COLT 2006 Program

The 19th Annual Conference on Learning Theory



June 22-25, 2006 Carnegie Mellon University Pittsburgh, PA



COLT '06 gratefully acknowledges financial support from Google, IBM Research, MLJ, NICTA, and Carnegie Mellon University.

WEDNESDAY June 21, 2006

Welcome Reception 7:00pm – 9:00pm Holiday Inn University Center 100 Lytton Ave

Day 1 – THURSDAY June 22, 2006

Talks in Giant Eagle Auditorium, Baker Hall Registration and check in: 8:30am – 9:20am

> Session 1: 9:20am – 10:30am Invited Talk: Luc Devroye Session Chair: Gabor Lugosi

9:20 Conference Welcome (Avrim Blum)9:30 Luc Devroye, *Random Multivariate Search Trees*

Break 10:30am - 10:50am

Session 2: 10:50am – 12:30pm Clustering, Un-, and Semisupervised Learning Session Chair: Phil Long

10:50 A Sober Look at Clustering Stability Shai Ben-David, Ulrike von Luxburg, David Pal

11:15 PAC Learning Axis-aligned Mixtures of Gaussians with No Separation Assumption Jon Feldman, Rocco Servedio, Ryan O'Donnell

11:40 *Stable Transductive Learning* Ran El-Yaniv, Dmitry Pechyony

12:05 Uniform Convergence of Adaptive Graph-based Regularization, Matthias Hein

Lunch 12:30pm – 2:00pm Rangos Hall, University Center

Session 3: 2:00pm – 3:40pm Statistical Learning Theory Session Chair: Alex Smola

- **2:00** The Rademacher Complexity of Linear Transformation Classes, Andreas Maurer
- **2:25** Function Classes that Approximate the Bayes Risk Ingo Steinwart, Don Hush, Clint Scovel
- **2:50** Functional Classification with Margin Conditions Magalie Fromont, Christine Tuleau

3:15 Significance and Recovery of Block Structures in Binary Matrices with Noise Xing Sun, Andrew Nobel

Break 3:40pm - 4:00pm

Session 4: 4:00pm – 5:40pm Regularized Learning and Kernel Methods Session Chair: Ingo Steinwart

- **4:00** Maximum Entropy Distribution Estimation with Generalized Regularization Miroslav Dudik, Robert Schapire
- **4:25** Unifying Divergence Minimization and Statistical Inference via Convex Duality Yasemin Altun, Alex Smola
- **4:50** Mercer's Theorem, Feature Maps, and Smoothing Ha Quang Minh, Partha Niyogi, Yuan Yao
- 5:15 Learning Bounds for Support Vector Machines with Learned Kernels Nathan Srebro and Shai Ben-David

Banquet at the Andy Warhol Museum 7:00pm – 10:00pm

Shuttle Buses depart Frew Street 6:15pm, Holiday Inn 6:30



Day 2 – FRIDAY June 23, 2006

Talks in Giant Eagle Auditorium, Baker Hall

Session 5: 9:00am – 10:40am Query Learning and Teaching Session Chair: Lisa Hellerstein

9:00 On Optimal Learning Algorithms for Multiplicity Automata, Laurence Bisht, Nader Bshouty, Hanna Mazzawi

9:25 Exact Learning Composed Classes With a Small Number of Mistakes, Nader Bshouty, Hanna Mazzawi

- **9:50** *DNF are Teachable in the Average Case* Homin Lee, Rocco Servedio, Andrew Wan
- **10:15** *Teaching Randomized Learners* Frank Balbach, Thomas Zeugmann

Break 10:40am - 11:00am

Session 6: 11:00am – 12:40pm Inductive Inference Session Chair: Thomas Zeugmann

- **11:00** Memory-limited U-Shaped Learning Lorenzo Carlucci, John Case, Sanjay Jain, Frank Stephan
- **11:25** On Learning Languages from Positive Data and a Limited Number of Short Counterexamples Sanjay Jain, Efim Kinber
- **11:50** Learning Rational Stochastic Languages Francois Denis, Yann Esposito, Amaury Habrard
- 12:15 Parent Assignment Is Hard for the MDL, AIC, and NML Costs, Mikko Koivisto

Lunch 12:40pm – 2:15pm Attendees on their own

Session 7: 2:15pm – 3:55pm

Learning Algorithms and Limitations on Learning Session Chair: Claudio Gentile

- **2:15** Uniform-distribution Learnability of Noisy Linear Threshold Functions with Restricted Focus of Attention Jeffrey Jackson
- **2:40** Improved Lower Bounds for Learning Intersections of Halfspaces, Adam Klivans, Alexander Sherstov
- **3:05** Efficient Learning Algorithms Yield Circuit Lower Bounds, Lance Fortnow, Adam Klivans
- **3:30** Active Sampling for Multiple Output Identification Shai Fine, Yishay Mansour

Break 3:55pm – 4:15pm

Session 8: 4:15pm – 5:55pm Online Aggregation Session Chair: Leon Bottou

- **4:15** Optimal Oracle Inequality for Aggregation of Classifiers under Low Noise Condition, Guillaume Lecue
- **4:40** Aggregation and Sparsity via l_1 Penalized Least Squares Florentina Bunea, Alexandre Tsybakov, Marten Wegkamp
- **5:05** A randomized online learning algorithm for better variance control, Jean-Yves Audibert
- **5:30** Online Tracking of Linear Subspaces Koby Crammer
 - **Open Problem Session: 8:30pm 9:00pm** Newell-Simon Hall, Room 3305 Session Chairs: Phil Long and Shai Ben-David
 - Business Meeting: 9:00pm 10:30pm Newell-Simon Hall, Room 3305

Day 3 – SATURDAY June 24, 2006

Talks in Giant Eagle Auditorium, Baker Hall

Session 9: 9:30am – 10:30am

Invited talk: Volodya Vovk Predictions as Statements and Decisions Session Chair: Sham Kakade

Break 10:30am - 10:50am

Session 10: 10:50am – 12:30pm Online Prediction and Reinforcement Learning I Session Chair: Nicolo Cesa-Bianchi

- **10:50** Online Learning with Variable Stage Duration Shie Mannor, Nahum Shimkin
- **11:15** Online Learning meets Optimization in the Dual Shai Shalev-Shwartz, Yoram Singer
- **11:40** *Ranking with a P-Norm Push* Cynthia Rudin
- 12:05 Online Multitask Learning Ofer Dekel, Philip Long, Yoram Singer

Lunch 12:30pm – 2:00pm Attendees on their own

Session 11: 2:00pm - 3:40pm Online Prediction and Reinforcement Learning II Session Chair: Vladimir Vovk

- **2:00** The Shortest Path Problem Under Partial Monitoring Andras Gyorgy, Tamas Linder, Gyorgy Ottucsak
- 2:25 Tracking the Best Hyperplane with a Simple Budget Perceptron, Nicolo Cesa-Bianchi, Claudio Gentile
- 2:50 Logarithmic Regret Algorithms for Online Convex Optimization Elad Hazan, Adam Kalai, Satyen Kale, Amit Agarwal
- 3:15 Online Variance Minimization Manfred Warmuth, Dima Kuzmin

Break 3:40pm - 4:00pm

Session 12: 4:00pm - 5:40pm Online Prediction and Reinforcement Learning III Session Chair: Jyrki Kivinen

- 4:00 Online Learning with Constraints Shie Mannor, John Tsitsiklis
- 4:25 Continuous Experts and the Binning Algorithm Jacob Abernethy, John Langford, Manfred Warmuth
- 4:50 Competing with Wild Prediction Rules Volodya Vovk
- 5:15 Learning Near-optimal Policies with Bellman-residual Minimization Based Fitted Policy Iteration and a Single Sample Path Andras Antos, Csaba Szepesvari, Remi Munos

Impromptu Session I: 8:00pm – 10:00pm Session Chair: Avrim Blum Newell-Simon Hall, Room 3305

Day 4 – SUNDAY June 25, 2006

Talks in Giant Eagle Auditorium, Baker Hall (Overlap Day with ICML)

> Session 13: 9:30am - 10:30am Invited talk: Gyorgy Turan Learning and Logic Session Chair: Hans Simon

Break 10:30am - 10:50am

Session 14: 10:50am - 11:40am Other Approaches Session Chair: Tong Zhang

10:50 Subset Ranking using Regression David Cossock, Tong Zhang

11:15 Improving Random Projections Using Marginal Information, Ping Li, Trevor Hastie, Kenneth Church

> Impromptu Session II: 11:40am – 12:30pm Session Chair: Avrim Blum

> > ***12:30pm Conference ends***



