James Bowden

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EDUCATION

California Institute of Technology   **GPA 4.0/4.0**
B.S. Computer Science, Data Science Minor   Grad: 2023

WORK EXPERIENCE

Software Engineering Intern at Uber | Jun. 2021 – Sept. 2021
- Incoming SWE intern on Marketplace Engineering Team, ML focus

Machine Learning Researcher, SURF Intern | Jun. 2020 - Present
Yisong Yue Group, Caltech
- Integrated deep kernel learning (DKL) with Bayesian optimization (BO) using PyTorch to improve model fit, find global optima faster
- Supplemented with Thompson sampling, Monte Carlo dropout
- Cut regret by over 50% with DK-BO compared to best GP models; wrote paper currently pending publication
- Develop multi-fidelity DK-BO for real-world problems like COVID-19 protein engineering and nanophotonics filter design

Undergraduate Bioinformatics Researcher | Dec. 2019 – Present
Kaihang Wang Lab, Caltech
- Undergraduate bioinformatics lead in research group
- Produced tools to predict set of minimum essential genes, assemble nanopore reads, recode genes using Pandas, NumPy
- Inform wet bench projects like genome minimization and recoding

PROJECT EXPERIENCE

Ancestral Genome Reconstruction, Wang Lab | Mar. 2020 - Present
- Lead team of 3 Caltech juniors to create automated pipeline:
  - Collapse large amounts of sequence data to gene ordering data
  - Analyze ordering differences to predict consensus ordering
  - Reconstruct consensus genome and perform viability checks
- Researched and integrated existing cmd line tools into pipeline
- Build server to host as web tool for use by scientific community

Alien Escape Game, Caltech | Mar. - Jun. 2020
- Created escape game from scratch using C with team of 3 students
- Implemented A* pathfinding, physics engine, vision, map, graphics
- Significantly reduced lag via dynamic programming

TEACHING EXPERIENCE

Teaching Assistant, Caltech | Sept. 2020 - Present
- CS 3 (Software Design, C): Hold office hours, code reviews, lab section. Help instill good development and testing practices.
- CS 2 (Data Structures & Algorithms, Java): Hold office hours, lead lab section, help optimize online learning, write lab. Head TA next year.
- CS 1 (Intro Programming, Python): Hold office hours, grade code.

Investing Principles Crash Course, Wave LF | Jun. - Aug. 2020
- Created curriculum and co-taught basics of investing, stock market, indicators, options to over 1100 middle and high school students

SKILLS

Languages
Python, C, Java, JavaScript, MATLAB, HTML, Latex, OCaml

Tools
PyTorch, sklearn, Pandas, NumPy, matplotlib

Techniques
Bayesian Optimization, Deep Learning, SVM, Web Scraping

COURSEWORK

- ML & Data Mining
- (Machine) Learning Systems
- Statistical Inference
- Advanced Topics in ML
- Probability and Statistics
- Applied Linear Algebra
- Data Structures & Algorithms
- Software Design
- Computing Systems

AWARDS

Thermo-Fisher Sch., 2019
One of six recipients of scholarship for biomedical research experience

Teaching Mode, 2018
Best summer research presentation in cohort of 30

Eagle Scout, 2018

ACTIVITIES

Social Director, Caltech's Fleming House
Organize all events for 120-person dorm, remote/in-person

Treasurer, Caltech Student Investment Fund
$1M AUM, STEM sector focus

Ambassador, Caltech SURF
Advise and support cohort of summer research fellows

Frosh Camp Counselor
Orient and support new frosh

Caltech Cannon Master

Caltech Water Polo Team