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EDUCATION

Carnegie Mellon University, Pittsburgh, PA 15213, USA
Ph.D. program in Machine Learning Fall 2008-present
M.S. in Machine Learning May 2011
Member of the Auton Lab
Advisor: Prof. Jeff Schneider

National Taiwan University, Taipei City, Taiwan
M.S. in Computer Science and Information Engineering June 2006
Member of the Machine Learning and Data Mining Group (Developer of LIBSVM *)*
Advisor: Prof. Chih-Jen Lin
B.S.E in Computer Science and Information Engineering June 2004

RESEARCH INTERESTS

Learning Dynamic Models, Latent Variable Models, Ranking, Large-scale Machine Learning

PUBLICATIONS

[1] **Tzu-Kuo Huang** and Jeff Schneider. "Spectral Learning of Hidden Markov Models from Dynamic and Static Data." To appear in *Proceedings of the 30th International Conference on Machine Learning (ICML)*, 2013

[2] **Tzu-Kuo Huang** and Jeff Schneider. "Learning Bi-clustered Vector Auto-regressive Models." *Proceedings of European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD)* 2012.

[3] **Tzu-Kuo Huang** and Jeff Schneider. "Learning Auto-regressive Models from Sequence and Non-sequence Data." *Advances in Neural Information Processing Systems (NIPS)* 25, 2011.

[4] **Tzu-Kuo Huang**, Le Song and Jeff Schneider. "Learning Nonlinear Dynamic Models from Non-sequenced Data." *Thirteenth International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2010.

[5] Liang Xiong, Xi Chen, **Tzu-Kuo Huang**, Jeff Schneider and Jaime Carbonell. "Temporal Collaborative Filtering with Bayesian Probabilistic Tensor Factorization." *SIAM International Conference on Data Mining (SDM)*, 2010.

[6] **Tzu-Kuo Huang** and Jeff Schneider. "Learning Linear Dynamical Systems without Sequence Information." *Proceedings of the 26th International Conference on Machine Learning (ICML)*, 2009

[7] **Tzu-Kuo Huang**, Chih-Jen Lin and Ruby C. Weng. "Ranking Individuals by Group Comparisons." *Journal of Machine Learning Research (JMLR)*, 9, 2187–2216, 2008
A short version appears in *Proceedings of the 23rd International Conference on Machine Learning (ICML)*, 425–432, 2006

[8] **Tzu-Kuo Huang**, Ruby C. Weng and Chih-Jen Lin. "Generalized Bradley-Terry Models and Multi-class Probability Estimates." *Journal of Machine Learning Research (JMLR)*, 7, 85–115, 2006

[9] **Tzu-Kuo Huang**, Ruby C. Weng and Chih-Jen Lin. "A Generalized Bradley-Terry Model: From Group Competition to Individual Skill." In *Advances in Neural Information Processing Systems (NIPS)* 17, 601–608, 2005

[10] Simon M. Lucas and **Tzu-Kuo Huang**. "Sequence Recognition with Scanning N-Tuple Ensembles." In *Proceedings of the 2004 International Conference on Pattern Recognition (ICPR)*, 3, 410–413, 2004

OTHER RESEARCH WORK

[1] Chao Yuan, Christian Balderer, **Tzu-Kuo Huang** and Claus Neubauer. "Robust Sensor Correlation Analysis for Machine Condition Monitoring." World International Property Organization (WIPO) patent application No. PCT/US2006/045959

RESEARCH EXPERIENCE

Carnegie Mellon University, Pittsburgh, PA 15213, USA
Research Assistant to Prof. Jeff Schneider Fall 2008–present

- Exploiting Non-sequenced Data in Dynamic Model Learning
  In quite a few modern time series modeling tasks, the collection of reliable time series turns out to be a major challenge, either due to the slow progression of the dynamic process of interest, or inaccessibility of repetitive measurements of the same dynamic process over time. Such a lack of reliable sequence data makes learning difficult for most existing methods, which require sequences of observations as input. In those situations, however, it is often easier to collect a large amount of non-sequence samples, or snapshots of the dynamic process of interest.

  Our work aims to exploit such non-sequence data to improve dynamic model learning. We consider two scenarios: 1) only non-sequence, independent snapshots of the dynamic process are available; 2) little sequence data and abundant non-sequence data are available. Under some simple dynamic models, we have developed several learning methods for these two scenarios, and obtained satisfactory results on a few synthetic and real data sets.

Microsoft Corporation, Bellevue, WA
Research Intern at Bing, working in the crawl selection team May 2012–August 2012
Manager: Dr. Tai-Yi Huang

- Researched on crawl selection algorithms that adapt to different URL metrics and improve discovery performance by learning from daily feedback

National Taiwan University, Taipei City, Taiwan
Research Assistant to Prof. Chih-Jen Lin March 2003–June 2006

- Ranking Individuals by Group Comparisons
  Proposed a novel model, derived simple and efficient algorithms for estimating individuals' strengths from group comparison outcomes; proved the necessary and sufficient condition for unique estimation; conducted experiments on records of a major bridge event, Bermuda Bowl 2005, and extensively analyzed the results
- Probability Estimates for Multi-class Classification
  Proposed a model for estimating class probabilities under the framework of error-correction output codings; devised a new estimation algorithm based on minimizing the Kullback-Leibler distance with

a convergence proof; validated the approach on both synthetic and real-world data sets under a wide range of settings

- Other Projects: Hierarchical Classification, Support Vector Machine for Sequence Classification, Feature Selection and Classification of EEG Data

Siemens Corporate Research, Princeton, NJ, USA
Intern at the Intelligent Vision and Reasoning Department January 2005–June 2005
Supervisor: Dr. Claus Neubauer

- Developed commercial software tools for visualizing sensor data in power plants
- Designed algorithms that identify groups of correlated power plant sensors in the presence of noisy measurements and abnormal conditions (*patent pending*); conducted extensive experiments on real sensor data; implemented the algorithms in commercial software for power-plant monitoring

WORK EXPERIENCE

National Taiwan University, Taipei City, Taiwan
Full-time Assistant to the Department of Computer Science August 2007–July 2008

- Manager of the department's main computing facility for CS undergraduates
- Teaching Assistant

Military Police Command, Taiwan
Signal Corporal in Information and Communication Company October 2006–August 2007

AWARDS

Master Thesis Award, Institute of Information and Computing Machinery, Taiwan 2006

Master Thesis Award, Taiwanese Association for Artificial Intelligence 2006

Top Five, Brain Computer Interface Competition 2003
Second place in data set Ib among 8 teams, Fourth place in data set Ia and IV among 15 teams
`http://ida.first.fraunhofer.de/projects/bci/competition_ii/results/`
(with Kai-Min Chung and Chih-Jen Lin)

President's Award, National Taiwan University Spring 2002

SERVICES

Program Committee: The 10th International Conference on Latent Variable Analysis and Source Separation (LVA/ICA 2012), IJCAI 2011, The 3rd Asian Conference on Machine Learning (ACML 2011)

Reviewer: IEEE Transactions on Neural Networks, IEEE Transactions on Signal Processing, Data Mining and Knowledge Discovery, ICML (2012, 2013)

Volunteer: ICML 2009, NIPS 2004

REFERENCES

Available upon request