

Matthew D. Schmill

Curriculum Vitae

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Education

Ph.D., Computer Science

University of Massachusetts, Amherst, 5/2004

Title: *Learning the Structure of Activity for a Mobile Robot*

Advisor: Paul R. Cohen

Committee: Neil Berthier, Paul R. Cohen, Rod Grupen, Victor Lesser

M.S., Computer Science

University of Massachusetts, Amherst, 5/1997

B.S., Computer Science

University of Massachusetts, Amherst, 5/1994

Concentration: Computer Graphics

Summa Cum Laude

Experience in Higher Education

1/2011 – present **Assistant Research Scientist**

Department of Computer Science & Electrical Engineering

University of Maryland Baltimore County

Ongoing projects include Managing Uncertainty in Text-to-Sketch, and GLOBE: A Global Collaboration Engine.

1/2006 – 12/2010 **Research Associate**

Department of Computer Science & Electrical Engineering

University of Maryland Baltimore County

Responsibilities include research direction, system architecting, and implementation of key systems for grant-funded research. Programs include: Meta-cognition for robust AI systems (MCL), a metareasoning-ready robot monitor & control architecture (Raccoon), Bootstrapped Learning, a Probabilistic Framework for Text-to-Sketch, and GLOBE: A Global Collaboration Engine.

12/2004 – 12/2005 **Postdoctoral Research Fellow**

Department of Astronomy
University of Massachusetts, Amherst
<http://www.lmtgm.org>

Involved in the design and development of monitor and control software for the Large Millimeter Telescope (<http://www.lmtgm.org/>) and related projects. Projects included real-time, networking, and user interface tools for use on a 50m diameter millimeter-wave telescope under construction in Puebla, Mexico, as well as design and development for monitor and control software for other instruments under development at the university.

10/2004 – 12/2004 **Postdoctoral Research Fellow**

Experimental Knowledge Systems Lab
University of Massachusetts, Amherst

Responsible for rapid development of a social simulation called the *Asymmetric Threat Assessment Tool* as part of a 3-month rolling start to DARPA's "Integrated Battle Command" program. The program involved integrating a handful of intelligent tools into a military planning setting to improve efficiency and performance. The program concluded with a 4-day demo in which we presented and used our tool in a live planning scenario.

9/1995 – 5/2004 **Research Assistant**

Experimental Knowledge Systems Lab
University of Massachusetts, Amherst

Conducted research on a variety of research projects in a multidisciplinary AI lab. These projects drew from the areas of machine learning, intelligent data analysis, data mining, simulation, and planning. Research culminated with a project aimed at understanding the development of activity in intelligent agents, and included work with both simulated agents and the Pioneer-2 mobile robot.

6/1994 – 8/1995 **Systems Programmer**

Experimental Knowledge Systems Lab
University of Massachusetts, Amherst

Served as the primary developer of a MacOS interface to CLASP, an analytical statistics application. This application was the companion software to *Empirical Methods for Artificial Intelligence* (Cohen 1995).

Fellowships and Research Support

1/2010 – 1/2013 **IC Postdoctoral Research Fellow**

A Probabilistic Framework for Text to Sketch.

The Intelligence Community (IC) Postdoctoral Research Fellowship Program funds basic research in areas of interest to the Intelligence Community. This program has been extended to a third year.

Ph.D. Students

Niels Kasch. March 2012. Committee member, Reader. University of Maryland, Baltimore County CSEE.

Sourav Mukherjee, August 2011, Committee member. University of Maryland, Baltimore County CSEE.

Marc Pickett. April 2011. Committee member, Reader. University of Maryland, Baltimore County CSEE.

Master's Students

Ashwinkumar Ganeshan, Master of Science, 2012. Committee member. University of Maryland, Baltimore County. CSEE.

Francisco Proto Guerra e Vasconcelos, Master of Science, 2009. Committee member. University of Maryland, Baltimore County CSEE.

Teaching Experience

Instructor for CS120 – Introduction to the Internet, University of Massachusetts, Amherst. Summer 1999. Responsible for design, instruction, and grading of intensive internet course taken by a mix of university students, continuing education students, and gifted high school students.

Consultant for CS201 – Introduction to Assembly Language Programming, University of Massachusetts, Amherst. Fall 1992. Assisted students in understanding and writing of x86 assembly language programs.

Publications

Conference Proceedings

Matthew D Schmill and Tim Oates. “Managing Uncertainty in Text-To-Sketch Tracking Problems”. *Proceedings of the 23rd IEEE International Conference on Tools with AI*. Boca Raton, FL. November 2011.

Gary W. King, Matthew D. Schmill, Andrew Hannon, and Paul Cohen. "The Asymmetric Threat Assessment Tool (ATAT)". In *Proceedings of the 14th Conference on Behavior Representation in Modeling and Simulation (BRIMS)* Orlando, FL. May 2005.

Matthew D. Schmill, and Paul R. Cohen. A Motivational System That Drives the Development of Activity. *Proceedings of the Sixth International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS)*. 2002.

Victor Lavrenko, Matthew D. Schmill, Dawn Lawrie, Paul Ogilvie, David Jensen, and James Allan. "Language Models for Financial News Recommendation". In *Proceedings of the Ninth International Conference on Information and Knowledge Management (CIKM)*. 2000.

Tim Oates, Matthew D. Schmill, Paul R. Cohen. "A Method for Clustering the Experiences of a Mobile Robot that Accords with Human Judgments". In *Proceedings of the Seventeenth International Conference on Artificial Intelligence*. 2000.

Matthew D. Schmill, Tim Oates and Paul R. Cohen. "Learning Planning Operators in Real-World, Partially Observable Environments". In *Proceedings of the Fifth International Conference on Artificial Intelligence Planning and Scheduling*. 2000.

Oates, Tim, Matthew D. Schmill and Paul R. Cohen. "Efficient Mining of Statistical Dependencies". In *Proceedings of the Sixteenth International Joint Conference on Artificial Intelligence*. 1999.

Oates, Tim, Matthew Schmill and Paul R. Cohen. "Identifying Qualitatively Different Outcomes of Actions: Gaining Autonomy Through Learning". In *Proceedings of The Fourth International Conference on Autonomous Agents*. 1999.

Matthew D. Schmill, Michael T. Rosenstein, Paul R. Cohen, and Paul Utgoff. "Learning What is Relevant to the Effects of Actions for a Mobile Robot". In *Proceedings of the Second International Conference on Autonomous Agents*, pp. 247-253. 1998.

David Jensen and Matthew D. Schmill. "Accounting for Multiple Comparisons in Decision Tree Pruning". In *Proceedings of the Third International Conference on Knowledge Discovery and Data Mining*. 1997.

Tim Oates, Matthew D. Schmill, and Paul R. Cohen. "Parallel and Distributed Search for Structure in Multivariate Time Series". *Proceedings of the Ninth European Conference on Machine Learning*. 1996.

Schmill, Matthew D., Tim Oates and Paul R. Cohen. "Tools for Detecting Dependencies in AI Systems". In *Proceedings of the Seventh International IEEE Conference on Tools with Artificial Intelligence*. 1995.

Articles

Michael L. Anderson, Scott Fults, Darsana P. Josyula, Tim Oates, Don Perlis, Matthew D. Schmill, Shomir Wilson, and Dean Wright. "A self-help guide for autonomous systems". *AI Magazine*, Summer 2008.

Book Chapters

Matthew D. Schmill, Michael Anderson, Scott Fults, Darsana Josyula, Tim Oates, Don Perlis, Hamid Haidarian, Shomir Wilson, and Dean Wright. "The Metacognitive Loop and Reasoning about Anomalies". In Cox, M., Raja, A. (Ed.), *Metareasoning: Thinking about Thinking*. MIT Press, MA, USA, 2010.

Oates, Tim, Matthew D. Schmill, Dawn E. Gregory and Paul R. Cohen. Detecting Complex Dependencies in Categorical Data. In Doug Fisher and Hans Lenz, editors, *Finding Structure in Data: Artificial Intelligence and Statistics V*. Springer Verlag. 1995.

Workshops

Hamid Haidarian, Wikum Dinalankara, Scott Fults, Shomir Wilson, Don Perlis, Matthew D Schmill, Tim Oates, Darsana Josyula, and Michael Anderson. "The Metacognitive Loop: An architecture for building robust intelligent systems". In *Proceedings of the AAAI Fall Symposium on Commonsense Knowledge (AAAI/CSK'10)*, Arlington, VA, USA, November 11-13, 2010.

Darsana Josyula, Bette Donahue, Matt McCaslin, Michelle Snowden, Michael Anderson, Matthew D. Schmill, Tim Oates, and Don Perlis. "Metacognition for Detecting and Resolving Conflicts in Operational Policies", In *Proceedings of the Workshop on Metacognition for Robust Social Systems at the 24th AAAI Conference on Artificial Intelligence (AAAI-10)*, July 11-15, 2010

Matthew D. Schmill, Darsana Josyula, Michael Anderson, Tim Oates, Don Perlis, and Scott Fults. "Ontologies for Reasoning about Failures in AI Systems". In *First International Workshop on Metareasoning in Agent-Based Systems*, 2007.

Michael L. Anderson, Matthew D. Schmill, Tim Oates, Don Perlis, Darsana Josyula, Dean Wright, and Shomir Wilson. "Toward Domain-Neutral Human-Level Metacognition". In *Proceedings of the Eighth International Symposium on Logical Formalizations of Commonsense Reasoning*, 2007.

Victor Lavrenko, Matthew D. Schmill, Dawn Lawrie, Paul Ogilvie, David Jensen, and James Allan. 2000. "Mining of Concurrent Text and Time Series", In *Proceedings of the Sixth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*.

Tim Oates, Matthew D. Schmill, and Paul R. Cohen. "Identifying Qualitatively Different Outcomes of Actions: Experiments with a Mobile Robot". In *Working Notes of the IJCAI-99 Workshop on Robot Action Planning*. 1999.

Matthew D. Schmill, Tim Oates, and Paul R. Cohen. "Learned Models for Continuous Planning". In *The Preliminary Papers of the Seventh International Workshop on Artificial Intelligence and Statistics*. 1999.

Tim Oates, Matthew D. Schmill, Paul R. Cohen, and Casey Durfee. Efficient Mining of Statistical Dependencies. In *Preliminary Papers of the Seventh International Workshop on Artificial Intelligence and Statistics*, 1999.

Tim Oates, Matthew D. Schmill, David Jensen, and Paul R. Cohen. A Family of Algorithms for Finding Temporal Structure in Data. *The Preliminary Papers of the Sixth International Workshop on Artificial Intelligence and Statistics*. 1997.

M.T. Rosenstein, Paul R. Cohen, Matthew D. Schmill, and Marc S. Atkin. Action representation, prediction and concepts. In *Preliminary Papers of the AAAI Workshop on Robots, Softbots, Immobiles: Theories of Action, Planning and Control*. 1997.

Presentations

"A Probabilistic Framework for Text to Sketch", Full presentation at *The 2012 NGA Academic Research Program*. August 2012.

"Managing Uncertainty in Text-To-Sketch Tracking Problems". Full presentation to *The 23rd IEEE International Conference on Tools with AI*. November 2011.

"A Probabilistic Framework for Text to Sketch", Full presentation at *The 2011 NGA Academic Research Program*. September 2011.

"A Probabilistic Framework for Text to Sketch". Full presentation to *The 11th annual Intelligence Community Postdoctoral Research Fellowship Colloquium*. April 2011.

"Managing Uncertainty in Text to Sketch". Poster presentation to *The 10th annual Intelligence Community Postdoctoral Research Fellowship Colloquium*. April 2010.

"Ontologies for Reasoning about Failures in AI Systems". Full Presentation to *The First International Workshop on Metareasoning in Agent-Based Systems*. May 2007.

“Learning Planning Operators in Real-World, Partially Observable Environments”. Full presentation to *The Fifth International Conference on Artificial Intelligence Planning and Scheduling*. May 2000.

“Learned Models for Continuous Planning”. Poster presented to *The Seventh International Workshop on Artificial Intelligence and Statistics*. January 2000.

“Learning What is Relevant to the Effects of Actions for a Mobile Robot”. Full presentation to *The Second International Conference on Autonomous Agents*. May 1998.

“A Family of Algorithms for Finding Temporal Structure in Data”. Poster presented to *The Sixth International Workshop on Artificial Intelligence and Statistics*. January 1998.

“Tools for Detecting Dependencies in AI Systems”. Full presentation to *The Seventh International IEEE Conference on Tools with Artificial Intelligence*. November 1995.

Professional Service

August – November 2012 **Program Committee**
IEEE Conference on Development and Learning / EpiRob 2012.
Javier Movellan, Matthew Schlesinger, Jochen Triesch, co-chairs.

March – July 2010 **Program Committee**
AAAI-10 Workshop on Metacognition for robust social systems.
Darsana Josyula and Anita Raja, co-chairs.

January – March 2009 **Reviewer**
International Conference on Machine Learning (ICML-09).
Leon Bottou and Michael Littman, co-chairs.

April – May 2008 **Reviewer**
International Conference on Development and Learning (ICDL-08).
Brian Scassellati and Gedeon Deak, co-chairs.

References

Available upon request.