

Matthew E. Taylor

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EDUCATION

- **The University of Texas**, Austin, TX. September 2003 – August 2008.
Ph.D., Department of Computer Sciences
Dissertation: Autonomous Inter-Task Transfer in Reinforcement Learning Domains.
Advisor: Dr. Peter Stone
Committee: Risto Miikkulainen, Raymond Mooney, Bruce Porter, Peter Stone, and Richard S. Sutton
- **Amherst College**, Amherst, MA. September 1997 – May 2001.
A.B., *magna cum laude* in Computer Science and Physics with distinction

APPOINTMENTS

- **The University of Southern California**, Summer 2008 – present
Postdoctoral Research Associate in the Department of Computer Science with Dr. Milind Tambe.
Responsibilities include supervising students and directing three DARPA research grants.
- **The University of Texas at Austin**, Autumn 2004 – Summer 2008.
Research Assistant in the Department of Computer Sciences with Dr. Peter Stone. Research interests include reinforcement learning and transfer learning.
- **Cycorp**, Summer 2006.
Research Intern. Implemented machine learning techniques to solve novel problems within Cyc, a large cognitive architecture.
- **Epic Systems Corporation**, July 2001 – July 2003.
Software Developer and *Lead Software Developer* for medical applications used worldwide. Defined, developed, tested, and documented new product features.
- **Microsoft**, Summer 2000.
Software Developer Intern in the Microsoft Office group. Designed and added features to a C++ code base utilizing client/server and server/server interactions.
- **NSF Funded Research Experience for Undergraduates**, Summer 1999.
Physics Research Intern at the University of Nebraska, Lincoln. Worked with Dr. Robert Hilborn experimentally testing the symmetrization postulate via diode laser absorption spectroscopy.

TEACHING

- **Assistant Instructor** at **The University of Texas at Austin** for *Software Systems: Unix*.
Autumn 2007, Spring 2008.
Sole instructor for 40+ student class designed to quickly familiarize students with Unix/Linux.
Overall student evaluation: 4.4/5.0.
- **Teaching Assistant** at **The University of Texas at Austin** for *Computer Fluency*
with Dr. Bruce Porter. Autumn 2005.
Discussion leader, grader, and occasional lecturer. Overall student evaluation: 4.3/5.0.
- **Teaching Assistant** and **Tutor** at **Amherst College** for computer science and physics.
Spring 1998 – Autumn 2000.
- **Teacher** and **Academic Director** at **American Computer Experience Computer Camp**.
Summers of 1996, 1997, & 1998.

HONORS

- **Nominated by department** for the ACM Doctoral Dissertation Award. Department limited to one nominee. Autumn 2008.
- **Nominated by department** for UT-Austin's William S. Livingston Outstanding Graduate Student Academic Employee Award: Assistant Instructor. Limited to one nominee per department. Spring 2008.
- **Nominated by department** for UT-Austin's William S. Livingston Outstanding Graduate Student Academic Employee Award: Graduate Research Assistant. Limited to one nominee per department. Spring 2007.
- **Best Paper Award:** Genetic and Evolutionary Computation Conference, GA Track, July 2006.
- **MCD Fellowship:** UT-Austin's Department of Computer Sciences, Autumn 2003 – Summer 2004.
- **Dean's Excellence Award:** UT-Austin's College of Natural Sciences, Autumn 2003.
- **Sigma Xi:** Awarded for research completed in a senior thesis at Amherst College, Spring 2001.
- **NSF/STEMTEC Teaching Fellowship,** Autumn 1998.

STUDENTS SUPERVISED

- **My Luc** undergraduate, Spring 2008.
- **Greg Rathjen** undergraduate, Autumn 2008 – present.
- **Jagrut Sharma** M.S., Autumn 2008 – present.
- **Prateek Tandon** undergraduate, Autumn 2008 – present.

Co-advised with Milind Tambe:

- **Manish Jain** Ph.D., Autumn 2008 – present.
- **Jun-young Kwak** Ph.D., Autumn 2008 – present.
- **Rob Zinkov** Ph.D., Autumn 2008 – present.

PROFESSIONAL ACTIVITIES

- **Organizing committee member:**
 - *Transfer Learning for Complex Tasks*, AAI-08 workshop.
- **Committee member:**
 - *The 2nd Annual Reinforcement Learning Competition*, ICML-08.
- **Journal reviewer:**
 - *International Journal of Agent Technologies and Systems* (IJATS), 2008.
 - *Autonomous Agents and Multi-Agent Systems* (JAAMAS), 2008.
 - *Artificial Intelligence* (AIJ), 2007, 2008.
 - *Journal of Artificial Intelligence Research* (JAIR), 2007.
 - *Machine Learning* (MLJ), 2007.
- **Conference program committee member:**
 - The International Joint Conference on Artificial Intelligence (IJCAI), 2009.
 - Autonomous Agents and Multiagent Systems (AAMAS), 2009.
 - Neural Information Processing Systems (NIPS), 2008.
 - The International Conference on Machine Learning (ICML), 2008.
 - The European Conference on Machine Learning (ECML), 2007.
 - The Conference of the Spanish Association for Artificial Intelligence (CAEPIA), 2007.
- **Conference reviewer:**
 - The 6th International Semantic Web Conference (ISWC), 2007
 - The International Joint Conference on Artificial Intelligence (IJCAI), 2007.
- **Workshop program committee member:**
 - AAMAS workshop on *Adaptive Learning Agents and Multi-Agent Systems*, 2008.
 - ICML workshop on *Structural Knowledge Transfer for Machine Learning*, 2006.

- **Departmental service:**
 - Organized the transfer learning reading group, 2007–08.
 - Graduate Student Faculty Recruiting Committee, 2007.
 - Computer Sciences Space Committee, 2006.
 - Graduate Representative Association of Computer Sciences, 2004–05.
 - Founded and organized the department’s reinforcement learning reading group, 2003–04.

INVITED TALKS and COLLOQUIA

- “An Overview of Agent and Multiagent Learning”
 - **University of Southern California**, Los Angeles, CA. Guest Lecture, CS499. November 2008.
- “Towards Autonomous Inter-Task Transfer in Reinforcement Learning Domains”
 - **University of Southern California**, Los Angeles, CA. Departmental Seminar. June 2008.
 - **Carnegie Mellon University**, Pittsburgh, PA. Manuela Veloso’s group meeting. April 2008.
 - **University of Wisconsin**, Madison, WI. Artificial Intelligence Seminar. October 2007.
 - **University of Washington**, Seattle, WA. Pedro Domingos’s group meeting. October 2007.
 - **Microsoft Research**, Redmond, WA. Machine Learning Reading Group. October 2007.
 - **Harvard University**, Cambridge, MA. AI Research Series. September 2007.
 - **MIT**, Cambridge, MA. Nick Roy’s & Leslie Pack Kaelbling’s group meeting. September 2007.
 - **Brown University**, Providence, RI. Seminar. September 2007.
 - **University of Alberta**, Edmonton, CA. Artificial Intelligence Seminar Series. August 2007.
- “Faster Inference through Reinforcement Learning”
 - **Cyrcorp**, Austin, TX. August 2006.
- “Speeding up Reinforcement Learning via Behavior Transfer”
 - **Amherst College**, Amherst, MA. Departmental Colloquium. September 2005.
 - **UMass-Amherst**, Amherst, MA. Machine Learning and Friends Lunch. September 2005.
 - **Stanford**, Stanford, CA. Pat Langley’s group meeting. June 2005.

CONFERENCE PRESENTATIONS (Full Paper)

- “Transferring Instances for Model-Based Reinforcement Learning”
 - **ECML-PKDD-08**, Antwerp, Belgium, September 2008.
- “Autonomous Transfer for Reinforcement Learning”
 - **AAMAS-08**, Estoril, Portugal, May 2008.
- “Transfer Learning and Intelligence: an Argument and Approach”
 - **AGI-08**, Memphis, TN, March 2008.
- “Temporal Difference and Policy Search Methods for Reinforcement Learning: An Empirical Comparison”
 - **AAAI-07**, Vancouver, Canada, July 2007.
- “Cross-Domain Transfer for Reinforcement Learning”
 - **ICML-07**, Corvallis, OR, June 2007.
- “Transfer via Inter-Task Mappings in Policy Search Reinforcement Learning”
 - **AAMAS-07**, Honolulu, HI, May 2007.
- “Guiding Inference with Policy Search Reinforcement Learning”
 - **FLAIRS-07**, Key West, FL, May 2007.
- “Autonomous Classification of Knowledge into an Ontology”
 - **FLAIRS-07**, Key West, FL, May 2007.
- “Comparing Evolutionary and Temporal Difference Methods for Reinforcement Learning”
 - **GECCO-06**, Seattle, WA, July 2006.
- “Value functions for RL-Based Behavior Transfer: A Comparative Study”
 - **AAAI-05**, Pittsburgh, PA, July 2005.
- “Behavior Transfer for Value-Function-Based Reinforcement Learning”
 - **AAMAS-05**, Utrecht, The Netherlands, July 2005.

SELECTED PUBLICATIONS

Publications are available and cross-listed by *type*, *date*, and *topic*, at:

<http://www.cs.utexas.edu/~mtaylor/>

Journal Articles

1. **Matthew E. Taylor**, Peter Stone, and Yaxin Liu. Transfer Learning via Inter-Task Mappings for Temporal Difference Learning. *Journal of Machine Learning Research*, 8(1):2125–2167, 2007.
2. Shimon Whiteson, **Matthew E. Taylor**, and Peter Stone. Empirical studies in action selection for reinforcement learning. *Adaptive Behavior*, 15(1):33–50, 2007.

Ph.D. Dissertation

3. **Matthew E. Taylor**. Autonomous Inter-Task Transfer in Reinforcement Learning Domains. Department of Computer Sciences, The University of Texas at Austin, August 2008. Also available as Technical Report UT-AI-TR-08-5.

Book Chapters

4. Peter Stone, Gregory Kuhlmann, **Matthew E. Taylor**, and Yaxin Liu. Keepaway soccer: From machine learning testbed to benchmark. In Itsuki Noda, Adam Jacoff, Ansgar Bredendfeld, and Yasutake Takahashi, editors, *RoboCup-2005: Robot Soccer World Cup IX*, volume 4020, pages 93–105. Springer Verlag, Berlin, 2006. 28% acceptance rate at RoboCup-2005.

Refereed Conference Papers

5. Katherine K. Coons, Behnam Robatmili, **Matthew E. Taylor**, Bertrand A. Maher, Kathryn McKinley, and Doug Burger. Feature Selection and Policy Optimization for Distributed Instruction Placement Using Reinforcement Learning. In *Proceedings of the Seventh International Joint Conference on Parallel Architectures and Compilation Techniques (PACT)*, October 2008. 19% acceptance rate.
6. **Matthew E. Taylor**, Nicholas K. Jong, and Peter Stone. Transferring Instances for Model-Based Reinforcement Learning. In *Proceedings of the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD)*, September 2008. 19% acceptance rate.
7. **Matthew E. Taylor**, Gregory Kuhlmann, and Peter Stone. Autonomous Transfer for Reinforcement Learning. In *Proceedings of the Seventh International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2008. 22% acceptance rate.
8. **Matthew E. Taylor**, Gregory Kuhlmann, and Peter Stone. Transfer Learning and Intelligence: an Argument and Approach. In *Proceedings of the First Conference on Artificial General Intelligence (AGI)*, March 2008. 50% acceptance rate.
9. **Matthew E. Taylor**, Shimon Whiteson, and Peter Stone. Temporal Difference and Policy Search Methods for Reinforcement Learning: An Empirical Comparison. In *Proceedings of the Twenty-Second Conference on Artificial Intelligence (AAAI)*, pages 1675–1678, Nectar Track, July 2007. 38% acceptance rate.
10. **Matthew E. Taylor** and Peter Stone. Cross-Domain Transfer for Reinforcement Learning. In *Proceedings of the Twenty-Fourth International Conference on Machine Learning (ICML)*, June 2007. 29% acceptance rate.
11. **Matthew E. Taylor**, Shimon Whiteson, and Peter Stone. Transfer via Inter-Task Mappings in Policy Search Reinforcement Learning. In *Proceedings of the Sixth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2007. 22% acceptance rate.

12. Mazda Ahmadi, **Matthew E. Taylor**, and Peter Stone. IFSA: Incremental Feature-Set Augmentation for Reinforcement Learning Tasks. In *Proceedings of the Sixth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2007. 22% acceptance rate.
Best Student Paper Nomination.
13. **Matthew E. Taylor** and Peter Stone. Towards Reinforcement Learning Representation Transfer. In *Proceedings of the Sixth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, poster presentation, May 2007. 22% acceptance rate for papers, additional 25% for posters.
14. **Matthew E. Taylor**, Cynthia Matuszek, Pace Reagan, and Michael Witbrock. Guiding Inference with Policy Search Reinforcement Learning. In *Proceedings of the 20th International FLAIRS Conference (FLAIRS)*, May 2007. 52% acceptance rate.
15. **Matthew E. Taylor**, Cynthia Matuszek, Bryan Klimt, and Michael Witbrock. Autonomous Classification of Knowledge into an Ontology. In *Proceedings of the 20th International FLAIRS Conference (FLAIRS)*, May 2007. 52% acceptance rate.
16. **Matthew E. Taylor**, Shimon Whiteson, and Peter Stone. Comparing Evolutionary and Temporal Difference Methods for Reinforcement Learning. In *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO)*, pages 1321–28, July 2006. 46% acceptance rate, 85 submissions to GA track.
Best Paper Award, Genetic Algorithms Track.
17. **Matthew E. Taylor**, Peter Stone, and Yaxin Liu. Value Functions for RL-Based Behavior Transfer: A Comparative Study. In *Proceedings of the Twentieth Conference on Artificial Intelligence (AAAI)*, July 2005. 18% acceptance rate.
18. **Matthew E. Taylor** and Peter Stone. Behavior Transfer for Value-Function-Based Reinforcement Learning. In *Proceedings of the Fourth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, pages 53–59, July 2005. 24.5% acceptance rate.

Refereed Workshop and Symposium Papers

19. **Matthew E. Taylor**, Nicholas K. Jong, and Peter Stone. Transferring Instances for Model-Based Reinforcement Learning. In *AAMAS 2008 Workshop on Adaptive Learning Agents and Multi-Agent Systems*, May 2008.
20. **Matthew E. Taylor**, Katherine E. Coons, Behnam Robotmili, Doug Burger, and Kathryn S. McKinley. Policy Search Optimization for Spatial Path Planning. In *NIPS Workshop: Machine Learning for Systems Problems*, poster presentation, December 2007.
21. **Matthew E. Taylor** and Peter Stone. Representation Transfer for Reinforcement Learning. In *AAAI 2007 Fall Symposium on Computational Approaches to Representation Change during Learning and Development*, November 2007.
22. **Matthew E. Taylor**, Gregory Kuhlmann, and Peter Stone. Accelerating Search with Transferred Heuristics. In *ICAPS–07 Workshop on AI Planning and Learning*, poster presentation, September 2007.
23. Shimon Whiteson, **Matthew E. Taylor** and Peter Stone. Adaptive Tile Coding for Reinforcement Learning. In *NIPS Workshop: Towards a New Reinforcement Learning?*, poster, December 2006.
24. **Matthew E. Taylor**, Shimon Whiteson, and Peter Stone. Transfer learning for Policy Search Methods. In *ICML Workshop: Structural Knowledge Transfer for Machine Learning*, poster presentation, June 2006.

25. **Matthew E. Taylor**, and Peter Stone. Speeding up Reinforcement Learning with Behavior Transfer. *AAAI 2004 Fall Symposium on Real-life Reinforcement Learning*, October 2004.

Other Papers

26. Shimon Whiteson, **Matthew E. Taylor** and Peter Stone. Adaptive Tile Coding for Value Function Approximation. Technical Report AI-TR-07-339, University of Texas at Austin, 2007.