Stephanie Milani

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 stephmilani

Education

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

Research Experience

2019–Present	**Carnegie Mellon University**, *Research Assistant*. Advisor: Fei Fang.
2021	**Microsoft Research, Cambridge**, *Research Intern*. Advisors: Katja Hofmann and Harm van Seijen.
2019	**Carnegie Mellon University**, *Research Assistant*. Advisor: David Held.
2018–2019	**Carnegie Mellon University**, *Research Intern*. Advisor: Katia Sycara.
	University of Maryland, Baltimore County, *Research Assistant*. Advisor: Cynthia Matuszek.
2016–2019	**University of Maryland, Baltimore County**, *Research Assistant*. Advisor: Marie desJardins.
2018	**Carnegie Mellon University**, *Robotics Institute Summer Scholar*. Advisor: Katia Sycara. *4% acceptance*.
2017	**Carnegie Mellon University**, *Robotics Institute Summer Scholar*. Advisor: Christoph Mertz. *4% acceptance*.
2014–2016	**University of Maryland, School of Medicine**, *Research Assistant*. Advisor: Jennifer Wenzel.

Teaching Experience

2021–Present	**Historical Advances in Machine Learning (10-777), CMU**, *Teaching Assistant*.

Honors and Awards

Honors

2021	**IBM PhD Fellowship Nomination**
	Microsoft Research PhD Fellowship Nomination
2020	**Microsoft Research Ada Lovelace Fellowship Nomination**
	Open Phil AI Fellowship Finalist
2018–2019	**Newman Civic Fellow** 1/268 awarded nationally, for leadership and dedication to increasing access to CS.

	Rewriting the Code Fellow
	Awarded for technically-skilled experience and projects.
2017–2019	**National Academy of Engineering Grand Challenge Scholar**
2018	**NSF Research Experience for Undergraduates**
	Awarded to research norm-aware planning and learning at Carnegie Mellon University.
2017–2018	**France-Merrick Scholar**
	1/7 awarded, for commitment to leadership and service in CS and AI.
2017, 2018	**UMBC Researcher of the Week**
	Awarded for work on planning and reinforcement learning.
2017	**Traffic21 Women in Transportation Fellow**
	Only student awarded fellowship, for research at Carnegie Mellon University.

Awards

2021	**Funding Proposal for MineRL BASALT**
	Artificial Intelligence Journal (AIJ), €15,000. Awarded to R. Shah, C. Wild, S. H. Wang, N. Alex, B. Houghton, W. H. Guss, **S. Milani**, N. Topin, P. Abbeel, S. Russell, and A. Dragan.
2020	**Inclusivity Compute and Conference Grants for MineRL Competition at NeurIPS**
	Artificial Intelligence Journal (AIJ), €7,500. Awarded to **S. Milani** and N. Topin.
	Top Reviewer Award, ICML (top 33% of all reviewers)
2019	**Travel Awards: NeurIPS, RLDM, ICML, ICML Diversity and Inclusion** (Declined)
	Inclusivity Travel Grants for MineRL Competition and Workshop at NeurIPS
	Artificial Intelligence Journal (AIJ), €3,000. Awarded to **S. Milani** and N. Topin.
	UMBC Honors College Community Service Award
	1/4 awarded, for strong academic performance and outstanding community service.
2018–2019	**UMBC Undergraduate Research Award**
	1/55 awarded, for work on hierarchical, norm-aware reinforcement learning.
2018	**Best Undergrad Poster Presentation, UMBC CSEE Research Symposium**
	Awarded for work on abstract Markov decision processes.
	OurCS Workshop Oracle Scholar
	1/102 students chosen to attend workshop for exploring research problems.
	Grace Hopper Student Scholar
	1/657 awarded, funded by Palo Alto Networks to attend Grace Hopper.
	CWIT Grace Hopper Award (Declined)
	26% acceptance, funded to attend Grace Hopper.
	Inclusion@RSS Scholar
	Awarded to attend Robotics: Science and Systems Conference.
2017	**UMBC Battlebots Tournament, Third-Place Winner**

Publications . . . .

Peer-Reviewed Papers

[1] E. Zuniga*, **S. Milani***, M. Jacob, and K. Hofmann. Understanding Human-like Behavior in Video Game Navigation. *The 35th Conference on Neural Information Processing Systems (NeurIPS) Human-Centered AI Workshop*, 2021.

[2] W. H. Guss, A. Dirik*, B. V. Galbraith*, B. Houghton*, A. Kanervisto*, N. S. Kuno*, **S. Milani***, S. Mohanty*, K. Ramanauskas*, R. Salakhutdinov*, R. Shah*, N. Topin*, S. H. Wang*, and C. Wild*. The

MineRL Diamond Competition on Sample Efficient Reinforcement Learning. *The 35th Conference on Neural Information Processing Systems (NeurIPS) Competition Track*, 2021.

[3] R. Shah, C. Wild, S. H. Wang, N. Alex, B. Houghton, W. H. Guss, **S. Milani**, N. Topin, P. Abbeel, S. Russell, and A. Dragan. The MineRL BASALT Competition on Learning from Human Feedback. *The 35th Conference on Neural Information Processing Systems (NeurIPS) Competition Track*, 2021.

[4] W. H. Guss, **S. Milani**, N. Topin, B. Houghton, S. Mohanty, A. Melnik, A. Harter, B. Buschmaas, B. Jaster, C. Berganski, D. Heitkamp, M. Henning, H. Ritter, C. Wu, X. Hao, Y. Lu, H. Mao, Y. Mao, C. Wang, M. Opanowicz, A. Kanervisto, Y. Schraner, C. Scheller, X. Zhou, L. Liu, D. Nishio, T. Tsuneda, K. Ramanauskas, and G. Juceviciute. Towards robust and domain agnostic reinforcement learning competitions: MineRL 2020. *Proceedings of the NeurIPS 2020 Competition and Demonstration Track*, 2021.

[5] N. Topin, **S. Milani**, F. Fang, and M. Veloso. Iterative Bounding MDPs: Learning Interpretable Policies via Non-Interpretable Methods. *Proceedings of the 35th AAAI Conference on Artificial Intelligence*, 2021. *21% acceptance*.

[6] **S. Milani**, W. Shen, K. S. Chan, S. Venkatesan, N. O. Leslie, C. Kamhoua, and F. Fang. Harnessing the Power of Deception in Attack Graph Games. *Proceedings of the 11th Conference on Decision and Game Theory for Security*, 2020.

[7] W. H. Guss, M. Y. Castro*, S. Devlin*, B. Houghton*, N. S. Kuno*, C. Loomis*, **S. Milani***, S. Mohanty*, K. Nakata*, R. Salakhutdinov*, J. Schulman*, S. Shiroshita*, N. Topin*, A. Ummadisingu*, and O. Vinyals*. NeurIPS 2020 Competition: The MineRL Competition on Sample Efficient Reinforcement Learning using Human Priors. *The 34th Conference on Neural Information Processing Systems (NeurIPS) Competition Track*, 2020.

[8] **S. Milani**, N. Topin, B. Houghton, W. H. Guss, S. P. Mohanty, K. Nakata, O. Vinyals, and N. S. Kuno. A Retrospective Analysis of the 2019 MineRL Competition on Sample-Efficient Reinforcement Learning Using Human Priors. *Proceedings of the NeurIPS 2019 Competition and Demonstration Track*, 2020.

[9] **S. Milani***, Z. Fan*, S. Gulati, T. Nguyen, F. Fang, and A. Yadav. Intelligent Tutoring Strategies for Students with Autism Spectrum Disorder: A Reinforcement Learning Approach. *The 34th AAAI Conference on Artificial Intelligence (AAAI) Workshop on AI for Education*, 2020. Also accepted for lightning talk at the *CMU Symposium on AI and Social Good*, 2020.

[10] J. Winder, **S. Milani**, M. Landen, E. Oh, S. Parr, S. Squire, M. desJardins, and C. Matuszek. Planning with Abstract Learned Models While Learning Transferable Subtasks. *34th AAAI Conference on Artificial Intelligence*, 2020. *20.6% acceptance*.

[11] B. Houghton, **S. Milani**, N. Topin, W. H. Guss, K. Hofmann, D. Perez-Liebana, M. Veloso, and R. Salakhutdinov. Guaranteeing Reproducibility in Deep Learning Competitions. *The 33rd Conference on Neural Information Processing Systems (NeurIPS) Challenges in Machine Learning (CiML) Workshop*, 2019.

[12] W. H. Guss, C. Codel*, K. Hofmann*, B. Houghton*, N. S. Kuno*, **S. Milani***, S. Mohanty*, D. Perez-Liebana*, R. Salakhutdinov*, N. Topin*, M. Veloso*, and P. Wang*. The MineRL Competition on Sample Efficient Reinforcement Learning using Human Priors. *The 33rd Conference on Neural Information Processing Systems (NeurIPS) Competition Track*, 2019.

[13] H. Li, **S. Milani**, V. Krishnamoorthy, M. Lewis, and K. Sycara. Perceptions of Domestic Robots' Normative Behavior Across Cultures. *Proceedings of the 3rd AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society (AIES)*, 2019.

[14] **S. Milani**, N. Topin, and K. Sycara. Penalty-Modified Markov Decision Processes: Efficient Incorporation of Norms into Sequential Decision Making Problems. *The 4th Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM)*, 2019.

[15] J. Winder, **S. Milani**, M. Landen, E. Oh, S. Parr, S. Squire, M. desJardins, and C. Matuszek. Planning with Abstract, Learned Models. *Do Good Robotics Symposium*, 2019.

[16] J. Winder, S. Squire, M. Landen, **S. Milani**, and M. desJardins. Towards Planning with Hierarchies of Learned Markov Decision Processes. *The 27th International Conference on Automated Planning and Scheduling (ICAPS) Integrated Execution of Planning and Acting (IntEx) Workshop*, 2017.

[17] S. Squire, J. Winder, M. Landen, **S. Milani**, and M. desJardins. R-AMDP: Model-based Learning for Abstract Markov Decision Process Hierarchies. *The 3rd Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM)*, 2017.

Technical Reports

[1] **S. Milani**. Penalty-Modified Abstract Markov Decision Processes. *Technical Report for Undergraduate Research Award, UMBC*, 2019.

[2] **S. Milani**. Creating a Scalable Framework for Model-Free Reinforcement Learning in Norm-Rich Environments. *Robotics Institute Summer Scholars Working Papers Journal*, 2018.

[3] **S. Milani** and C. Mertz. Generating Hard Positive Examples via Adversary for Occluded Traffic Sign Detection. *Robotics Institute Summer Scholars Working Papers Journal*, 2017.

* *denotes equal contribution.*

Selected Presentations . . . .

2021	The MineRL BASALT / Diamond Competitions at NeurIPS. *Poster presentation, ICML RL for Real Life Workshop*.
	The MineRL 2020 Competition on Sample Efficient Reinforcement Learning using Human Priors. *Oral presentation, Microsoft Research AI and Gaming Summit*.
2019	Penalty-Modified Abstract Markov Decision Processes. *Poster presentation, UMBC Undergraduate Research and Career Day*.
2018	Creating a Scalable Framework for Reinforcement Learning in Norm-Rich Environments. *Poster presentation, Robotics Institute Summer Scholars Summer Research Showcase*.
	Online Learning for Decision Making. *Oral presentation, Hello Research*.
	Learning Abstracted Models and Hierarchies of Abstract Markov Decision Processes. *Poster presentation, UMBC CSEE Research Symposium*. Winner of Best Undergraduate Poster Presentation.
2017	A-Faster R-CNN: Generating Hard Positive Examples via Adversary for Traffic Sign Detection. *Poster presentation, Robotics Institute Summer Scholars Summer Research Showcase*.

Professional Service . . . .

Organizing

2021-Present	**MineRL BASALT Competition on Learning from Human Feedback**, Organizer.
2019-Present	**MineRL Competition on Sample-Efficient Reinforcement Learning**, Organizer.
2021	**Minecraft as a Research Platform Workshop at MSR Research Summit**, Organizer.

Reviewing

2021	NeurIPS-21 Competition Track, ICML-21
2020	ICLR-21, AAAI-21, Game Theory and Machine Learning for Cyber Security (book chapter reviewer), ICML-20 (Top Reviewer Award), AAAI-20 Workshop on Diversity in Artificial Intelligence
2019	ICML-19 Workshop on AI for Social Good, ICLR-19 Workshop on AI for Social Good
2017, 2018	RISS Working Papers Journal

Conference Volunteering

2020	ICML, ICLR
2019	RLDM
2017	ICAPS
2016	Maryland Computing Education Summit

Academic / Departmental Service

2020-2021	**Carnegie Mellon University Machine Learning Master's Admissions Committee**.
2020	**Carnegie Mellon University RISS Admissions Committee**.
2017, 2018	**RISS Working Papers Journal**, Assistant Managing Editor.
2017	**UMBC Department of IT**, Machine Learning Consultant.

Invitation-only Meetings

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

Outreach . . . .

2020–Present	**CMU Graduate Application Support Program (GASP)**, Mentor.
2019–Present	**CMU AI Mentorship Program**, Mentor.
2021	**RISS Graduate School Application Support**, Panelist.
2020	**The Campus Laboratory School at Carlow University Career Day**, Presenter.
2019	**Steel City Showdown FIRST Robotics Competition**, Referee and Volunteer.
	Robotics Institute Summer Scholars Program, Presenter at Orientation.
	Rewriting the Code Alumni Office Hours.
	Dedicated 30 min/week to provide career and academic advice to female undergrads.
2016-2019	**UMBC Computer Science Education**, Vice President, President, Treasurer.
2017–2018	**Creative Coders**, Curriculum Development Coordinator.
	Developed curriculum for middle-school students to learn CS concepts.
2017	**Creative Coders**, Co-founder.
	Co-founded program to introduce middle-school students to CS.
	QuHacks Hackathon at UMBC, Organizer.
	Organized day-long hackathon for appx. 100 high-school and middle-school students.
	North County High School Computer Science Classes, Co-presenter.
2016–2017	**Computer Science Matters in Maryland**, Curriculum Developer.
2016, 2017	**Hour of Code at UMBC**, Organizer and Volunteer.
	Organized and volunteered during two-day-long Hour of Code events on CS and AI.

Relevant Coursework . . . .

Graduate

Convex Optimization; Data Analysis; Advanced Machine Learning Theory and Methods; Graduate Artificial Intelligence; Advanced Introduction to Machine Learning; Intermediate Statistics.

Undergraduate

Design and Analysis of Algorithms; Data Management Systems; Introduction to Machine Learning; Artificial Intelligence; Data Structures; Software Engineering; The Science of Making Good Decisions; Neuropsychology; Computation, Complexity, and Emergence.

Affiliations

Rewriting the Code Alumni, AAAI, ACM.

Selected Media Coverage

- "Security games reveal how networks can fool cyber attackers." U.S. Army DEVCOM Army Research Laboratory Public Affairs. November 2020.
- "MineRL sample-efficient reinforcement learning challenge—back for a second year—benefits organizers, as well as larger research community," by Noboru Sean Kuno. Microsoft Research Blog. August 2020.
- "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.