Jae Tak Kim

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EDUCATION

SWARTHMORE COLLEGE
Bachelor of Arts
May 2021 | Swarthmore, PA
Major: Computer Science
Minors: Mathematics, Philosophy
Cum. GPA: 3.75
Major GPA: 4.0
Sigma Xi, The Frank Milewski Endowed Scholarship

PEACHTREE RIDGE HS
Grad. May 2017 | Suwanee, GA

COURSEWORK

ONLINE
Fast.ai *Practical Deep Learning for Coders*
Coursera *Machine Learning*
Caltech *Learning from Data*
Michael Nielsen *Neural Networks and Deep Learning*

UNDERGRADUATE
Data Structures+Algorithms
Advanced Algorithms
Artificial Intelligence *(current)*
Natural Language Processing *(current)*
Theory of Computation
Operating Systems
Programming Languages
Combinatorics
Applied Linear Algebra
Operations Research
Abstract Algebra I&II
Real Analysis I

SKILLS

PROGRAMMING
C • C++ • Python •
Numpy/PyTorch/Fastai • OCaml • Git •
Linux • LaTeX

PUBLICATIONS

[1] J. Brody, **Jae Tak Kim**, P. Lerdputtipongporn, and H. Srinivasulu. A Strong XOR Lemma for Randomized Query Complexity. *Theory of Computing Journal*, 2020. Submitted. https://arxiv.org/abs/2007.05580.

TECHNICAL PROJECTS

INTERPRETER + TYPE INFERENCER* Spring 2020
- Wrote an interpreter and type inferencer for a purely functional language similar to OCaml and Lisp. Written in OCaml.
- Implemented the entire type inference algorithm that uses equational inference to infer types, deduce the logical closure, checks for consistency including cycle detection, and then uses substitution to provide the type for the user.

FILE SYSTEM FOR LINUX* Spring 2020
- Wrote a file system for Linux in C++ using the FUSE library for OS interfacing.
- Implemented creating, reading, writing, and removing files and directories. Also updates file metadata and manages inode block pointers (both direct and indirect).

COVID19 RADIOGRAPHY CLASSIFIER Summer 2020
- Wrote a classifier that takes in chest X-ray images and determines whether it indicates Covid-19, a normal chest, or viral pneumonia using a convolutional neural network. Dataset from a **Kaggle competition**.
- Uses Fast.ai API for PyTorch to achieve a 2.5% error rate.

STOCKS VOLATILITY MODELING Fall 2019
- Wrote Python script for forecasting S&P 500 stock prices based on volatility modeling (observing variance in price).
- Implemented algorithms for Moving Average and ARCH(p) modeling.

** As these projects were completed for a class, due to college policy, I cannot keep the repo public. Please email me and I can share a private link to the code.*

RESEARCH

THEORETICAL COMPUTER SCIENCE | Researcher
May 2019 – August 2019 | Swarthmore, PA
Worked with **Prof. Joshua Brody** to prove a significant lemma in the field of computational complexity theory. See publication [1].

Summer 2020
Note: Algorithmic Robotics research at UMD *cancelled due to Covid-19*

POLYMATH REU | Researcher
Summer 2020 | Virtual
Worked on a combinatorics problem called Hat Guessing Number on Graphs.

WORK EXPERIENCE

SWARTHMORE COLLEGE
Admissions Fellow
August 2020 - December 2020
One of 10 students of the senior class chosen to work in the admissions office to conduct interviews of prospective students and evaluate potential fit for the school.

Teaching Assistant for Linear Algebra Course 2x
Spring 2018, Fall 2018
Teaching Assistant for Theory of Computation Course
Spring 2020
Grader for Machine Learning Course
Spring 2019
Grader for Honors Multivariate Calculus Course
Spring 2019