiang, Wu Yan, Bu Yude, Zhao Guodong. 2014. Spectral Classification Using Restricted Boltzmann Machine. *Publications of the Astronomical Society of Australia* **31**. . [Crossref]

3786. Suwicha Jirayucharoensak, Setha Pan-Ngum, Pasin Israsena. 2014. EEG-Based Emotion Recognition Using Deep Learning Network with Principal Component Based Covariate Shift Adaptation. *The Scientific World Journal* **2014**, 1-10. [Crossref]

3787. Ji Wan, Dayong Wang, Steven Chu Hong Hoi, Pengcheng Wu, Jianke Zhu, Yongdong Zhang, Jintao Li. Deep Learning for Content-Based Image Retrieval 157-166. [Crossref]

3788. Charles Wong. 2014. A Novel Operational Partition between Neural Network Classifiers on Vulnerability to Data Mining Bias. *Journal of Software Engineering and Applications* **07**:04, 264-272. [Crossref]

3789. Yu Cao, Shawn Steffey, Jianbiao He, Degui Xiao, Cui Tao, Ping Chen, Henning Müller. 2014. Medical Image Retrieval: A Multimodal Approach. *Cancer Informatics* **13s3**, CIN.S14053. [Crossref]

3790. Matthew D. Zeiler, Rob Fergus. Visualizing and Understanding Convolutional Networks 818-833. [Crossref]

3791. Hung Nghiep Tran, Tin Huynh, Tien Do. Author Name Disambiguation by Using Deep Neural Network 123-132. [Crossref]

3792. Girija Chetty, Mohammad Yamin. A Novel Multimodal Data Analytic Scheme for Human Activity Recognition 449-458. [Crossref]

3793. Alexey Potapov, Vita Batishcheva, Maxim Peterson. Limited Generalization Capabilities of Autoencoders with Logistic Regression on Training Sets of Small Sizes 256-264. [Crossref]

3794. Weiqiang Sun, Weizhong Zhao, Wenjia Niu, Liang Chang. A DBN-Based Classifying Approach to Discover the Internet Water Army 78-89. [Crossref]

3795. Tiago Prado Oliveira, Jamil Salem Barbar, Alexsandro Santos Soares. Multilayer Perceptron and Stacked Autoencoder for Internet Traffic Prediction 61-71. [Crossref]

3796. E. M. Albornoz, M. Sánchez-Gutiérrez, F. Martinez-Licona, H. L. Rufiner, J. Goddard. Spoken Emotion Recognition Using Deep Learning 104-111. [Crossref]

3797. Xiang Lilan Zhang, Ji Ping Sun, Xu Hui Huang, Zhi Gang Luo. 2014. A Novel Weighted Dynamic Time Warping for Light Weight Speaker-Dependent Speech Recognition in Noisy and Bad Recording Conditions. *Applied Mechanics and Materials* **490-491**, 1347-1355. [Crossref]

3798. Jianwen Sun, Alexander Steinecker, Philipp Glocker. Application of Deep Belief Networks for Precision Mechanism Quality Inspection 87-93. [Crossref]

3799. Zhi-jun Sun, Lei Xue, Yang-ming Xu, Zhi-yong Sun. 2013. Shared Representation of SAR Target and Shadow Based on Multilayer Auto-encoder. *JOURNAL OF RADARS* **2**:2, 195-202. [Crossref]

3800. Naoyuki Kanda, Ryu Takeda, Yasunari Obuchi. Elastic spectral distortion for low resource speech recognition with deep neural networks 309-314. [Crossref]

3801. Eric J. Humphrey, Juan P. Bello, Yann LeCun. 2013. Feature learning and deep architectures: new directions for music informatics. *Journal of Intelligent Information Systems* **41**:3, 461-481. [Crossref]

3802. Choon-Boon Ng, Yong-Haur Tay, Bok-Min Goi. Comparing Image Representations for Training a Convolutional Neural Network to Classify Gender 29-33. [Crossref]

3803. Karel Vesely, Mirko Hannemann, Lukas Burget. Semi-supervised training of Deep Neural Networks 267-272. [Crossref]

3804. Karl Ni, Ryan Prenger. Learning features in deep architectures with unsupervised kernel k-means 981-984. [Crossref]

3805. Aboul Ella Hassanien, Eiman Tamah Al-Shammari, Neveen I. Ghali. 2013. Computational intelligence techniques in bioinformatics. *Computational Biology and Chemistry* **47**, 37-47. [Crossref]

3806. Wenge Rong, Baolin Peng, Yuanxin Ouyang, Chao Li, Zhang Xiong. Semi-supervised Dual Recurrent Neural Network for Sentiment Analysis 438-445. [Crossref]

3807. Venice Erin Liong, Jiwen Lu, Gang Wang. Face recognition using Deep PCA 1-5. [Crossref]

3808. Xingyu Zeng, Wanli Ouyang, Xiaogang Wang. Multi-stage Contextual Deep Learning for Pedestrian Detection 121-128. [Crossref]

3809. Ziheng Wang, Yongqiang Li, Shangfei Wang, Qiang Ji. Capturing Global Semantic Relationships for Facial Action Unit Recognition 3304-3311. [Crossref]

3810. Guangsen Wang, Khe Chai Sim. Context-dependent modelling of deep neural network using logistic regression 338-343. [Crossref]

3811. Shaheen Ahmed, Lenis Mauricio Merino, Zijing Mao, Jia Meng, Kay Robbins, Yufei Huang. A Deep Learning method for classification of images RSVP events with EEG data 33-36. [Crossref]

3812. Bo Li, Wenze Hu, Tianfu Wu, Song-Chun Zhu. Modeling Occlusion by Discriminative AND-OR Structures 2560-2567. [Crossref]

3813. Franco Scarselli, Ah Chung Tsoi, Markus Hagenbuchner, Lucia Di Noi. 2013. Solving graph data issues using a layered architecture approach with applications to web spam detection. *Neural Networks* **48**, 78-90. [Crossref]

3814. Pawel Swietojanski, Arnab Ghoshal, Steve Renals. Hybrid acoustic models for distant and multichannel large vocabulary speech recognition 285-290. [Crossref]

3815. Yosuke Kashiwagi, Daisuke Saito, Nobuaki Minematsu, Keikichi Hirose. Discriminative piecewise linear transformation based on deep learning for noise robust automatic speech recognition 350-355. [Crossref]

3816. Joris Driesen, Steve Renals. Lightly supervised automatic subtitling of weather forecasts 452-457. [Crossref]

3817. Yu Chen, Dequan Zheng, Tiejun Zhao. Adapting deep belief nets to Chinese entity detection 1830-1834. [Crossref]

3818. Meng Cai, Yongzhe Shi, Jia Liu. Deep maxout neural networks for speech recognition 291-296. [Crossref]

3819. Zhenyao Zhu, Ping Luo, Xiaogang Wang, Xiaoou Tang. Deep Learning Identity-Preserving Face Space 113-120. [Crossref]

3820. Jia Cheng Ni, Yue Lei Xu. SAR automatic target recognition based on a visual cortical system 778-782. [Crossref]

3821. Bonny Banerjee, Jayanta K. Dutta. An Online Clustering Algorithm That Ignores Outliers: Application to Hierarchical Feature Learning from Sensory Data 505-512. [Crossref]

3822. Yuan Zhang, Nan Du, Kang Li, Jinchao Feng, Kebin Jia, Aidong Zhang. Critical protein detection in dynamic PPI networks with multi-source integrated deep belief nets 29-36. [Crossref]

3823. Duc Le, Emily Mower Provost. Emotion recognition from spontaneous speech using Hidden Markov models with deep belief networks 216-221. [Crossref]

3824. Hans Lobel, Rene Vidal, Alvaro Soto. Hierarchical Joint Max-Margin Learning of Mid and Top Level Representations for Visual Recognition 1697-1704. [Crossref]

3825. Wanli Ouyang, Xiaogang Wang. Joint Deep Learning for Pedestrian Detection 2056-2063. [Crossref]

3826. Toru Nakashika, Tetsuya Takiguchi, Yasuo Ariki. High-Frequency Restoration Using Deep Belief Nets for Super-resolution 38-42. [Crossref]

3827. Zhouhan Lin, Yushi Chen, Xing Zhao, Gang Wang. Spectral-spatial classification of hyperspectral image using autoencoders 1-5. [Crossref]

3828. Philip Graff, Farhan Feroz, Michael P. Hobson, Anthony Lasenby. Neural Networks for Astronomical Data Analysis and Bayesian Inference 16-23. [Crossref]

3829. Yuxi Luo, Yi Wan. A novel efficient method for training sparse auto-encoders 1019-1023. [Crossref]

3830. Yi Sun, Xiaogang Wang, Xiaoou Tang. Hybrid Deep Learning for Face Verification 1489-1496. [Crossref]

3831. Kriti Chakdar, Brian Potetz. Deep Learning for the Semiautomated Analysis of Pap Smears 193-214. [Crossref]

3832. G. Carneiro, J. C. Nascimento. 2013. Combining Multiple Dynamic Models and Deep Learning Architectures for Tracking the Left Ventricle Endocardium in Ultrasound Data. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **35**:11, 2592-2607. [Crossref]

3833. Peng Li, Jian Cheng, Hanqing Lu. 2013. Hashing with dual complementary projection learning for fast image retrieval. *Neurocomputing* **120**, 83-89. [Crossref]

3834. Chrisantha Fernando. 2013. From Blickets to Synapses: Inferring Temporal Causal Networks by Observation. *Cognitive Science* **37**:8, 1426-1470. [Crossref]

3835. Tara N. Sainath, Brian Kingsbury, Hagen Soltau, Bhuvana Ramabhadran. 2013. Optimization Techniques to Improve Training Speed of Deep Neural Networks for Large Speech Tasks. *IEEE Transactions on Audio, Speech, and Language Processing* **21**:11, 2267-2276. [Crossref]

3836. Sabanadesan Umakanthan, Simon Denman, Clinton Fookes, Sridha Sridharan. Semi-Binary Based Video Features for Activity Representation 1-7. [Crossref]

3837. Gustavo Carneiro, Zhibin Liao, Tat-Jun Chin. Closed-Loop Deep Vision 1-8. [Crossref]

3838. Quoc Bao Nguyen, Jonas Gehring, Kevin Kilgour, Alex Waibel. Optimizing deep bottleneck feature extraction 152-156. [Crossref]

3839. Xueyun Chen, Shiming Xiang, Cheng-Lin Liu, Chun-Hong Pan. Aircraft Detection by Deep Belief Nets 54-58. [Crossref]

3840. Ying Zhang, Saizheng Zhang. Optimized Deep Learning Architectures with Fast Matrix Operation Kernels on Parallel Platform 71-78. [Crossref]

3841. Calvin Hung, Juan Nieto, Zachary Taylor, James Underwood, Salah Sukkarieh. Orchard fruit segmentation using multi-spectral feature learning 5314-5320. [Crossref]

3842. Muhammad Ghifary, W. Bastiaan Kleijn, Mengjie Zhang. Sparse representations in deep learning for noise-robust digit classification 340-345. [Crossref]

3843. Xiaolong Zhu, Ruoxin Sang, Xuhui Jia, Kwan-Yee K. Wong. A hand shape recognizer from simple sketches 130-135. [Crossref]

3844. Fabian Triefenbach, Azarakhsh Jalalvand, Kris Demuynck, Jean-Pierre Martens. 2013. Acoustic Modeling With Hierarchical Reservoirs. *IEEE Transactions on Audio, Speech, and Language Processing* **21**:11, 2439-2450. [Crossref]

3845. Telmo Amaral, Luis M. Silva, Luis A. Alexandre, Chetak Kandaswamy, Jorge M. Santos, Joaquim Marques de Sa. Using Different Cost Functions to Train Stacked Auto-Encoders 114-120. [Crossref]

3846. Kouta Tanaka, Seiji Hotta. Local Subspace Classifier with Gabor Filter Decomposition for Image Classification 823-827. [Crossref]

3847. Xue Mei Fan, Shu Jun Zhang, Kevin Hapeshi, Yin Sheng Yang. 2013. Biological System Behaviours and Natural-Inspired Methods and their Applications to Supply Chain Management. *Applied Mechanics and Materials* **461**, 942-958. [Crossref]

3848. Toby Lightheart, Steven Grainger, Tien-Fu Lu. 2013. Spike-Timing-Dependent Construction. *Neural Computation* **25**:10, 2611-2645. [Abstract] [Full Text] [PDF] [PDF Plus]

3849. Kai Zhao, Zhiyong Wu, Lianhong Cai. A real-time speech driven talking avatar based on deep neural network 1-4. [Crossref]

3850. Suraj Kamal, Shameer K. Mohammed, P. R. Saseendran Pillai, M. H. Supriya. Deep learning architectures for underwater target recognition 48-54. [Crossref]

3851. Hong Yu, Ruxia Hong, XiaoLei Huang, Zhengyou Wang. Obstacle Detection with Deep Convolutional Neural Network 265-268. [Crossref]

3852. Yun Zhu, Yanqing Zhang, Yi Pan. Large-scale restricted boltzmann machines on single GPU 169-174. [Crossref]

3853. Min Han, Xinying Wang. Multi Reservoir Support Vector Echo State Machine for Multivariate Time Series Prediction 983-987. [Crossref]

3854. Konstantinos Charalampous, Antonios Gasteratos. Bio-inspired deep learning model for object recognition 51-55. [Crossref]

3855. Eric W. Healy, Sarah E. Yoho, Yuxuan Wang, DeLiang Wang. 2013. An algorithm to improve speech recognition in noise for hearing-impaired listeners. *The Journal of the Acoustical Society of America* **134**:4, 3029-3038. [Crossref]

3856. Zhen-Hua Ling, Li Deng, Dong Yu. 2013. Modeling Spectral Envelopes Using Restricted Boltzmann Machines and Deep Belief Networks for Statistical Parametric Speech Synthesis. *IEEE Transactions on Audio, Speech, and Language Processing* **21**:10, 2129-2139. [Crossref]

3857. Predrag D. Djurdjevic, Manfred Huber. Deep Belief Network for Modeling Hierarchical Reinforcement Learning Policies 2485-2491. [Crossref]

3858. Bonny Banerjee, Jayanta K. Dutta. Hierarchical feature learning from sensorial data by spherical clustering 7-13. [Crossref]

3859. Guangsen Wang, Khe Chai Sim. Context dependent acoustic keyword spotting using deep neural network 1-10. [Crossref]

3860. Kyogu Lee, Ziwon Hyung, Juhan Nam. Acoustic scene classification using sparse feature learning and event-based pooling 1-4. [Crossref]

3861. Peng Qi, Shuochen Su, Xiaolin Hu. Modeling outer products of features for image classification 334-338. [Crossref]

3862. Sabato Marco Siniscalchi, Jinyu Li, Chin-Hui Lee. 2013. Hermitian Polynomial for Speaker Adaptation of Connectionist Speech Recognition Systems. *IEEE Transactions on Audio, Speech, and Language Processing* **21**:10, 2152-2161. [Crossref]

3863. Xiaojuan Jiang, Yinghua Zhang, Wensheng Zhang, Xian Xiao. A novel sparse auto-encoder for deep unsupervised learning 256-261. [Crossref]

3864. Jung-Chao Ban, Chih-Hung Chang. 2013. The learning problem of multi-layer neural networks. *Neural Networks* **46**, 116-123. [Crossref]

3865. Christian P. Koch, Anna M. Perna, Sabrina Weissmüller, Stefanie Bauer, Max Pillong, Renato B. Baleeiro, Michael Reutlinger, Gerd Folkers, Peter Walden, Paul Wrede, Jan A. Hiss, Zoe Waibler, Gisbert Schneider. 2013. Exhaustive Proteome Mining for Functional MHC-I Ligands. *ACS Chemical Biology* **8**:9, 1876-1881. [Crossref]

3866. Longfei Li, Yong Zhao, Dongmei Jiang, Yanning Zhang, Fengna Wang, Isabel Gonzalez, Enescu Valentin, Hichem Sahli. Hybrid Deep Neural Network--Hidden Markov Model (DNN-HMM) Based Speech Emotion Recognition 312-317. [Crossref]

3867. Tayyaba Azim, Mahesan Niranjan. Inducing discrimination in biologically inspired models of visual scene recognition 1-6. [Crossref]

3868. Niko Wilbert, Tiziano Zito, Rike-Benjamin Schuppner, Zbigniew Jędrzejewski-Szmek, Laurenz Wiskott, Pietro Berkes. 2013. Building extensible frameworks for data processing: The case of MDP, Modular toolkit for Data Processing. *Journal of Computational Science* **4**:5, 345-351. [Crossref]

3869. Juan C. Ruiz-Rodríguez, Adolf Ruiz-Sanmartín, Vicent Ribas, Jesús Caballero, Alejandra García-Roche, Jordi Riera, Xavier Nuvials, Miriam de Nadal, Oriol de Sola-Morales, Joaquim Serra, Jordi Rello. 2013. Innovative continuous non-invasive cuffless blood pressure monitoring based on photoplethysmography technology. *Intensive Care Medicine* **39**:9, 1618-1625. [Crossref]

3870. Yan Huang, Wei Wang, Liang Wang, Tieniu Tan. Multi-task deep neural network for multi-label learning 2897-2900. [Crossref]

3871. Junbin Gao, Yi Guo, Ming Yin. Restricted Boltzmann machine approach to couple dictionary training for image super-resolution 499-503. [Crossref]

3872. Marc'Aurelio Ranzato, Volodymyr Mnih, Joshua M. Susskind, Geoffrey E. Hinton. 2013. Modeling Natural Images Using Gated MRFs. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **35**:9, 2206-2222. [Crossref]

3873. Zhangzhang Si, Song-Chun Zhu. 2013. Learning AND-OR Templates for Object Recognition and Detection. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **35**:9, 2189-2205. [Crossref]

3874. Dongyang Cheng, Tanfeng Sun, Xinghao Jiang, Shilin Wang. Unsupervised feature learning using Markov deep belief network 260-264. [Crossref]

3875. Katja Hansen, Grégoire Montavon, Franziska Biegler, Siamac Fazli, Matthias Rupp, Matthias Scheffler, O. Anatole von Lilienfeld, Alexandre Tkatchenko, Klaus-Robert Müller. 2013. Assessment and Validation of Machine Learning Methods for Predicting Molecular Atomization Energies. *Journal of Chemical Theory and Computation* **9**:8, 3404-3419. [Crossref]

3876. Deli Pei, Huaping Liu, Yulong Liu, Fuchun Sun. Unsupervised multimodal feature learning for semantic image segmentation 1-6. [Crossref]

3877. How Jing, Yu Tsao. Sparse maximum entropy deep belief nets 1-6. [Crossref]

3878. Jordan Fish, Lisa Ossian, Juyang Weng. Novelty estimation in developmental networks: Acetylcholine and norepinephrine 1-8. [Crossref]

3879. Sepehr Jalali, Paul J. Seekings, Cheston Tan, Aiswarya Ratheesh, Joo-Hwee Lim, Elizabeth A. Taylor. The use of optical and sonar images in the human and dolphin brain for image classification 1-8. [Crossref]

3880. Hoo-Chang Shin, M. R. Orton, D. J. Collins, S. J. Doran, M. O. Leach. 2013. Stacked Autoencoders for Unsupervised Feature Learning and Multiple Organ Detection in a Pilot Study Using 4D Patient Data. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **35**:8, 1930-1943. [Crossref]

3881. R. Salakhutdinov, J. B. Tenenbaum, A. Torralba. 2013. Learning with Hierarchical-Deep Models. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **35**:8, 1958-1971. [Crossref]

3882. R. Memisevic. 2013. Learning to Relate Images. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **35**:8, 1829-1846. [Crossref]

3883. Raqibul Hasan, Tarek M. Taha. Routing bandwidth model for feed forward neural networks on multicore neuromorphic architectures 1-8. [Crossref]

3884. Peng Li, Jian Cheng, Hanqing Lu. 2013. Dual local consistency hashing with discriminative projections selection. *Signal Processing* **93**:8, 2256-2264. [Crossref]

3885. Prasanna Tamilselvan, Pingfeng Wang, Michael Pecht. 2013. A multi-attribute classification fusion system for insulated gate bipolar transistor diagnostics. *Microelectronics Reliability* **53**:8, 1117-1129. [Crossref]

3886. Kartik Audhkhasi, Osonde Osoba, Bart Kosko. Noise benefits in backpropagation and deep bidirectional pre-training 1-8. [Crossref]

3887. Tomas Maul. 2013. Early experiments with neural diversity machines. *Neurocomputing* **113**, 36-48. [Crossref]

3888. Rakesh Chalasani, Jose C. Principe, Naveen Ramakrishnan. A fast proximal method for convolutional sparse coding 1-5. [Crossref]

3889. Bruno U. Pedroni, Srinjoy Das, Emre Neftci, Kenneth Kreutz-Delgado, Gert Cauwenberghs. Neuromorphic adaptations of restricted Boltzmann machines and deep belief networks 1-6. [Crossref]

3890. Zheng Shou, Yuhao Zhang, H. J. Cai. A study of transformation-invariances of deep belief networks 1-8. [Crossref]

3891. Dao Lam, Donald Wunsch. Unsupervised feature learning classification using an extreme learning machine 1-5. [Crossref]

3892. Raimar Wagner, Markus Thom, Roland Schweiger, Gunther Palm, Albrecht Rothermel. Learning convolutional neural networks from few samples 1-7. [Crossref]

3893. Y. Bengio, A. Courville, P. Vincent. 2013. Representation Learning: A Review and New Perspectives. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **35**:8, 1798-1828. [Crossref]

3894. Hou Xin, Zhang Hong, Yuan Ding. A New Pedestrian Detect Method in Crowded Scenes 1820-1824. [Crossref]

3895. Ian J. Goodfellow, Aaron Courville, Yoshua Bengio. 2013. Scaling Up Spike-and-Slab Models for Unsupervised Feature Learning. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **35**:8, 1902-1914. [Crossref]

3896. Shusen Zhou, Qingcai Chen, Xiaolong Wang. 2013. Convolutional Deep Networks for Visual Data Classification. *Neural Processing Letters* **38**:1, 17-27. [Crossref]

3897. Mojtaba Solgi, Juyang Weng. Stereo where-what networks: Unsupervised binocular feature learning 1-8. [Crossref]

3898. Jonathan Masci, Ueli Meier, Gabriel Fricout, Jurgen Schmidhuber. Multi-scale pyramidal pooling network for generic steel defect classification 1-8. [Crossref]

3899. Alessandro Lusci, Gianluca Pollastri, Pierre Baldi. 2013. Deep Architectures and Deep Learning in Chemoinformatics: The Prediction of Aqueous Solubility for Drug-Like Molecules. *Journal of Chemical Information and Modeling* **53**:7, 1563-1575. [Crossref]

3900. David P. Reichert, Peggy Seriès, Amos J. Storkey. 2013. Charles Bonnet Syndrome: Evidence for a Generative Model in the Cortex?. *PLoS Computational Biology* **9**:7, e1003134. [Crossref]

3901. Prasanna Tamilselvan, Pingfeng Wang. 2013. Failure diagnosis using deep belief learning based health state classification. *Reliability Engineering & System Safety* **115**, 124-135. [Crossref]

3902. Zhaoquan Yuan, Jitao Sang, Changsheng Xu. Tag-aware image classification via Nested Deep Belief nets 1-6. [Crossref]

3903. Yuxuan Wang, DeLiang Wang. 2013. Towards Scaling Up Classification-Based Speech Separation. *IEEE Transactions on Audio, Speech, and Language Processing* **21**:7, 1381-1390. [Crossref]

3904. Xuemei Fan, Shujun Zhang, Longzhao Wang, Yinsheng Yang, Kevin Hapeshi. 2013. An Evaluation Model of Supply Chain Performances Using 5DBSC and LMBP Neural Network Algorithm. *Journal of Bionic Engineering* **10**:3, 383-395. [Crossref]

3905. Qin-Zhen Guo, Zhi Zeng, Shuwu Zhang, Yuan Zhang, Fangyuan Wang. Adaptive bit allocation hashing for approximate nearest neighbor search 1-6. [Crossref]

3906. Qing Li, Weidong Cai, David Dagan Feng. Lung image patch classification with automatic feature learning 6079-6082. [Crossref]

3907. Meng Cai, Wei-Qiang Zhang, Jia Liu. Improving deep neural network acoustic models using unlabeled data 137-141. [Crossref]

3908. Juyang Weng, Matthew D. Luciw, Qi Zhang. 2013. Brain-Like Emergent Temporal Processing: Emergent Open States. *IEEE Transactions on Autonomous Mental Development* **5**:2, 89-116. [Crossref]

3909. Siddhartha Chandra, Shailesh Kumar, C.V. Jawahar. Learning Multiple Non-linear Sub-spaces Using K-RBMs 2778-2785. [Crossref]

3910. Joseph J. Lim, C. Lawrence Zitnick, Piotr Dollar. Sketch Tokens: A Learned Mid-level Representation for Contour and Object Detection 3158-3165. [Crossref]

3911. Nishchal K. Verma, Vishal Kumar Gupta, Mayank Sharma, Rahul Kumar Sevakula. Intelligent condition based monitoring of rotating machines using sparse auto-encoders 1-7. [Crossref]

3912. Uwe Schmidt, Carsten Rother, Sebastian Nowozin, Jeremy Jancsary, Stefan Roth. Discriminative Non-blind Deblurring 604-611. [Crossref]

3913. Wanli Ouyang, Xingyu Zeng, Xiaogang Wang. Modeling Mutual Visibility Relationship in Pedestrian Detection 3222-3229. [Crossref]

3914. Xiaofeng Ren, Deva Ramanan. Histograms of Sparse Codes for Object Detection 3246-3253. [Crossref]

3915. Roni Mittelman, Honglak Lee, Benjamin Kuipers, Silvio Savarese. Weakly Supervised Learning of Mid-Level Features with Beta-Bernoulli Process Restricted Boltzmann Machines 476-483. [Crossref]

3916. Yang Yang, Guang Shu, Mubarak Shah. Semi-supervised Learning of Feature Hierarchies for Object Detection in a Video 1650-1657. [Crossref]

3917. Hidekazu Yanagimoto, Mika Shimada, Akane Yoshimura. Document similarity estimation for sentiment analysis using neural network 105-110. [Crossref]

3918. Tomasz Orlowski. Application of deep belief networks in image semantic analysis and lossy compression for transmission 1-5. [Crossref]

3919. Fei Chen, Huimin Yu, Roland Hu, Xunxun Zeng. Deep Learning Shape Priors for Object Segmentation 1870-1877. [Crossref]

3920. Behrooz Makki, Mona Noori Hosseini. 2013. Some refinements of the standard autoassociative neural network. *Neural Computing and Applications* **22**:7-8, 1461-1475. [Crossref]

3921. Yale Song, Louis-Philippe Morency, Randall Davis. Action Recognition by Hierarchical Sequence Summarization 3562-3569. [Crossref]

3922. Liefeng Bo, Xiaofeng Ren, Dieter Fox. Multipath Sparse Coding Using Hierarchical Matching Pursuit 660-667. [Crossref]

3923. Petr Fousek, Steven Rennie, Pierre Dognin, Vaibhava Goel. Direct product based deep belief networks for automatic speech recognition 3148-3152. [Crossref]

3924. Raul Fernandez, Asaf Rendel, Bhuvana Ramabhadran, Ron Hoory. F0 contour prediction with a deep belief network-Gaussian process hybrid model 6885-6889. [Crossref]

3925. Shiyin Kang, Xiaojun Qian, Helen Meng. Multi-distribution deep belief network for speech synthesis 8012-8016. [Crossref]

3926. Hang Su, Gang Li, Dong Yu, Frank Seide. Error back propagation for sequence training of Context-Dependent Deep NetworkS for conversational speech transcription 6664-6668. [Crossref]

3927. Laszlo Toth. Phone recognition with deep sparse rectifier neural networks 6985-6989. [Crossref]

3928. Ann Lee, Yaodong Zhang, James Glass. Mispronunciation detection via dynamic time warping on deep belief network-based posteriorgrams 8227-8231. [Crossref]

3929. Pan Zhou, Cong Liu, Qingfeng Liu, Lirong Dai, Hui Jiang. A cluster-based multiple deep neural networks method for large vocabulary continuous speech recognition 6650-6654. [Crossref]

3930. Hector P. Martinez, Yoshua Bengio, Georgios N. Yannakakis. 2013. Learning deep physiological models of affect. *IEEE Computational Intelligence Magazine* **8**:2, 20-33. [Crossref]

3931. Pawel Swietojanski, Arnab Ghoshal, Steve Renals. Revisiting hybrid and GMM-HMM system combination techniques 6744-6748. [Crossref]

3932. Jonas Gehring, Yajie Miao, Florian Metze, Alex Waibel. Extracting deep bottleneck features using stacked auto-encoders 3377-3381. [Crossref]

3933. Samuel Thomas, Michael L. Seltzer, Kenneth Church, Hynek Hermansky. Deep neural network features and semi-supervised training for low resource speech recognition 6704-6708. [Crossref]

3934. Zhao You, Xiaorui Wang, Bo Xu. Investigation of deep Boltzmann machines for phone recognition 7600-7603. [Crossref]

3935. G. Heigold, V. Vanhoucke, A. Senior, P. Nguyen, M. Ranzato, M. Devin, J. Dean. Multilingual acoustic models using distributed deep neural networks 8619-8623. [Crossref]

3936. Jingfei Jiang, Rongdong Hu, Mikel Lujan. A Flexible Memory Controller Supporting Deep Belief Networks with Fixed-Point Arithmetic 144-152. [Crossref]

3937. Arnab Ghoshal, Pawel Swietojanski, Steve Renals. Multilingual training of deep neural networks 7319-7323. [Crossref]

3938. Quoc V. Le. Building high-level features using large scale unsupervised learning 8595-8598. [Crossref]

3939. Yuyin Sun, Liefeng Bo, Dieter Fox. Attribute based object identification 2096-2103. [Crossref]

3940. Jie Li, Xiaorui Wang, Bo Xu. Understanding the dropout strategy and analyzing its effectiveness on LVCSR 7614-7618. [Crossref]

3941. Shanshan Zhang, Ce Zhang, Zhao You, Rong Zheng, Bo Xu. Asynchronous stochastic gradient descent for DNN training 6660-6663. [Crossref]

3942. Yelin Kim, Honglak Lee, Emily Mower Provost. Deep learning for robust feature generation in audiovisual emotion recognition 3687-3691. [Crossref]

3943. Zhen-Hua Ling, Li Deng, Dong Yu. Modeling spectral envelopes using restricted Boltzmann machines for statistical parametric speech synthesis 7825-7829. [Crossref]

3944. Jing Huang, Brian Kingsbury. Audio-visual deep learning for noise robust speech recognition 7596-7599. [Crossref]

3945. Yoshua Bengio, Nicolas Boulanger-Lewandowski, Razvan Pascanu. Advances in optimizing recurrent networks 8624-8628. [Crossref]

3946. Meng-Ge Wang, Yan Song, Bing Jiang, Li-Rong Dai, Ian McLoughlin. Exemplar based language recognition method for short-duration speech segments 7354-7358. [Crossref]

3947. Xin Zheng, Zhiyong Wu, Binbin Shen, Helen Meng, Lianhong Cai. Investigation of tandem deep belief network approach for phoneme recognition 7586-7590. [Crossref]

3948. Arun Narayanan, DeLiang Wang. Ideal ratio mask estimation using deep neural networks for robust speech recognition 7092-7096. [Crossref]

3949. Peter Bell, Pawel Swietojanski, Steve Renals. Multi-level adaptive networks in tandem and hybrid ASR systems 6975-6979. [Crossref]

3950. Hamid Palangi, Rabab Ward, Li Deng. Using deep stacking network to improve structured compressed sensing with Multiple Measurement Vectors 3337-3341. [Crossref]

3951. Li Deng, Geoffrey Hinton, Brian Kingsbury. New types of deep neural network learning for speech recognition and related applications: an overview 8599-8603. [Crossref]

3952. Li Deng, Xiao Li. 2013. Machine Learning Paradigms for Speech Recognition: An Overview. *IEEE Transactions on Audio, Speech, and Language Processing* **21**:5, 1060-1089. [Crossref]

3953. Bernhard Nessler, Michael Pfeiffer, Lars Buesing, Wolfgang Maass. 2013. Bayesian Computation Emerges in Generic Cortical Microcircuits through Spike-Timing-Dependent Plasticity. *PLoS Computational Biology* **9**:4, e1003037. [Crossref]

3954. Joseph G. Makin, Matthew R. Fellows, Philip N. Sabes. 2013. Learning Multisensory Integration and Coordinate Transformation via Density Estimation. *PLoS Computational Biology* **9**:4, e1003035. [Crossref]

3955. Prasanna Tamilselvan, Pingfeng Wang. A Multi-attribute Classification Fusion System for Structural Health Diagnostics . [Crossref]

3956. Eric Fosler-Lussier, Yanzhang He, Preethi Jyothi, Rohit Prabhavalkar. 2013. Conditional Random Fields in Speech, Audio, and Language Processing. *Proceedings of the IEEE* **101**:5, 1054-1075. [Crossref]

3957. T. Condie, P. Mineiro, N. Polyzotis, M. Weimer. Machine learning on Big Data 1242-1244. [Crossref]

3958. Sabato Marco Siniscalchi, Dong Yu, Li Deng, Chin-Hui Lee. 2013. Exploiting deep neural networks for detection-based speech recognition. *Neurocomputing* **106**, 148-157. [Crossref]

3959. O. Firat, F. T. Y. Vural. Representation learning with convolutional sparse autoencoders for remote sensing 1-4. [Crossref]

3960. Tetsuya Ogata, Hiroshi G. Okuno. Integration of behaviors and languages with a hierarchal structure self-organized in a neuro-dynamical model 89-95. [Crossref]

3961. Michèle Basseville. 2013. Divergence measures for statistical data processing—An annotated bibliography. *Signal Processing* **93**:4, 621-633. [Crossref]

3962. Xiao-Lei Zhang, Ji Wu. 2013. Deep Belief Networks Based Voice Activity Detection. *IEEE Transactions on Audio, Speech, and Language Processing* **21**:4, 697-710. [Crossref]

3963. Mengyi Liu, Shaoxin Li, Shiguang Shan, Xilin Chen. AU-aware Deep Networks for facial expression recognition 1-6. [Crossref]

3964. J.A. Perez-Benitez, L.R. Padovese. 2013. A system for classification of time-series data from industrial non-destructive device. *Engineering Applications of Artificial Intelligence* **26**:3, 974-983. [Crossref]

3965. Sabato Marco Siniscalchi, Dong Yu, Li Deng, Chin-Hui Lee. 2013. Speech Recognition Using Long-Span Temporal Patterns in a Deep Network Model. *IEEE Signal Processing Letters* **20**:3, 201-204. [Crossref]

3966. Jonghoon Jin, Aysegul Dundar, Jordan Bates, Clement Farabet, Eugenio Culurciello. Tracking with deep neural networks 1-5. [Crossref]

3967. Alan Jern, Charles Kemp. 2013. A probabilistic account of exemplar and category generation. *Cognitive Psychology* **66**:1, 85-125. [Crossref]

3968. Reinhold Scherer, Josef Faller, David Balderas, Elisabeth V. C. Friedrich, Markus Pröll, Brendan Allison, Gernot Müller-Putz. 2013. Brain–computer interfacing: more than the sum of its parts. *Soft Computing* **17**:2, 317-331. [Crossref]

3969. Christian Wolf, Daniel Gaida, André Stuhlsatz, Thomas Ludwig, Seán McLoone, Michael Bongards. 2013. Predicting organic acid concentration from UV/vis spectrometry measurements – a comparison of machine learning techniques. *Transactions of the Institute of Measurement and Control* **35**:1, 5-15. [Crossref]

3970. Martin Längkvist, Silvia Coradeschi, Amy Loutfi, John Rayappan. 2013. Fast Classification of Meat Spoilage Markers Using Nanostructured ZnO Thin Films and Unsupervised Feature Learning. *Sensors* **13**:2, 1578-1592. [Crossref]

3971. Adam Lammert, Louis Goldstein, Shrikanth Narayanan, Khalil Iskarous. 2013. Statistical methods for estimation of direct and differential kinematics of the vocal tract. *Speech Communication* **55**:1, 147-161. [Crossref]

3972. Peng Li, Meng Wang, Jian Cheng, Changsheng Xu, Hanqing Lu. 2013. Spectral Hashing With Semantically Consistent Graph for Image Indexing. *IEEE Transactions on Multimedia* **15**:1, 141-152. [Crossref]

3973. Risheng Liu, Zhouchen Lin, Wei Zhang, Kewei Tang, Zhixun Su. 2013. Toward designing intelligent PDEs for computer vision: An optimal control approach. *Image and Vision Computing* **31**:1, 43-56. [Crossref]

3974. Jesse Eickholt, Jianlin Cheng. 2013. DNdisorder: predicting protein disorder using boosting and deep networks. *BMC Bioinformatics* **14**:1, 88. [Crossref]

3975. Shuiwang Ji, Wei Xu, Ming Yang, Kai Yu. 2013. 3D Convolutional Neural Networks for Human Action Recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **35**:1, 221-231. [Crossref]

3976. Frank Klefenz, Adam Williamson. 2013. Modeling the Formation Process of Grouping Stimuli Sets through Cortical Columns and Microcircuits to Feature Neurons. *Computational Intelligence and Neuroscience* **2013**, 1-10. [Crossref]

3977. Mathias Niepert. Statistical Relational Data Integration for Information Extraction 251-283. [Crossref]

3978. Ângelo Cardoso, Andreas Wichert. 2013. Handwritten digit recognition using biologically inspired features. *Neurocomputing* **99**, 575-580. [Crossref]

3979. Yunbin Deng, Yu Zhong. 2013. Keystroke Dynamics User Authentication Based on Gaussian Mixture Model and Deep Belief Nets. *ISRN Signal Processing* **2013**, 1-7. [Crossref]

3980. Tom Brosch, Roger Tam. Manifold Learning of Brain MRIs by Deep Learning 633-640. [Crossref]

3981. Heung-Il Suk, Dinggang Shen. Deep Learning-Based Feature Representation for AD/MCI Classification 583-590. [Crossref]

3982. Ayan Acharya, Aditya Rawal, Raymond J. Mooney, Eduardo R. Hruschka. Using Both Latent and Supervised Shared Topics for Multitask Learning 369-384. [Crossref]

3983. Sarah Michele Rajtmajer, Brian Smith, Shashi Phoha. 2012. Non-negative sparse autoencoder neural networks for the detection of overlapping, hierarchical communities in networked datasets. *Chaos: An Interdisciplinary Journal of Nonlinear Science* **22**:4, 043141. [Crossref]

3984. Nam Tuan Nguyen, Yichuan Wang, Husheng Li, Xin Liu, Zhu Han. Extracting typical users' moving patterns using deep learning 5410-5414. [Crossref]

3985. P. J. Bell, M. J. F. Gales, P. Lanchantin, X. Liu, Y. Long, S. Renals, P. Swietojanski, P. C. Woodland. Transcription of multi-genre media archives using out-of-domain data 324-329. [Crossref]

3986. Leonardo Badino, Claudia Canevari, Luciano Fadiga, Giorgio Metta. Deep-level acoustic-to-articulatory mapping for DBN-HMM based phone recognition 370-375. [Crossref]

3987. Gang Li, Huifeng Zhu, Gong Cheng, Kit Thambiratnam, Behrooz Chitsaz, Dong Yu, Frank Seide. Context-dependent Deep Neural Networks for audio indexing of real-life data 143-148. [Crossref]

3988. P. Baldi. 2012. Boolean autoencoders and hypercube clustering complexity. *Designs, Codes and Cryptography* **65**:3, 383-403. [Crossref]

3989. Jia Pan, Cong Liu, Zhiguo Wang, Yu Hu, Hui Jiang. Investigation of deep neural networks (DNN) for large vocabulary continuous speech recognition: Why DNN surpasses GMMS in acoustic modeling 301-305. [Crossref]

3990. Pawel Swietojanski, Arnab Ghoshal, Steve Renals. Unsupervised cross-lingual knowledge transfer in DNN-based LVCSR 246-251. [Crossref]

3991. Ben Mitchell, John Sheppard. Deep Structure Learning: Beyond Connectionist Approaches 162-167. [Crossref]

3992. Jesse Eickholt, Jianlin Cheng. 2012. Predicting protein residue–residue contacts using deep networks and boosting. *Bioinformatics* **28**:23, 3066-3072. [Crossref]

3993. Salvador Dura-Bernal, Thomas Wennekers, Susan L. Denham. 2012. Top-Down Feedback in an HMAX-Like Cortical Model of Object Perception Based on Hierarchical Bayesian Networks and Belief Propagation. *PLoS ONE* **7**:11, e48216. [Crossref]

3994. Nathan Fortier, John W. Sheppard, Karthik Ganesan Pillai. DOSI: Training artificial neural networks using overlapping swarm intelligence with local credit assignment 1420-1425. [Crossref]

3995. Hannes Schulz, Sven Behnke. 2012. Deep Learning. *KI - Künstliche Intelligenz* **26**:4, 357-363. [Crossref]

3996. George Saon, Jen-Tzung Chien. 2012. Large-Vocabulary Continuous Speech Recognition Systems: A Look at Some Recent Advances. *IEEE Signal Processing Magazine* **29**:6, 18-33. [Crossref]

3997. Tara Sainath, Bhuvana Ramabhadran, David Nahamoo, Dimitri Kanevsky, Dirk Compernolle, Kris Demuynck, Jort Gemmeke, Jerome Bellegarda, Shiva Sundaram. 2012. Exemplar-Based Processing for Speech Recognition: An Overview. *IEEE Signal Processing Magazine* **29**:6, 98-113. [Crossref]

3998. Geoffrey Hinton, Li Deng, Dong Yu, George Dahl, Abdel-rahman Mohamed, Navdeep Jaitly, Andrew Senior, Vincent Vanhoucke, Patrick Nguyen, Tara Sainath, Brian Kingsbury. 2012. Deep Neural Networks for Acoustic Modeling in Speech Recognition: The Shared Views of Four Research Groups. *IEEE Signal Processing Magazine* **29**:6, 82-97. [Crossref]

3999. Masaki Ogino, Mai Hikita, Sawa Fuke, Minoru Asada. Generation of condition-dependent reaching movements based on layered associative networks 1-6. [Crossref]

4000. Dragos Calitoiu, B John Oommen, Doron Nussbaum. 2012. Large-scale neuro-modeling for understanding and explaining some brain-related chaotic behavior. *SIMULATION* **88**:11, 1316-1337. [Crossref]

4001. Xinying Wang, Min Han. Multivariate chaotic time series prediction based on Hierarchic Reservoirs 384-388. [Crossref]

4002. Pan Zhou, Lirong Dai, Qingfeng Liu, Hui Jiang. Combining information from multi-stream features using deep neural network in speech recognition 557-561. [Crossref]

4003. Zhaohui Liang, Gang Zhang, Ziping Li, Jian Yin, Wenbin Fu. Deep learning for acupuncture point selection patterns based on veteran doctor experience of Chinese medicine 396-401. [Crossref]

4004. Wendelin Böhmer, Steffen Grünewälder, Hannes Nickisch, Klaus Obermayer. 2012. Generating feature spaces for linear algorithms with regularized sparse kernel slow feature analysis. *Machine Learning* **89**:1-2, 67-86. [Crossref]

4005. Renato de Pontes Pereira, Paulo Martins Engel, Rafael C. Pinto. Learning Abstract Behaviors with the Hierarchical Incremental Gaussian Mixture Network 131-135. [Crossref]

4006. Kuan-Ting Yu, Shih-Huan Tseng, Li-Chen Fu. Learning hierarchical representation with sparsity for RGB-D object recognition 3011-3016. [Crossref]

4007. Eduardo Mercado, Cynthia M. Henderson. Neurally Inspired Models of Psychological Processes . [Crossref]

4008. Pierre Baldi, Zhiqin Lu. 2012. Complex-valued autoencoders. *Neural Networks* **33**, 136-147. [Crossref]

4009. Fei Long, Tingfan Wu, Javier R. Movellan, Marian S. Bartlett, Gwen Littlewort. 2012. Learning spatiotemporal features by using independent component analysis with application to facial expression recognition. *Neurocomputing* **93**, 126-132. [Crossref]

4010. Jimmy SJ. Ren, Wei Wang, Jiawei Wang, Stephen Liao. An unsupervised feature learning approach to improve automatic incident detection 172-177. [Crossref]

4011. Andre Lemme, René Felix Reinhart, Jochen Jakob Steil. 2012. Online learning and generalization of parts-based image representations by non-negative sparse autoencoders. *Neural Networks* **33**, 194-203. [Crossref]

4012. Huma Lodhi. 2012. Computational biology perspective: kernel methods and deep learning. *Wiley Interdisciplinary Reviews: Computational Statistics* **4**:5, 455-465. [Crossref]

4013. Ruslan Salakhutdinov, Geoffrey Hinton. 2012. An Efficient Learning Procedure for Deep Boltzmann Machines. *Neural Computation* **24**:8, 1967-2006. [Abstract] [Full Text] [PDF] [PDF Plus]

4014. Lamberto Ballan, Marco Bertini, Alberto Del Bimbo, Lorenzo Seidenari, Giuseppe Serra. 2012. Effective Codebooks for Human Action Representation and Classification in Unconstrained Videos. *IEEE Transactions on Multimedia* **14**:4, 1234-1245. [Crossref]

4015. Michele De Filippo De Grazia, Simone Cutini, Matteo Lisi, Marco Zorzi. 2012. Space coding for sensorimotor transformations can emerge through unsupervised learning. *Cognitive Processing* **13**:S1, 141-146. [Crossref]

4016. Tingfan Wu, N. J. Butko, P. Ruvolo, J. Whitehill, M. S. Bartlett, J. R. Movellan. 2012. Multilayer Architectures for Facial Action Unit Recognition. *IEEE Transactions on Systems, Man, and Cybernetics, Part B (Cybernetics)* **42**:4, 1027-1038. [Crossref]

4017. Daphne Bavelier, C. Shawn Green, Alexandre Pouget, Paul Schrater. 2012. Brain Plasticity Through the Life Span: Learning to Learn and Action Video Games. *Annual Review of Neuroscience* **35**:1, 391-416. [Crossref]

4018. A. Clark. 2012. Dreaming the Whole Cat: Generative Models, Predictive Processing, and the Enactivist Conception of Perceptual Experience. *Mind* **121**:483, 753-771. [Crossref]

4019. Congcong Li, Adarsh Kowdle, Ashutosh Saxena, Tsuhan Chen. 2012. Toward Holistic Scene Understanding: Feedback Enabled Cascaded Classification Models. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **34**:7, 1394-1408. [Crossref]

4020. H. C. Burger, C. J. Schuler, S. Harmeling. Image denoising: Can plain neural networks compete with BM3D? 2392-2399. [Crossref]

4021. Noel Lopes, Bernardete Ribeiro, Joao Goncalves. Restricted Boltzmann Machines and Deep Belief Networks on multi-core processors 1-7. [Crossref]

4022. Wanli Ouyang, Xiaogang Wang. A discriminative deep model for pedestrian detection with occlusion handling 3258-3265. [Crossref]

4023. Liwei Wang, Yin Li, Jiaya Jia, Jian Sun, D. Wipf, J. M. Rehg. Learning sparse covariance patterns for natural scenes 2767-2774. [Crossref]

4024. Ping Luo, Xiaogang Wang, Xiaoou Tang. Hierarchical face parsing via deep learning 2480-2487. [Crossref]

4025. Ashwini Shikaripur Nadig, Brian Potetz. A hierarchical Bayesian model for pattern recognition 1-8. [Crossref]

4026. Dan C. Ciresan, Ueli Meier, Jurgen Schmidhuber. Transfer learning for Latin and Chinese characters with Deep Neural Networks 1-6. [Crossref]

4027. T. Deselaers, T. Gass, G. Heigold, H. Ney. 2012. Latent Log-Linear Models for Handwritten Digit Classification. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **34**:6, 1105-1117. [Crossref]

4028. Prasanna Tamilselvan, Pingfeng Wang, Ramkumar Jayaraman. Health diagnostics with unexampled faulty states using a two-fold classification method 1-11. [Crossref]

4029. Jonghyun Choi, Abhishek Sharma, David W. Jacobs, Larry S. Davis. Data insufficiency in sketch versus photo face recognition 1-8. [Crossref]

4030. Lech Szymanski, Brendan McCane. Deep, super-narrow neural network is a universal classifier 1-8. [Crossref]

4031. Juyang Weng, Matthew Luciw. 2012. Brain-Like Emergent Spatial Processing. *IEEE Transactions on Autonomous Mental Development* **4**:2, 161-185. [Crossref]

4032. Zhengping Ji, Wentao Huang, Steven P. Brumby. Learning sparse representation via a nonlinear shrinkage encoder and a linear sparse decoder 1-8. [Crossref]

4033. G. B. Huang, Honglak Lee, E. Learned-Miller. Learning hierarchical representations for face verification with convolutional deep belief networks 2518-2525. [Crossref]

4034. Zhenwen Dai, J. Lucke. Unsupervised learning of translation invariant occlusive components 2400-2407. [Crossref]

4035. Zhou Bai, Stefan C. Kremer. Sequence learning: analysis and solutions for sparse data in high dimensional spaces 298-305. [Crossref]

4036. Yoshua Bengio, Nicolas Chapados, Olivier Delalleau, Hugo Larochelle, Xavier Saint-Mleux, Christian Hudon, Jérôme Louradour. 2012. DETONATION CLASSIFICATION FROM ACOUSTIC SIGNATURE WITH THE RESTRICTED BOLTZMANN MACHINE. *Computational Intelligence* **28**:2, 261-288. [Crossref]

4037. Prasanna Tamilselvan, Pingfeng Wang. A Hybrid Inference Approach for Health Diagnostics with Unexampled Faulty States . [Crossref]

4038. A. Stuhlsatz, J. Lippel, T. Zielke. 2012. Feature Extraction With Deep Neural Networks by a Generalized Discriminant Analysis. *IEEE Transactions on Neural Networks and Learning Systems* **23**:4, 596-608. [Crossref]

4039. Christian Keck, Cristina Savin, Jörg Lücke. 2012. Feedforward Inhibition and Synaptic Scaling – Two Sides of the Same Coin?. *PLoS Computational Biology* **8**:3, e1002432. [Crossref]

4040. Oriol Vinyals, Suman V. Ravuri, Daniel Povey. Revisiting Recurrent Neural Networks for robust ASR 4085-4088. [Crossref]

4041. Abdel-rahman Mohamed, Geoffrey Hinton, Gerald Penn. Understanding how Deep Belief Networks perform acoustic modelling 4273-4276. [Crossref]

4042. G. Carneiro, J. C. Nascimento, A. Freitas. 2012. The Segmentation of the Left Ventricle of the Heart From Ultrasound Data Using Deep Learning Architectures and Derivative-Based Search Methods. *IEEE Transactions on Image Processing* **21**:3, 968-982. [Crossref]

4043. Heiga Zen, Mark J. F. Gales, Yoshihiko Nankaku, Keiichi Tokuda. 2012. Product of Experts for Statistical Parametric Speech Synthesis. *IEEE Transactions on Audio, Speech, and Language Processing* **20**:3, 794-805. [Crossref]

4044. Meng Sun, Hugo Van hamme. Tri-factorization learning of sub-word units with application to vocabulary acquisition 5177-5180. [Crossref]

4045. Galen Andrew, Jeff Bilmes. Sequential Deep Belief Networks 4265-4268. [Crossref]

4046. P. Tamilselvan, Yibin Wang, Pingfeng Wang. Deep Belief Network based state classification for structural health diagnosis 1-11. [Crossref]

4047. Sylvain Chartier, Craig Leth-Steensen, Marie-France Hébert. 2012. Performing complex associations using a generalised bidirectional associative memory. *Journal of Experimental & Theoretical Artificial Intelligence* **24**:1, 23-42. [Crossref]

4048. Juyang Weng. 2012. Symbolic Models and Emergent Models: A Review. *IEEE Transactions on Autonomous Mental Development* **4**:1, 29-53. [Crossref]

4049. Gokhan Tur, Li Deng, Dilek Hakkani-Tur, Xiaodong He. Towards deeper understanding: Deep convex networks for semantic utterance classification 5045-5048. [Crossref]

4050. Christian Plahl, Tara N. Sainath, Bhuvana Ramabhadran, David Nahamoo. Improved pre-training of Deep Belief Networks using Sparse Encoding Symmetric Machines 4165-4168. [Crossref]

4051. Sawrav Roy, Ankit Kundu. Concept of stochastic memory & data retrieval using artificial neural networks increasing memory capacity and data security by data overlapping 468-473. [Crossref]

4052. Tara N. Sainath, Brian Kingsbury, Bhuvana Ramabhadran. Auto-encoder bottleneck features using deep belief networks 4153-4156. [Crossref]

4053. Yaodong Zhang, Ruslan Salakhutdinov, Hung-An Chang, James Glass. Resource configurable spoken query detection using Deep Boltzmann Machines 5161-5164. [Crossref]

4054. Kandan Ramakrishnan, Evgeniy Bart. Learning Domain-Specific Feature Descriptors for Document Images 415-418. [Crossref]

4055. J. Vervaeke, T. P. Lillicrap, B. A. Richards. 2012. Relevance Realization and the Emerging Framework in Cognitive Science. *Journal of Logic and Computation* **22**:1, 79-99. [Crossref]

4056. M. W. Spratling. 2012. Unsupervised Learning of Generative and Discriminative Weights Encoding Elementary Image Components in a Predictive Coding Model of Cortical Function. *Neural Computation* **24**:1, 60-103. [Abstract] [Full Text] [PDF] [PDF Plus]

4057. Junfei Chen, Qiongji Jin, Jing Chao. 2012. Design of Deep Belief Networks for Short-Term Prediction of Drought Index Using Data in the Huaihe River Basin. *Mathematical Problems in Engineering* **2012**, 1-16. [Crossref]

4058. Geoffrey E. Hinton. A Practical Guide to Training Restricted Boltzmann Machines 599-619. [Crossref]

4059. Iveta Mrazova, Marek Kukacka. 2012. Can Deep Neural Networks Discover Meaningful Pattern Features?. *Procedia Computer Science* **12**, 194-199. [Crossref]

4060. Yoshua Bengio. Practical Recommendations for Gradient-Based Training of Deep Architectures 437-478. [Crossref]

4061. Georgios Exarchakis, Marc Henniges, Julian Eggert, Jörg Lücke. Ternary Sparse Coding 204-212. [Crossref]

4062. Lloyd Watts. Reverse-Engineering the Human Auditory Pathway 47-59. [Crossref]

4063. Adam Coates, Andrew Y. Ng. Learning Feature Representations with K-Means 561-580. [Crossref]

4064. Grégoire Montavon, Klaus-Robert Müller. Better Representations: Invariant, Disentangled and Reusable 559-560. [Crossref]

4065. Abdel-rahman Mohamed, George E. Dahl, Geoffrey Hinton. 2012. Acoustic Modeling Using Deep Belief Networks. *IEEE Transactions on Audio, Speech, and Language Processing* **20**:1, 14-22. [Crossref]

4066. Jason Weston, Frédéric Ratle, Hossein Mobahi, Ronan Collobert. Deep Learning via Semi-supervised Embedding 639-655. [Crossref]

4067. G. E. Dahl, Dong Yu, Li Deng, A. Acero. 2012. Context-Dependent Pre-Trained Deep Neural Networks for Large-Vocabulary Speech Recognition. *IEEE Transactions on Audio, Speech, and Language Processing* **20**:1, 30-42. [Crossref]

4068. James Martens, Ilya Sutskever. Training Deep and Recurrent Networks with Hessian-Free Optimization 479-535. [Crossref]

4069. Martin Längkvist, Lars Karlsson, Amy Loutfi. 2012. Sleep Stage Classification Using Unsupervised Feature Learning. *Advances in Artificial Neural Systems* **2012**, 1-9. [Crossref]

4070. William Penny. 2012. Bayesian Models of Brain and Behaviour. *ISRN Biomathematics* **2012**, 1-19. [Crossref]

4071. Soumi Ray, Tim Oates. Improving the Discovery and Characterization of Hidden Variables by Regularizing the LO-net 442-447. [Crossref]

4072. Karel Vesely, Martin Karafiat, Frantisek Grezl. Convolutive Bottleneck Network features for LVCSR 42-47. [Crossref]

4073. Brian Cheung, Carl Sable. Hybrid Evolution of Convolutional Networks 293-297. [Crossref]

4074. Tara N. Sainath, Brian Kingsbury, Bhuvana Ramabhadran, Petr Fousek, Petr Novak, Abdel-rahman Mohamed. Making Deep Belief Networks effective for large vocabulary continuous speech recognition 30-35. [Crossref]

4075. Frank Seide, Gang Li, Xie Chen, Dong Yu. Feature engineering in Context-Dependent Deep Neural Networks for conversational speech transcription 24-29. [Crossref]

4076. J. Schluter, C. Osendorfer. Music Similarity Estimation with the Mean-Covariance Restricted Boltzmann Machine 118-123. [Crossref]

4077. Lars Buesing, Johannes Bill, Bernhard Nessler, Wolfgang Maass. 2011. Neural Dynamics as Sampling: A Model for Stochastic Computation in Recurrent Networks of Spiking Neurons. *PLoS Computational Biology* **7**:11, e1002211. [Crossref]

4078. Dong Yu, Jinyu Li, Li Deng. 2011. Calibration of Confidence Measures in Speech Recognition. *IEEE Transactions on Audio, Speech, and Language Processing* **19**:8, 2461-2473. [Crossref]

4079. Zhangzhang Si, Song-Chun Zhu. Unsupervised learning of stochastic AND-OR templates for object modeling 648-655. [Crossref]

4080. Xingyao Ye, Alan Yuille. Learning a dictionary of deformable patches using GPUs 483-490. [Crossref]

4081. Ke Chen, A. Salman. 2011. Learning Speaker-Specific Characteristics With a Deep Neural Architecture. *IEEE Transactions on Neural Networks* **22**:11, 1744-1756. [Crossref]

4082. Matthew D. Zeiler, Graham W. Taylor, Rob Fergus. Adaptive deconvolutional networks for mid and high level feature learning 2018-2025. [Crossref]

4083. Kihyuk Sohn, Dae Yon Jung, Honglak Lee, Alfred O. Hero. Efficient learning of sparse, distributed, convolutional feature representations for object recognition 2643-2650. [Crossref]

4084. Antony W. Savich, Medhat Moussa. Resource Efficient Arithmetic Effects on RBM Neural Network Solution Quality Using MNIST 35-40. [Crossref]

4085. Bryan Bai, S. C. Kremer. Regularization of sequence data for machine learning 19-25. [Crossref]

4086. F. Fleuret, T. Li, C. Dubout, E. K. Wampler, S. Yantis, D. Geman. 2011. Comparing machines and humans on a visual categorization test. *Proceedings of the National Academy of Sciences* **108**:43, 17621-17625. [Crossref]

4087. Yan Liu, Shusen Zhou, Qingcai Chen. 2011. Discriminative deep belief networks for visual data classification. *Pattern Recognition* **44**:10-11, 2287-2296. [Crossref]

4088. Ahmad A. Al Sallab, Mohsen A. Rashwan. Self learning machines using Deep Networks 21-26. [Crossref]

4089. Erik M. Schmidt, Youngmoo E. Kim. Learning emotion-based acoustic features with deep belief networks 65-68. [Crossref]

4090. Luoting Fu, Levent Burak Kara. 2011. Neural network-based symbol recognition using a few labeled samples. *Computers & Graphics* **35**:5, 955-966. [Crossref]

4091. Miaozhen Lin, Xin Fan. Low resolution face recognition with pose variations using deep belief networks 1522-1526. [Crossref]

4092. Gul Muhammad Khan, Julian F. Miller, David M. Halliday. 2011. Evolution of Cartesian Genetic Programs for Development of Learning Neural Architecture. *Evolutionary Computation* **19**:3, 469-523. [Abstract] [PDF] [PDF Plus]

4093. Antoine Vinel, Trinh Minh Tri Do, Thierry Artieres. Joint Optimization of Hidden Conditional Random Fields and Non Linear Feature Extraction 513-517. [Crossref]

4094. Liefeng Bo, Xiaofeng Ren, Dieter Fox. Depth kernel descriptors for object recognition 821-826. [Crossref]

4095. Hanlin Goh, Lukasz Kusmierz, Joo-Hwee Lim, Nicolas Thome, Matthieu Cord. Learning invariant color features with sparse topographic restricted Boltzmann machines 1241-1244. [Crossref]

4096. Andrea Censi, Richard M. Murray. Bootstrapping sensorimotor cascades: A group-theoretic perspective 2056-2063. [Crossref]

4097. Long Zhu, Yuanhao Chen, Alan Yuille. 2011. Recursive Compositional Models for Vision: Description and Review of Recent Work. *Journal of Mathematical Imaging and Vision* **41**:1-2, 122-146. [Crossref]

4098. Lei Zhang, Zhi Zeng, Qiang Ji. 2011. Probabilistic Image Modeling With an Extended Chain Graph for Human Activity Recognition and Image Segmentation. *IEEE Transactions on Image Processing* **20**:9, 2401-2413. [Crossref]

4099. Adam Coates, Blake Carpenter, Carl Case, Sanjeev Satheesh, Bipin Suresh, Tao Wang, David J. Wu, Andrew Y. Ng. Text Detection and Character Recognition in Scene Images with Unsupervised Feature Learning 440-445. [Crossref]

4100. Olivier Breuleux, Yoshua Bengio, Pascal Vincent. 2011. Quickly Generating Representative Samples from an RBM-Derived Process. *Neural Computation* **23**:8, 2058-2073. [Abstract] [Full Text] [PDF] [PDF Plus]

4101. Stephan K. U. Zibner, Christian Faubel, Gregor Schoner. Making a robotic scene representation accessible to feature and label queries 1-7. [Crossref]

4102. Andrea Censi, Richard M. Murray. Uncertain semantics, representation nuisances, and necessary invariance properties of bootstrapping agents 1-8. [Crossref]

4103. Pascal Vincent. 2011. A Connection Between Score Matching and Denoising Autoencoders. *Neural Computation* **23**:7, 1661-1674. [Abstract] [Full Text] [PDF] [PDF Plus]

4104. Ahmad Salman, Ke Chen. Exploring speaker-specific characteristics with deep learning 103-110. [Crossref]

4105. Juyang Weng. Three theorems: Brain-like networks logically reason and optimally generalize 2983-2990. [Crossref]

4106. Jing Chao, Furao Shen, Jinxi Zhao. Forecasting exchange rate with deep belief networks 1259-1266. [Crossref]

4107. Zhengping Ji, Wentao Huang, G. Kenyon, L. M. A. Bettencourt. Hierarchical discriminative sparse coding via bidirectional connections 2844-2851. [Crossref]

4108. Leo Pape, Faustino Gomez, Mark Ring, Jurgen Schmidhuber. Modular deep belief networks that do not forget 1191-1198. [Crossref]

4109. Ann M. Hermundstad, Kevin S. Brown, Danielle S. Bassett, Jean M. Carlson. 2011. Learning, Memory, and the Role of Neural Network Architecture. *PLoS Computational Biology* **7**:6, e1002063. [Crossref]

4110. E. Ganmor, R. Segev, E. Schneidman. 2011. Sparse low-order interaction network underlies a highly correlated and learnable neural population code. *Proceedings of the National Academy of Sciences* **108**:23, 9679-9684. [Crossref]

4111. Liefeng Bo, Kevin Lai, Xiaofeng Ren, Dieter Fox. Object recognition with hierarchical kernel descriptors 1729-1736. [Crossref]

4112. S Harmeling, C K I Williams. 2011. Greedy Learning of Binary Latent Trees. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **33**:6, 1087-1097. [Crossref]

4113. Joshua Susskind, Geoffrey Hinton, Roland Memisevic, Marc Pollefeys. Modeling the joint density of two images under a variety of transformations 2793-2800. [Crossref]

4114. Vinay Shet, Maneesh Singh, Claus Bahlmann, Visvanathan Ramesh, Jan Neumann, Larry Davis. 2011. Predicate Logic Based Image Grammars for Complex Pattern Recognition. *International Journal of Computer Vision* **93**:2, 141-161. [Crossref]

4115. Devi Parikh, C. Lawrence Zitnick. Finding the weakest link in person detectors 1425-1432. [Crossref]

4116. Hubert Cecotti. 2011. A time–frequency convolutional neural network for the offline classification of steady-state visual evoked potential responses. *Pattern Recognition Letters* **32**:8, 1145-1153. [Crossref]

4117. Sergey Karayev, Mario Fritz, Sanja Fidler, Trevor Darrell. A probabilistic model for recursive factorized image features 401-408. [Crossref]

4118. Marc'Aurelio Ranzato, Joshua Susskind, Volodymyr Mnih, Geoffrey Hinton. On deep generative models with applications to recognition 2857-2864. [Crossref]

4119. Quoc V. Le, Will Y. Zou, Serena Y. Yeung, Andrew Y. Ng. Learning hierarchical invariant spatio-temporal features for action recognition with independent subspace analysis 3361-3368. [Crossref]

4120. Guido Montufar, Nihat Ay. 2011. Refinements of Universal Approximation Results for Deep Belief Networks and Restricted Boltzmann Machines. *Neural Computation* **23**:5, 1306-1319. [Abstract] [Full Text] [PDF] [PDF Plus]

4121. Ruhi Sarikaya, Geoffrey E. Hinton, Bhuvana Ramabhadran. Deep belief nets for natural language call-routing 5680-5683. [Crossref]

4122. Abdel-rahman Mohamed, Tara N. Sainath, George Dahl, Bhuvana Ramabhadran, Geoffrey E. Hinton, Michael A. Picheny. Deep Belief Networks using discriminative features for phone recognition 5060-5063. [Crossref]

4123. George E. Dahl, Dong Yu, Li Deng, Alex Acero. Large vocabulary continuous speech recognition with context-dependent DBN-HMMS 4688-4691. [Crossref]

4124. Oriol Vinyals, Suman V. Ravuri. Comparing multilayer perceptron to Deep Belief Network Tandem features for robust ASR 4596-4599. [Crossref]

4125. Jeff Berry, Ian Fasel. Dynamics of tongue gestures extracted automatically from ultrasound 557-560. [Crossref]

4126. John Ashburner, Stefan Klöppel. 2011. Multivariate models of inter-subject anatomical variability. *NeuroImage* **56**:2, 422-439. [Crossref]

4127. Hannes Schulz, Andreas Müller, Sven Behnke. 2011. Exploiting local structure in Boltzmann machines. *Neurocomputing* **74**:9, 1411-1417. [Crossref]

4128. Asja Fischer, Christian Igel. 2011. Bounding the Bias of Contrastive Divergence Learning. *Neural Computation* **23**:3, 664-673. [Abstract] [Full Text] [PDF] [PDF Plus]

4129. Nicolas Le Roux, Nicolas Heess, Jamie Shotton, John Winn. 2011. Learning a Generative Model of Images by Factoring Appearance and Shape. *Neural Computation* **23**:3, 593-650. [Abstract] [Full Text] [PDF] [PDF Plus]

4130. Satohiro Tajima, Masataka Watanabe. 2011. Acquisition of nonlinear forward optics in generative models: Two-stage "downside-up" learning for occluded vision. *Neural Networks* **24**:2, 148-158. [Crossref]

4131. Salvador Dura-Bernal, Thomas Wennekers, Susan L. Denham. Modelling object perception in cortex: Hierarchical Bayesian networks and belief propagation 1-6. [Crossref]

4132. Dan Knights, Elizabeth K. Costello, Rob Knight. 2011. Supervised classification of human microbiota. *FEMS Microbiology Reviews* **35**:2, 343-359. [Crossref]

4133. Muneki Yasuda, Tetsuharu Sakurai, Kazuyuki Tanaka. 2011. Learning algorithm in restricted Boltzmann machines using Kullback-Leibler importance estimation procedure. *Nonlinear Theory and Its Applications, IEICE* **2**:2, 153-164. [Crossref]

4134. Bernardete Ribeiro, Noel Lopes. Deep Belief Networks for Financial Prediction 766-773. [Crossref]

4135. Soumi Ray, Tim Oates. 2011. Discovering and Characterizing Hidden Variables Using a Novel Neural Network Architecture: LO-Net. *Journal of Robotics* **2011**, 1-16. [Crossref]

4136. Salah Rifai, Grégoire Mesnil, Pascal Vincent, Xavier Muller, Yoshua Bengio, Yann Dauphin, Xavier Glorot. Higher Order Contractive Auto-Encoder 645-660. [Crossref]

4137. Jonathan Masci, Ueli Meier, Dan Cireşan, Jürgen Schmidhuber. Stacked Convolutional Auto-Encoders for Hierarchical Feature Extraction 52-59. [Crossref]

4138. Dong Yu, Li Deng. 2011. Deep Learning and Its Applications to Signal and Information Processing [Exploratory DSP. *IEEE Signal Processing Magazine* **28**:1, 145-154. [Crossref]

4139. David P. Reichert, Peggy Series, Amos J. Storkey. A Hierarchical Generative Model of Recurrent Object-Based Attention in the Visual Cortex 18-25. [Crossref]

4140. Ying Nian Wu. 2011. Data Augmentation, Internal Representation, and Unsupervised Learning. *Journal of Computational and Graphical Statistics* **20**:3, 581-583. [Crossref]

4141. Keith Worden, Wieslaw J. Staszewski, James J. Hensman. 2011. Natural computing for mechanical systems research: A tutorial overview. *Mechanical Systems and Signal Processing* **25**:1, 4-111. [Crossref]

4142. Geoffrey Hinton, Ruslan Salakhutdinov. 2011. Discovering Binary Codes for Documents by Learning Deep Generative Models. *Topics in Cognitive Science* **3**:1, 74-91. [Crossref]

4143. Paul Hollesen, Warren A. Connors, Thomas Trappenberg. Comparison of Learned versus Engineered Features for Classification of Mine Like Objects from Raw Sonar Images 174-185. [Crossref]

4144. Athina Spiliopoulou, Amos Storkey. Comparing Probabilistic Models for Melodic Sequences 289-304. [Crossref]

4145. Bernardete Ribeiro, Ivo Gonçalves, Sérgio Santos, Alexander Kovacec. Deep Learning Networks for Off-Line Handwritten Signature Recognition 523-532. [Crossref]

4146. Jyri J. Kivinen, Christopher K. I. Williams. Transformation Equivariant Boltzmann Machines 1-9. [Crossref]

4147. Yoonseop Kang, Seungjin Choi. Restricted Deep Belief Networks for Multi-view Learning 130-145. [Crossref]

4148. Danielle S. McNamara. 2011. Computational Methods to Extract Meaning From Text and Advance Theories of Human Cognition. *Topics in Cognitive Science* **3**:1, 3-17. [Crossref]

4149. Manuel Jesús Marín-Jiménez, Nicolás Pérez de la Blanca, María Ángeles Mendoza. Learning Features for Human Action Recognition Using Multilayer Architectures 338-346. [Crossref]

4150. Yoshua Bengio, Olivier Delalleau. On the Expressive Power of Deep Architectures 18-36. [Crossref]

4151. Ying Wu, Thomas K. Doyle, Colin Fyfe. Multi-layer Topology Preserving Mapping for K-Means Clustering 84-91. [Crossref]

4152. Nicolas Heess, Nicolas Le Roux, John Winn. Weakly Supervised Learning of Foreground-Background Segmentation Using Masked RBMs 9-16. [Crossref]

4153. Marcel A. J. van Gerven, Floris P. de Lange, Tom Heskes. 2010. Neural Decoding with Hierarchical Generative Models. *Neural Computation* **22**:12, 3127-3142. [Abstract] [Full Text] [PDF] [PDF Plus]

4154. Yan Wu, H. J. Cai. A Simulation Study of Deep Belief Network Combined with the Self-Organizing Mechanism of Adaptive Resonance Theory 1-4. [Crossref]

4155. Ben Goertzel, Ruiting Lian, Itamar Arel, Hugo de Garis, Shuo Chen. 2010. A world survey of artificial brain projects, Part II: Biologically inspired cognitive architectures. *Neurocomputing* **74**:1-3, 30-49. [Crossref]

4156. John Dines, Junichi Yamagishi, Simon King. 2010. Measuring the Gap Between HMM-Based ASR and TTS. *IEEE Journal of Selected Topics in Signal Processing* **4**:6, 1046-1058. [Crossref]

4157. Soumi Ray, Tim Oates. Discovering and Characterizing Hidden Variables in Streaming Multivariate Time Series 913-916. [Crossref]

4158. Mostafa A. Salama, Aboul Ella Hassanien, Aly A. Fahmy. Deep Belief Network for clustering and classification of a continuous data 473-477. [Crossref]

4159. Drausin Wulsin, Justin Blanco, Ram Mani, Brian Litt. Semi-Supervised Anomaly Detection for EEG Waveforms Using Deep Belief Nets 436-441. [Crossref]

4160. Thomas P. Karnowski, Itamar Arel, Derek Rose. Deep Spatiotemporal Feature Learning with Application to Image Classification 883-888. [Crossref]

4161. Ben Goertzel, Joel Pitt, Matthew Ikle, Cassio Pennachin, Liu Rui. 2010. Glocal memory: A critical design principle for artificial brains and minds. *Neurocomputing* **74**:1-3, 84-94. [Crossref]

4162. Vikramjit Mitra, Hosung Nam, Carol Y. Espy-Wilson, Elliot Saltzman, Louis Goldstein. 2010. Retrieving Tract Variables From Acoustics: A Comparison of Different Machine Learning Strategies. *IEEE Journal of Selected Topics in Signal Processing* **4**:6, 1027-1045. [Crossref]

4163. Mark Steedman. 2010. Embodied compositionality. *Physics of Life Reviews* **7**:4, 418-420. [Crossref]

4164. Tanya Schmah, Grigori Yourganov, Richard S. Zemel, Geoffrey E. Hinton, Steven L. Small, Stephen C. Strother. 2010. Comparing Classification Methods for Longitudinal fMRI Studies. *Neural Computation* **22**:11, 2729-2762. [Abstract] [Full Text] [PDF] [PDF Plus] [Supplemental Material]

4165. I Arel, D C Rose, T P Karnowski. 2010. Deep Machine Learning - A New Frontier in Artificial Intelligence Research [Research Frontier]. *IEEE Computational Intelligence Magazine* **5**:4, 13-18. [Crossref]

4166. Daniel Le Ly, Paul Chow. 2010. High-Performance Reconfigurable Hardware Architecture for Restricted Boltzmann Machines. *IEEE Transactions on Neural Networks* **21**:11, 1780-1792. [Crossref]

4167. Yoshua Bengio, Olivier Delalleau, Clarence Simard. 2010. DECISION TREES DO NOT GENERALIZE TO NEW VARIATIONS. *Computational Intelligence* **26**:4, 449-467. [Crossref]

4168. Pradeep K. Atrey, M. Anwar Hossain, Abdulmotaleb El Saddik, Mohan S. Kankanhalli. 2010. Multimodal fusion for multimedia analysis: a survey. *Multimedia Systems* **16**:6, 345-379. [Crossref]

4169. Youngmin Cho, Lawrence K. Saul. 2010. Large-Margin Classification in Infinite Neural Networks. *Neural Computation* **22**:10, 2678-2697. [Abstract] [Full Text] [PDF] [PDF Plus]

4170. D. B. L. Bong, J. Y. B. Tan, A. R. H. Rigit. Optimization of the backpropagation hidden layer by hybrid K-means-Greedy Algorithm for time series prediction 669-674. [Crossref]

4171. Hugo Larochelle, Yoshua Bengio, Joseph Turian. 2010. Tractable Multivariate Binary Density Estimation and the Restricted Boltzmann Forest. *Neural Computation* **22**:9, 2285-2307. [Abstract] [Full Text] [PDF] [PDF Plus]

4172. M Luciw, Juyang Weng. 2010. Top–Down Connections in Self-Organizing Hebbian Networks: Topographic Class Grouping. *IEEE Transactions on Autonomous Mental Development* **2**:3, 248-261. [Crossref]

4173. Angelo Cangelosi, Giorgio Metta, Gerhard Sagerer, Stefano Nolfi, Chrystopher Nehaniv, Kerstin Fischer, Jun Tani, Tony Belpaeme, Giulio Sandini, Francesco Nori, Luciano Fadiga, Britta Wrede, Katharina Rohlfing, Elio Tuci, Kerstin Dautenhahn, Joe Saunders, Arne Zeschel. 2010. Integration of Action and Language Knowledge: A Roadmap for Developmental Robotics. *IEEE Transactions on Autonomous Mental Development* **2**:3, 167-195. [Crossref]

4174. Shusen Zhou, Qingcai Chen, Xiaolong Wang. Discriminative Deep Belief Networks for image classification 1561-1564. [Crossref]

4175. Nicolas Le Roux, Yoshua Bengio. 2010. Deep Belief Networks Are Compact Universal Approximators. *Neural Computation* **22**:8, 2192-2207. [Abstract] [Full Text] [PDF] [PDF Plus]

4176. Maryam Sabzevari, Saeed Toosizadeh, Saeed Rahati Quchani, Vahid Abrishami. A fast and accurate facial expression synthesis system for color face images using face graph and deep belief network V2-354-V2-358. [Crossref]

4177. Manuel J. Marin-Jimenez, Nicolas Perez de la Blanca, M. Angeles Mendoza. RBM-based Silhouette Encoding for Human Action Modelling 979-982. [Crossref]

4178. Shusen Zhou, Qingcai Chen, Xiaolong Wang. Deep Quantum Networks for Classification 2885-2888. [Crossref]

4179. Yuki Sasamoto, Yuichiro Yoshikawa, Minoru Asada. Mutually constrained multimodal mapping for simultaneous development: Modeling vocal imitation and lexicon acquisition 291-296. [Crossref]

4180. Ian Fasel, Jeff Berry. Deep Belief Networks for Real-Time Extraction of Tongue Contours from Ultrasound During Speech 1493-1496. [Crossref]

4181. Andre Stuhlsatz, Jens Lippel, Thomas Zielke. Discriminative feature extraction with Deep Neural Networks 1-8. [Crossref]

4182. Sascha Lange, Martin Riedmiller. Deep auto-encoder neural networks in reinforcement learning 1-8. [Crossref]

4183. Mark J. Embrechts, Blake J. Hargis, Jonathan D. Linton. Augmented Efficient BackProp for backpropagation learning in deep autoassociative neural networks 1-6. [Crossref]

4184. Andreas Muller, Hannes Schulz, Sven Behnke. Topological features in locally connected RBMs 1-6. [Crossref]

4185. Niccolo Bandinelli, Monica Bianchini, Franco Scarselli. Learning long-term dependencies using layered graph neural networks 1-8. [Crossref]

4186. Marc'Aurelio Ranzato, Geoffrey E. Hinton. Modeling pixel means and covariances using factorized third-order boltzmann machines 2551-2558. [Crossref]

4187. Matthew D. Zeiler, Dilip Krishnan, Graham W. Taylor, Rob Fergus. Deconvolutional networks 2528-2535. [Crossref]

4188. Gary B. Huang, Erik Learned-Miller. Learning class-specific image transformations with higher-order Boltzmann machines 25-32. [Crossref]

4189. Derek C. Rose, Itamar Arel, Thomas P. Karnowski, Vincent C. Paquit. Applying deep-layered clustering to mammography image analytics 1-4. [Crossref]

4190. Rohit Gandrakota, V. S. Chakravarthy, Ranjan K. Pradhan. 2010. A Model of Indispensability of a Large Glial Layer in Cerebrovascular Circulation. *Neural Computation* **22**:4, 949-968. [Abstract] [Full Text] [PDF] [PDF Plus]

4191. G. E. Hinton. 2010. Learning to represent visual input. *Philosophical Transactions of the Royal Society B: Biological Sciences* **365**:1537, 177-184. [Crossref]

4192. Abdel-rahman Mohamed, Geoffrey Hinton. Phone recognition using Restricted Boltzmann Machines 4354-4357. [Crossref]

4193. Jiongyun Xie, Hongtao Lu, Deng Nan, Cai Nengbin. Sparse Deep Belief Net for Handwritten Digits Classification 71-78. [Crossref]

4194. Kevin Swersky, Bo Chen, Ben Marlin, Nando de Freitas. A tutorial on stochastic approximation algorithms for training Restricted Boltzmann Machines and Deep Belief Nets 1-10. [Crossref]

4195. Christian Wolf, Daniel Gaida, André Stuhlsatz, Seán McLoone, Michael Bongards. Organic Acid Prediction in Biogas Plants Using UV/vis Spectroscopic Online-Measurements 200-206. [Crossref]

4196. Sang Kyun Kim, Peter Leonard McMahon, Kunle Olukotun. A Large-Scale Architecture for Restricted Boltzmann Machines 201-208. [Crossref]

4197. Tao Liu. A Novel Text Classification Approach Based on Deep Belief Network 314-321. [Crossref]

4198. Benjamin Labbé, Romain Hérault, Clément Chatelain. Learning Deep Neural Networks for High Dimensional Output Problems 63-68. [Crossref]

4199. M.M. Islam, M.A. Sattar, M.F. Amin, Xin Yao, K. Murase. 2009. A New Constructive Algorithm for Architectural and Functional Adaptation of Artificial Neural Networks. *IEEE Transactions on Systems, Man, and Cybernetics, Part B (Cybernetics)* **39**:6, 1590-1605. [Crossref]

4200. Renqiang Min, David A. Stanley, Zineng Yuan, Anthony Bonner, Zhaolei Zhang. A Deep Non-linear Feature Mapping for Large-Margin kNN Classification 357-366. [Crossref]

4201. Karl Friston, Stefan Kiebel. 2009. Cortical circuits for perceptual inference. *Neural Networks* **22**:8, 1093-1104. [Crossref]

4202. Ernest J. Feleppa, Mark J. Rondeau, Paul Lee, Christopher R. Porter. Prostate-cancer imaging using machine-learning classifiers: Potential value for guiding biopsies, targeting therapy, and monitoring treatment 527-529. [Crossref]

4203. L'ubor Ladicky, Chris Russell, Pushmeet Kohli, Philip H.S. Torr. Associative hierarchical CRFs for object class image segmentation 739-746. [Crossref]

4204. Frank Jäkel, Bernhard Schölkopf, Felix A. Wichmann. 2009. Does Cognitive Science Need Kernels?. *Trends in Cognitive Sciences* **13**:9, 381-388. [Crossref]

4205. Sang Kyun Kim, Lawrence C. McAfee, Peter L. McMahon, Kunle Olukotun. A highly scalable Restricted Boltzmann Machine FPGA implementation 367-372. [Crossref]

4206. David Sussillo, L.F. Abbott. 2009. Generating Coherent Patterns of Activity from Chaotic Neural Networks. *Neuron* **63**:4, 544-557. [Crossref]

4207. S. Fuke, M. Ogino, M. Asada. 2009. Acquisition of the Head-Centered Peri-Personal Spatial Representation Found in VIP Neuron. *IEEE Transactions on Autonomous Mental Development* **1**:2, 131-140. [Crossref]

4208. Ruslan Salakhutdinov, Geoffrey Hinton. 2009. Semantic hashing. *International Journal of Approximate Reasoning* **50**:7, 969-978. [Crossref]

4209. Yoshua Bengio, Olivier Delalleau. 2009. Justifying and Generalizing Contrastive Divergence. *Neural Computation* **21**:6, 1601-1621. [Abstract] [Full Text] [PDF] [PDF Plus]

4210. M. Norouzi, M. Ranjbar, G. Mori. Stacks of convolutional Restricted Boltzmann Machines for shift-invariant feature learning 2735-2742. [Crossref]

4211. Ralph Linsker. Neural learning of Kalman filtering, Kalman control, and system identification 1835-1842. [Crossref]

4212. Lamberto Ballan, Alessio Bazzica, Marco Bertini, Alberto Del Bimbo, Giuseppe Serra. Deep networks for audio event classification in soccer videos 474-477. [Crossref]

4213. Daniela M. Witten, Robert Tibshirani. 2009. Covariance-regularized regression and classification for high dimensional problems. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)* **71**:3, 615-636. [Crossref]

4214. M.J. Marin-Jimenez, N. Perez de la Blanca, M.A. Mendoza, M. Lucena, J.M. Fuertes. Learning action descriptors for recognition 5-8. [Crossref]

4215. Kai A. Krueger, Peter Dayan. 2009. Flexible shaping: How learning in small steps helps. *Cognition* **110**:3, 380-394. [Crossref]

4216. Jong-Wan Kim, Duk-Shin Oh, Kee-Cheon Kim. 2009. Tag Trajectory Generation Scheme for RFID Tag Tracing in Ubiquitous Computing. *The KIPS Transactions:PartD* **16D**:1, 1-10. [Crossref]

4217. Hyun-Kyung Shin. 2009. Development of Monitoring Tool for Synaptic Weights on Artificial Neural Network. *The KIPS Transactions:PartD* **16D**:1, 139-144. [Crossref]

4218. Raia Hadsell, Pierre Sermanet, Jan Ben, Ayse Erkan, Marco Scoffier, Koray Kavukcuoglu, Urs Muller, Yann LeCun. 2009. Learning long-range vision for autonomous off-road driving. *Journal of Field Robotics* **26**:2, 120-144. [Crossref]

4219. Tobias Gass, Thomas Deselaers, Hermann Ney. Deformation-Aware Log-Linear Models 201-210. [Crossref]

4220. Jie Tang, Jing Zhang. A Discriminative Approach to Topic-Based Citation Recommendation 572-579. [Crossref]

4221. Włodzisław Duch, Tomasz Maszczyk. Almost Random Projection Machine 789-798. [Crossref]

4222. Stanley Bileschi. Object detection at multiple scales improves accuracy 1-5. [Crossref]

4223. Dennis L. Molfese, Victoria J. Molfese, Jennifer Beswick, Jill Jacobi-Vessels, Peter J. Molfese, Alexandra P.F. Key, Gillian Starkey. 2008. Dynamic Links Between Emerging Cognitive Skills and Brain Processes. *Developmental Neuropsychology* **33**:6, 682-706. [Crossref]

4224. Ilya Sutskever, Geoffrey E. Hinton. 2008. Deep, Narrow Sigmoid Belief Networks Are Universal Approximators. *Neural Computation* **20**:11, 2629-2636. [Abstract] [PDF] [PDF Plus]

4225. Ralph Linsker. 2008. Neural network learning of optimal Kalman prediction and control. *Neural Networks* **21**:9, 1328-1343. [Crossref]

4226. L.F. Abbott. 2008. Theoretical Neuroscience Rising. *Neuron* **60**:3, 489-495. [Crossref]

4227. Thomas G. Dietterich, Pedro Domingos, Lise Getoor, Stephen Muggleton, Prasad Tadepalli. 2008. Structured machine learning: the next ten years. *Machine Learning* **73**:1, 3-23. [Crossref]

4228. R. Hadsell, A. Erkan, P. Sermanet, M. Scoffier, U. Muller, Yann LeCun. Deep belief net learning in a long-range vision system for autonomous off-road driving 628-633. [Crossref]

4229. M. N. Abdelghani, T. P. Lillicrap, D. B. Tweed. 2008. Sensitivity Derivatives for Flexible Sensorimotor Learning. *Neural Computation* **20**:8, 2085-2111. [Abstract] [PDF] [PDF Plus]

4230. STEVEN GUTSTEIN, OLAC FUENTES, ERIC FREUDENTHAL. 2008. KNOWLEDGE TRANSFER IN DEEP CONVOLUTIONAL NEURAL NETS. *International Journal on Artificial Intelligence Tools* **17**:03, 555-567. [Crossref]

4231. Patrick Byrne, Suzanna Becker. 2008. A Principle for Learning Egocentric-Allocentric Transformation. *Neural Computation* **20**:3, 709-737. [Abstract] [PDF] [PDF Plus]

4232. Muneki Yasuda, Kazuyuki Tanaka. Approximate Learning Algorithm for Restricted Boltzmann Machines 692-697. [Crossref]

4233. Amr Ahmed, Kai Yu, Wei Xu, Yihong Gong, Eric Xing. Training Hierarchical Feed-Forward Visual Recognition Models Using Transfer Learning from Pseudo-Tasks 69-82. [Crossref]

4234. Long Zhu, Chenxi Lin, Haoda Huang, Yuanhao Chen, Alan Yuille. Unsupervised Structure Learning: Hierarchical Recursive Composition, Suspicious Coincidence and Competitive Exclusion 759-773. [Crossref]

4235. Grigorios Tzortzis, Aristidis Likas. Deep Belief Networks for Spam Filtering 306-309. [Crossref]

4236. Geoffrey E. Hinton. 2007. Learning multiple layers of representation. *Trends in Cognitive Sciences* **11**:10, 428-434. [Crossref]

4237. Joseph F. Murray, Kenneth Kreutz-Delgado. 2007. Visual Recognition and Inference Using Dynamic Overcomplete Sparse Learning. *Neural Computation* **19**:9, 2301-2352. [Abstract] [PDF] [PDF Plus]

4238. Y. LeCun, S. Chopra, M. Ranzato, F.-J. Huang. Energy-Based Models in Document Recognition and Computer Vision 337-341. [Crossref]

4239. Ole Winther, Kaare Brandt Petersen. 2007. Bayesian independent component analysis: Variational methods and non-negative decompositions. *Digital Signal Processing* **17**:5, 858-872. [Crossref]

4240. M. Ranzato, Y. LeCun. A Sparse and Locally Shift Invariant Feature Extractor Applied to Document Images 1213-1217. [Crossref]

4241. Wlodzislaw Duch. 2007. Intuition, Insight, Imagination and Creativity. *IEEE Computational Intelligence Magazine* **2**:3, 40-52. [Crossref]

4242. Julia Lasserre, Anitha Kannan, John Winn. Hybrid learning of large jigsaws 1-8. [Crossref]

4243. Marc'Aurelio Ranzato, Fu Jie Huang, Y-Lan Boureau, Yann LeCun. Unsupervised Learning of Invariant Feature Hierarchies with Applications to Object Recognition 1-8. [Crossref]

4244. Thomas R. Shultz. 2007. The Bayesian revolution approaches psychological development. *Developmental Science* **10**:3, 357-364. [Crossref]

4245. Geoffrey E. Hinton. To recognize shapes, first learn to generate images 535-547. [Crossref]

4246. Yoshua Bengio. On the challenge of learning complex functions 521-534. [Crossref]

4247. Xian-Hua Zeng, Si-Wei Luo, Jiao Wang. Auto-Associative Neural Network System for Recognition 2885-2890. [Crossref]

4248. Iman Raeesi Vanani, Morteza Amirhosseini. Deep Learning for Opinion Mining 40-65. [Crossref]

4249. Nick F Ryman-Tubb. Neural-Symbolic Processing in Business Applications 270-314. [Crossref]

4250. Boris Defourny, Damien Ernst, Louis Wehenkel. Multistage Stochastic Programming 97-143. [Crossref]

4251. Juan José Carrasco, Juan Caravaca, Mónica Millán-Giraldo, Gonzalo Vergara, José M. Martínez-Martínez, Javier Sanchis, Emilio Soria-Olivas. Prediction of Temperature in Buildings using Machine Learning Techniques 314-333. [Crossref]

4252. Anand Narasimhamurthy. An Overview of Machine Learning in Medical Image Analysis 36-58. [Crossref]

4253. Jitendra Jonnagaddala, Hong-Jie Dai, Pradeep Ray, Siaw-Teng Liaw. Mining Electronic Health Records to Guide and Support Clinical Decision Support Systems 184-201. [Crossref]

4254. Armando Vieira. Business Applications of Deep Learning 39-67. [Crossref]

4255. Sanjiban Sekhar Roy, Pulkit Kulshrestha, Pijush Samui. Classifying Images of Drought-Affected Area Using Deep Belief Network, kNN, and Random Forest Learning Techniques 102-119. [Crossref]

4256. Mohamed Elleuch, Monji Kherallah. An Improved Arabic Handwritten Recognition System Using Deep Support Vector Machines 656-678. [Crossref]

4257. Eric Villeneuve, François Pérès, Cedrik Beler, Vicente González-Prida. Sensor-Based Decision Making in Uncertain Context 234-257. [Crossref]

4258. Leonard Johard, Vittorio Lippi, Larisa Safina, Manuel Mazzara. Mind and Matter 63-82. [Crossref]

4259. Mohammadreza Hajiarbabi, Arvin Agah. Novel Techniques in Skin and Face Detection in Color Images 190-220. [Crossref]

4260. Priti Srinivas Sajja, Rajendra Akerkar. Deep Learning for Big Data Analytics 1-21. [Crossref]

4261. Jitendra Jonnagaddala, Hong-Jie Dai, Pradeep Ray, Siaw-Teng Liaw. Mining Electronic Health Records to Guide and Support Clinical Decision Support Systems 252-269. [Crossref]

4262. Emanuele Fumeo, Luca Oneto, Giorgio Clerico, Renzo Canepa, Federico Papa, Carlo Dambra, Nadia Mazzino, Davida Anguita. Big Data Analytics for Train Delay Prediction 320-348. [Crossref]

4263. Shuxiang Xu, Yunling Liu. A Theoretical Framework for Parallel Implementation of Deep Higher Order Neural Networks 1-11. [Crossref]

4264. Stephen Dass, Prabhu J.. Amelioration of Big Data Analytics by Employing Big Data Tools and Techniques 212-232. [Crossref]

4265. Shuxiang Xu, Yunling Liu. A Theoretical Framework for Parallel Implementation of Deep Higher Order Neural Networks 351-361. [Crossref]

4266. Anand Narasimhamurthy. An Overview of Machine Learning in Medical Image Analysis 23-45. [Crossref]

4267. Usha Moorthy, Usha Devi Gandhi. A Survey of Big Data Analytics Using Machine Learning Algorithms 95-123. [Crossref]

4268. Dharmendra Singh Rajput, T. Sunil Kumar Reddy, Dasari Naga Raju. Investigation on Deep Learning Approach for Big Data 25-38. [Crossref]