Riley Simmons-Edler

Research Scientist

Education

2015 - 2022 spring (expected)

PhD, Computer Science

Princeton University

Advisor: Sebastian Seung
Thesis: *"Overcoming Sampling and Exploration Challenges in Reinforcement Learning"*

2013 - 2014

M.S., Biology

New York University

Advisor: Richard Bonneau
Thesis: *"Two Component Reference Energy for the Design of Proteins and Foldamers"*

2009 - 2013

B.A., Computer Science and Biology

New York University

Experience

PhD Candidate — **Princeton University**
(Sebastian Seung)
2015 - Today

I've been a PhD student at Princeton since 2015, where I've done research on deep reinforcement learning, neural networks, computer vision, and program synthesis, among other topics, advised by Prof. Sebastian Seung. I also received the Gordon Y.S. Wu Fellowship in Engineering in my first year, which is awarded to promising first year PhD students in the school of engineering and applied science at Princeton.

Research Intern — **Samsung AI NYC**
(Daniel Lee and Sebastian Seung)
2018 - 2021

I was an intern at the Samsung AI Center in NYC, where I worked with my advisor Sebastian and center head Daniel Lee (also professor at Cornell) on reinforcement learning for robotics. More recently I have also collaborated on some work on ultrasonic perception for robot navigation and safety.

Research Assistant — **New York University**
(Richard Bonneau)
2011 - 2014

Before coming to Princeton I worked in the lab of Prof. Richard Bonneau at NYU on computational protein modeling. I used machine learning to predict properties of proteins from structural simulations, and worked on the protein modeling program Rosetta, improving the simulator's modeling of proteins containing synthetic amino acids.

Publications

- Vyacheslav Alipov, Riley Simmons-Edler, Nikita Putintsev, Pavel Kalinin, Dmitry P. Vetrov (2021). *"Towards Practical Credit Assignment for Deep Reinforcement Learning"*. **Arxiv**, 2021.
- Xiaoran Fan, Riley Simmons-Edler, Daewon Lee, Larry Jackel, Richard Howard, Daniel Lee (2021). *"Aurasense: Robot Collision Avoidance by Full-Surface Proximity Detection"*. In **The International Conference on Intelligent Robots and Systems (IROS)**, 2021.
- Riley Simmons-Edler, Ben Eisner, Daniel Yang, Anthony Bisulco, Eric Mitchell, Sebastian Seung, Daniel Lee (2020). *"Reward Prediction Error as an Exploration Objective in Deep Reinforcement Learning"*. In **Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI)**, Yokohama, Japan, January 7-15, 2021.
- Riley Simmons-Edler, Ben Eisner, Eric Mitchell, Sebastian Seung, Daniel Lee (2019). *"Q-Learning for Continuous Actions with Cross-Entropy Guided Policies"*. In **The Reinforcement Learning for Real Life (RL4RealLife) Workshop in the 36th International Conference on Machine Learning (ICML)**, 2019.
- Riley Simmons-Edler, Anders Miltner, Sebastian Seung (2018). *"Program Synthesis Through Reinforcement Learning Guided Search"*. **Arxiv**, 2018.
- Evan Baugh, Riley Simmons-Edler, Christian Mueller, Rebecca Alford, Natalia Volfovsky, Alex Lash, Richard Bonneau (2016). *"Robust Classification of Protein Variation Using Structural Modeling and Large-Scale Data Integration"*. **Nucleic Acids Research**, 44 (6), pp. 2501-2513, doi:10.1093/nar/gkw120, 2016.

Research Interests

- Deep Reinforcement Learning
- Robotics
- Program Synthesis
- Bio-inspired ML
- Applied Reinforcement Learning
- Reinforcement Learning + NLP

Contact

11 Wethersfield Rd
Plainsboro, N.J., 08536

(609)-672-8795

rileys@cs.princeton.edu

Google Scholar

@SimmonsEdler

LinkedIn

Teaching

Assistant in Instruction - Neural Networks: Theory and Applications — 2018 Spring
(Sebastian Seung)
Princeton University

Assistant in Instruction - Computer Vision — 2016/2017 Fall
(Szymon Rusinkiewicz, Olga Russakovsky)
Princeton University

Assistant in Instruction - Computer Graphics — 2017 Spring
(Szymon Rusinkiewicz)
Princeton University

Teaching Assistant - Principles of Biology — 2013 Fall
(Multiple Faculty)
New York University