Sophia Kolak

May 31st 1999
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Website

Education

Columbia University
Major: Computer Science
Minor: Mathematics
G.P.A. 3.7

Skills

Languages:
Python, C++, C, Java, MATLAB

WebDev:
HTML, CSS, XML, YAML

Databases:
mySQL, neo4j, graphQL

Other:
Unix, LaTex, Git, ROS

Courses

Completed:

Advanced Programming
Computer Science Theory
Linear Algebra
Data Structures & Algorithms
Discrete Math
Accelerated Multivariable Calculus
Intro to CS in Java
Physics E&M
Calculus II, Calculus I
Geological Research in Death Valley

Fall 2019:

Artificial Intelligence
Introduction to Cryptography
Analysis of Algorithms

Research Experience

May-Aug '19 **Carnegie Mellon University, ISR** — Research Assistant
- Quantified software quality and popularity within the Robot Operating System (ROS).
- Mined extensive data on ROS packages and their relationships to each other.
- Modeled the ROS ecosystem as a massive dependency graph using Neo4j and mysql.
- Writing a paper for MSR 2020 that summarizes our results.

Oct-May '18 **Axel Laboratory, Zuckerman Institute** — Research Assistant
- Implemented new deep learning techniques on neurological trial data from an experiment on place-cell activity conducted in the lab.
- Attempted to computationally model the olfactory system's representation of distance and time.

Fall 2019 **Computer Science Theory** — Teaching Assistant
- Holding weekly office hours, participating in an online forum by answering questions, and grading homework and exams.

May-Aug '18 **Coding4Youth** — Computer Science Instructor
- Taught two weekly coding courses in Java, Html, and CSS through Coding4Youth's online learning system

Honors & Awards

2019 **ROScon Talk Acceptance** — Macau, China
Upcoming indsutry talk entitled "It Takes a Village to Build a Robot"

2019 **SPLASH Student Research Competition** — Athens, Greece
Accepted to the upcoming SRC for extended abstract on the ROS Ecosystem

Dec'18 **NASA Micro-G NExt Winner** — Houston, Texas
Selected to test our tool at NASA's NBL for outstanding research paper and proof of concept. Successfully passed all of NASA's test cases.

May 18', 19' **Dean's List** — Columbia University
Awarded for a GPA above 3.7

Projects

May-Aug '19 **ROS Ecosystem Database**
Created the first database of the entire ROS ecosystem including quality and popularity metrics. Modeled the ecosystem as a dependency graph and confirmed a power law dependency distribution, among other things (working paper).

Jan '19 **Tensor Flow+LFADS (for research)** — Open-Source
Implemented code in Python and MATLAB for LFADS, a new neuroanalysis technique that uses RNN and deep learning to find causal factors in high dimensionality neuron spiking data.

Oct '18 **Hack Harvard** — FaceFeed
Wrote a C# and XML based program that runs a photo through the Azure Cognitive Face API and generates responses to quizes based on the output. Link

Extra-Curricular

2018-pres **Association for Women in Mathematics, Treasurer**
Managing the Club budget, organizing monthly general body meetings and bi-weekly events to support women in mathematics.

2018-pres **Columbia Space Initiative, Micro-G Team Member**
Wrote a successful proof of concept paper, designed and built a sharp-edge detection and removal device for handrails on the ISS, and was selected to test our tool at NASA's NBL.