

Seungjae Ryan Lee

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EDUCATION

Princeton University

Princeton, NJ

Bachelor of Arts in Mathematics with Minors in Machine Learning and Computer Science

Expected May 2021

Relevant Coursework: Algorithms and Data Structures, Advanced Programming Techniques, Intro to Programming Systems, Computer Vision, Junior Seminar on Mathematics for Data Science, Probability and Stochastic Systems, Fundamentals of Statistics, Combinatorics

PUBLICATION

Experiments with the Markoff Surface

Accepted by *Experimental Mathematics*

Matthew de Courcy-Ireland and Seungjae Ryan Lee

Preprint at arXiv:1812.07275

- Analyzed graph structures and spectral patterns of Markoff graphs with four million vertices and six million edges
- Proved a deterministic formula for the number of orbits of any Markoff graph in a prime field
- **Technologies:** C++, MATLAB, Python

EXPERIENCE

SK T-Brain - Machine Learning Research Lab

Seoul, Korea

Machine Learning Research Intern

August 2019 - September 2019

- Ranked #6 in Eighth Dialog System Technology Challenge: End-to-End Multi-domain Task Completion, hosted by Microsoft Research
- Modified and trained LiteAttnCat, a state-of-the-art word-level reinforcement learning algorithm
- Developed a data visualization interface for the MultiWoZ 2.1 task-oriented dialog dataset
- **Technologies:** PyTorch, Python, Microsoft Azure, JavaScript, VueJS

Google Summer of Code: TensorFlow - Open-Source Machine Learning Framework

Remote

Student Software Developer

May 2019 - August 2019

- Implemented Random Network Distillation, a state-of-the-art bonus-based exploration reinforcement learning algorithm
- Improved the documentation for Proximal Policy Optimization, a popular baseline reinforcement learning algorithm
- **Technologies:** TensorFlow, TensorBoard, Python, Google Cloud Platform

Scratchwork LLC - Collaborative Whiteboard Web App for Researchers

Princeton, NJ

Co-founder and Software Developer

June 2017 - September 2018

- Designed and built the main dashboard page allowing users to create, edit, or delete boards
- Implemented login and integrated it with Google OAuth with Passport.js
- Accepted to and participated in the 2017 Princeton eLab Summer Accelerator
- **Technologies:** JavaScript, MongoDB, ExpressJS, NodeJS, ESLint

PROJECTS

Baseball Action Recognition

November 2019 - Present

- Modify the Two-Stream Inflated 3D ConvNet (I3D) model to classify video clips from the Baseball Database (BBDB)

Reinforcement Learning Database

January 2019 - Present

- Extract the performances of reinforcement learning algorithms from research paper PDFs
- Analyze the relationship among environments, algorithms, and their performances through unsupervised learning

NeurIPS 2019 MineRL Competition

June 2019 - October 2019

- Developed a reinforcement learning algorithm that learns to play Minecraft from human demonstrations with 3 teammates

OpenAI Retro Contest

April 2018 - June 2018

- Developed alternative experience replay prioritization techniques for the Rainbow reinforcement learning algorithm

FoodMap

January 2017 - May 2017

- Led a team of four members to develop a Django web app that maps all food offered in Princeton campus

AWARDS, ACHIEVEMENTS, AND SERVICE

- Publish **Reinforcement Learning Weekly**, a weekly newsletter highlighting latest projects and research, to 906 subscribers
- Led **Deep Reinforcement Learning Seminar** with 11 participants reviewing 22 seminal papers
- Served as a reviewer for the **ICLR 2019 Reproducibility Challenge**
- Published a featured developer guide for the **NeurIPS 2018 AI for Prosthetics Challenge**
- Awarded the **Bershadsky Family Summer Research Scholarship** by Princeton University in 2016
- Designed and taught **Deep Learning Zero To All Season 2**, an online course sponsored by Naver, with 6 content developers

SKILLS

Programming Languages: Python, JavaScript, C++

Technologies: PyTorch, TensorFlow, TensorBoard, NumPy, Pandas, Matplotlib, Plotly, NodeJS, Django, PostgreSQL, Heroku, Git, Linux