

Stephanie Milani

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Education

- 2019–Present **Ph.D. in Machine Learning**, *Carnegie Mellon University*.
Advisor: Fei Fang.
- 2019 **B.S. in Computer Science**, *University of Maryland, Baltimore County*, *Cum Laude*.
Advisors: Marie desJardins and Cynthia Matuszek.
- 2019 **B.A. in Psychology**, *University of Maryland, Baltimore County*, *Cum Laude*.

Experience

- 2019–Present **Research Assistant**, *Carnegie Mellon University*.
Advisor: Fei Fang.
Deep reinforcement learning and game theory for social good.
- 2019 **Research Assistant**, *Carnegie Mellon University*.
Advisor: David Held.
Reinforcement learning from demonstrations for robotics.
- 2019 **Research Assistant**, *UMBC*.
Advisor: Cynthia Matuszek.
Norm-aware hierarchical reinforcement learning.
- 2018–2019 **Research Intern**, *Carnegie Mellon University*.
Advisor: Katia Sycara.
Context-aware normative planning, learning, and reasoning for domestic service robots.
- 2016–2019 **Research Assistant**, *UMBC*.
Advisor: Marie desJardins.
Hierarchical model-based reinforcement learning.
- 2018 **Robotics Institute Summer Scholar**, *Carnegie Mellon University*.
(4% acceptance.) Advisor: Katia Sycara.
Norm-aware reinforcement learning.
- 2017 **Robotics Institute Summer Scholar**, *Carnegie Mellon University*.
(4% acceptance.) Advisor: Christoph Mertz.
Generation of adversarial examples for partially occluded traffic sign detection.
- 2014–2016 **Research Assistant**, *University of Maryland, School of Medicine*.
Advisor: Jennifer Wenzel.
Role of dopamine and the endocannabinoid system in reward and reinforcement.

Awards

Research

- 2018–2019 **Undergraduate Research Award**, UMBC (1/55 awarded).
Awarded for work on hierarchical, norm-aware reinforcement learning.
- 2018 **NSF Research Experience for Undergraduates**, Carnegie Mellon University.

- 2018 **Best Undergrad Poster Presentation**, UMBC CSEE Research Symposium.
Awarded for work on abstract Markov decision processes.
- 2017, 2018 **Researcher of the Week**, UMBC.
- 2017 **Traffic21 Women in Transportation Fellow**, Carnegie Mellon University.
- Service and Leadership**
- 2019 **Honors College Community Service Award**, UMBC (*1/4 awarded*).
- 2018–2019 **Newman Civic Fellow**, Newman Civic Foundation (*1/268 awarded nationally*).
Awarded for leadership and dedication to spreading and increasing access to CS.
- 2018–2019 **Rewriting the Code Fellow**, Rewriting the Code.
- 2017–2018 **France-Merrick Scholar**, UMBC (*1/7 awarded*).
Awarded for commitment to leadership and service in CS and AI.

Academic

- 2019 **Honors College Certificate**, UMBC.
- 2014 **Golden Key International Honour Society Nomination**, UMBC.
- National Academy of Engineering Grand Challenge Scholar**, UMBC.
- Honors Scholar**, UMBC.
- Meritus Scholar**, UMBC.
Merit-based scholarship awarded to one student per year to cover books.
- Presidential Scholar**, UMBC.
Merit-based scholarship to cover all of tuition for four years.

Travel

- 2019 **NeurIPS, RLDM, ICML, ICML Diversity and Inclusion** (Declined).
- 2018 **Oracle Scholar**, funded to attend OurCS Workshop (*1/102 chosen*).
- 2018 **Grace Hopper Student Scholar**, funded by Palo Alto Networks to attend GHC (*1/657 chosen*).
- 2018 **CWIT Grace Hopper Award**, funded to attend GHC (*26% acceptance*) (Declined).
- 2018 **Inclusion@RSS Scholar**, funded to attend RSS.

Publications

- [1] John Winder, **Stephanie Milani**, Matthew Landen, Erebus Oh, Shane Parr, Shawn Squire, Marie desJardins, and Cynthia Matuszek. Planning with Abstract Learned Models (PALM): Learning Transferable Subtasks from Hard Problems. *AAAI Conference on Artificial Intelligence (AAAI)*, 2020. *20.6% acceptance*.
- [2] William H. Guss, Cayden Codel*, Katja Hofmann*, Brandon Houghton*, Noboru (Sean) Kuno*, **Stephanie Milani***, Sharada Mohanty*, Diego Perez-Liebana*, Ruslan Salakhutdinov*, Nicholay Topin*, Manuela Veloso*, and Phillip Wang*. The MineRL Competition on Sample Efficient Reinforcement Learning using Human Priors. *Neural Information Processing Systems (NeurIPS) Competition Track*, 2019.
- [3] Brandon Houghton, **Stephanie Milani**, Nicholay Topin, William Guss, Katja Hofmann, Diego

Perez-Liebana, Manuela Veloso, and Ruslan Salakhutdinov. Guaranteeing Reproducibility in Deep Learning Competitions. *NeurIPS Challenges in Machine Learning (CiML) Workshop*, 2019.

- [4] John Winder, **Stephanie Milani**, Matthew Landen, Erebus Oh, Shane Parr, Shawn Squire, Marie desJardins, and Cynthia Matuszek. Planning with Abstract, Learned Models. *Do Good Robotics Symposium*, 2019.
- [5] **Stephanie Milani**, Nicholay Topin, and Katia Sycara. Penalty-Modified Markov Decision Processes: Efficient Incorporation of Norms into Sequential Decision Making Problems. *Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM)*, 2019.
- [6] Huao Li, **Stephanie Milani**, Vigneshram Krishnamoorthy, Michael Lewis, and Katia Sycara. Perceptions of Domestic Robots' Normative Behavior Across Cultures. In *Conference on Artificial Intelligence, Ethics, and Society (AIES)*, 2019.
- [7] Shawn Squire, John Winder, Matthew Landen, **Stephanie Milani**, and Marie desJardins. R-AMDP: Model-based Learning for Abstract Markov Decision Process Hierarchies. *Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM)*, 2017.
- [8] John Winder, Shawn Squire, Matthew Landen, **Stephanie Milani**, and Marie desJardins. Towards Planning with Hierarchies of Learned Markov Decision Processes. *International Conference on Automated Planning and Scheduling (ICAPS) - Integrated Execution of Planning and Acting (IntEx) Workshop*, 2017.

Technical Reports

- [1] **Stephanie Milani**. Penalty-Modified Abstract Markov Decision Processes. *Technical Report for Undergraduate Research Award, UMBC*, 2019.
- [2] **Stephanie Milani**. Creating a Scalable Framework for Model-Free Reinforcement Learning in Norm-Rich Environments. *Robotics Institute Summer Scholars Working Papers Journal*, 2018.
- [3] **Stephanie Milani** and Christoph Mertz. Generating Hard Positive Examples via Adversary for Occluded Traffic Sign Detection. *Robotics Institute Summer Scholars Working Papers Journal*, 2017.

Professional Service

- 2019–Present **NeurIPS MineRL Competition on Sample-Efficient Reinforcement Learning**, Organizer.
- 2019 **RLDM at McGill University**, Volunteer.
- 2019 **ICML Workshop on AI for Social Good**, Reviewer.
- 2019 **ICLR Workshop on AI for Social Good**, Reviewer.
- 2017, 2018 **RISS Working Papers Journal**, Reviewer.
- 2017, 2018 **RISS Working Papers Journal**, Assistant Managing Editor.
- 2017 **UMBC Department of IT**, Machine Learning Consultant.
- 2017 **ICAPS at Carnegie Mellon University**, Volunteer.
- 2016 **Maryland Computing Education Summit at UMBC**, Volunteer.

Invitation-only Meetings

- 2018 **CCC AI Roadmap Workshop: Integrated Intelligence.**
Resulted in *A 20-Year Community Roadmap for AI Research in the US.*

Grant Support

- [1] **Stephanie Milani** and Nicholay Topin. Inclusivity Travel Grants for MineRL Competition and Workshop at NeurIPS 2019 (2019), *Artificial Intelligence Journal (AIJ)*, € 3,000, 2019.

Selected Presentations

- [1] **Stephanie Milani**. “A Hierarchical Framework for Norm-Aware Planning and Reinforcement Learning,” poster presentation at the UMBC Undergraduate Research and Creative Achievement Day, 2019.
- [2] Jessie Chen ^{$\alpha-\beta$} , Hailey James ^{$\alpha-\beta$} , **Stephanie Milani** ^{$\alpha-\beta$} , Marjorie Wenjun Wu ^{$\alpha-\beta$} , and Hanlin Zhou ^{$\alpha-\beta$} . “Online Learning for Decision Making,” oral presentation at Hello Research Closing Presentations, 2018.
- [3] **Stephanie Milani** and Katia Sycara. “Creating a Scalable Framework for Reinforcement Learning in Norm-Rich Environments,” poster presentation at the Robotics Institute Summer Scholars Research Showcase, 2018.
- [4] Khalil Anderson ^{$\alpha-\beta$} , **Stephanie Milani** ^{$\alpha-\beta$} , Puja Trivedi ^{$\alpha-\beta$} , Matthew Landen, John Winder, Shawn Squire, and Marie desJardins. “Learning Abstracted Models and Hierarchies of Abstract Markov Decision Processes,” poster presentation at the UMBC CSEE Research Symposium, 2018.
- [5] **Stephanie Milani** and Christoph Mertz. “A-Faster R-CNN: Generating Hard Positive Examples via Adversary for Traffic Sign Detection,” poster presentation at the Robotics Institute Summer Scholars Research Showcase, 2017

$\alpha-\beta$ denotes alphabetical order.

Teaching and Mentoring

Curriculum Development

- 2017–2018 **Creative Coders**, Curriculum Development Coordinator.
Developed curriculum for middle-school students to learn CS concepts.
- 2016–2017 **Computer Science Matters in Maryland**, Curriculum Developer.

Tutoring

- 2017 **QuHacks Hackathon at UMBC.**
- 2016, 2017 **Hour of Code at UMBC.**
Introduced UMBC and middle-school students to CS and AI via hands-on activities.

Mentoring

- 2019–Present **CMU AI Mentorship Program.**
- 2019 **Rewriting the Code Alumni Office Hours.**
Dedicated 30 min/week to provide career and academic advice to female undergrads.

Outreach

- 2019 **Steel City Showdown FIRST Robotics Competition**, Referee and Volunteer.
- 2019 **Robotics Institute Summer Scholars Program**, Presenter at Orientation.
- 2019 **UMBC Computer Science Education**, Treasurer.
- 2017–2018 **UMBC Computer Science Education**, President.
- 2017 **Creative Coders**, Co-founder.
Co-founded program to introduce middle-school students to CS.
- 2017 **QuHacks Hackathon at UMBC**, Organizer.
Organized day-long hackathon for appx. 100 high-school and middle-school students.
- 2017 **North County High School Computer Science Classes**, Co-presenter.
- 2016–2017 **UMBC Computer Science Education**, Vice President.
- 2016, 2017 **Hour of Code at UMBC**, Organizer.
Organized two-day-long Hour of Code events.

Affiliations

- 2019–Present Rewriting the Code, Alumni.
- 2019–Present Association for the Advancement of Artificial Intelligence (AAAI), Member.
- 2018–Present Association for Computing Machinery (ACM), Member.
- 2017–2019 Center for Women in Technology (CWIT), Affiliate.

Selected Media Coverage

- “Project Malmo competition returns with student organizers and a new mission: To democratize reinforcement learning,” by Noboru Sean Kuno. Microsoft Research Blog. August 2019.
- “Traffic21's Women in Transportation Awardee Joining CMU's Machine Learning Ph.D. Program.” Mobility21. April 2019.
- “Stephanie Milani named Newman Civic Fellow for expanding access to CS education,” by Catalina Sofia Dansberger Duque. UMBC News. April 2018.
- “The Hour of Code Arrives at UMBC,” by Declan Keefe. The Retriever. December 2017.