Tutorials on topics in machine learning

- IAPR®
 - 1. Assessing and Comparing Classification Algorithms
 - 1. Cross Validation Andrew Moore
 - 2. The Many Faces of ROC Analysis in Machine Learning Peter A. Flach, ICML'04
 - 2. Classification
 - 1. Decision trees Andrew Moore
 - 2. Tutorial on Practical Prediction Theory for Classification John Langford, JMLR'05
 - 3. Tutorial on Fusion of Multiple Pattern Classifiers Fabio Roli Al-IA 2003
 - 3. Clustering
 - 1. Spectral Clustering Chris H.Q. Ding, ICML'04
 - 4. Data Mining
 - 1. A Data Mining tutorial Graham Williams, Markus Hegland and Stephen Roberts
 - 2. Data mining tutorial LIS Rudjer Boskovic Institute
 - 5. Dimensionality reduction
 - 1. Principal Component Analysis and Matrix Factorizations for Learning Chris H.Q. Ding, ICML'05
 - 2. Spectral Methods for Dimensionality Reduction (part 1) (part 2) Lawrence Saul, 2005.
 - 6. Ensemble learning methods
 - 1. A tutorial on Boosting Yoav Freund and Robert Schapire
 - 2. Boosting tutorial Ron Meir
 - 7. Evolutionary Computation
 - 1. A Genetic Algorithm Tutorial Darrell Whitley
 - 8. Generative methods
 - 1. Graphical models and variational methods: Message-passing and relaxations (Martin Wainwright)
 - 2. A Brief Introduction to Graphical Models and Bayesian Networks Kevin Murphy, 1998
 - 3. Graphical models David Heckerman, UAI'99
 - 4. Nonparametric Bayesian Methods Michael I. Jordan NIPS'05
 - 5. Bayesian Methods for Machine Learning Zoubin Ghahramani, ICML'04
 - 6. Graphical models, exponential families, and variational inference (Martin Wainwright, Michael Jordan)
 - 7. Bayesian Methods for Machine Learning Radford Neal, NIPS'04
 - 9. Hidden Markov models
 - 1. A Tutorial on Hidden Markov Models and Selected Applications in Speech Recognition Lawrence R. Rabiner, Proceedings of the IEEE, 1989
 - 2. Markov Random Fields and Stochastic Image Models Charles A. Bouman ICIP'95
 - 3. An Introduction to the Kalman Filter Greg Welch and Gary Bishop
 - 4. An Introduction to Conditional Random Fields for Relational Learning Charles Sutton and Andrew McCallum
- 10. Learning theory
 - 1. Statistical Learning Theory Olivier Bousquet & Bernhard Schölkopf
 - 2. Complexity Theory and the No Free Lunch Theorem Darrell Whitley, Jean Paul Watson, 2005
 - 3. A Tutorial on Computational Learning Theory Vasant Honavar, 1997
 - 4. A Geometric Approach to Statistical Learning Theory Shahar Mendelson, NIPS'04
 - 5. VC-dimension for characterizing classifiers Andrew Moore
- 11. Neural networks
 - 1. Independent Component Analysis Aapo Hyvärinen and Erkki Oja, in Neural Networks
 - 2. Neural Networks Ingrid F. Russell
 - 3. Introduction to Radial Basis Function Networks Mark J. L. Orr, 1996
- 12. Parameter estimation/Optimization techniques
 - 1. Optimization for Kernel Methods S. Sathiya Keerthi in MLSS, Canberra'06
 - 2. Expectation-Maximization as lower bound maximization Thomas P. Minka, 1998
 - 3. Markov Chain Monte Carlo for Computer Vision Song-Chun Zhu, Frank Dellaert and Zhuowen Tu, ICCV 2005
 - 4. Tutorial on variational approximation methods Tommi S. Jaakkola, NIPS'00
 - 5. Energy Based Models: Structured Learning Beyond Likelihoods Yann LeCun, NIPS'06
- 13. Regression
 - 1. Advances in Gaussian Processes Carl Edward Rasmussen in NIPS 2006
- 14. Reinforcement Learning / Q-learning
 - 1. Reinforcement Learning Satinder Singh NIPS'05
 - 2. Learning Representation And Behavior: Manifold and Spectral Methods for Markov Decision Processes and Reinforcement Learning Sridhar Mahadevan and Mauro Maggioni, ICML'06
 - 3. Towards Bayesian Reinforcement Learning Pascal Poupart, NIPS workshop'06
- 15. Significant applications
 - 1. Grammar Induction: Techniques and Theory Colin de la Higuera and Tim Oates, ICML'06

- 2. Bayesian Models of Human Learning and Inference J. Tenenbaum, NIPS'06
- 3. Text mining and internet content filtering José María Gómez Hidalgo, ECML/PKDD'02
- 4. Information Extraction, Theory and Practice Ronen Feldman, ICML'06
- 5. Probabilistic mechanisms in human sensorimotor control Daniel Wolpert, NIPS'04

Online Video Tutorials

- 1. Clustring
 - 1. Lectures on Clustering (Ulrike von Luxburg, 3:24')
 - 2. Game Theory & Clustering (Marcello Pelillo, 2:56')
 - 3. Clustering the Tagged Web (Hector Garcia-Molina, et. al., 0:30')
 - 4. Multi-Assignment Clustering for Boolean Data (Mario Frank, 0:25')
 - 5. Extracting Semantic Networks from Text via Relational Clustering (Pedro Domingos, Stanley Kok, 00:20')
- 2. Ensemble Methods
 - 1. From Trees to Forests and Rule Sets A Unified Overview of Ensemble Methods (Giovanni Seni, John Elder, 2:45')
 - 2. An Introduction to Ensemble and Boosting (Amir Saffari, 0:16')
 - 3. Overview of New Developments in Boosting (Joseph K. Bradley, 0:47')
 - 4. Large-Margin Thresholded Ensembles for Ordinal Regression (Hsuan-Tien Lin, 0:17')
 - 5. Identifying Feature Relevance using a Random Forest (Jeremy D. Rogers, 0:26')
- 3. Markov Processes
 - 1. A Tutorial Introduction to Stochastic Differential Equations: Continuous-time Gaussian Markov Processes (Chris William, 0:42')
 - 2. Markov Chain Monte Carlo Methods (Christian Rober, 3:52')
 - 3. Sequential Monte Carlo methods (Arnaud Doucet, 2:16')
 - 4. Abstraction Augmented Markov Models (Adrian Silvescu, 0:21')
 - 5. Bayesian Probabilistic Matrix Factorization using Markov Chain Monte Carlo (Ruslan Salakhutdinov, 0:24')
- 4. Computational Learning Theory
 - 1. Online Learning and Game Theory (Adam Kalai, 1:37')
 - 2. Who is Afraid of Non-Convex Loss Functions? (Yann LeCun, 0:59')
 - 3. Online Learning and Bregman Divergences (Manfred K. Warmuth, 3:32')
 - 4. Graph complexity for structure and learning (John Shawe-Taylor, 0:32')
 - 5. Entropy Properties of a Decision Rule Class in Connection with machine learning abilities (Alexey Chervonenkis, 0:45')
- 5. Neural Networks
 - 1. Neural control Layers, Loops, Learning (Florentin Worgotter,0:58')
 - 2. Implications of decoding for theories of neural representation (James Haxby, 0:36')
 - 3. Exploring Spatially Embedded Artificial Neural Networks (Patricia Vargas, 0:57')
 - 4. Mixtures of Neural Nets (Edward Snelson, 0:30')
 - 5. Convolutional Object Finder, A Neural Architecture for Fast and Robust Object Detection (Christophe Garcia, 0:22')
- 6. Reinforcement Learning
 - 1. Introduction to Reinforcement Learning and Bayesian learning (Mohammad Ghavamzadeh, 0:20')
 - 2. Reinforcement learning (Scott Sanner, 5:09')
 - 3. Introduction to Reinforcement Learning (Csaba Szepesvar, 5:47')
 - 4. Model-Based Reinforcement Learning (Michael Littman, 1:54')
 - 5. Reinforcement Learning (Satinder Singh, 4:58')
- 7. Regression
 - 1. Multiplicative Updates for L1-Regularized Linear and Logistic Regression (Lawrence Saul, 0:24')
 - 2. Tree Augmented Naive Bayes for Regression Using Mixtures of Truncated Exponentials: Application to Higher Education Management (Antonio Salmeron, 0:20')
 - 3. Large-Margin Thresholded Ensembles for Ordinal Regression (Hsuan-Tien Lin, 0:17')
 - 4. Utility-Based Regression (Luis Torgo, 0:02')

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