Machine Learning & Deep Learning Tutorials

* This repository contains a topic-wise curated list of Machine Learning and Deep Learning tutorials, articles and other resources. Other awesome lists can be found in this [list](https://github.com/sindresorhus/awesome).
* If you want to contribute to this list, please read [Contributing Guidelines](https://github.com/ujjwalkarn/Machine-Learning-Tutorials/blob/master/contributing.md).
* [Curated list of R tutorials for Data Science, NLP and Machine Learning](https://github.com/ujjwalkarn/DataScienceR).
* [Curated list of Python tutorials for Data Science, NLP and Machine Learning](https://github.com/ujjwalkarn/DataSciencePython).

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  + [Bootstraping](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#boot)
* [Deep Learning](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#deep)
  + [Frameworks](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#frame)
  + [Feed Forward Networks](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#feed)
  + [Recurrent Neural Nets, LSTM, GRU](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#rnn)
  + [Restricted Boltzmann Machine, DBNs](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#rbm)
  + [Autoencoders](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#auto)
  + [Convolutional Neural Nets](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#cnn)
  + [Graph Representation Learning](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#nrl)
* [Natural Language Processing](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#nlp)
  + [Topic Modeling, LDA](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#topic)
  + [Word2Vec](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#word2vec)
* [Computer Vision](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#vision)
* [Support Vector Machine](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#svm)
* [Reinforcement Learning](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#rl)
* [Decision Trees](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#dt)
* [Random Forest / Bagging](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#rf)
* [Boosting](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#gbm)
* [Ensembles](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#ensem)
* [Stacking Models](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#stack)
* [VC Dimension](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#vc)
* [Bayesian Machine Learning](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#bayes)
* [Semi Supervised Learning](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#semi)
* [Optimizations](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#opt)
* [Other Useful Tutorials](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#other)

Introduction

* [Machine Learning Course by Andrew Ng (Stanford University)](https://www.coursera.org/learn/machine-learning)
* [Curated List of Machine Learning Resources](https://hackr.io/tutorials/learn-machine-learning-ml)
* [In-depth introduction to machine learning in 15 hours of expert videos](http://www.dataschool.io/15-hours-of-expert-machine-learning-videos/)
* [An Introduction to Statistical Learning](http://www-bcf.usc.edu/~gareth/ISL/)
* [List of Machine Learning University Courses](https://github.com/prakhar1989/awesome-courses#machine-learning)
* [Machine Learning for Software Engineers](https://github.com/ZuzooVn/machine-learning-for-software-engineers)
* [Dive into Machine Learning](https://github.com/hangtwenty/dive-into-machine-learning)
* [A curated list of awesome Machine Learning frameworks, libraries and software](https://github.com/josephmisiti/awesome-machine-learning)
* [A curated list of awesome data visualization libraries and resources.](https://github.com/fasouto/awesome-dataviz)
* [An awesome Data Science repository to learn and apply for real world problems](https://github.com/okulbilisim/awesome-datascience)
* [The Open Source Data Science Masters](http://datasciencemasters.org/)
* [Machine Learning FAQs on Cross Validated](http://stats.stackexchange.com/questions/tagged/machine-learning)
* [Machine Learning algorithms that you should always have a strong understanding of](https://www.quora.com/What-are-some-Machine-Learning-algorithms-that-you-should-always-have-a-strong-understanding-of-and-why)
* [Difference between Linearly Independent, Orthogonal, and Uncorrelated Variables](http://terpconnect.umd.edu/~bmomen/BIOM621/LineardepCorrOrthogonal.pdf)
* [List of Machine Learning Concepts](https://en.wikipedia.org/wiki/List_of_machine_learning_concepts)
* [Slides on Several Machine Learning Topics](http://www.slideshare.net/pierluca.lanzi/presentations)
* [MIT Machine Learning Lecture Slides](http://www.ai.mit.edu/courses/6.867-f04/lectures.html)
* [Comparison Supervised Learning Algorithms](http://www.dataschool.io/comparing-supervised-learning-algorithms/)
* [Learning Data Science Fundamentals](http://www.dataschool.io/learning-data-science-fundamentals/)
* [Machine Learning mistakes to avoid](https://medium.com/@nomadic_mind/new-to-machine-learning-avoid-these-three-mistakes-73258b3848a4#.lih061l3l)
* [Statistical Machine Learning Course](http://www.stat.cmu.edu/~larry/=sml/)
* [TheAnalyticsEdge edX Notes and Codes](https://github.com/pedrosan/TheAnalyticsEdge)
* [Have Fun With Machine Learning](https://github.com/humphd/have-fun-with-machine-learning)
* [Twitter's Most Shared #machineLearning Content From The Past 7 Days](http://theherdlocker.com/tweet/popularity/machinelearning)

Interview Resources

* [41 Essential Machine Learning Interview Questions (with answers)](https://www.springboard.com/blog/machine-learning-interview-questions/)
* [How can a computer science graduate student prepare himself for data scientist interviews?](https://www.quora.com/How-can-a-computer-science-graduate-student-prepare-himself-for-data-scientist-machine-learning-intern-interviews)
* [How do I learn Machine Learning?](https://www.quora.com/How-do-I-learn-machine-learning-1)
* [FAQs about Data Science Interviews](https://www.quora.com/topic/Data-Science-Interviews/faq)
* [What are the key skills of a data scientist?](https://www.quora.com/What-are-the-key-skills-of-a-data-scientist)
* [The Big List of DS/ML Interview Resources](https://towardsdatascience.com/the-big-list-of-ds-ml-interview-resources-2db4f651bd63)

Artificial Intelligence

* [Awesome Artificial Intelligence (GitHub Repo)](https://github.com/owainlewis/awesome-artificial-intelligence)
* [UC Berkeley CS188 Intro to AI](http://ai.berkeley.edu/home.html), [Lecture Videos](http://ai.berkeley.edu/lecture_videos.html), [2](https://www.youtube.com/watch?v=W1S-HSakPTM)
* [Programming Community Curated Resources for learning Artificial Intelligence](https://hackr.io/tutorials/learn-artificial-intelligence-ai)
* [MIT 6.034 Artificial Intelligence Lecture Videos](https://www.youtube.com/playlist?list=PLUl4u3cNGP63gFHB6xb-kVBiQHYe_4hSi), [Complete Course](https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-034-artificial-intelligence-fall-2010/)
* [edX course | Klein & Abbeel](https://courses.edx.org/courses/BerkeleyX/CS188x_1/1T2013/info)
* [Udacity Course | Norvig & Thrun](https://www.udacity.com/course/intro-to-artificial-intelligence--cs271)
* [TED talks on AI](http://www.ted.com/playlists/310/talks_on_artificial_intelligen)

Genetic Algorithms

* [Genetic Algorithms Wikipedia Page](https://en.wikipedia.org/wiki/Genetic_algorithm)
* [Simple Implementation of Genetic Algorithms in Python (Part 1)](http://outlace.com/miniga.html), [Part 2](http://outlace.com/miniga_addendum.html)
* [Genetic Algorithms vs Artificial Neural Networks](http://stackoverflow.com/questions/1402370/when-to-use-genetic-algorithms-vs-when-to-use-neural-networks)
* [Genetic Algorithms Explained in Plain English](http://www.ai-junkie.com/ga/intro/gat1.html)
* [Genetic Programming](https://en.wikipedia.org/wiki/Genetic_programming)
  + [Genetic Programming in Python (GitHub)](https://github.com/trevorstephens/gplearn)
  + [Genetic Alogorithms vs Genetic Programming (Quora)](https://www.quora.com/Whats-the-difference-between-Genetic-Algorithms-and-Genetic-Programming), [StackOverflow](http://stackoverflow.com/questions/3819977/what-are-the-differences-between-genetic-algorithms-and-genetic-programming)

Statistics

* [Stat Trek Website](http://stattrek.com/) - A dedicated website to teach yourselves Statistics
* [Learn Statistics Using Python](https://github.com/rouseguy/intro2stats) - Learn Statistics using an application-centric programming approach
* [Statistics for Hackers | Slides | @jakevdp](https://speakerdeck.com/jakevdp/statistics-for-hackers) - Slides by Jake VanderPlas
* [Online Statistics Book](http://onlinestatbook.com/2/index.html) - An Interactive Multimedia Course for Studying Statistics
* [What is a Sampling Distribution?](http://stattrek.com/sampling/sampling-distribution.aspx)
* Tutorials
  + [AP Statistics Tutorial](http://stattrek.com/tutorials/ap-statistics-tutorial.aspx)
  + [Statistics and Probability Tutorial](http://stattrek.com/tutorials/statistics-tutorial.aspx)
  + [Matrix Algebra Tutorial](http://stattrek.com/tutorials/matrix-algebra-tutorial.aspx)
* [What is an Unbiased Estimator?](https://www.physicsforums.com/threads/what-is-an-unbiased-estimator.547728/)
* [Goodness of Fit Explained](https://en.wikipedia.org/wiki/Goodness_of_fit)
* [What are QQ Plots?](http://onlinestatbook.com/2/advanced_graphs/q-q_plots.html)
* [OpenIntro Statistics](https://www.openintro.org/stat/textbook.php?stat_book=os) - Free PDF textbook

Useful Blogs

* [Edwin Chen's Blog](http://blog.echen.me/) - A blog about Math, stats, ML, crowdsourcing, data science
* [The Data School Blog](http://www.dataschool.io/) - Data science for beginners!
* [ML Wave](http://mlwave.com/) - A blog for Learning Machine Learning
* [Andrej Karpathy](http://karpathy.github.io/) - A blog about Deep Learning and Data Science in general
* [Colah's Blog](http://colah.github.io/) - Awesome Neural Networks Blog
* [Alex Minnaar's Blog](http://alexminnaar.com/) - A blog about Machine Learning and Software Engineering
* [Statistically Significant](http://andland.github.io/) - Andrew Landgraf's Data Science Blog
* [Simply Statistics](http://simplystatistics.org/) - A blog by three biostatistics professors
* [Yanir Seroussi's Blog](https://yanirseroussi.com/) - A blog about Data Science and beyond
* [fastML](http://fastml.com/) - Machine learning made easy
* [Trevor Stephens Blog](http://trevorstephens.com/) - Trevor Stephens Personal Page
* [no free hunch | kaggle](http://blog.kaggle.com/) - The Kaggle Blog about all things Data Science
* [A Quantitative Journey | outlace](http://outlace.com/) - learning quantitative applications
* [r4stats](http://r4stats.com/) - analyze the world of data science, and to help people learn to use R
* [Variance Explained](http://varianceexplained.org/) - David Robinson's Blog
* [AI Junkie](http://www.ai-junkie.com/) - a blog about Artificial Intellingence
* [Deep Learning Blog by Tim Dettmers](http://timdettmers.com/) - Making deep learning accessible
* [J Alammar's Blog](http://jalammar.github.io/)- Blog posts about Machine Learning and Neural Nets
* [Adam Geitgey](https://medium.com/@ageitgey/machine-learning-is-fun-80ea3ec3c471#.f7vwrtfne) - Easiest Introduction to machine learning
* [Ethen's Notebook Collection](https://github.com/ethen8181/machine-learning) - Continuously updated machine learning documentations (mainly in Python3). Contents include educational implementation of machine learning algorithms from scratch and open-source library usage

Resources on Quora

* [Most Viewed Machine Learning writers](https://www.quora.com/topic/Machine-Learning/writers)
* [Data Science Topic on Quora](https://www.quora.com/Data-Science)
* [William Chen's Answers](https://www.quora.com/William-Chen-6/answers)
* [Michael Hochster's Answers](https://www.quora.com/Michael-Hochster/answers)
* [Ricardo Vladimiro's Answers](https://www.quora.com/Ricardo-Vladimiro-1/answers)
* [Storytelling with Statistics](https://datastories.quora.com/)
* [Data Science FAQs on Quora](https://www.quora.com/topic/Data-Science/faq)
* [Machine Learning FAQs on Quora](https://www.quora.com/topic/Machine-Learning/faq)

Kaggle Competitions WriteUp

* [How to almost win Kaggle Competitions](https://yanirseroussi.com/2014/08/24/how-to-almost-win-kaggle-competitions/)
* [Convolution Neural Networks for EEG detection](http://blog.kaggle.com/2015/10/05/grasp-and-lift-eeg-detection-winners-interview-3rd-place-team-hedj/)
* [Facebook Recruiting III Explained](http://alexminnaar.com/tag/kaggle-competitions.html)
* [Predicting CTR with Online ML](http://mlwave.com/predicting-click-through-rates-with-online-machine-learning/)
* [How to Rank 10% in Your First Kaggle Competition](https://dnc1994.com/2016/05/rank-10-percent-in-first-kaggle-competition-en/)

Cheat Sheets

* [Probability Cheat Sheet](http://static1.squarespace.com/static/54bf3241e4b0f0d81bf7ff36/t/55e9494fe4b011aed10e48e5/1441352015658/probability_cheatsheet.pdf), [Source](http://www.wzchen.com/probability-cheatsheet/)
* [Machine Learning Cheat Sheet](https://github.com/soulmachine/machine-learning-cheat-sheet)
* [ML Compiled](https://ml-compiled.readthedocs.io/en/latest/)

Classification

* [Does Balancing Classes Improve Classifier Performance?](http://www.win-vector.com/blog/2015/02/does-balancing-classes-improve-classifier-performance/)
* [What is Deviance?](http://stats.stackexchange.com/questions/6581/what-is-deviance-specifically-in-cart-rpart)
* [When to choose which machine learning classifier?](http://stackoverflow.com/questions/2595176/when-to-choose-which-machine-learning-classifier)
* [What are the advantages of different classification algorithms?](https://www.quora.com/What-are-the-advantages-of-different-classification-algorithms)
* [ROC and AUC Explained](http://www.dataschool.io/roc-curves-and-auc-explained/) ([related video](https://youtu.be/OAl6eAyP-yo))
* [An introduction to ROC analysis](https://ccrma.stanford.edu/workshops/mir2009/references/ROCintro.pdf)
* [Simple guide to confusion matrix terminology](http://www.dataschool.io/simple-guide-to-confusion-matrix-terminology/)

Linear Regression

* [General](https://github.com/ujjwalkarn/Machine-Learning-Tutorials" \l "general-)
  + [Assumptions of Linear Regression](http://pareonline.net/getvn.asp?n=2&v=8), [Stack Exchange](http://stats.stackexchange.com/questions/16381/what-is-a-complete-list-of-the-usual-assumptions-for-linear-regression)
  + [Linear Regression Comprehensive Resource](http://people.duke.edu/~rnau/regintro.htm)
  + [Applying and Interpreting Linear Regression](http://www.dataschool.io/applying-and-interpreting-linear-regression/)
  + [What does having constant variance in a linear regression model mean?](http://stats.stackexchange.com/questions/52089/what-does-having-constant-variance-in-a-linear-regression-model-mean/52107?stw=2#52107)
  + [Difference between linear regression on y with x and x with y](http://stats.stackexchange.com/questions/22718/what-is-the-difference-between-linear-regression-on-y-with-x-and-x-with-y?lq=1)
  + [Is linear regression valid when the dependant variable is not normally distributed?](https://www.researchgate.net/post/Is_linear_regression_valid_when_the_outcome_dependant_variable_not_normally_distributed)
* Multicollinearity and VIF
  + [Dummy Variable Trap | Multicollinearity](https://en.wikipedia.org/wiki/Multicollinearity)
  + [Dealing with multicollinearity using VIFs](https://jonlefcheck.net/2012/12/28/dealing-with-multicollinearity-using-variance-inflation-factors/)
* [Residual Analysis](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#residuals-)
  + [Interpreting plot.lm() in R](http://stats.stackexchange.com/questions/58141/interpreting-plot-lm)
  + [How to interpret a QQ plot?](http://stats.stackexchange.com/questions/101274/how-to-interpret-a-qq-plot?lq=1)
  + [Interpreting Residuals vs Fitted Plot](http://stats.stackexchange.com/questions/76226/interpreting-the-residuals-vs-fitted-values-plot-for-verifying-the-assumptions)
* [Outliers](https://github.com/ujjwalkarn/Machine-Learning-Tutorials#outliers-)
  + [How should outliers be dealt with?](http://stats.stackexchange.com/questions/175/how-should-outliers-be-dealt-with-in-linear-regression-analysis)
* [Elastic Net](https://en.wikipedia.org/wiki/Elastic_net_regularization)
  + [Regularization and Variable Selection via the Elastic Net](https://web.stanford.edu/~hastie/Papers/elasticnet.pdf)

Logistic Regression

* [Logistic Regression Wiki](https://en.wikipedia.org/wiki/Logistic_regression)
* [Geometric Intuition of Logistic Regression](http://florianhartl.com/logistic-regression-geometric-intuition.html)
* [Obtaining predicted categories (choosing threshold)](http://stats.stackexchange.com/questions/25389/obtaining-predicted-values-y-1-or-0-from-a-logistic-regression-model-fit)
* [Residuals in logistic regression](http://stats.stackexchange.com/questions/1432/what-do-the-residuals-in-a-logistic-regression-mean)
* [Difference between logit and probit models](http://stats.stackexchange.com/questions/20523/difference-between-logit-and-probit-models#30909), [Logistic Regression Wiki](https://en.wikipedia.org/wiki/Logistic_regression), [Probit Model Wiki](https://en.wikipedia.org/wiki/Probit_model)
* [Pseudo R2 for Logistic Regression](http://stats.stackexchange.com/questions/3559/which-pseudo-r2-measure-is-the-one-to-report-for-logistic-regression-cox-s), [How to calculate](http://stats.stackexchange.com/questions/8511/how-to-calculate-pseudo-r2-from-rs-logistic-regression), [Other Details](http://www.ats.ucla.edu/stat/mult_pkg/faq/general/Psuedo_RSquareds.htm)
* [Guide to an in-depth understanding of logistic regression](http://www.dataschool.io/guide-to-logistic-regression/)

Model Validation using Resampling

* [Resampling Explained](https://en.wikipedia.org/wiki/Resampling_(statistics))
* [Partioning data set in R](http://stackoverflow.com/questions/13536537/partitioning-data-set-in-r-based-on-multiple-classes-of-observations)
* [Implementing hold-out Validaion in R](http://stackoverflow.com/questions/22972854/how-to-implement-a-hold-out-validation-in-r), [2](http://www.gettinggeneticsdone.com/2011/02/split-data-frame-into-testing-and.html)

* [Cross Validation](https://en.wikipedia.org/wiki/Cross-validation_(statistics))
  + [How to use cross-validation in predictive modeling](http://stuartlacy.co.uk/2016/02/04/how-to-correctly-use-cross-validation-in-predictive-modelling/)
  + [Training with Full dataset after CV?](http://stats.stackexchange.com/questions/11602/training-with-the-full-dataset-after-cross-validation)
  + [Which CV method is best?](http://stats.stackexchange.com/questions/103459/how-do-i-know-which-method-of-cross-validation-is-best)
  + [Variance Estimates in k-fold CV](http://stats.stackexchange.com/questions/31190/variance-estimates-in-k-fold-cross-validation)
  + [Is CV a subsitute for Validation Set?](http://stats.stackexchange.com/questions/18856/is-cross-validation-a-proper-substitute-for-validation-set)
  + [Choice of k in k-fold CV](http://stats.stackexchange.com/questions/27730/choice-of-k-in-k-fold-cross-validation)
  + [CV for ensemble learning](http://stats.stackexchange.com/questions/102631/k-fold-cross-validation-of-ensemble-learning)
  + [k-fold CV in R](http://stackoverflow.com/questions/22909197/creating-folds-for-k-fold-cv-in-r-using-caret)
  + [Good Resources](http://www.chioka.in/tag/cross-validation/)
  + Overfitting and Cross Validation
    - [Preventing Overfitting the Cross Validation Data | Andrew Ng](http://ai.stanford.edu/~ang/papers/cv-final.pdf)
    - [Over-fitting in Model Selection and Subsequent Selection Bias in Performance Evaluation](http://www.jmlr.org/papers/volume11/cawley10a/cawley10a.pdf)
    - [CV for detecting and preventing Overfitting](http://www.autonlab.org/tutorials/overfit10.pdf)
    - [How does CV overcome the Overfitting Problem](http://stats.stackexchange.com/questions/9053/how-does-cross-validation-overcome-the-overfitting-problem)

* [Bootstrapping](https://en.wikipedia.org/wiki/Bootstrapping_(statistics))
  + [Why Bootstrapping Works?](http://stats.stackexchange.com/questions/26088/explaining-to-laypeople-why-bootstrapping-works)
  + [Good Animation](https://www.stat.auckland.ac.nz/~wild/BootAnim/)
  + [Example of Bootstapping](http://statistics.about.com/od/Applications/a/Example-Of-Bootstrapping.htm)
  + [Understanding Bootstapping for Validation and Model Selection](http://stats.stackexchange.com/questions/14516/understanding-bootstrapping-for-validation-and-model-selection?rq=1)
  + [Cross Validation vs Bootstrap to estimate prediction error](http://stats.stackexchange.com/questions/18348/differences-between-cross-validation-and-bootstrapping-to-estimate-the-predictio), [Cross-validation vs .632 bootstrapping to evaluate classification performance](http://stats.stackexchange.com/questions/71184/cross-validation-or-bootstrapping-to-evaluate-classification-performance)

Deep Learning

* [fast.ai - Practical Deep Learning For Coders](http://course.fast.ai/)
* [fast.ai - Cutting Edge Deep Learning For Coders](http://course.fast.ai/part2.html)
* [A curated list of awesome Deep Learning tutorials, projects and communities](https://github.com/ChristosChristofidis/awesome-deep-learning)
* [Deep Learning Papers Reading Roadmap](https://github.com/floodsung/Deep-Learning-Papers-Reading-Roadmap/blob/master/README.md)
* [Lots of Deep Learning Resources](http://deeplearning4j.org/documentation.html)
* [Interesting Deep Learning and NLP Projects (Stanford)](http://cs224d.stanford.edu/reports.html), [Website](http://cs224d.stanford.edu/)
* [Core Concepts of Deep Learning](https://devblogs.nvidia.com/parallelforall/deep-learning-nutshell-core-concepts/)
* [Understanding Natural Language with Deep Neural Networks Using Torch](https://devblogs.nvidia.com/parallelforall/understanding-natural-language-deep-neural-networks-using-torch/)
* [Stanford Deep Learning Tutorial](http://ufldl.stanford.edu/tutorial/)
* [Deep Learning FAQs on Quora](https://www.quora.com/topic/Deep-Learning/faq)
* [Google+ Deep Learning Page](https://plus.google.com/communities/112866381580457264725)
* [Recent Reddit AMAs related to Deep Learning](http://deeplearning.net/2014/11/22/recent-reddit-amas-about-deep-learning/), [Another AMA](https://www.reddit.com/r/IAmA/comments/3mdk9v/we_are_google_researchers_working_on_deep/)
* [Where to Learn Deep Learning?](http://www.kdnuggets.com/2014/05/learn-deep-learning-courses-tutorials-overviews.html)
* [Deep Learning nvidia concepts](http://devblogs.nvidia.com/parallelforall/deep-learning-nutshell-core-concepts/)
* [Introduction to Deep Learning Using Python (GitHub)](https://github.com/rouseguy/intro2deeplearning), [Good Introduction Slides](https://speakerdeck.com/bargava/introduction-to-deep-learning)
* [Video Lectures Oxford 2015](https://www.youtube.com/playlist?list=PLE6Wd9FR--EfW8dtjAuPoTuPcqmOV53Fu), [Video Lectures Summer School Montreal](http://videolectures.net/deeplearning2015_montreal/)
* [Deep Learning Software List](http://deeplearning.net/software_links/)
* [Hacker's guide to Neural Nets](http://karpathy.github.io/neuralnets/)
* [Top arxiv Deep Learning Papers explained](http://www.kdnuggets.com/2015/10/top-arxiv-deep-learning-papers-explained.html)
* [Geoff Hinton Youtube Vidoes on Deep Learning](https://www.youtube.com/watch?v=IcOMKXAw5VA)
* [Awesome Deep Learning Reading List](http://deeplearning.net/reading-list/)
* [Deep Learning Comprehensive Website](http://deeplearning.net/), [Software](http://deeplearning.net/software_links/)
* [deeplearning Tutorials](http://deeplearning4j.org/)
* [AWESOME! Deep Learning Tutorial](https://www.toptal.com/machine-learning/an-introduction-to-deep-learning-from-perceptrons-to-deep-networks)
* [Deep Learning Basics](http://alexminnaar.com/deep-learning-basics-neural-networks-backpropagation-and-stochastic-gradient-descent.html)
* [Intuition Behind Backpropagation](https://medium.com/spidernitt/breaking-down-neural-networks-an-intuitive-approach-to-backpropagation-3b2ff958794c)
* [Stanford Tutorials](http://ufldl.stanford.edu/tutorial/supervised/MultiLayerNeuralNetworks/)
* [Train, Validation & Test in Artificial Neural Networks](http://stackoverflow.com/questions/2976452/whats-is-the-difference-between-train-validation-and-test-set-in-neural-networ)
* [Artificial Neural Networks Tutorials](http://stackoverflow.com/questions/478947/what-are-some-good-resources-for-learning-about-artificial-neural-networks)
* [Neural Networks FAQs on Stack Overflow](http://stackoverflow.com/questions/tagged/neural-network?sort=votes&pageSize=50)
* [Deep Learning Tutorials on deeplearning.net](http://deeplearning.net/tutorial/index.html)
* [Neural Networks and Deep Learning Online Book](http://neuralnetworksanddeeplearning.com/)
* Neural Machine Translation
  + [Machine Translation Reading List](https://github.com/THUNLP-MT/MT-Reading-List#machine-translation-reading-list)
  + [Introduction to Neural Machine Translation with GPUs (part 1)](https://devblogs.nvidia.com/parallelforall/introduction-neural-machine-translation-with-gpus/), [Part 2](https://devblogs.nvidia.com/parallelforall/introduction-neural-machine-translation-gpus-part-2/), [Part 3](https://devblogs.nvidia.com/parallelforall/introduction-neural-machine-translation-gpus-part-3/)
  + [Deep Speech: Accurate Speech Recognition with GPU-Accelerated Deep Learning](https://devblogs.nvidia.com/parallelforall/deep-speech-accurate-speech-recognition-gpu-accelerated-deep-learning/)
* Deep Learning Frameworks

* + [Torch vs. Theano](http://fastml.com/torch-vs-theano/)
  + [dl4j vs. torch7 vs. theano](http://deeplearning4j.org/compare-dl4j-torch7-pylearn.html)
  + [Deep Learning Libraries by Language](http://www.teglor.com/b/deep-learning-libraries-language-cm569/)
  + [Theano](https://en.wikipedia.org/wiki/Theano_(software))
    - [Website](http://deeplearning.net/software/theano/)
    - [Theano Introduction](http://www.wildml.com/2015/09/speeding-up-your-neural-network-with-theano-and-the-gpu/)
    - [Theano Tutorial](http://outlace.com/Beginner-Tutorial-Theano/)
    - [Good Theano Tutorial](http://deeplearning.net/software/theano/tutorial/)
    - [Logistic Regression using Theano for classifying digits](http://deeplearning.net/tutorial/logreg.html#logreg)
    - [MLP using Theano](http://deeplearning.net/tutorial/mlp.html#mlp)
    - [CNN using Theano](http://deeplearning.net/tutorial/lenet.html#lenet)
    - [RNNs using Theano](http://deeplearning.net/tutorial/rnnslu.html#rnnslu)
    - [LSTM for Sentiment Analysis in Theano](http://deeplearning.net/tutorial/lstm.html#lstm)
    - [RBM using Theano](http://deeplearning.net/tutorial/rbm.html#rbm)
    - [DBNs using Theano](http://deeplearning.net/tutorial/DBN.html#dbn)
    - [All Codes](https://github.com/lisa-lab/DeepLearningTutorials)
    - [Deep Learning Implementation Tutorials - Keras and Lasagne](https://github.com/vict0rsch/deep_learning/)
  + [Torch](http://torch.ch/)
    - [Torch ML Tutorial](http://code.madbits.com/wiki/doku.php), [Code](https://github.com/torch/tutorials)
    - [Intro to Torch](http://ml.informatik.uni-freiburg.de/_media/teaching/ws1415/presentation_dl_lect3.pdf)
    - [Learning Torch GitHub Repo](https://github.com/chetannaik/learning_torch)
    - [Awesome-Torch (Repository on GitHub)](https://github.com/carpedm20/awesome-torch)
    - [Machine Learning using Torch Oxford Univ](https://www.cs.ox.ac.uk/people/nando.defreitas/machinelearning/), [Code](https://github.com/oxford-cs-ml-2015)
    - [Torch Internals Overview](https://apaszke.github.io/torch-internals.html)
    - [Torch Cheatsheet](https://github.com/torch/torch7/wiki/Cheatsheet)
    - [Understanding Natural Language with Deep Neural Networks Using Torch](http://devblogs.nvidia.com/parallelforall/understanding-natural-language-deep-neural-networks-using-torch/)
  + Caffe
    - [Deep Learning for Computer Vision with Caffe and cuDNN](https://devblogs.nvidia.com/parallelforall/deep-learning-computer-vision-caffe-cudnn/)
  + TensorFlow
    - [Website](http://tensorflow.org/)
    - [TensorFlow Examples for Beginners](https://github.com/aymericdamien/TensorFlow-Examples)
    - [Stanford Tensorflow for Deep Learning Research Course](https://web.stanford.edu/class/cs20si/syllabus.html)
      * [GitHub Repo](https://github.com/chiphuyen/tf-stanford-tutorials)
    - [Simplified Scikit-learn Style Interface to TensorFlow](https://github.com/tensorflow/skflow)
    - [Learning TensorFlow GitHub Repo](https://github.com/chetannaik/learning_tensorflow)
    - [Benchmark TensorFlow GitHub](https://github.com/soumith/convnet-benchmarks/issues/66)
    - [Awesome TensorFlow List](https://github.com/jtoy/awesome-tensorflow)
    - [TensorFlow Book](https://github.com/BinRoot/TensorFlow-Book)
    - [Android TensorFlow Machine Learning Example](https://blog.mindorks.com/android-tensorflow-machine-learning-example-ff0e9b2654cc)
      * [GitHub Repo](https://github.com/MindorksOpenSource/AndroidTensorFlowMachineLearningExample)
    - [Creating Custom Model For Android Using TensorFlow](https://blog.mindorks.com/creating-custom-model-for-android-using-tensorflow-3f963d270bfb)
      * [GitHub Repo](https://github.com/MindorksOpenSource/AndroidTensorFlowMNISTExample)
* Feed Forward Networks

* + [A Quick Introduction to Neural Networks](https://ujjwalkarn.me/2016/08/09/quick-intro-neural-networks/)
  + [Implementing a Neural Network from scratch](http://www.wildml.com/2015/09/implementing-a-neural-network-from-scratch/), [Code](https://github.com/dennybritz/nn-from-scratch)
  + [Speeding up your Neural Network with Theano and the gpu](http://www.wildml.com/2015/09/speeding-up-your-neural-network-with-theano-and-the-gpu/), [Code](https://github.com/dennybritz/nn-theano)
  + [Basic ANN Theory](https://takinginitiative.wordpress.com/2008/04/03/basic-neural-network-tutorial-theory/)
  + [Role of Bias in Neural Networks](http://stackoverflow.com/questions/2480650/role-of-bias-in-neural-networks)
  + [Choosing number of hidden layers and nodes](http://stackoverflow.com/questions/3345079/estimating-the-number-of-neurons-and-number-of-layers-of-an-artificial-neural-ne),[2](http://stackoverflow.com/questions/10565868/multi-layer-perceptron-mlp-architecture-criteria-for-choosing-number-of-hidde?lq=1),[3](http://stackoverflow.com/questions/9436209/how-to-choose-number-of-hidden-layers-and-nodes-in-neural-network/2)
  + [Backpropagation in Matrix Form](http://sudeepraja.github.io/Neural/)
  + [ANN implemented in C++ | AI Junkie](http://www.ai-junkie.com/ann/evolved/nnt6.html)
  + [Simple Implementation](http://stackoverflow.com/questions/15395835/simple-multi-layer-neural-network-implementation)
  + [NN for Beginners](http://www.codeproject.com/Articles/16419/AI-Neural-Network-for-beginners-Part-of)
  + [Regression and Classification with NNs (Slides)](http://www.autonlab.org/tutorials/neural13.pdf)
  + [Another Intro](http://www.doc.ic.ac.uk/~nd/surprise_96/journal/vol4/cs11/report.html)
* Recurrent and LSTM Networks

* + [awesome-rnn: list of resources (GitHub Repo)](https://github.com/kjw0612/awesome-rnn)
  + [Recurrent Neural Net Tutorial Part 1](http://www.wildml.com/2015/09/recurrent-neural-networks-tutorial-part-1-introduction-to-rnns/), [Part 2](http://www.wildml.com/2015/09/recurrent-neural-networks-tutorial-part-2-implementing-a-language-model-rnn-with-python-numpy-and-theano/), [Part 3](http://www.wildml.com/2015/10/recurrent-neural-networks-tutorial-part-3-backpropagation-through-time-and-vanishing-gradients/), [Code](https://github.com/dennybritz/rnn-tutorial-rnnlm/)
  + [NLP RNN Representations](http://colah.github.io/posts/2014-07-NLP-RNNs-Representations/)
  + [The Unreasonable effectiveness of RNNs](http://karpathy.github.io/2015/05/21/rnn-effectiveness/), [Torch Code](https://github.com/karpathy/char-rnn), [Python Code](https://gist.github.com/karpathy/d4dee566867f8291f086)
  + [Intro to RNN](http://deeplearning4j.org/recurrentnetwork.html), [LSTM](http://deeplearning4j.org/lstm.html)
  + [An application of RNN](http://hackaday.com/2015/10/15/73-computer-scientists-created-a-neural-net-and-you-wont-believe-what-happened-next/)
  + [Optimizing RNN Performance](http://svail.github.io/)
  + [Simple RNN](http://outlace.com/Simple-Recurrent-Neural-Network/)
  + [Auto-Generating Clickbait with RNN](https://larseidnes.com/2015/10/13/auto-generating-clickbait-with-recurrent-neural-networks/)
  + [Sequence Learning using RNN (Slides)](http://www.slideshare.net/indicods/general-sequence-learning-with-recurrent-neural-networks-for-next-ml)
  + [Machine Translation using RNN (Paper)](http://emnlp2014.org/papers/pdf/EMNLP2014179.pdf)
  + [Music generation using RNNs (Keras)](https://github.com/MattVitelli/GRUV)
  + [Using RNN to create on-the-fly dialogue (Keras)](http://neuralniche.com/post/tutorial/)
  + Long Short Term Memory (LSTM)
    - [Understanding LSTM Networks](http://colah.github.io/posts/2015-08-Understanding-LSTMs/)
    - [LSTM explained](https://apaszke.github.io/lstm-explained.html)
    - [Beginner’s Guide to LSTM](http://deeplearning4j.org/lstm.html)
    - [Implementing LSTM from scratch](http://www.wildml.com/2015/10/recurrent-neural-network-tutorial-part-4-implementing-a-grulstm-rnn-with-python-and-theano/), [Python/Theano code](https://github.com/dennybritz/rnn-tutorial-gru-lstm)
    - [Torch Code for character-level language models using LSTM](https://github.com/karpathy/char-rnn)
    - [LSTM for Kaggle EEG Detection competition (Torch Code)](https://github.com/apaszke/kaggle-grasp-and-lift)
    - [LSTM for Sentiment Analysis in Theano](http://deeplearning.net/tutorial/lstm.html#lstm)
    - [Deep Learning for Visual Q&A | LSTM | CNN](http://avisingh599.github.io/deeplearning/visual-qa/), [Code](https://github.com/avisingh599/visual-qa)
    - [Computer Responds to email using LSTM | Google](http://googleresearch.blogspot.in/2015/11/computer-respond-to-this-email.html)
    - [LSTM dramatically improves Google Voice Search](http://googleresearch.blogspot.ch/2015/09/google-voice-search-faster-and-more.html), [Another Article](http://deeplearning.net/2015/09/30/long-short-term-memory-dramatically-improves-google-voice-etc-now-available-to-a-billion-users/)
    - [Understanding Natural Language with LSTM Using Torch](http://devblogs.nvidia.com/parallelforall/understanding-natural-language-deep-neural-networks-using-torch/)
    - [Torch code for Visual Question Answering using a CNN+LSTM model](https://github.com/abhshkdz/neural-vqa)
    - [LSTM for Human Activity Recognition](https://github.com/guillaume-chevalier/LSTM-Human-Activity-Recognition/)
  + Gated Recurrent Units (GRU)
    - [LSTM vs GRU](http://www.wildml.com/2015/10/recurrent-neural-network-tutorial-part-4-implementing-a-grulstm-rnn-with-python-and-theano/)
  + [Time series forecasting with Sequence-to-Sequence (seq2seq) rnn models](https://github.com/guillaume-chevalier/seq2seq-signal-prediction)

* [Recursive Neural Network (not Recurrent)](https://en.wikipedia.org/wiki/Recursive_neural_network)
  + [Recursive Neural Tensor Network (RNTN)](http://deeplearning4j.org/recursiveneuraltensornetwork.html)
  + [word2vec, DBN, RNTN for Sentiment Analysis](http://deeplearning4j.org/zh-sentiment_analysis_word2vec.html)
* Restricted Boltzmann Machine

* + [Beginner's Guide about RBMs](http://deeplearning4j.org/restrictedboltzmannmachine.html)
  + [Another Good Tutorial](http://deeplearning.net/tutorial/rbm.html)
  + [Introduction to RBMs](http://blog.echen.me/2011/07/18/introduction-to-restricted-boltzmann-machines/)
  + [Hinton's Guide to Training RBMs](https://www.cs.toronto.edu/~hinton/absps/guideTR.pdf)
  + [RBMs in R](https://github.com/zachmayer/rbm)
  + [Deep Belief Networks Tutorial](http://deeplearning4j.org/deepbeliefnetwork.html)
  + [word2vec, DBN, RNTN for Sentiment Analysis](http://deeplearning4j.org/zh-sentiment_analysis_word2vec.html)
* Autoencoders: Unsupervised (applies BackProp after setting target = input)

* + [Andrew Ng Sparse Autoencoders pdf](https://web.stanford.edu/class/cs294a/sparseAutoencoder.pdf)
  + [Deep Autoencoders Tutorial](http://deeplearning4j.org/deepautoencoder.html)
  + [Denoising Autoencoders](http://deeplearning.net/tutorial/dA.html), [Theano Code](http://deeplearning.net/tutorial/code/dA.py)
  + [Stacked Denoising Autoencoders](http://deeplearning.net/tutorial/SdA.html#sda)
* Convolutional Neural Networks

* + [An Intuitive Explanation of Convolutional Neural Networks](https://ujjwalkarn.me/2016/08/11/intuitive-explanation-convnets/)
  + [Awesome Deep Vision: List of Resources (GitHub)](https://github.com/kjw0612/awesome-deep-vision)
  + [Intro to CNNs](http://deeplearning4j.org/convolutionalnets.html)
  + [Understanding CNN for NLP](http://www.wildml.com/2015/11/understanding-convolutional-neural-networks-for-nlp/)
  + [Stanford Notes](http://vision.stanford.edu/teaching/cs231n/), [Codes](http://cs231n.github.io/), [GitHub](https://github.com/cs231n/cs231n.github.io)
  + [JavaScript Library (Browser Based) for CNNs](http://cs.stanford.edu/people/karpathy/convnetjs/)
  + [Using CNNs to detect facial keypoints](http://danielnouri.org/notes/2014/12/17/using-convolutional-neural-nets-to-detect-facial-keypoints-tutorial/)
  + [Deep learning to classify business photos at Yelp](http://engineeringblog.yelp.com/2015/10/how-we-use-deep-learning-to-classify-business-photos-at-yelp.html)
  + [Interview with Yann LeCun | Kaggle](http://blog.kaggle.com/2014/12/22/convolutional-nets-and-cifar-10-an-interview-with-yan-lecun/)
  + [Visualising and Understanding CNNs](https://www.cs.nyu.edu/~fergus/papers/zeilerECCV2014.pdf)
* Network Representation Learning

* + [Awesome Graph Embedding](https://github.com/benedekrozemberczki/awesome-graph-embedding)
  + [Awesome Network Embedding](https://github.com/chihming/awesome-network-embedding)
  + [Network Representation Learning Papers](https://github.com/thunlp)
  + [Knowledge Representation Learning Papers](https://github.com/thunlp/KRLPapers)
  + [Graph Based Deep Learning Literature](https://github.com/naganandy/graph-based-deep-learning-literature)

Natural Language Processing

* [A curated list of speech and natural language processing resources](https://github.com/edobashira/speech-language-processing)
* [Understanding Natural Language with Deep Neural Networks Using Torch](http://devblogs.nvidia.com/parallelforall/understanding-natural-language-deep-neural-networks-using-torch/)
* [tf-idf explained](http://michaelerasm.us/post/tf-idf-in-10-minutes/)
* [Interesting Deep Learning NLP Projects Stanford](http://cs224d.stanford.edu/reports.html), [Website](http://cs224d.stanford.edu/)
* [The Stanford NLP Group](https://nlp.stanford.edu/)
* [NLP from Scratch | Google Paper](https://static.googleusercontent.com/media/research.google.com/en/us/pubs/archive/35671.pdf)
* [Graph Based Semi Supervised Learning for NLP](http://graph-ssl.wdfiles.com/local--files/blog%3A_start/graph_ssl_acl12_tutorial_slides_final.pdf)
* [Bag of Words](https://en.wikipedia.org/wiki/Bag-of-words_model)
  + [Classification text with Bag of Words](http://fastml.com/classifying-text-with-bag-of-words-a-tutorial/)
* Topic Modeling

* + [Topic Modeling Wikipedia](https://en.wikipedia.org/wiki/Topic_model)
  + [Probabilistic Topic Models Princeton PDF](http://www.cs.columbia.edu/~blei/papers/Blei2012.pdf)
  + [LDA Wikipedia](https://en.wikipedia.org/wiki/Latent_Dirichlet_allocation), [LSA Wikipedia](https://en.wikipedia.org/wiki/Latent_semantic_analysis), [Probabilistic LSA Wikipedia](https://en.wikipedia.org/wiki/Probabilistic_latent_semantic_analysis)
  + [What is a good explanation of Latent Dirichlet Allocation (LDA)?](https://www.quora.com/What-is-a-good-explanation-of-Latent-Dirichlet-Allocation)
  + [Introduction to LDA](http://blog.echen.me/2011/08/22/introduction-to-latent-dirichlet-allocation/), [Another good explanation](http://confusedlanguagetech.blogspot.in/2012/07/jordan-boyd-graber-and-philip-resnik.html)
  + [The LDA Buffet - Intuitive Explanation](http://www.matthewjockers.net/2011/09/29/the-lda-buffet-is-now-open-or-latent-dirichlet-allocation-for-english-majors/)
  + [Your Guide to Latent Dirichlet Allocation (LDA)](https://medium.com/@lettier/how-does-lda-work-ill-explain-using-emoji-108abf40fa7d)
  + [Difference between LSI and LDA](https://www.quora.com/Whats-the-difference-between-Latent-Semantic-Indexing-LSI-and-Latent-Dirichlet-Allocation-LDA)
  + [Original LDA Paper](https://www.cs.princeton.edu/~blei/papers/BleiNgJordan2003.pdf)
  + [alpha and beta in LDA](http://datascience.stackexchange.com/questions/199/what-does-the-alpha-and-beta-hyperparameters-contribute-to-in-latent-dirichlet-a)
  + [Intuitive explanation of the Dirichlet distribution](https://www.quora.com/What-is-an-intuitive-explanation-of-the-Dirichlet-distribution)
  + [topicmodels: An R Package for Fitting Topic Models](https://cran.r-project.org/web/packages/topicmodels/vignettes/topicmodels.pdf)
  + [Topic modeling made just simple enough](https://tedunderwood.com/2012/04/07/topic-modeling-made-just-simple-enough/)
  + [Online LDA](http://alexminnaar.com/online-latent-dirichlet-allocation-the-best-option-for-topic-modeling-with-large-data-sets.html), [Online LDA with Spark](http://alexminnaar.com/distributed-online-latent-dirichlet-allocation-with-apache-spark.html)
  + [LDA in Scala](http://alexminnaar.com/latent-dirichlet-allocation-in-scala-part-i-the-theory.html), [Part 2](http://alexminnaar.com/latent-dirichlet-allocation-in-scala-part-ii-the-code.html)
  + [Segmentation of Twitter Timelines via Topic Modeling](https://alexisperrier.com/nlp/2015/09/16/segmentation_twitter_timelines_lda_vs_lsa.html)
  + [Topic Modeling of Twitter Followers](http://alexperrier.github.io/jekyll/update/2015/09/04/topic-modeling-of-twitter-followers.html)
  + [Multilingual Latent Dirichlet Allocation (LDA)](https://github.com/ArtificiAI/Multilingual-Latent-Dirichlet-Allocation-LDA). ([Tutorial here](https://github.com/ArtificiAI/Multilingual-Latent-Dirichlet-Allocation-LDA/blob/master/Multilingual-LDA-Pipeline-Tutorial.ipynb))
  + [Deep Belief Nets for Topic Modeling](https://github.com/larsmaaloee/deep-belief-nets-for-topic-modeling)
  + [Gaussian LDA for Topic Models with Word Embeddings](http://www.cs.cmu.edu/~rajarshd/papers/acl2015.pdf)
  + Python
    - [Series of lecture notes for probabilistic topic models written in ipython notebook](https://github.com/arongdari/topic-model-lecture-note)
    - [Implementation of various topic models in Python](https://github.com/arongdari/python-topic-model)
* word2vec

* + [Google word2vec](https://code.google.com/archive/p/word2vec)
  + [Bag of Words Model Wiki](https://en.wikipedia.org/wiki/Bag-of-words_model)
  + [word2vec Tutorial](https://rare-technologies.com/word2vec-tutorial/)
  + [A closer look at Skip Gram Modeling](http://homepages.inf.ed.ac.uk/ballison/pdf/lrec_skipgrams.pdf)
  + [Skip Gram Model Tutorial](http://alexminnaar.com/word2vec-tutorial-part-i-the-skip-gram-model.html), [CBoW Model](http://alexminnaar.com/word2vec-tutorial-part-ii-the-continuous-bag-of-words-model.html)
  + [Word Vectors Kaggle Tutorial Python](https://www.kaggle.com/c/word2vec-nlp-tutorial/details/part-2-word-vectors), [Part 2](https://www.kaggle.com/c/word2vec-nlp-tutorial/details/part-3-more-fun-with-word-vectors)
  + [Making sense of word2vec](http://rare-technologies.com/making-sense-of-word2vec/)
  + [word2vec explained on deeplearning4j](http://deeplearning4j.org/word2vec.html)
  + [Quora word2vec](https://www.quora.com/How-does-word2vec-work)
  + [Other Quora Resources](https://www.quora.com/What-are-the-continuous-bag-of-words-and-skip-gram-architectures-in-laymans-terms), [2](https://www.quora.com/What-is-the-difference-between-the-Bag-of-Words-model-and-the-Continuous-Bag-of-Words-model), [3](https://www.quora.com/Is-skip-gram-negative-sampling-better-than-CBOW-NS-for-word2vec-If-so-why)
  + [word2vec, DBN, RNTN for Sentiment Analysis](http://deeplearning4j.org/zh-sentiment_analysis_word2vec.html)
* Text Clustering
  + [How string clustering works](http://stackoverflow.com/questions/8196371/how-clustering-works-especially-string-clustering)
  + [Levenshtein distance for measuring the difference between two sequences](https://en.wikipedia.org/wiki/Levenshtein_distance)
  + [Text clustering with Levenshtein distances](http://stackoverflow.com/questions/21511801/text-clustering-with-levenshtein-distances)
* Text Classification
  + [Classification Text with Bag of Words](http://fastml.com/classifying-text-with-bag-of-words-a-tutorial/)
* Named Entity Recognitation
  + [Stanford Named Entity Recognizer (NER)](https://nlp.stanford.edu/software/CRF-NER.shtml)
  + [Named Entity Recognition: Applications and Use Cases- Towards Data Science](https://towardsdatascience.com/named-entity-recognition-applications-and-use-cases-acdbf57d595e)
* [Language learning with NLP and reinforcement learning](http://blog.dennybritz.com/2015/09/11/reimagining-language-learning-with-nlp-and-reinforcement-learning/)
* [Kaggle Tutorial Bag of Words and Word vectors](https://www.kaggle.com/c/word2vec-nlp-tutorial/details/part-1-for-beginners-bag-of-words), [Part 2](https://www.kaggle.com/c/word2vec-nlp-tutorial/details/part-2-word-vectors), [Part 3](https://www.kaggle.com/c/word2vec-nlp-tutorial/details/part-3-more-fun-with-word-vectors)
* [What would Shakespeare say (NLP Tutorial)](https://gigadom.wordpress.com/2015/10/02/natural-language-processing-what-would-shakespeare-say/)
* [A closer look at Skip Gram Modeling](http://homepages.inf.ed.ac.uk/ballison/pdf/lrec_skipgrams.pdf)

Computer Vision

* [Awesome computer vision (github)](https://github.com/jbhuang0604/awesome-computer-vision)
* [Awesome deep vision (github)](https://github.com/kjw0612/awesome-deep-vision)

Support Vector Machine

* [Highest Voted Questions about SVMs on Cross Validated](http://stats.stackexchange.com/questions/tagged/svm)
* [Help me Understand SVMs!](http://stats.stackexchange.com/questions/3947/help-me-understand-support-vector-machines)
* [SVM in Layman's terms](https://www.quora.com/What-does-support-vector-machine-SVM-mean-in-laymans-terms)
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Other Tutorials

* For a collection of Data Science Tutorials using R, please refer to [this list](https://github.com/ujjwalkarn/DataScienceR).
* For a collection of Data Science Tutorials using Python, please refer to [this list](https://github.com/ujjwalkarn/DataSciencePython).