

# Samuel Barrett

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## Education

- **University of Texas At Austin** Austin, TX  
*Ph.D. Candidate, Department of Computer Science* 8/08 - 10/14
  - Dissertation: *Making Friends on the Fly: Advances in Ad Hoc Teamwork*
  - Advisor: Prof. Peter Stone
  - Research: Ad hoc teams, reinforcement learning, transfer learning, and robotics
- **Stevens Institute of Technology** Hoboken, NJ  
*Bachelor of Science in Computer Science* 8/04 - 5/08
  - Minor in Mathematics, Minor in Music Technology
  - GPA: 3.957 Dean's List

## Work Experience

- **Cogitai, Inc.** Somerville, MA  
*Research Scientist* 8/16 - Present
  - Lead a team of researchers and engineers
  - Performed research on continual learning
  - Developed continual learning demonstrations on robotics platforms using ROS
- **Amazon Robotics** North Reading, MA  
*Research Scientist* 11/14 - 08/16
  - Developed a machine learning system for identifying problems in Amazon warehouses
  - Performed research on applying machine learning to robotics systems
  - Taught a course on machine learning at Amazon Robotics
- **University of Texas at Austin** Austin, TX  
*Graduate Research Assistant* 08/12 - 12/12, 8/13 - 10/14
  - Created an empirical algorithm for cooperating with unknown teammates
  - Developed behaviors for locomotion, teamwork, and whole body control for humanoid robots
  - Designed and implemented a shared memory architecture for robots that includes the ability to log and debug behaviors
  - Analyzed teamwork problems theoretically and proved their tractability

*Teaching Assistant*

  - CS 394R – Reinforcement Learning: Theory and Practice *Spring 2013*
  - CS 371P – Object Oriented Programming *Spring 2009*
  - CS 371P – Object Oriented Programming *Fall 2008*

*NDSEG Fellow* 8/09 - 8/12

  - Developed a novel transfer learning algorithm for combining information from many sources
  - Led robot soccer team to win RoboCup 2012 in the Standard Platform League
  - Contributed to championship-winning simulated robot soccer team
  - Designed a framework for analyzing teamwork problems and their solutions

- **MIT Lincoln Laboratory** Lexington, MA  
*Research Intern* 6/09-8/09
  - Created a system using Hidden Markov Models (HMMs) for detecting terrorist activity and anomalous behavior
  - Combined many possible sources of information into a unified algorithm
- **Stevens Institute of Technology** Hoboken, NJ  
*Researcher* 6/05 - 8/08
  - Combined text analysis with analysis of social networking to predict the popularity of news stories
  - Optimized sensor placement for detecting underwater threats for harbor security
  - Developed a harbor model that considers environmental factors including water currents
  - Implemented a multi-objective genetic algorithm
- **NSF-funded REU at Utah State University** Logan, UT  
*Researcher* 6/07 - 9/07
  - Performed research in computer vision and image processing
  - Developed an efficient system for content-based image retrieval
  - Designed an image-agnostic approach for learning long-term image similarities

## Skills

- **Proficient Languages:** C++, Python, C, L<sup>A</sup>T<sub>E</sub>X
- **Familiar Languages:** Java, Scheme, Lua, MATLAB, Mathematica, HTML, PHP, SQL, Javascript
- **Tools:** Git, Subversion, Linux, Unix, Windows
- **Skills:** Machine Learning, Robotics, Artificial Intelligence, Computer Vision, Reinforcement Learning, Supervised Learning, Transfer Learning

## Awards and Honors

### The University of Texas at Austin

- RoboCup SPL World 3<sup>rd</sup> Place Team Leader, 2013
- RoboCup SPL World Champions Team Leader, 2012
- RoboCup SPL U.S. Open Champions Team Leader, 2012
- RoboCup 3D Simulator League World Champions Team Member, 2011
- RoboCup SPL World 3<sup>rd</sup> Place Team Member, 2010
- RoboCup SPL U.S. Open Champions Team Member, 2010
- National Defense Science and Engineering Graduate (NDSEG) Fellowship, 2009-2012

### Stevens Institute of Technology

- NSF GRFP Honorable Mention, 2008
- Thomas E. McCandless Music Award, 2008
- John F. Richardson Award for Excellence in Humanities, 2008
- Barry M. Goldwater Scholarship, 2007-2008
- Upsilon Pi Epsilon, Computer Science International Honor Society, 2006-Present
- Barry M. Goldwater Scholarship Honorable Mention, 2006
- Neupauer Scholarship, Four year, full tuition, merit scholarship, 2004-2008

## Organizing Committees

- AAAI Workshop on Multiagent Interaction without Prior Coordination (MIPC), 2014
- AAMAS Workshop on Adaptive Learning Agents (ALA), 2014

- RoboCup Standard Platform League (SPL), 2012

## Program Committees

- Twenty-Eighth AAAI Conference on Artificial Intelligence (AAAI), 2014
- International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS), 2014
- AAMAS Workshop on Adaptive Learning Agents (ALA), 2012-2014
- International Joint Conference on Artificial Intelligence (IJCAI), 2013
- AAMAS Workshop on Autonomous Robots and Multirobot Systems (ARMS), 2013

## Reviewer

- European Conference on Artificial Intelligence (ECAI), 2014
- Annals of Mathematics and Artificial Intelligence (AMAI), 2013
- IEEE Transactions on Cybernetics (CYB-E), 2013
- IEEE Transactions on Neural Networks and Learning Systems (TNNLS), 2013
- Journal of Quantitative Analysis of Sports (DGJQAS), 2013
- International Conference on Robotics and Automation (ICRA), 2013
- International Conference on Intelligent Robots and Systems (IROS), 2012
- Journal of Artificial Intelligence Research (JAIR), 2012
- Robotics and Autonomous Systems (RAS), 2011
- Advances in Complex Systems (ACS), 2011
- Humanoids Workshop on Humanoid Soccer Robots, 2010

## Code Releases

- UT Austin Villa 2012 code release  
[http://www.cs.utexas.edu/~AustinVilla/?p=downloads/source\\_code\\_and\\_binaries](http://www.cs.utexas.edu/~AustinVilla/?p=downloads/source_code_and_binaries)
- Reinforcement learning and pursuit domain code release  
<http://github.com/utexas-bwi/rl-pursuit>

### Journal Articles

- [1] **Samuel Barrett**, A. Rosenfeld, S. Kraus, and P. Stone, “Making friends on the fly: Cooperating with new teammates,” *Artificial Intelligence*, October 2016.
- [2] X. Qi, **Samuel Barrett**, and R. Chang, “A noise-resilient collaborative learning approach to content-based image retrieval,” *International Journal of Intelligent Systems*, 2011.

### Refereed Conference Papers

- [1] **Samuel Barrett** and P. Stone, “Cooperating with unknown teammates in complex domains: A robot soccer case study of ad hoc teamwork,” in *Proceedings of the Twenty-Ninth AAAI Conference on Artificial Intelligence*, January 2015.
- [2] P. Khandelwal, **Samuel Barrett**, and P. Stone, “Leading the way: An efficient multi-robot guidance system,” in *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2015.
- [3] N. Agmon, **Samuel Barrett**, and P. Stone, “Modeling uncertainty in leading ad hoc teams,” in *Proceedings of the 13th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2014.
- [4] **Samuel Barrett**, N. Agmon, N. Hazon, S. Kraus, and P. Stone, “Communicating with unknown teammates,” in *Proceedings of the Twenty-First European Conference on Artificial Intelligence*, August 2014.
- [5] P. MacAlpine, K. Genter, **Samuel Barrett**, , and P. Stone, “The RoboCup 2013 drop-in player challenges: Experiments in ad hoc teamwork,” in *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, September 2014.
- [6] **Samuel Barrett**, P. Stone, S. Kraus, and A. Rosenfeld, “Teamwork with limited knowledge of teammates,” in *Proceedings of the Twenty-Seventh AAAI Conference on Artificial Intelligence (AAAI)*, July 2013.
- [7] A. Farchy, **Samuel Barrett**, P. MacAlpine, and P. Stone, “Humanoid robots learning to walk faster: From the real world to simulation and back,” in *Proc. of 12th Int. Conf. on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2013.
- [8] P. MacAlpine, **Samuel Barrett**, D. Urieli, V. Vu, and P. Stone, “Design and optimization of an omnidirectional humanoid walk: A winning approach at the RoboCup 2011 3D simulation competition,” in *Proceedings of the Twenty-Sixth AAAI Conference on Artificial Intelligence (AAAI)*, July 2012.
- [9] **Samuel Barrett** and P. Stone, “An analysis framework for ad hoc teamwork tasks,” in *Proceedings of the 11th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2012)*, June 2012.
- [10] P. MacAlpine, D. Urieli, **Samuel Barrett**, S. Kalyanakrishnan, F. Barrera, A. Lopez-Mobilia, N. Sturca, V. Vu, and P. Stone, “UT Austin Villa 2011: A champion agent in the RoboCup 3D soccer simulation competition,” in *Proceedings of the 11th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2012)*, June 2012.
- [11] R. Lin, S. Kraus, N. Agmon, **Samuel Barrett**, and P. Stone, “Comparing agents: Success against people in security domains,” in *Proceedings of the Twenty-Fifth AAAI Conference on Artificial Intelligence*, August 2011.
- [12] **Samuel Barrett**, P. Stone, and S. Kraus, “Empirical evaluation of ad hoc teamwork in the pursuit domain,” in *Proc. of 11th Int. Conf. on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2011.

- [13] W. Campbell, **Samuel Barrett**, J. Acevedo-Aviles, B. Delaney, and C. Weinstein, “Detection and simulation of scenarios with hidden Markov models and event dependency graphs,” in *Acoustics Speech and Signal Processing (ICASSP), 2010 IEEE International Conference on*, pp. 5434–5437, 2010.
- [14] **Samuel Barrett**, R. Chang, and X. Qi, “A fuzzy combined learning approach to content-based image retrieval,” in *IEEE International Conference on Multimedia and Expo (ICME)*, pp. 838–841, July 2009.
- [15] **Samuel Barrett**, “Optimizing sensor placement for intruder detection with genetic algorithms,” in *IEEE International Conference on Intelligence and Security Informatics*, pp. 185–188, May 2007.
- [16] I. Goldman, **Samuel Barrett**, and J. V. Nickerson, “Optimization of multi-attribute tasks for underwater motion of robotic sensor agents,” in *IEEE International Conference on Intelligence and Security Informatics*, p. 374, May 2007.

## Book Chapters

- [1] **Samuel Barrett**, K. Genter, Y. He, T. Hester, P. Khandelwal, J. Menashe, and P. Stone, “UT Austin Villa 2012: Standard platform league world champions,” in *RoboCup-2012: Robot Soccer World Cup XVI* (X. Chen, P. Stone, L. E. Sucar, and T. V. der Zant, eds.), Lecture Notes in Artificial Intelligence, Berlin: Springer Verlag, 2013.
- [2] **Samuel Barrett**, K. Genter, Y. He, T. Hester, P. Khandelwal, J. Menashe, and P. Stone, “The 2012 UT Austin Villa code release,” in *RoboCup-2013: Robot Soccer World Cup XVII*, 2013.
- [3] A. Bai, X. Chen, P. MacAlpine, D. Urieli, **Samuel Barrett**, and P. Stone, “Wright Eagle and UT Austin Villa: RoboCup 2011 simulation league champions,” in *RoboCup-2011: Robot Soccer World Cup XV* (T. Roefer, N. M. Mayer, J. Savage, and U. Saranlı, eds.), Lecture Notes in Artificial Intelligence, Berlin: Springer Verlag, 2012.

## Refereed Workshop/Symposium Papers

- [1] J. Grizou, **Samuel Barrett**, M. Lopes, and P. Stone, “Collaboration in ad hoc teamwork: Ambiguous tasks, roles, and communication,” in *AAMAS Adaptive Learning Agents (ALA) Workshop*, May 2016.
- [2] J. Menashe, K. Genter, **Samuel Barrett**, and P. Stone, “UT Austin Villa 2013: Advances in vision, kinematics, and strategy,” in *The Eighth Workshop on Humanoid Soccer Robots at Humanoids 2013*, October 2013.
- [3] **Samuel Barrett** and P. Stone, “Ad hoc teamwork in variations of the pursuit domain,” in *Proceedings of the Twenty-Fifth AAAI Conference on Artificial Intelligence Student Abstract and Poster Program*, August 2011.
- [4] **Samuel Barrett** and P. Stone, “Ad hoc teamwork modeled with multi-armed bandits: An extension to discounted infinite rewards,” in *Tenth International Conference on Autonomous Agents and Multiagent Systems - Adaptive Learning Agents Workshop (ALA)*, May 2011.
- [5] **Samuel Barrett**, M. E. Taylor, and P. Stone, “Transfer learning for reinforcement learning on a physical robot,” in *Ninth International Conference on Autonomous Agents and Multiagent Systems - Adaptive Learning Agents Workshop (ALA)*, May 2010.
- [6] **Samuel Barrett**, K. Genter, T. Hester, M. Quinlan, and P. Stone, “Controlled kicking under uncertainty,” in *The Fifth Workshop on Humanoid Soccer Robots at Humanoids 2010*, December 2010.
- [7] E. Sadlon, Y. Sakamoto, J. Ma, **Samuel Barrett**, and J. V. Nickerson, “The ecology of Digg: Niches and reciprocity in a social network landscape,” in *ACM CHI Workshop on Social Mediating Technologies: Developing the Research Agenda*, 2009.

- [8] E. Sadlon, Y. Sakamoto, **Samuel Barrett**, and J. V. Nickerson, “The karma of Digg: Reciprocity in online social networks,” in *Proceedings of the 18th Annual Workshop on Information Technologies and Systems (WITS)*, December 2008.

### Unrefereed

- [1] **Samuel Barrett**, K. Genter, T. Hester, P. Khandelwal, M. Quinlan, P. Stone, and M. Sridharan, “Austin Villa 2011: Sharing is caring: Better awareness through information sharing,” Tech. Rep. UT-AI-TR-12-01, The University of Texas at Austin, Department of Computer Sciences, AI Laboratory, January 2012.
- [2] P. MacAlpine, D. Urieli, **Samuel Barrett**, S. Kalyanakrishnan, F. Barrera, A. Lopez-Mobilia, N. Ştiurcă, V. Vu, and P. Stone, “UT Austin Villa 2011 3D Simulation Team report,” Tech. Rep. AI11-10, The University of Texas at Austin, Department of Computer Science, AI Laboratory, December 2011.
- [3] **Samuel Barrett**, K. Genter, M. Hausknecht, T. Hester, P. Khandelwal, J. Lee, M. Quinlan, A. Tian, P. Stone, and M. Sridharan, “Austin Villa 2010 standard platform team report,” Tech. Rep. UT-AI-TR-11-01, The University of Texas at Austin, Department of Computer Sciences, AI Laboratory, January 2011.