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Useful Resources

Below is a compilation of web links. Hopefully these resources will help improve your learning experience.

Informative Web Sites

- <u>Java Applets for Machine Learning</u> Note: The applets are in German ** Page not accesible. Message: The page you want to visit cannot be displayed.

- <u>A Brief Introduction to Machine Learning by Gunnar Ratsch</u>

- <u>CS229 Machine Learning - Stanford</u> - This is the Stanford CS course on Machine Learning that Prof Ng has taught for a number of years. The material parallels the Coursera course, but covers some additional topics and goes into much more depth on the mathematics.

- <u>Dive into Machine Learning</u> compiles a variety of resources, taking a hack-first approach so you can get "hooked." Prof. Ng's course is the centerpiece.

- <u>Cornell Virtual Workshop</u> Training on programming languages, parallel computing, code improvement, and data analysis.

Linear Algebra

- <u>Introduction to Linear Algebra</u>

- <u>CS 229 Section notes on Linear Algebra</u>

- <u>Free linear algebra book with solutions</u>

Writing Equations in Forum Posts

- <u>Short Guide to LaTex Math</u> Here is a quick guide to entering equations using LaTeX. The directives are inserted between two dollar signs. For example, the fraction for one half is entered as \$\$ \frac{1}{2}\$\$,(without any escapes before the dollar signs) and displays as $\frac{1}{2}$.

- <u>LaTex Math Tutorial</u>

Online E-Books

- <u>Introduction to Machine Learning by Nils J. Nilsson</u>

- <u>Introduction to Machine Learning by Alex Smola and S.V.N. Vishwanathan</u>

- Introduction to Data Science by Jeffrey Stanton The link appears to be dead, here is another.
- Bayesian Reasoning and Machine Learning by David Barber
- Understanding Machine Learning, © 2014 by Shai Shalev-Shwartz and Shai Ben-David
- Elements of Statistical Learning, by Hastie, Tibshirani, and Friedman
- Pattern Recognition and Machine Learning, by Christopher M. Bishop

Textbook information

- (none)

Advanced classes online

- Andrew Ng's advanced lectures - YouTube
- Machine Learning - CosmoLearning
- Machine Learning - AcademicEarth
- Learning from Data - Caltech
- Machine Learning - MIT
- Machine Learning - U. of Washington - via Coursera
- Big Data, Large Scale Machine Learning - NYU (not a MOOC)
- Machine Learning UBC 2013 - Youtube
- Neural Networks Demystified

Machine Learning frameworks and libraries in Python

- PyBrain: Various machine learning algorithms for Python programmers. Focuses on neural networks.
- PyML: Machine Learning object oriented framework for Linux and Mac OS X focused on classification and regression by Asa Ben-Hur.
- scikit-learn: Comprehensive Machine Learning toolkit for Python (based on SciPy with numpy and mathplotlib). "Ipython -pylab" provides interactive environment like Octave - scikit-learn provides optimized implementations of pretty well everything (using fast libraries like liblinear and libsvm). Should be used instead of Octave for research prototyping, production and especially for education.
- tensor-flow: open source software library for machine learning.

Machine Learning frameworks and libraries in C++

- mlpack: a scalable C++ machine learning library.

- SHARK: a fast, modular, feature-rich open-source C++ machine learning library.

- Dlib-ml: A Machine Learning Toolkit.

- Waffles: A collection of command-line tools for researchers in machine learning, data mining, and related fields. All of the functionality is also provided in a clean C++ class library.

- MLC++: a library of C++ classes for supervised machine learning.

Machine Learning frameworks and libraries in Java

- Weka: A collection of machine learning algorithms for data mining tasks.

- Apache Mahout: A scalable machine learning library .

- LIBLINEAR : LIBLINEAR -- A Library for Large Linear Classification. I think this link was mentioned in one of the lectures.

- Deeplearning4j: Open-source, distributed, deep-learning library for the JVM. Integrated with Hadoop and Spark, DL4J is designed to be used on distributed GPUs and CPUs.

Machine Learning Data Sets

- Links to many ML data repositories

- UCI Machine Learning Repository - Univ of California Irvine

- Kaggle: Machine Learning and data mining activities

- COCO-Text: Dataset for Text Detection and Recognition

Octave packages

- http://octave.sourceforge.net/ GNU Octave packages development and repository.

Octave online

- http://octave-online.net/

Translation Projects

- Mexico Study Group Notes

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Useful papers

- Massive collection of academic papers are available here: <u>Machine Learning Library</u>.

General

- Domingos, Pedro. <u>"A few useful things to know about machine learning."</u> Communications of the ACM 55, no. 10 (2012): 78-87

- Shewchuk, Jonathan Richard. <u>"An Introduction to the Conjugate Gradient Method Without the Agonizing Pain."</u> 1994

- To understand cost functions better <u>An Introduction To Understanding Cost Functions</u>

Boosting

- Friedman, J. H. <u>"Greedy Function Approximation: A Gradient Boosting Machine."</u> (Feb. 1999a)

- Ridgeway, Greg. <u>"Generalized Boosted Models: A guide to the gbm package."</u> Update 1 (2007): 1.

- Rojas, Raúl. <u>"AdaBoost and the Super Bowl of Classifiers A Tutorial Introduction to Adaptive Boosting."</u> Freie University, Berlin (2009).

Outlier and Anomaly Detection

- Chandola, Varun, Arindam Banerjee, and Vipin Kumar. <u>"Outlier detection: A survey."</u> ACM Computing Surveys, to appear (2007).

- Kriegel, Hans-Peter, Peer Kröger, and Arthur Zimek. <u>"Outlier detection techniques."</u> In Tutorial at the 13th Pacific-Asia Conference on Knowledge Discovery and Data Mining. 2009.

SVM

- "An Idiot's Guide to Support Vector Machines"

<u>http://web.mit.edu/6.034/wwwbob/svm-notes-long-08.pdf</u>

Interesting applications

- Castillo, Carlos, Marcelo Mendoza, and Barbara Poblete. <u>"Information credibility on Twitter."</u> In Proceedings of the 20th international conference on World wide web, pp. 675-684. ACM, 2011.

- Norman, Kenneth A., Sean M. Polyn, Greg J. Detre, and James V. Haxby. <u>"Beyond mind-reading: multi-voxel pattern analysis of fMRI data."</u>Trends in cognitive sciences 10, no. 9 (2006): 424-430.

- Pereira, Francisco, Tom Mitchell, and Matthew Botvinick. <u>"Machine learning classifiers and fMRI: a tutorial overview."</u> Neuroimage 45, no. 1 Suppl (2009): S199.

- Dean Pomerleau Autonomous Driving (link)

Deep Learning School, Sept. 2016 (URL includes links to video archives)

https://www.bayareadlschool.org/   5/5