BHADALE GROUP OF COMPANIES
- IT AND REAL ESTATE

Sept 4 2019

Neural Network Usage Catalogue

Bhadale IT Developers Pvt. Ltd | Bhadale Real Estate Developers Pvt. Ltd (registration due)

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Bhadale Group of Companies

Bhadale Group of Companies consists of Bhadale IT Developers Pvt. Ltd and Bhadale Real Estate Developers Pvt Ltd.

1. **Bhadale IT Developers Pvt. Ltd** is an IT and Computer Engineering company

   This company provides consultation in areas of cutting edge technologies, research outsourcing, and software consultation related to data center and related engineering practices

2. **Bhadale Real Estate Developers Pvt. Ltd** is a Real estate company

   This company provides development of Infrastructure for IT Datacenter and allied sectors. It manages the engineering design, landscaping, civil architecture, presently serving internal projects.

Bhadale Group of Companies has aggressive programs in place to serve the niche market.

Bhadale IT Developers Pvt. Ltd Programs and Services

IT Division programs

1 Cloud Architecture
2 AI
3 Digital
4 Automation
5 R&D services
6 Engineering services
7 Mentoring Services
8 Data center services
9 Outsourcing

There are various services offered under each program, details are described below

IT Division program related services

Cloud Architecture

- Cloud Enterprise Architecture
- Cloud Business Architecture
- Cloud Information / Website data Architecture
- Cloud Solution Architecture
- Data center Virtualization and Cloud services (IaaS)
- Cloud Technical Architecture – Project specific
- Cloud ERP Solutions (SaaS, PaaS)
- Cloud Strategy and Transformation
- Cloud Systems Integration and consolidation
- Cloud Project Management
- Cloud Pre sales support
- Business Needs (RFI/RFQ/RFP assistance)

- Cloud Quality Initiatives
- Cloud Business Analysis
- Cloud Infrastructure Planning – hardware , network, storage , backup (IaaS, PaaS)
- Cloud business portfolio assessment services (workshops)

AI

- Artificial intelligence and advanced machine learning
- Intelligent applications, Intelligent things
- Conversational systems
- Mesh app and service architecture
- Adaptive security architecture

Digital

- Virtual reality and augmented reality: Brief capability, deliverables and service offering
- Digital twins
- Blockchains and distributed ledgers
- Digital technology platforms

Automation

- Robotic Process Automation
- IoT
- Manufacturing robots
- BPO call center robots
- Chatbots
- Remote workers
- Hazardous jobs robots(Mine bombs, nuclear waste, underwater, space etc)

R&D services

- PHD mentor, buddy
- BPO - Outsourced work in areas of research areas related to IT and Computer Engineering

Engineering services (Only Engg)

- Engineering services for Data centers
- Engineering services for IT Departments
- Engineering architectures, drawings, road ways, town house planning, parking, safety, outdoor maintenance, lighting etc
- All other aspects of engineering: Civil, electrical, water and sewage, safety and mechanical motors, pumps, refrigeration, cooling

Mentoring Services

- IT Mentoring
- Engineering Mentoring
- Business Mentoring
- Mentoring for specials categories based on age, and disabled
- Mentoring for special professionals like Military and Govt officials under Govt Programs

Data center services (Engg + IT)

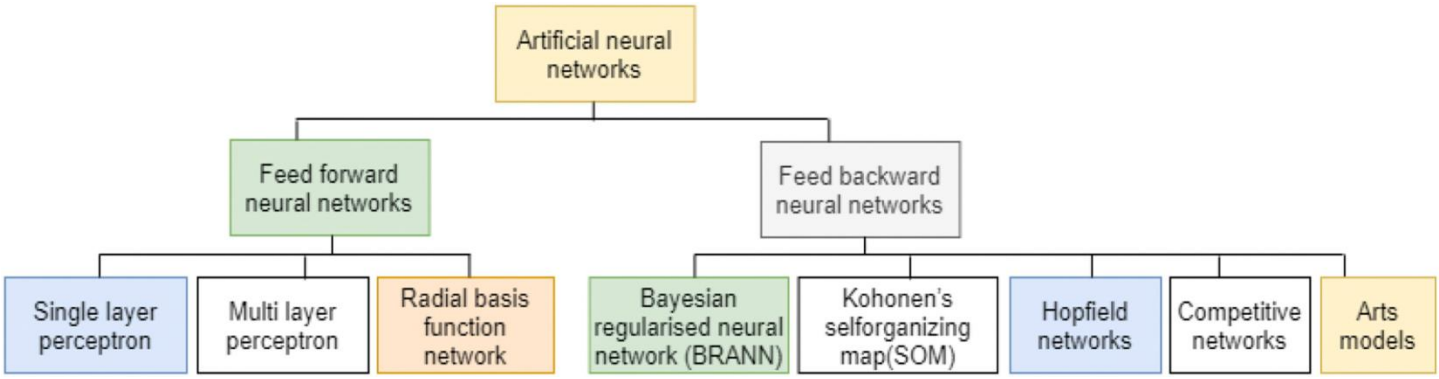
- Data center Engineering services
- Data Center IT Services
- Data center Security services
- Data Center QA services
- Datacenter Cloud services
- Datacenter compliances services
- Data center based business solutions

Outsourcing

- Insourcing
- Outsourcing
- Near sourcing
- Cloud sourcing
- BPO services
- IT specific services
- Engineering specific services
- Training specific services

Service details for Bhadale IT Developers Pvt. Ltd

IT Division programs – Neural Network types and their usage services



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We have a large set of subcategories; few are mentioned below with details tabulated

NN No	NN Name	Key NN component features / Data Structures/ Algorithms / Use cases
1	**Multilayer Perceptron (MLP)**	Is a class of feedforward artificial neural network, utilizes a supervised learning technique called backpropagation for training. Offer approximate solutions for extremely complex problems like fitness approximation, MLPs make good classifier algorithms, MLF NN in Chemistry to predict chemical changes in alkene structure, most popular applications are Google's autonomous or self-driving cars
2	**Feed forward neural networks-General**	They are mostly used in pattern generation, pattern recognition and classification.
3	**RBF neural networks**	NW uses radial basis functions as activation functions. Radial basis function neural network (RBFNN) to study transformer switching overvoltages. new approach to study transformer switching overvoltages during power system restoration For this purpose, an RBFNN has been used to estimate the peak and duration overvoltages due to transformer energization. Equivalent circuit parameters have been used as RBFNN inputs to achieve good generalization capability for trained ANN https://www.hindawi.com/journals/cin/2012/654895/ Application of Radial Basis Function Network with a Gaussian Function of Artificial Neural Networks in Osmo-dehydration of Plant Materials. The mass transfer in the three plant materials were successfully predicted by the ANN models indicating the

		ability of ANN to model both linear and non-linear models as an advantage over empirical equations for quality predictions in food processing. https://scialert.net/fulltextmobile/?doi=jai.2011.233.244 ANN applications in food and agriculture included fermentation (Latrille *et al*., 1993), extrusion (Linko *et al*., 1992), filtration (Dornier *et al*., 1995), drying (Huang and Mujumdar, 1993), psychrometry (Sreekanth *et al*., 1998), thermal processing (Sablani *et al*., 1995), rheology (Ruan *et al*., 1995) and sensory science (Park *et al*., 1995) radial basis function (RBF) neural network is used for the mechanical fault diagnosis of a gearbox , Our aim is to use the RBF neural network to realize the mapping between the ten vibration features and the three gear states(normal, root crack, tooth broken). In other words, we use the ten inputs to determine the three outputs. https://iopscience.iop.org/article/10.1088/1757-899X/269/1/012056 radial basis function networks for solar-array modelling and maximum power-point prediction
4	**DFF neural networks**	
5	**Recurrent Neural Networks(RNN)**	
	Recursive Neural Networks (RN)	
6	**LSTM networks - general**	
7	**Gated Recurrent Unit - GRUs - LSTMs**	
8	**Autoencoders (AE)**	
9	**Variational Autoencoders (AEs)**	
10	**Denoising AE (DAE)**	
11	**Sparse AE(SAE)**	
12	**Markov Chains (MC)**	
13	**Hopfield networks(HN)**	
14	**Boltzmann machines(BM)**	
15	**Restricted BM(RBM)**	
16	**Deep Belief NW (DBNs)**	
17	**Deep Convolution NW (DCN)**	
18	**De Convolution**	

	NW (DNs)	
19	**Deep Convolution Inverse Graph NW (DCIGN)**	
20	**Generative Adversal NW (GAN)**	
21	**Deep Convolutional Generative Adversarial Network (DCGAN)**	
22	**Conditional GAN(CGAN)**	
23	**Liquid State Machine(LSM)**	
24	**Extreme Learning machine (ELM)**	
25	**Echo State NW (ESN)**	
26	**Deep Residual NW (DRN)**	
27	**Kohonen NW (KN)**	
28	**Support Vector Matrix (SVM)**	
29	**Neural Turing Machine (NTM)**	
30	**Bidirectional Recurrent Neural Networks (BRNN)**	
31	**BPTT**	
32	**Truncated BPTT**	
31	**Combination of a CNN and a BRNN**	
33	**Sequence-To-Sequence Models**	Consists of two recurrent neural networks. There's an encoder that processes the input and a decoder that processes the output.
34	**Deep stacking network (DSN)**	
35	**General regression neural network (GRNN)**	
36	**Self-organizing map (SOM)**	
37	**Hierarchical RNN**	
38	**Neocognitron**	
39	**Spiking neural**	

	networks (SNN)	
40	**Multilayer kernel machines (MKM)**	applications to optical character recognition and DNA analysis.
41	**Neuro-fuzzy**	
42	**Hierarchical temporal memory (HTM)**	
43	**Holographic Associative Memory (HAM)**	
44	**Capsule NN**	
45	**Hierarchical Convolutional Deep Maxout Network**	
46	**Ensembles-DNN/CNN/RNN**	
47	**Feed backward neural networks-General**	applied to tasks like un-segmentation, and pattern recognition (connected handwriting recognition), examples are Kohonen's self organizing map and recurrent neural network (RNN). They are used in content addressable memories
48	**k-nearest neighbours (kNNs)**	
49	**Wavelet networks**	Forecasting the daily total amount of solar radiation

Reverse table

Use Case No	Use Case Name	Key NN component
1	**Predicting normal and pathological cases / Prediction of Intrapartum Hypoxia from Cardiotocography Data**	These classifiers include the back-propagation trained feed-forward neural network classifier (BPXNC), Levenberg–Marquardt trained feed-forward neural network classifier (LMNC), automatic neural network classifier (NEURC), radial basis function neural network classifier (RBNC), random neural network classifier (RNNC), and the perceptron linear classifier (PERLC)
2	**Organ Detection Using Deep Learning, Stacked autoencoder**	Stacked autoencoder models learn representative features of data from the given dataset in an unsupervised manner using deep neural networks. This can be promising in medical image analysis, because it can be applied to automatically analyze a diverse, large set of medical images, despite the difficulty of obtaining libraries of accurately labeled example datasets and the intrinsic abnormalities present in patient datasets.

		Sparse autoencoders are trained using the backpropagation algorithm, in the same way as feed forward neural networks are trained for classification, minimize the squared-error cost function
3	**Classification of Electroencephalographic Signals Using Time–Frequency Images With Wavelets and Texture Features**	Identifying epileptic seizure activities automatically using electroencephalographic (EEG) signals is of great significance in the treatment of epilepsy. EEG signals are transformed into a t–f image using short-time Fourier transform and the t–f images are further decomposed into various component images by applying coiflet wavelet transformation. The texture descriptor, namely the local binary pattern, gray-level cooccurrence matrix, and local tetra pattern methods, are employed to compute the features from the wavelet-filtered images. The extracted features are fed into four different classifiers for t–f image classification
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https://www.sciencedirect.com/topics/computer-science/feedforward-neural-network

https://en.wikipedia.org/wiki/Types_of_artificial_neural_networks

https://en.wikipedia.org/wiki/Deep_learning

TODO:

1. Collect various types of nn used based on use cases that are mapped to real business cases, solutions.
2. Table the units as catalogue for ready reference that u can use to use the generic nn components with logic, algorithm, data structures and other useful black box enumeration.
3. Collect , see your offerings that use nn components. Table these in another table, Use case driven components selection.
4. Have a ready reference for the performance, deployed target servers, platforms, IoT mobiles, nw units etc. Tabulate these in the tables.
5. All these tables help anyone choose right one for automation. See how DataRobot automates tasks and how you can personalize, selections using this and other automation tools.
6. Finally see how much time, effort needed to deliver a business solution and how you price it
7. Please add generic block diagrams for solutions and see how these can be deployed in platform specific servers, containers, that ensure scalability, integration into IDe specific and reduced dev time as much as 50%.

For more details, contact below:

Contact

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