Trevor Santarra[*]

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[*] formerly Sarratt

Education

2011–2019   **Ph.D. in Computer Science**, University of California at Santa Cruz.
Dissertation: *Communicating Plans in Ad Hoc Multiagent Teams*
Research topics: *Ad Hoc Teams, Multiagent Planning, Active Learning, Behavior Modeling*

2007–2011   **B.S. in Applied Mathematics**, University of Tulsa.
Minors: *Biology, Chemistry, and Computer Science*

Experience

2017–Present   **Senior Research Engineer**, Unity Technologies.
- Developed a runtime-editable, node-based graph editor for authoring behavior graphs.
- Employed data-oriented design for cache-friendly, parallelized graph algorithms used primarily for graph search in sequential decision-making domains.
- Developed a trait-based planning domain description language for use in games.
- Trained deep-learning state evaluation networks for use as a plan evaluation heuristic.

2011–2019   **Ph.D. Student**, University of California at Santa Cruz.
- Characterized policy communication as active inference in multiagent ad hoc teamwork.
- Developed a decision-theoretic planning framework incorporating agent models constructed from prior knowledge, online observations, and communicated policy information.
- Explored alternative belief revision approaches to agent modeling when coordinating with teammates exhibiting non-stationary policies.

Summer 2013   **Visiting Researcher**, Institute for Creative Technologies, University of Southern California.
- Proposed and implemented recursive mental models for wartime negotiation simulations.
- Extended the functionality of the POMDP-based social simulation tool, PsychSim.

Winter 2013   **Research Intern**, Honda Research Institute.
- Developed a real-time driver monitoring system using depth sensors and machine learning.
- See Patent US9501693 B2.

2008–2011   **Student Researcher**, University of Tulsa.
Computational Neuroscience and Adaptive Systems Lab
- Programmed several video processing algorithms in Java for *C. elegans* video analysis.
- Implemented neural controllers into the ALIVE simulator.

Gryllotalpa Major Ecology Lab
- Performed DNA sequencing on tissue samples from various cricket species.
- Aligned sequences and constructed phylogeny trees from probable mutation histories.

Institute of Bioinformatics and Computational Biology
- Implemented complex biological models using a stochastic pi-calculus.
- Developed a model for iron diffusion across membranes using a grid of stochastic cells.

Patents

2018   Berges; Vincent-Pierre, Ebrahimi; Amir, Juliani; Arthur, Meuleau; Nicolas and **Santarra; Trevor**. Method and System for a Behavior Generator Using Deep Learning and an Automated Planner (Provisional)

2018   Ebrahimi; Amir, Meuleau; Nicolas and **Santarra; Trevor**. Method and System for Behavior Generation with a Trait-Based Planning Domain Language (Provisional)

2013   **Sarratt, Trevor** and Fujimura, Kikuo. Real-time multiclass driver action recognition using random forests. U.S. Patent 9501693 B2

Skills

Programming	C#, Python, C++, Java
AI Specialties	Decision-theoretic Planning, Multiagent Systems, Machine Learning, Game AI
Unity	Burst + C# Job System, Entities, UI Toolkit, Cloud Tech

Teaching

Teaching Assistant, *University of California at Santa Cruz.*

Spring 2017	CMPM172: Game Design Studio III
Winter 2017	CMPM171: Game Design Studio II
Winter 2016	CMPM146: Game AI
Spring 2015	CMPM172: Game Design Studio III
Winter 2012	CMPS20: Game Design Experience

Teaching Assistant, *University of Tulsa.*

Spring 2010	MATH2024: Calculus II
Fall 2009	MATH2024: Calculus II

Papers

2016	**Trevor Sarratt** and Arnav Jhala. "Policy Communication for Coordination with Unknown Teammates" *3rd Workshop on Multiagent Interaction without Prior Coordination, AAAI-16.*
2015	**Trevor Sarratt** and Arnav Jhala. "Tuning Belief Revision for Coordination with Inconsistent Agents" *Eleventh Annual AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment,* 2015.
2015	**Trevor Sarratt** and Arnav Jhala. "The Role of Models and Communication in the Ad Hoc Multi-Agent Team Decision Problem" *The Third Annual Conference on Advances in Cognitive Systems, Atlanta, GA.*
2015	**Trevor Sarratt** and Arnav Jhala. "RAPID: A Belief Convergence Strategy for Collaborating with Inconsistent Agents" *Second Workshop on Multiagent Interaction without Prior Coordination, AAAI-15.*
2014	**Trevor Sarratt**, Soja Marie Morgens, and Arnav Jhala. "Domain-Specific Sentiment Classification for Games-Related Tweets" *Third Workshop on Games and NLP, AIIDE-14.*
2014	**Trevor Sarratt**, David Pynadath, and Arnav Jhala. "Converging to a Player Model in Monte-Carlo Tree Search" *IEEE Conference on Computational Intelligence and Games, CIG-2014.*
2011	Roger Mailler, Jacob Graves, Nathan Willy, and **Trevor Sarratt**. "A Biologically Accurate Simulation of the Locomotion of Caenorhabditis elegans," in *The International Journal on Advances in Life Sciences,* vol. 2(3), pp. 82-93.
2010	Abinash Padhi, Richard E. Young, Jr., Cara Hoffart, **Trevor Sarratt**, Jennifer Fancher, Michael Steffen and Peggy S. M. Hill. "Investigating genetic relationships within the Gryllotalpidae: A molecular hypothesis," in *Journal of Orthoptera Research,* vol. 19(2), pp. 357-360.
2009	Stephen Tyree, Rayus Kuplicki, **Trevor Sarratt**, Scott Fujan and John Hale. "GridSPiM: A Framework for Simple Locality and Containment in the Stochastic Pi-Calculus," in *Lecture Notes in Computer Science: Bioinformatics and Computational Biology,* pp. 409-423.

Posters

2016	**Trevor Santarra** and Arnav Jhala. "Communicating Intentions for Coordination with Unknown Teammates" *The Fifteenth Annual Conference on Autonomous Agents and Multiagent Systems, Singapore.*
2014	**Trevor Sarratt**. "Leveraging Communication for Player Modeling and Cooperative Play" *The 10th AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment.*
2010	Richard Young, **Trevor Sarratt**, and Peggy Hill. "Investigating genetic relationships within the Gryllotalpidae." *Animal Behaviour Society,* Annual Meeting, Williamsburg, VA.
2008	Stephen Tyree, Rayus Kuplicki, **Trevor Sarratt**, Scott Fujan and John Hale. "Towards a Multi-Level Calculus for Cellular Modeling and Simulation". *International Society for Computational Biology,* Sixth Rocky Mountain Bioinformatics Conference, Aspen, CO.