

Seungjae Ryan Lee

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EDUCATION

Princeton University

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

Princeton, NJ

Expected May 2021

Relevant Coursework: Algorithms, Probability, Statistics, Computer Vision, Seminar on Math for Data Science, Graph Theory, Intro to Computer Systems, Advanced Programming Techniques, Combinatorics, Topology, Complex Analysis, Abstract Algebra

PUBLICATION

Experiments with the Markoff Surface

Published in *Experimental Mathematics*

Matthew de Courcy-Ireland and **Seungjae Ryan Lee**

January 2020

- 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

EXPERIENCE

Bloomberg L.P.

Remote

Software Engineer Intern

June 2020 - August 2020

- Trained a word2vec word embedding model using Bloomberg's financial data
- Reduced the size of the embedding by 97% and increased inference speed by 5 times while maintaining performance
- Used weakly supervised learning to train a generative model for multi-entity relation extraction

Princeton University

Princeton, NJ and Remote

Course Assistant

January 2020 - May 2020

- Taught data science and R to undergraduate students enrolled in SML201: Introduction to Data Science

SK T-Brain

Seoul, Korea

Machine Learning Research Intern

August 2019 - September 2019

- Ranked 6th in the End-to-End Multi-domain Task Completion Challenge (DSTC8) hosted by Microsoft Research
- Developed a data visualization interface for the MultiWOZ 2.1 task-oriented conversation dataset

Google Summer of Code: TensorFlow

Remote

Student Software Developer

May 2019 - August 2019, June 2020 - August 2020

- Implemented and documented popular reinforcement learning algorithms (DQN, PPO) using Swift for TensorFlow
- Prototyped Random Network Distillation, a bonus-based exploration reinforcement learning algorithm

Scratchwork LLC - Collaborative Whiteboard 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 whiteboards
- Implemented login with Google OAuth integration using Passport.js

PROJECTS

MagNet

March 2020 - Present

- Created a database of voltage and current signals of magnetic components with different shapes and waveforms
- Developed neural networks with PyTorch to estimate magnetic core loss from the voltage signal
- Used AutoML with Optuna to tune hyperparameters and optimize neural network architecture

Baseball Action Recognition

November 2019 - January 2020

- Fine-tuned the Two-Stream Inflated 3D ConvNet (I3D) model to classify video clips from the Baseball Database
- Analyzed the effect of video frame rate on action recognition accuracy

OpenAI Retro Contest - Placed 49/229

April 2018 - June 2018

- Developed alternative experience replay prioritization techniques and performed ablation studies

AWARDS, ACHIEVEMENTS, AND SERVICE

- Publish **Reinforcement Learning Weekly**, a newsletter highlighting latest ML research, to 1274 subscribers
- Led **Deep Reinforcement Learning Seminar** with 11 participants reviewing 22 seminal papers
- Served as a reviewer for the **NeurIPS 2019 Reproducibility Challenge** and **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 **Deep Learning Zero To All Season 2**, an online course sponsored by Naver, with 6 content developers

SKILLS

Python, JavaScript, C++, R, Swift, PyTorch, TensorFlow, TensorBoard, NumPy, Pandas, Matplotlib, Plotly, Gensim, SpaCy, NLTK, Snorkel, Optuna, NodeJS, VueJS, Django, MongoDB, PostgreSQL, Heroku, Google Cloud Platform, Microsoft Azure, Git, Linux