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Tomáš Šingliar

Curriculum vitae

Objectives

- Research
- Design better probabilistic models of complex systems, improving decision making about critical infrastructure. Bring machine learning from the clean computer lab into our messy reality.
- Career
- Graduate in 2008 with a PhD in Computer Science from Pitt. Join Boeing Phantom Works in 2009.

Education

- 2008
- Defended PhD thesis “Machine learning tools for transportation networks” at U Pitt, Computer Science. Revisions pending. The thesis develops better ways to predict traffic state and utilize this information to improve performance in decision making and planning, such as driving directions. Traffic data modeling and anomaly (incident) detection techniques are presented.
- 2005
- MS in Computer Science, University of Pittsburgh. GPA 3.982.
- 2001
- MSc in Computer Science, Comenius University, Bratislava, Slovakia.
 - *Formal foundations and methods* track – in-depth study of principles of computation, specification and verification formalisms for all major programming paradigms. Diploma thesis “On synchronicity and concurrency in Petri Nets”.
 - *Systems and Software Engineering* track – principles and challenges facing the development and deployment of large-scale systems.

Peer-reviewed publications

Conferences

- UAI08
- T. Singliar, D. Dash: Efficient Inference in Persistent Dynamic Bayesian Networks; 24th Conference on Uncertainty in Artificial Intelligence, 2008 (poster)
- ISAIM08
- T. Singliar, M. Hauskrecht: Approximation Strategies for Routing in Dynamic Stochastic Networks; 10th International Symposium on Artificial Intelligence and Mathematics, 2008 (talk)
- PKDD07
- T. Singliar, M. Hauskrecht: Learning to Detect Adverse Traffic Events from Noisily Labeled Data; 11th European Conference on Principles and Practice of Knowledge Discovery in Databases, 2007 (talk)
- ECML07
- T. Singliar, M. Hauskrecht: Modeling Highway Traffic Volumes; 18th European Conference on Machine Learning, 2007 (poster)
- AAAI07
- T. Singliar, D. Dash: COD: Online Temporal Clustering for Outbreak Detection; 22nd Conference on Artificial Intelligence, 2007 (talk)

Peer-reviewed publications (continued)

- SDM05 • T. Singliar, M. Hauskrecht: Variational Learning for Noisy-OR Component Analysis; SIAM Conference on Statistical Data Mining, 2005 (talk)
- UAI03 • M. Hauskrecht, T. Singliar: Monte-Carlo optimization for resource allocation problems in stochastic network systems; International Conference on Uncertainty in Artificial Intelligence, 2003 (talk)
- ATPN03 • G. Juhas, R. Lorenz, T. Singliar: On synchronicity and concurrency in Petri Nets; Proceedings of Applications and Theory of Petri Nets, 2003 (talk)

Journals

- JMLR06 • T. Singliar, M. Hauskrecht: Noisy-OR Component Analysis and its Application to Link Analysis. *Journal of Machine Learning Research*, vol. 7, October 2006

Workshops

- ICML06 • T. Singliar, M. Hauskrecht: Towards a Learning Incident Detection System. Workshop on Machine Learning for Surveillance and Event Detection, International Conference on Machine Learning 2006. (talk)
- NIPS03 • T. Singliar, M. Hauskrecht: Modeling Large Stochastic Networks. Workshop on Robust Communication in Complex Networks; Neural Information Processing Systems 2003. (poster)

Other presentations

- Oct 2007 • Persistence in dynamic Bayesian networks; poster; Intel Research Pittsburgh Open House
- 2007, 08 • Research posters in U Pitt GradExpo
- Dec 2007 • An efficient algorithm for fault detection; most recent talk; U Pitt Intelligent Systems Program Forum
- 3 more talks in the same venue – ISP Forum
- Oct 2006 • Online clustering for malware outbreak detection; poster and demo; Intel Research Pittsburgh Open House;
- Feb 2007 • Learning to detect incidents; talk; Compunetix Research competition winner; U Pitt Computer Science Day
- Feb 2007 • Machine Learning Advances for Incident Detection; poster; “people’s choice award”; U Pitt Computer Science Day

Research experience

- 2007 • Graduate Technical Intern, Intel Research. Developed a much faster inference algorithm for a subclass of dynamic Bayesian networks, under mentorship of Dr. Denver Dash.
- 2006 • Graduate Technical Intern, Intel Research. Developed a new technique for detection of day-zero network worm intrusions that resulted in 40% reduction of worm penetration at time of detection, under mentorship of Dr. Denver Dash.
- 2002–now • Graduate Student Researcher, University of Pittsburgh. Design and implementation of novel data processing and machine learning algorithms in Matlab and C++ to support research goals, under mentorship of Dr. Milos Hauskrecht
- Program Committee IJCAI-09. Secondary reviewer for several conferences: UAI, AAI, ICML, AISTATS and NIPS.

Professional experience

- 2004 • Dimension 5, Slovakia. Developed component analysis and fast k -means modules for an advanced data visualization software package, Miner3D. The first design goal of Miner3D is to give the non-expert user powerful visualization techniques tamed and working *for him*. Customers have chosen Miner3D over other software, based on the value of the PCA visualization module built on that philosophy. <http://www.miner3d.com>
- 2005–now • Part-time Systems Administrator, Martifer Slovakia. Making sure the network (wired, wireless and VPN), e-mail (IMAP, SMTP) and file services (FTP, SAMBA) are up and running; data are secure and backed up.
- 2008 • Research Intern, guru.com. An ongoing project to rank matches in a specialized search application.

Teaching experience

Teaching assistantships, University of Pittsburgh

- Data Structures (undergraduate). (Instructor Dr. J. Ramirez) Trees, hash tables, libraries for arbitrary-size integers, ... 1 semester
- Introduction to Artificial Intelligence (undergraduate). (Instructor Prof. M. Hauskrecht) Basics of search, planning, knowledge representation and inference in FOL, reasoning and planning with uncertainty, Bayesian belief Networks, ... 2 semesters.
- Foundations of Artificial Intelligence (graduate). (Instructor Prof. M. Hauskrecht) Same as above, with more in-depth coverage. 1 semester
- Machine Learning (graduate). (Instructor Prof. M. Hauskrecht) Linear and logistic regression, neural networks, Bayesian belief networks, EM algorithm, bagging and boosting. Unsupervised methods, clustering. 1 semester

Student supervision

- 2007 • Supervised a Brackenridge undergraduate scholar. We developed models of local traffic flow properties, a structured prediction problem in machine learning speak.

Honors and awards

- 2007 • Winner, Compunetix graduate student research competition, Computer Science Day, University of Pittsburgh. Award: \$1000
- “People’s choice” research poster, Computer Science Day, University of Pittsburgh.
- ECML/PKDD 2007, Selective travel grant (total of 4 given). Award: EUR 500

Personal

- Citizen of • Slovak Republic
- Language • Slovak/Czech – native, English – native level, French – basic
- Interests • Photography, astronomy, books, tennis.

References

- Miloš Hauskrecht, Associate Professor, University of Pittsburgh, milos@cs.pitt.edu
- Janyce Wiebe, Professor, University of Pittsburgh, wiebe@cs.pitt.edu

References (continued)

- Denver Dash, Research Scientist, Intel Research, denver.h.dash@intel.com
- Jeenshang Lin, Associate Professor, University of Pittsburgh, jslin@engr.pitt.edu
- Pavol Droba, Development Team Leader, Dimension 5, pdr@miner3d.com