## **Learning Deep Learning（学习深度学习）**

There are lots of awesome reading lists or posts that summarized materials related to Deep Learning. So why would I commit another one? Well, the primary objective is to develop a complete reading list that allows readers to build a solid academic and practical background of Deep Learning. And this list is developed while I’m preparing my Deep Learning workshop. My research is related to Deep Neural Networks (DNNs) in general. Hence, this posts tends to summary contributions in DNNs instead of generative models.

### **For Novice（给深度学习初学者的书单）**

If you have no idea about Machine Learning and Scientific Computing, I suggest you learn the following materials while you are reading Machine Learning or Deep Learning books. You don’t have to master these materials, but basic understanding is important. It’s hard to open a meaningful conversation if the person has no idea about matrix or single variable calculus.

[Introduction to Algorithms](http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-006-introduction-to-algorithms-fall-2011/) by Erik Demaine and Srinivas Devadas.

[Single Variable Calculus](http://ocw.mit.edu/courses/mathematics/18-01sc-single-variable-calculus-fall-2010/) by David Jerison.

[Multivariable Calculus](http://ocw.mit.edu/courses/mathematics/18-02sc-multivariable-calculus-fall-2010/) by Denis Auroux.

[Differential Equations](http://ocw.mit.edu/courses/mathematics/18-03sc-differential-equations-fall-2011/) by Arthur Mattuck, Haynes Miller, Jeremy Orloff, John Lewis.

[Linear Algebra](http://ocw.mit.edu/courses/mathematics/18-06-linear-algebra-spring-2010/) by Gilbert Strang.

### **Theory of Computation, Learning Theory, Neuroscience, etc （基于深度学习的计算理论，学习理论，神经科学等等）**

[Introduction to the Theory of Computation](http://www.cs.virginia.edu/~robins/Sipser_2006_Second_Edition_Problems.pdf) by Michael Sipser.

[Artificial Intelligence: A Modern Approach](http://aima.cs.berkeley.edu/) by Stuart Russell and Peter Norvig.

[Pattern Recognition and Machine Learning](http://research.microsoft.com/en-us/um/people/cmbishop/prml/) by Christopher Bishop.

[Machine Learning: A probabilistic perspective](http://www.cs.ubc.ca/~murphyk/MLbook/) by Kevin Patrick Murphy.

[CS229 Machine Learning Course Materials](http://cs229.stanford.edu/materials.html) by Andrew Ng at Stanford University.

[Reinforcement Learning: An Introduction](http://webdocs.cs.ualberta.ca/~sutton/book/the-book.html) by Richard S. Sutton and Andrew G. Barto.

[Probabilistic Graphical Models: Principles and Techniques](http://mitpress.mit.edu/books/probabilistic-graphical-models) by Daphne Koller and Nir Friedman.

[Convex Optimization](http://stanford.edu/~boyd/cvxbook/) by Stephen Boyd and Lieven Vandenberghe.

[An Introduction to Statistical Learning with application in R](http://www-bcf.usc.edu/~gareth/ISL/) by Gareth James, Daniela Witten, Trevor Hastie and Robert Tibshirani.

[Neuronal Dynamics: From single neurons to networks and models of cognition](http://neuronaldynamics.epfl.ch/index.html) by Wulfram Gerstner, Werner M. Kistler, Richard Naud and Liam Paninski.

[Theoretical Neuroscience: Computational and Mathematical Modeling of Neural Systems](http://mitpress.mit.edu/books/theoretical-neuroscience) by Peter Dayan and Laurence F. Abbott.

[Michael I. Jordan Reading List of Machine Learning](https://news.ycombinator.com/item?id=1055042) at Hacker News.

### **Fundamentals of Deep Learning （关于深度学习基础知识的文献）**

[Deep Learning in Neural Networks: An Overview](http://people.idsia.ch/~juergen/deep-learning-overview.html) by Jürgen Schmidhuber.

[Deep Learning Book](http://www.iro.umontreal.ca/~bengioy/dlbook/) by Yoshua Bengio, Ian Goodfellow and Aaron Courville.

[Learning Deep Architectures for AI](http://www.iro.umontreal.ca/~bengioy/papers/ftml_book.pdf) by Yoshua Bengio

[Representation Learning: A Review and New Perspectives](http://arxiv.org/abs/1206.5538) by Yoshua Bengio, Aaron Courville, Pascal Vincent.

[Reading lists for new LISA students](https://docs.google.com/document/d/1IXF3h0RU5zz4ukmTrVKVotPQypChscNGf5k6E25HGvA/edit" \l "heading=h.5r7p5dbrilt4) by LISA Lab, University of Montreal.

### **Tutorials, Practical Guides, and Useful Software（关于深度学习的教材，实用手册以及有用的软件）**

[Machine Learning](https://www.coursera.org/course/ml) by Andrew Ng.

[Neural Networks for Machine Learning](https://www.coursera.org/course/neuralnets) by Geoffrey Hinton.

[Deep Learning Tutorial](http://deeplearning.net/tutorial/) by LISA Lab, University of Montreal.

[Unsupervised Feature Learning and Deep Learning Tutorial](http://deeplearning.stanford.edu/tutorial/) by AI Lab, Stanford University.

[CS231n: Convolutional Neural Networks for Visual Recognition](http://cs231n.stanford.edu/) by Stanford University.

[CS224d: Deep Learning for Natural Language Processing](http://cs224d.stanford.edu/) by Stanford University.

[Theano](http://deeplearning.net/software/theano/) by LISA Lab, University of Montreal.

[PyLearn2](http://deeplearning.net/software/pylearn2/) by LISA Lab, University of Montreal.

[Caffe](http://caffe.berkeleyvision.org/) by Berkeley Vision and Learning Center (BVLC) and community contributor Yangqing Jia.

[Torch 7](http://torch.ch/)

[neon](http://neon.nervanasys.com/docs/latest/index.html) by Nervana.

[cuDNN](https://developer.nvidia.com/cuDNN) by NVIDIA.

[ConvNetJS](http://cs.stanford.edu/people/karpathy/convnetjs/index.html) by Andrej Karpathy.

[DeepLearning4j](http://deeplearning4j.org/)

[Chainer: Neural network framework](http://chainer.org/) by Preferred Networks, Inc.

[Blocks](https://github.com/mila-udem/blocks) by LISA Lab, University of Montreal.

[Fuel](https://github.com/mila-udem/fuel) by LISA Lab, University of Montreal.

### **Literature in Deep Learning and Feature Learning（关于深度学习和特征学习的文献）**

*Deep Learning is a fast-moving community. Therefore the line between “Recent Advances” and “Literature that matter” is kind of blurred. Here I collected articles that are either introducing fundamental algorithms, techniques or highly cited by the community.*

[Automatic Speech Recognition - A Deep Learning Approach](http://link.springer.com/book/10.1007/978-1-4471-5779-3) by Dong Yu and Li Deng (*Published by Springer, no Open Access*)

[Backpropagation Applied to Handwritten Zip Code Recognition](https://www.ics.uci.edu/~welling/teaching/273ASpring09/lecun-89e.pdf) by Y. LeCun, B. Boser, J. S. Denker, D. Henderson, R. E. Howard, W. Hubbard and L. D. Jackel.

[Comparison of Training Methods for Deep Neural Networks](http://arxiv.org/abs/1504.06825) by Patrick O. Glauner.

[Deep Learning](http://www.nature.com/nature/journal/v521/n7553/full/nature14539.html) by Yann LeCun, Yoshua Bengio, Geoffrey Hinton. (NO FREE COPY AVAILABLE)

[Distributed Representations of Words and Phrases and their Compositionality](http://papers.nips.cc/paper/5021-distributed-representations-of-words-and-phrases-and-their-compositionality.pdf) by Tomas Mikolov, Ilya Sutskever, Kai Chen, Greg Corrado and Jeffrey Dean.

[Efficient Estimation of Word Representations in Vector Space](http://arxiv.org/abs/1301.3781) by Tomas Mikolov, Kai Chen, Greg Corrado, Jeffrey Dean.

[Efficient Large Scale Video Classification](http://arxiv.org/abs/1505.06250) by Balakrishnan Varadarajan, George Toderici, Sudheendra Vijayanarasimhan, Apostol Natsev.

[Foundations and Trends in Signal Processing: DEEP LEARNING — Methods and Applications](http://research.microsoft.com/pubs/219984/BOOK2014.pdf) by Li Deng and Dong Yu.

[From Frequency to Meaning: Vector Space Models of Semantics](http://www.jair.org/media/2934/live-2934-4846-jair.pdf) by Peter D. Turney and Patrick Pantel.

[LSTM: A Search Space Odyssey](http://arxiv.org/abs/1503.04069) by Klaus Greff, Rupesh Kumar Srivastava, Jan Koutník, Bas R. Steunebrink, Jürgen Schmidhuber.

[Supervised Sequence Labelling with Recurrent Neural Networks](http://www.cs.toronto.edu/~graves/preprint.pdf) by Alex Graves.

### **Recent Must-Read Advances in Deep Learning**

**（最近必读的关于深度学习领域的最新进展）**

*Most of papers here are produced in 2014 and after. Survey papers or review papers are not included.*

[A Convolutional Attention Network for Extreme Summarization of Source Code](http://arxiv.org/abs/1602.03001) by Miltiadis Allamanis, Hao Peng, Charles Sutton.

[A Deep Bag-of-Features Model for Music Auto-Tagging](http://arxiv.org/abs/1508.04999) by Juhan Nam, Jorge Herrera, Kyogu Lee.

[A Deep Generative Deconvolutional Image Model](http://arxiv.org/abs/1512.07344) by Yunchen Pu, Xin Yuan, Andrew Stevens, Chunyuan Li, Lawrence Carin.

[A Deep Neural Network Compression Pipeline: Pruning, Quantization, Huffman Encoding](http://arxiv.org/abs/1510.00149) by Song Han, Huizi Mao, William J. Dally.

[A Deep Pyramid Deformable Part Model for Face Detection](http://arxiv.org/abs/1508.04389) by Rajeev Ranjan, Vishal M. Patel, Rama Chellappa.

[A Deep Siamese Network for Scene Detection in Broadcast Videos](http://arxiv.org/abs/1510.08893) by Lorenzo Baraldi, Costantino Grana, Rita Cucchiara.

[A Hierarchical Recurrent Encoder-Decoder For Generative Context-Aware Query Suggestion](http://arxiv.org/abs/1507.02221) by Alessandro Sordoni, Yoshua Bengio, Hossein Vahabi, Christina Lioma, Jakob G. Simonsen, Jian-Yun Nie.

[A Large-Scale Car Dataset for Fine-Grained Categorization and Verification](http://arxiv.org/abs/1506.08959) by Linjie Yang, Ping Luo, Chen Change Loy, Xiaoou Tang.

[A Lightened CNN for Deep Face Representation](http://arxiv.org/abs/1511.02683) by Xiang Wu, Ran He, Zhenan Sun.

[A Mathematical Theory of Deep Convolutional Neural Networks for Feature Extraction](http://arxiv.org/abs/1512.06293) by Thomas Wiatowski, Helmut Bölcskei.

[A Multi-scale Multiple Instance Video Description Network](http://arxiv.org/abs/1505.05914) by Huijuan Xu, Subhashini Venugopalan, Vasili Ramanishka, Marcus Rohrbach, Kate Saenko.

[A Neural Attention Model for Abstractive Sentence Summarization](http://arxiv.org/abs/1509.00685) by Alexander M. Rush, Sumit Chopra, Jason Weston.

[A Recurrent Latent Variable Model for Sequential Data](http://arxiv.org/abs/1506.02216) by Junyoung Chung, Kyle Kastner, Laurent Dinh, Kratarth Goel, Aaron Courville, Yoshua Bengio.

[A Restricted Visual Turing Test for Deep Scene and Event Understanding](http://arxiv.org/abs/1512.01715) by Hang Qi, Tianfu Wu, Mun-Wai Lee, Song-Chun Zhu.

[A Sensitivity Analysis of (and Practitioners’ Guide to) Convolutional Neural Networks for Sentence Classification](http://arxiv.org/abs/1510.03820) by Ye Zhang, Byron Wallace.

[ABC-CNN: An Attention Based Convolutional Neural Network for Visual Question Answering](http://arxiv.org/abs/1511.05960) by Kan Chen, Jiang Wang, Liang-Chieh Chen, Haoyuan Gao, Wei Xu, Ram Nevatia.

[Accelerating Very Deep Convolutional Networks for Classification and Detection](http://arxiv.org/abs/1505.06798) by Xiangyu Zhang, Jianhua Zou, Kaiming He, Jian Sun.

[Accurate Image Super-Resolution Using Very Deep Convolutional Networks](http://arxiv.org/abs/1511.04587) by Jiwon Kim, Jung Kwon Lee, Kyoung Mu Lee.

[Action Recognition using Visual Attention](http://arxiv.org/abs/1511.04119) by Shikhar Sharma, Ryan Kiros, Ruslan Salakhutdinov.

[Action Recognition With Trajectory-Pooled Deep-Convolutional Descriptors](http://arxiv.org/abs/1505.04868) by Limin Wang, Yu Qiao, Xiaoou Tang.

[Action-Conditional Video Prediction using Deep Networks in Atari Games](http://arxiv.org/abs/1507.08750) by Junhyuk Oh, Xiaoxiao Guo, Honglak Lee, Richard Lewis, Satinder Singh.

[Active Object Localization with Deep Reinforcement Learning](http://arxiv.org/abs/1511.06015) by Juan C. Caicedo, Svetlana Lazebnik.

[adaQN: An Adaptive Quasi-Newton Algorithm for Training RNNs](http://arxiv.org/abs/1511.01169) by Nitish Shirish Keskar, Albert S. Berahas.

[Adding Gradient Noise Improves Learning for Very Deep Networks](http://arxiv.org/abs/1511.06807) by Arvind Neelakantan, Luke Vilnis, Quoc V. Le, Ilya Sutskever, Lukasz Kaiser, Karol Kurach, James Martens.

[Adversarial Autoencoders](http://arxiv.org/abs/1511.05644) by Alireza Makhzani, Jonathon Shlens, Navdeep Jaitly, Ian Goodfellow.

[Adversarial Manipulation of Deep Representations](http://arxiv.org/abs/1511.05122) by Sara Sabour, Yanshuai Cao, Fartash Faghri, David J. Fleet.

[All you need is a good init](http://arxiv.org/abs/1511.06422) by Dmytro Mishkin, Jiri Matas.

[An End-to-End Trainable Neural Network for Image-based Sequence Recognition and Its Application to Scene Text Recognition](http://arxiv.org/abs/1507.05717) by Baoguang Shi, Xiang Bai, Cong Yao.

[Answer Sequence Learning with Neural Networks for Answer Selection in Community Question Answering](http://arxiv.org/abs/1506.06490) by Xiaoqiang Zhou, Baotian Hu, Qingcai Chen, Buzhou Tang, Xiaolong Wang.

[Anticipating the future by watching unlabeled video](http://arxiv.org/abs/1504.08023) by Carl Vondrick, Hamed Pirsiavash, Antonio Torralba.

[Are You Talking to a Machine? Dataset and Methods for Multilingual Image Question Answering](http://arxiv.org/abs/1505.05612) by Haoyuan Gao, Junhua Mao, Jie Zhou, Zhiheng Huang, Lei Wang, Wei Xu.

[Artificial Neural Networks Applied to Taxi Destination Prediction](http://arxiv.org/abs/1508.00021) by Alexandre de Brébisson, Étienne Simon, Alex Auvolat, Pascal Vincent, Yoshua Bengio.

[Ask, Attend and Answer: Exploring Question-Guided Spatial Attention for Visual Question Answering](http://arxiv.org/abs/1511.05234) by Huijuan Xu, Kate Saenko.

[Ask Me Anything: Dynamic Memory Networks for Natural Language Processing](http://arxiv.org/abs/1506.07285) by Ankit Kumar, Ozan Irsoy, Jonathan Su, James Bradbury, Robert English, Brian Pierce, Peter Ondruska, Ishaan Gulrajani, Richard Socher.

[Ask Me Anything: Free-form Visual Question Answering Based on Knowledge from External Sources](http://arxiv.org/abs/1511.06973) by Qi Wu, Peng Wang, Chunhua Shen, Anton van den Hengel, Anthony Dick.

[Ask Your Neurons: A Neural-based Approach to Answering Questions about Images](http://arxiv.org/abs/1505.01121) by Mateusz Malinowski, Marcus Rohrbach, Mario Fritz.

[Associative Long Short-Term Memory](http://arxiv.org/abs/1602.03032) by Ivo Danihelka, Greg Wayne, Benigno Uria, Nal Kalchbrenner, Alex Graves.

[AttentionNet: Aggregating Weak Directions for Accurate Object Detection](http://arxiv.org/abs/1506.07704) by Donggeun Yoo, Sunggyun Park, Joon-Young Lee, Anthony Paek, In So Kweon.

[Attention-Based Models for Speech Recognition](http://arxiv.org/abs/1506.07503) by Jan Chorowski, Dzmitry Bahdanau, Dmitriy Serdyuk, Kyunghyun Cho, Yoshua Bengio.

[Attention to Scale: Scale-aware Semantic Image Segmentation](http://arxiv.org/abs/1511.03339) by Liang-Chieh Chen, Yi Yang, Jiang Wang, Wei Xu, Alan L. Yuille.

[Attention with Intention for a Neural Network Conversation Model](http://arxiv.org/abs/1510.08565) by Kaisheng Yao, Geoffrey Zweig, Baolin Peng.

[AtomNet: A Deep Convolutional Neural Network for Bioactivity Prediction in Structure-based Drug Discovery](http://arxiv.org/abs/1510.02855) by Izhar Wallach, Michael Dzamba, Abraham Heifets.

[Batch Normalization: Accelerating Deep Network Training by Reducing Internal Covariate Shift](http://arxiv.org/abs/1502.03167) by Sergey Ioffe and Christian Szegedy.

[Batch Normalized Recurrent Neural Networks](http://arxiv.org/abs/1510.01378) by César Laurent, Gabriel Pereyra, Philémon Brakel, Ying Zhang, Yoshua Bengio.

[Bayesian SegNet: Model Uncertainty in Deep Convolutional Encoder-Decoder Architectures for Scene Understanding](http://arxiv.org/abs/1511.02680) by Alex Kendall, Vijay Badrinarayanan, Roberto Cipolla.

[Better Computer Go Player with Neural Network and Long-term Prediction](http://arxiv.org/abs/1511.06410) by Yuandong Tian, Yan Zhu.

[Better Exploiting OS-CNNs for Better Event Recognition in Images](http://arxiv.org/abs/1510.03979) by Limin Wang, Zhe Wang, Sheng Guo, Yu Qiao.

[Benchmarking of LSTM Networks](http://arxiv.org/abs/1508.02774) by Thomas M. Breuel.

[Beyond Short Snipets: Deep Networks for Video Classification](http://arxiv.org/abs/1503.08909) by Joe Yue-Hei Ng, Matthew Hausknecht, Sudheendra Vijayanarasimhan, Oriol Vinyals, Rajat Monga, George Toderici.

[Beyond Temporal Pooling: Recurrence and Temporal Convolutions for Gesture Recognition in Video](http://arxiv.org/abs/1506.01911) by Lionel Pigou, Aäron van den Oord, Sander Dieleman, Mieke Van Herreweghe, Joni Dambre.

[Binarized Neural Networks](http://arxiv.org/abs/1602.02505) by Itay Hubara, Daniel Soudry, Ran El Yaniv.

[BinaryNet: Training Deep Neural Networks with Weights and Activations Constrained to +1 or -1](http://arxiv.org/abs/1602.02830) by Matthieu Courbariaux, Yoshua Bengio.

[Binding via Reconstruction Clustering](http://arxiv.org/abs/1511.06418) by Klaus Greff, Rupesh Kumar Srivastava, Jürgen Schmidhuber.

[Bottom-up and top-down reasoning with convolutional latent-variable models](http://arxiv.org/abs/1507.05699) by Peiyun Hu, Deva Ramanan.

[Brain4Cars: Car That Knows Before You Do via Sensory-Fusion Deep Learning Architecture](http://arxiv.org/abs/1601.00740) by Ashesh Jain, Hema S Koppula, Shane Soh, Bharad Raghavan, Avi Singh, Ashutosh Saxena.

[Brain-Inspired Deep Networks for Image Aesthetics Assessment](http://arxiv.org/abs/1601.04155) by Zhangyang Wang, Florin Dolcos, Diane Beck, Shiyu Chang, Thomas S. Huang.

[Character-level Convolutional Networks for Text Classification](http://arxiv.org/abs/1509.01626) by Xiang Zhang, Junbo Zhao, Yann LeCun.

[Compositional Memory for Visual Question Answering](http://arxiv.org/abs/1511.05676) by Aiwen Jiang, Fang Wang, Fatih Porikli, Yi Li.

[Compressing Convolutional Neural Networks](http://arxiv.org/abs/1506.04449) by Wenlin Chen, James T. Wilson, Stephen Tyree, Kilian Q. Weinberger, Yixin Chen.

[Compressing LSTMs into CNNs](http://arxiv.org/abs/1511.06433) by Krzysztof J. Geras, Abdel-rahman Mohamed, Rich Caruana, Gregor Urban, Shengjie Wang, Ozlem Aslan, Matthai Philipose, Matthew Richardson, Charles Sutton.

[Compression of Deep Neural Networks on the Fly](http://arxiv.org/abs/1509.08745) by Guillaume Soulié, Vincent Gripon, Maëlys Robert.

[Confusing Deep Convolution Networks by Relabelling](http://arxiv.org/abs/1510.06925) by Leigh Robinson, Benjamin Graham.

[Constrained Convolutional Neural Networks for Weakly Supervised Segmentation](http://arxiv.org/abs/1506.03648) by Deepak Pathak, Philipp Krähenbühl, Trevor Darrell.

[Continuous control with deep reinforcement learning](http://arxiv.org/abs/1509.02971) by Timothy P. Lillicrap, Jonathan J. Hunt, Alexander Pritzel, Nicolas Heess, Tom Erez, Yuval Tassa, David Silver, Daan Wierstra.

[Convergent Learning: Do different neural networks learn the same representations?](http://arxiv.org/abs/1511.07543) by Yixuan Li, Jason Yosinski, Jeff Clune, Hod Lipson, John Hopcroft.

[Convolutional Clustering for Unsupervised Learning](http://arxiv.org/abs/1511.06241) by Aysegul Dundar, Jonghoon Jin, Eugenio Culurciello.

[Convolutional Color Constancy](http://arxiv.org/abs/1507.00410) by Jonathan T. Barron.

[Convolutional LSTM Network: A Machine Learning Approach for Precipitation Nowcasting](http://arxiv.org/abs/1506.04214) by Xingjian Shi, Zhourong Chen, Hao Wang, Dit-Yan Yeung, Wai-Kin Wong, Wang-chun Woo.

[Convolutional Pose Machines](http://arxiv.org/abs/1602.00134) by Shih-En Wei, Varun Ramakrishna, Takeo Kanade, Yaser Sheikh.

[DAG-Recurrent Neural Networks For Scene Labeling](http://arxiv.org/abs/1509.00552) by Bing Shuai, Zhen Zuo, Gang Wang, Bing Wang.

[Data-dependent Initializations of Convolutional Neural Networks](http://arxiv.org/abs/1511.06856) by Philipp Krähenbühl, Carl Doersch, Jeff Donahue, Trevor Darrell.

[Data-free parameter pruning for Deep Neural Networks](http://arxiv.org/abs/1507.06149) by Suraj Srinivas, R. Venkatesh Babu.

[Decoupled Deep Neural Network for Semi-supervised Semantic Segmentation](http://arxiv.org/abs/1506.04924) by Seunghoon Hong, Hyeonwoo Noh, Bohyung Han.

[DeepBox: Learning Objectness with Convolutional Networks](http://arxiv.org/abs/1505.02146) by Weicheng Kuo, Bharath Hariharan, Jitendra Malik.

[DeepFont: Identify Your Font from An Image](http://arxiv.org/abs/1507.03196) by Zhangyang Wang, Jianchao Yang, Hailin Jin, Eli Shechtman, Aseem Agarwala, Jonathan Brandt, Thomas S. Huang.

[DeepFool: a simple and accurate method to fool deep neural networks](http://arxiv.org/abs/1511.04599) by Seyed-Mohsen Moosavi-Dezfooli, Alhussein Fawzi, Pascal Frossard.

[DeepID-Net: Deformable Deep Convolutional Neural Networks for Object Detection](http://arxiv.org/abs/1412.5661) by Wanli Ouyang, Xiaogang Wang, Xingyu Zeng, Shi Qiu, Ping Luo, Yonglong Tian, Hongsheng Li, Shuo Yang, Zhe Wang, Chen-Change Loy, Xiaoou Tang.

[DeepLogo: Hitting Logo Recognition with the Deep Neural Network Hammer](http://arxiv.org/abs/1510.02131) by Forrest N. Iandola, Anting Shen, Peter Gao, Kurt Keutzer.

[DeepProposal: Hunting Objects by Cascading Deep Convolutional Layers](http://arxiv.org/abs/1510.04445) by Amir Ghodrati, Ali Diba, Marco Pedersoli, Tinne Tuytelaars, Luc Van Gool.

[DeepSaliency: Multi-Task Deep Neural Network Model for Salient Object Detection](http://arxiv.org/abs/1510.05484) by Xi Li, Liming Zhao, Lina Wei, MingHsuan Yang, Fei Wu, Yueting Zhuang, Haibin Ling, Jingdong Wang.

[Deep Attention Recurrent Q-Network](http://arxiv.org/abs/1512.01693) by Ivan Sorokin, Alexey Seleznev, Mikhail Pavlov, Aleksandr Fedorov, Anastasiia Ignateva.

[Deep Captioning with Multimodal Recurrent Neural Networks (m-RNN)](http://arxiv.org/abs/1412.6632) by Junhua Mao, Wei Xu, Yi Yang, Jiang Wang, Zhiheng Huang, Alan Yuille.

[Deep Compositional Question Answering with Neural Module Networks](http://arxiv.org/abs/1511.02799) by Jacob Andreas, Marcus Rohrbach, Trevor Darrell, Dan Klein.

[Deep clustering: Discriminative embeddings for segmentation and separation](http://arxiv.org/abs/1508.04306) by John R. Hershey, Zhuo Chen, Jonathan Le Roux, Shinji Watanabe.

[Deep CNN Ensemble with Data Augmentation for Object Detection](http://arxiv.org/abs/1506.07224) by Jian Guo, Stephen Gould.

[Deep Compositional Captioning: Describing Novel Object Categories without Paired Training Data](http://arxiv.org/abs/1511.05284) by Lisa Anne Hendricks, Subhashini Venugopalan, Marcus Rohrbach, Raymond Mooney, Kate Saenko, Trevor Darrell.

[Deep Convolutional Matching](http://arxiv.org/abs/1506.07656) by Jerome Revaud, Philippe Weinzaepfel, Zaid Harchaoui, Cordelia Schmid.

[Deep Convolutional Networks are Hierarchical Kernel Machines](http://arxiv.org/abs/1508.01084) by Fabio Anselmi, Lorenzo Rosasco, Cheston Tan, Tomaso Poggio.

[Deep Convolutional Networks on Graph-Structured Data](http://arxiv.org/abs/1506.05163) by Mikael Henaff, Joan Bruna, Yann LeCun.

[Deep Fishing: Gradient Features from Deep Nets](http://arxiv.org/abs/1507.06429) by Albert Gordo, Adrien Gaidon, Florent Perronnin.

[Deep Generative Image Models using a Laplacian Pyramid of Adversarial Networks](http://arxiv.org/abs/1506.05751) by Emily Denton, Soumith Chintala, Arthur Szlam, Rob Fergus.

[Deep Kernel Learning](http://arxiv.org/abs/1511.02222) by Andrew Gordon Wilson, Zhiting Hu, Ruslan Salakhutdinov, Eric P. Xing.

[Deep Knowledge Tracing](http://arxiv.org/abs/1506.05908) by Chris Piech, Jonathan Spencer, Jonathan Huang, Surya Ganguli, Mehran Sahami, Leonidas Guibas, Jascha Sohl-Dickstein.

[Deep Learning Face Attributes in the Wild](http://arxiv.org/abs/1411.7766) by Ziwei Liu, Ping Luo, Xiaogang Wang, Xiaoou Tang.

[Deep Learning with S-shaped Rectified Linear Activation Units](http://arxiv.org/abs/1512.07030) by Xiaojie Jin, Chunyan Xu, Jiashi Feng, Yunchao Wei, Junjun Xiong, Shuicheng Yan.

[Deep multi-scale video prediction beyond mean square error](http://arxiv.org/abs/1511.05440) by Michael Mathieu, Camille Couprie, Yann LeCun.

[Deep Networks Resemble Human Feed-forward Vision in Invariant Object Recognition](http://arxiv.org/abs/1508.03929) by Saeed Reza Kheradpisheh, Masoud Ghodrati, Mohammad Ganjtabesh, Timothée Masquelier.

[Deep Networks with Internal Selective Attention through Feedback Connections](http://arxiv.org/abs/1407.3068) by Marijn Stollenga, Jonathan Masci, Faustino Gomez, Jürgen Schmidhuber.

[Deep Neural Networks predict Hierarchical Spatio-temporal Cortical Dynamics of Human Visual Object Recognition](http://arxiv.org/abs/1601.02970) by Radoslaw M. Cichy, Aditya Khosla, Dimitrios Pantazis, Antonio Torralba, Aude Oliva.

[Deep Recurrent Q-Learning for Partially Observable MDPs](http://arxiv.org/abs/1507.06527) by Matthew Hausknecht, Peter Stone.

[Deep Residual Learning for Image Recognition](http://arxiv.org/abs/1512.03385) by Kaiming He, Xiangyu Zhang, Shaoqing Ren, Jian Sun.

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[Search-Convolutional Neural Networks](http://arxiv.org/abs/1511.02136) by James Atwood, Don Towsley.

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[SegNet: A Deep Convolutional Encoder-Decoder Architecture for Image Segmentation](http://arxiv.org/abs/1511.00561) by Vijay Badrinarayanan, Alex Kendall, Roberto Cipolla.

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[Semantic Image Segmentation via Deep Parsing Network](http://arxiv.org/abs/1509.02634) by Ziwei Liu, Xiaoxiao Li, Ping Luo, Chen Change Loy, Xiaoou Tang.

[Semi-supervised Sequence Learning](http://arxiv.org/abs/1511.01432) by Andrew M. Dai, Quoc V. Le.

[SentiCap: Generating Image Descriptions with Sentiments](http://arxiv.org/abs/1510.01431) by Alexander Mathews, Lexing Xie, Xuming He.

[Show and Tell: A Neural Image Caption Generator](http://arxiv.org/abs/1411.4555) by Oriol Vinyals, Alexander Toshev, Samy Bengio, Dumitru Erhan

[Show, Attend and Tell: Neural Image Caption Generation with Visual Attention](http://arxiv.org/abs/1502.03044) by Kelvin Xu, Jimmy Ba, Ryan Kiros, Kyunghyun Cho, Aaron Courville, Ruslan Salakhutdinov, Richard Zemel, Yoshua Bengio.

[Simple Baseline for Visual Question Answering](http://arxiv.org/abs/1512.02167) by Bolei Zhou, Yuandong Tian, Sainbayar Sukhbaatar, Arthur Szlam, Rob Fergus.

[Skip-Thought Vectors](http://arxiv.org/abs/1506.06726) by Ryan Kiros, Yukun Zhu, Ruslan Salakhutdinov, Richard S. Zemel, Antonio Torralba, Raquel Urtasun, Sanja Fidler.

[Sparsifying Neural Network Connections for Face Recognition](http://arxiv.org/abs/1512.01891) by Yi Sun, Xiaogang Wang, Xiaoou Tang.

[Spatial Semantic Regularisation for Large Scale Object Detection](http://arxiv.org/abs/1510.02949) by Damian Mrowca, Marcus Rohrbach, Judy Hoffman, Ronghang Hu, Kate Saenko, Trevor Darrell.

[Spatial Transformer Networks](http://arxiv.org/abs/1506.02025) by Max Jaderberg, Karen Simonyan, Andrew Zisserman, Koray Kavukcuoglu.

[Spiking Deep Networks with LIF Neurons](http://arxiv.org/abs/1510.08829) by Eric Hunsberger, Chris Eliasmith.

[Stacked Attention Networks for Image Question Answering](http://arxiv.org/abs/1511.02274) by Zichao Yang, Xiaodong He, Jianfeng Gao, Li Deng, Alex Smola.

[Stacked What-Where Auto-encoders](http://arxiv.org/abs/1506.02351) by Junbo Zhao, Michael Mathieu, Ross Goroshin, Yann Lecun.

[STC: A Simple to Complex Framework for Weakly-supervised Semantic Segmentation](http://arxiv.org/abs/1509.03150) by Yunchao Wei, Xiaodan Liang, Yunpeng Chen, Xiaohui Shen, Ming-Ming Cheng, Yao Zhao, Shuicheng Yan.

[Stochastic Gradient Made Stable: A Manifold Propagation Approach for Large-Scale Optimization](http://arxiv.org/abs/1506.08350) by Yadong Mu, Wei Liu, Wei Fan.

[StochasticNet: Forming Deep Neural Networks via Stochastic Connectivity](http://arxiv.org/abs/1508.05463) by Mohammad Javad Shafiee, Parthipan Siva, Alexander Wong.

[Studying Very Low Resolution Recognition Using Deep Networks](http://arxiv.org/abs/1601.04153) by Zhangyang Wang, Shiyu Chang, Yingzhen Yang, Ding Liu, Thomas S. Huang.

[Super-Resolution with Deep Convolutional Sufficient Statistics](http://arxiv.org/abs/1511.05666) by Joan Bruna, Pablo Sprechmann, Yann LeCun.

[Superpixel Convolutional Networks using Bilateral Inceptions](http://arxiv.org/abs/1511.06739) by Raghudeep Gadde, Varun Jampani, Martin Kiefel, Peter V. Gehler.

[Structured Depth Prediction in Challenging Monocular Video Sequences](http://arxiv.org/abs/1511.06070) by Miaomiao Liu, Mathieu Salzmann, Xuming He.

[Structured Memory for Neural Turing Machines](http://arxiv.org/abs/1510.03931) by Wei Zhang, Yang Yu.

[Symmetry-invariant optimization in deep networks](http://arxiv.org/abs/1511.01754) by Vijay Badrinarayanan, Bamdev Mishra, Roberto Cipolla.

[Task Loss Estimation for Sequence Prediction](http://arxiv.org/abs/1511.06456) by Dzmitry Bahdanau, Dmitriy Serdyuk, Philémon Brakel, Nan Rosemary Ke, Jan Chorowski, Aaron Courville, Yoshua Bengio.

[Teaching Machines to Read and Comprehend](http://arxiv.org/abs/1506.03340) by Karl Moritz Hermann, Tomáš Kočiský, Edward Grefenstette, Lasse Espeholt, Will Kay, Mustafa Suleyman, Phil Blunsom.

[Text-Attentional Convolutional Neural Networks for Scene Text Detection](http://arxiv.org/abs/1510.03283) by Tong He, Weilin Huang, Yu Qiao, Jian Yao.

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[The Unreasonable Effectiveness of Recurrent Neural Networks](http://karpathy.github.io/2015/05/21/rnn-effectiveness/) by Andrej Karpathy.

[Towards Automatic Image Editing: Learning to See another You](http://arxiv.org/abs/1511.08446) by Amir Ghodrati, Xu Jia, Marco Pedersoli, Tinne Tuytelaars.

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[Towards Good Practices for Very Deep Two-Stream ConvNets](http://arxiv.org/abs/1507.02159) by Limin Wang, Yuanjun Xiong, Zhe Wang, Yu Qiao.

[Towards universal neural nets: Gibbs machines and ACE](http://arxiv.org/abs/1508.06585) by Galin Georgiev.

[Towards Vision-Based Deep Reinforcement Learning for Robotic Motion Control](http://arxiv.org/abs/1511.03791) by Fangyi Zhang, Juergen Leitner, Michael Milford, Ben Upcroft, Peter Corke.

[Train faster, generalize better: Stability of stochastic gradient descent](http://arxiv.org/abs/1509.01240) by Moritz Hardt, Benjamin Recht, Yoram Singer.

[Training a Convolutional Neural Network for Appearance-Invariant Place Recognition](http://arxiv.org/abs/1505.07428) by Ruben Gomez-Ojeda, Manuel Lopez-Antequera, Nicolai Petkov, Javier Gonzalez-Jimenez.

[Training Deep Networks with Structured Layers by Matrix Backpropagation](http://arxiv.org/abs/1509.07838) by Catalin Ionescu, Orestis Vantzos, Cristian Sminchisescu.

[Training Deeper Convolutional Networks with Deep Supervision](http://arxiv.org/abs/1505.02496) by Liwei Wang, Chen-Yu Lee, Zhuowen Tu, Svetlana Lazebnik.

[Trainable performance upper bounds for image and video captioning](http://arxiv.org/abs/1511.04590) by Li Yao, Nicolas Ballas, Kyunghyun Cho, John R. Smith, Yoshua Bengio.

[Training Very Deep Networks](http://arxiv.org/abs/1507.06228) by Rupesh Kumar Srivastava, Klaus Greff, Jürgen Schmidhuber.

[Transfer Learning from Deep Features for Remote Sensing and Poverty Mapping](http://arxiv.org/abs/1510.00098) by Michael Xie, Neal Jean, Marshall Burke, David Lobell, Stefano Ermon.

[Translating Videos to Natural Language Using Deep Recurrent Neural Networks](http://arxiv.org/abs/1412.4729) by Subhashini Venugopalan, Huijuan Xu, Jeff Donahue, Marcus Rohrbach, Raymond Mooney, Kate Saenko.

[Unconstrained Face Verification using Deep CNN Features](http://arxiv.org/abs/1508.01722) by Jun-Cheng Chen, Vishal M. Patel, Rama Chellappa.

[Un-regularizing: approximate proximal point and faster stochastic algorithms for empirical risk minimization](http://arxiv.org/abs/1506.07512) by Roy Frostig, Rong Ge, Sham M. Kakade, Aaron Sidford.

[Understanding Locally Competitive Networks](http://arxiv.org/abs/1410.1165) by Rupesh Kumar Srivastava, Jonathan Masci, Faustino Gomez, Jürgen Schmidhuber.

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[Unsupervised Extraction of Video Highlights Via Robust Recurrent Auto-encoders](http://arxiv.org/abs/1510.01442) by Huan Yang, Baoyuan Wang, Stephen Lin, David Wipf, Minyi Guo, Baining Guo.

[Unsupervised Learning of Video Representations using LSTMs](http://arxiv.org/abs/1502.04681) by Nitish Srivastava, Elman Mansimov, Ruslan Salakhutdinov.

[Unsupervised Learning of Visual Representations using Videos](http://arxiv.org/abs/1505.00687) by Xiaolong Wang, Abhinav Gupta.

[Unsupervised Semantic Parsing of Video Collections](http://arxiv.org/abs/1506.08438) by Ozan Sener, Amir Zamir, Silvio Savarese, Ashutosh Saxena.

[Unsupervised Visual Representation Learning by Context Prediction](http://arxiv.org/abs/1505.05192) by Carl Doersch, Abhinav Gupta, Alexei A. Efros.

[Using Descriptive Video Services to Create a Large Data Source for Video Annotation Research](http://arxiv.org/abs/1503.01070) by Atousa Torabi, Christopher Pal, Hugo Larochelle, Aaron Courville.

[Variable Rate Image Compression with Recurrent Neural Networks](http://arxiv.org/abs/1511.06085) by George Toderici, Sean M. O’Malley, Sung Jin Hwang, Damien Vincent, David Minnen, Shumeet Baluja, Michele Covell, Rahul Sukthankar.

[Video Paragraph Captioning using Hierarchical Recurrent Neural Networks](http://arxiv.org/abs/1510.07712) by Haonan Yu, Jiang Wang, Zhiheng Huang, Yi Yang, Wei Xu.

[VISALOGY: Answering Visual Analogy Questions](http://arxiv.org/abs/1510.08973) by Fereshteh Sadeghi, C. Lawrence Zitnick, Ali Farhadi.

[Visualizing and Understanding Deep Texture Representations](http://arxiv.org/abs/1511.05197) by Tsung-Yu Lin, Subhransu Maji.

[Visualizing and Understanding Recurrent Networks](http://arxiv.org/abs/1506.02078) by Andrej Karpathy, Justin Johnson, Fei-Fei Li.

[Visualizing Deep Convolutional Neural Networks Using Natural Pre-Images](http://arxiv.org/abs/1512.02017) by Aravindh Mahendran, Andrea Vedaldi.

[Visual7W: Grounded Question Answering in Images](http://arxiv.org/abs/1511.03416) by Yuke Zhu, Oliver Groth, Michael Bernstein, Li Fei-Fei.

[Watch and Learn: Semi-Supervised Learning of Object Detectors from Videos](http://arxiv.org/abs/1505.05769) by Ishan Misra, Abhinav Shrivastava, Martial Hebert.

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[Weakly-Supervised Alignment of Video With Text](http://arxiv.org/abs/1505.06027) by P. Bojanowski, R. Lagugie, Edouard Grave, Francis Bach, I. Laptev, J. Ponce, C. Schmid.

[Weakly Supervised Deep Detection Networks](http://arxiv.org/abs/1511.02853) by Hakan Bilen, Andrea Vedaldi.

[Weight Uncertainty in Neural Networks](http://arxiv.org/abs/1505.05424) by Charles Blundell, Julien Cornebise, Koray Kavukcuoglu, Daan Wierstra.

[What is Holding Back Convnets for Detection?](http://arxiv.org/abs/1508.02844) by Bojan Pepik, Rodrigo Benenson, Tobias Ritschel, Bernt Schiele.

[What to talk about and how? Selective Generation using LSTMs with Coarse-to-Fine Alignment](http://arxiv.org/abs/1509.00838) by Hongyuan Mei, Mohit Bansal, Matthew R. Walter.

[What can we learn about CNNs from a large scale controlled object dataset?](http://arxiv.org/abs/1512.01320) by Ali Borji, Saeed Izadi, Laurent Itti.

[Where To Look: Focus Regions for Visual Question Answering](http://arxiv.org/abs/1511.07394) by Kevin J. Shih, Saurabh Singh, Derek Hoiem.

[Who’s Behind the Camera? Identifying the Authorship of a Photograph](http://arxiv.org/abs/1508.05038) by Christopher Thomas, Adriana Kovashka.

[Why Regularized Auto-Encoders learn Sparse Representation?](http://arxiv.org/abs/1505.05561) by Devansh Arpit, Yingbo Zhou, Hung Ngo, Venu Govindaraju.

[WordRank: Learning Word Embeddings via Robust Ranking](http://arxiv.org/abs/1506.02761) by Shihao Ji, Hyokun Yun, Pinar Yanardag, Shin Matsushima, S. V. N. Vishwanathan.

[You Only Look Once: Unified, Real-Time Object Detection](http://arxiv.org/abs/1506.02640) by Joseph Redmon, Santosh Divvala, Ross Girshick, Ali Farhadi.

[Zero-Shot Learning via Semantic Similarity Embedding](http://arxiv.org/abs/1509.04767) by Ziming Zhang, Venkatesh Saligrama.

[ZNN - A Fast and Scalable Algorithm for Training 3D Convolutional Networks on Multi-Core and Many-Core Shared Memory Machines](http://arxiv.org/abs/1510.06706) by Aleksandar Zlateski, Kisuk Lee, H. Sebastian Seung.

[Zoom Better to See Clearer: Huamn Part Segmentation with Auto Zoom Net](http://arxiv.org/abs/1511.06881) by Fangting Xia, Peng Wang, Liang-Chieh Chen, Alan L. Yuille.

### **Dataset（数据集）**

[Caltech 101](http://www.vision.caltech.edu/Image_Datasets/Caltech101/) by L. Fei-Fei, R. Fergus and P. Perona.

[Caltech 256](http://www.vision.caltech.edu/Image_Datasets/Caltech256/) by G. Griffin, AD. Holub, P. Perona.

[CIFAR-10](http://www.cs.toronto.edu/~kriz/cifar.html) by Alex Krizhevsky, Vinod Nair, and Geoffrey Hinton.

[CIFAR-100](http://www.cs.toronto.edu/~kriz/cifar.html) by Alex Krizhevsky, Vinod Nair, and Geoffrey Hinton.

[The Comprehensive Cars (CompCars) dataset](http://mmlab.ie.cuhk.edu.hk/datasets/comp_cars/index.html) by Linjie Yang, Ping Luo, Chen Change Loy, Xiaoou Tang.

[Flickr30k](http://shannon.cs.illinois.edu/DenotationGraph/) by Peter Young, Alice Lai, Micah Hodosh, Julia Hockenmaier.

[ImageNet](http://image-net.org/download-images) by Olga Russakovsky, Jia Deng, Hao Su, Jonathan Krause, Sanjeev Satheesh, Sean Ma, Zhiheng Huang, Andrej Karpathy, Aditya Khosla, Michael Bernstein, Alexander C. Berg and Li Fei-Fei.

[Microsoft COCO](http://mscoco.org/) by Microsoft Research.

[MNIST](http://yann.lecun.com/exdb/mnist/) by Yann LeCun, Corinna Cortes, Christopher J.C. Burges.

[Places](http://places.csail.mit.edu/) by MIT Computer Science and Artificial Intelligence Laboratory.

[STL-10](http://cs.stanford.edu/~acoates/stl10/) by Adam Coates, Honglak Lee, Andrew Y. Ng.

[SVHN](http://ufldl.stanford.edu/housenumbers/) by Yuval Netzer, Tao Wang, Adam Coates, Alessandro Bissacco, Bo Wu, Andrew Y. Ng.

[WWW Crowd Dataset](http://www.ee.cuhk.edu.hk/~jshao/WWWCrowdDataset.html) by Jing Shao, Kai Kang, Chen Change Loy, and Xiaogang Wang.

### **Podcast, Talks, etc.(播客，访谈等等)**

[Talking Machines](http://www.thetalkingmachines.com/) hosted by Katherine Gorman and Ryan Adams.

[Machine Learning & Computer Vision Talks](http://www.computervisiontalks.com/) by computervisiontalks.

[How we’re teaching computers to understand pictures](http://www.ted.com/talks/fei_fei_li_how_we_re_teaching_computers_to_understand_pictures?language=en) by Fei-Fei Li, Stanford University.

[Deep Learning Community](https://plus.google.com/communities/112866381580457264725)

### **Amazon Web Service Public AMI for Deep Learning（亚马逊提供的用于深度学习的公共AMI网络服务）**

*I configured 2 types of GPU instances that are available in AWS and installed necessary software for Deep Learning practice. The first one is DGYDLGPUv4. It is a machine that provides 8-core CPU, 15GB RAM, 500GB SSD and 1 NVIDIA Grid K520 GPU, you can use it to learn Deep Learning or conduct normal size experiment. If you need even more computing resources, you can choose DGYDLGPUXv1. This new released GPU instance offered a 32-core CPU, 60GB RAM, 500GB SSD and 4 NVIDIA Grid K520 GPUs.*

*NVIDIA Driver, CUDA Toolkit 7.0, cuDNNv2, Anaconda, Theano are preinstalled.*

*Currently they are only available at Asia Pacific (Singapore). You can copy the instance to your close region.*

*If you are doing analysis or experiments, I suggest you to request spot instance instead of on-demand instance. This will save you a lot of costs.*

* ****DGYDLGPUv4**** (ami-ba516ee8) [Based on g2.2xlarge]
* ****DGYDLGPUXv1**** (ami-52516e00) [Based on g2.8xlarge]

*Currently, my build of Caffe in the instance is failed. You can use the AMI that is provided by Caffe community. You can get more details from [here](https://github.com/BVLC/caffe/wiki/Caffe-on-EC2-Ubuntu-14.04-Cuda-7)*

*So far the instance is only available at US East (N. Virginia)*

* ****Caffe/CuDNN built 2015-05-04**** (ami-763a331e) [For both g2.2xlarge and g2.8xlarge]

### **Practical Deep Neural Networks - GPU computing perspective(实用的深度神经网络—从GPU计算的角度来看)**

The following entries are materials I use in the workshop.

#### **Slides**

* [Introduction](http://rt.dgyblog.com/res/dlworkshop/introduction.pdf)
* [Python Platform for Scientific Computing](http://rt.dgyblog.com/res/dlworkshop/python_for_computing.pdf)
* [Theano Crash Course](http://rt.dgyblog.com/res/dlworkshop/theano_crash_course.pdf)
* [Machine Learning Basics](http://rt.dgyblog.com/res/dlworkshop/machine_learning_basics.pdf)
* [Softmax Regression](http://rt.dgyblog.com/res/dlworkshop/softmax.pdf)
* [Feedforward Neural Networks](http://rt.dgyblog.com/res/dlworkshop/mlp.pdf)
* [Convolutional Neural Networks](http://rt.dgyblog.com/res/dlworkshop/convnet.pdf)
* [Recurrent Neural Networks](http://rt.dgyblog.com/res/dlworkshop/rnn.pdf)

#### **Practical tutorials**

* [Python Warm-up, pre-processing](http://rt.dgyblog.com/tut/tut-dl-basics.html)
* [Feedforward Layer](http://rt.dgyblog.com/tut/tut-layer.html)
* [Softmax Regression](http://rt.dgyblog.com/tut/tut-svm-softmax.html)
* [Multi Layer Perceptron Network](http://rt.dgyblog.com/tut/tut-mlp.html)
* [Feedforward Model](http://rt.dgyblog.com/tut/tut-feedforward-model.html)
* [Auto-encoder](http://rt.dgyblog.com/tut/tut-autoencoder.html)
* [Convolutional Neural Networks](http://rt.dgyblog.com/tut/tut-convnet.html)
* [Recurrent Neural Networks](http://rt.dgyblog.com/tut/tut-rnn.html)

#### **Codes**

* [Telauges](https://github.com/duguyue100/telaugesa)
  + A new deep learning library for learning DL.
  + MLP Layers: Tanh Layer, Sigmoid Layer, Identity Layer, ReLU Layer
  + Softmax Regression
  + ConvNet layers: Tanh Layer, Sigmoid Layer, Identity Layer, ReLU Layer
  + Max-Pooling layer
  + Max-Pooling same size
  + Feedforward Model
  + Auto-Encoder Model
  + SGD, Adagrad, Adadelta, RMSprop, Adam
  + Dropout