James Bowden

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EDUCATION

California Institute of Technology **GPA 4.1/4**
B.S. Computer Science, Data Science Minor Grad: 2023

EXPERIENCE

Machine Learning Researcher | Jan. 2022 – Present
Katie Bouman Group, Caltech
- Exploring use of CycleGAN to accentuate deciding features in image data for model performance and explainability

Machine Learning Researcher | Jan. 2022 – Present
Anima Anandkumar Group, Caltech
- Partitioning ~200K-dimension signal data in the frequency domain to train diffusion models more efficiently
- Conditioning models of high-resolution signals on lower-resolution inputs

Machine Learning Researcher | Jun. 2020 – Present
Yisong Yue Group, Caltech
- Integrated Deep Kernel Learning (DKL) with BayesOpt (BO) to enhance model fit and find global optima faster
- Improved performance and runtime via Thompson sampling and Monte Carlo dropout
- Cut regret by over 50% compared to best GP models
- Develop multi-fidelity DK-BO for real applications like COVID protein engineering and nanophotonics filter design

Software Engineering Intern, Uber | Jun. – Sept. 2021
- Designed and analyzed ML models to increase driver offer acceptance rates and overall trip completion rates
- Pioneered geo-time embedding to create country-wide model and do cold-start prediction via transfer learning
- Improved trip completion model via conditional prediction
- Integrated new internal ML platform for increased modeling and training flexibility

Head Teaching Assistant, Caltech | Sept. 2020 – Present
- Serving as TA for:
  - CS 156a: Machine Learning Systems [Fall 2021]
  - CS 24: Computing Systems, C [Fall 2021]
  - CS 3: Software Design, C [Spring 2021]
  - CS 2: Data Structures/Algorithms, Java [Winter 2021, 2022]
  - CS 1: Intro Programming, Python [Fall 2020]
- Hold office hours, give code reviews, lead lab section, grade code, instill good development practices, write lab
- Head TA for CS 2 [Winter 2022]

SKILLS

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

Tools
PyTorch, Keras, TF, sklearn, pandas, NumPy, Hive

Techniques
Deep Learning, BayesOpt, Regression, Transfer Learning

COURSEWORK

- ML & Data Mining
- Machine Learning Systems
- Variational Inference
- NN Theory, Control
- Statistical Inference
- Bayesian Statistics
- Probability Models
- Markov Chains, Discrete Stochastic Processes
- Applied Linear Algebra
- Data Structures/Algorithms
- Software Design
- Computing Systems

AWARDS

Thermo-Fisher Sch., 2019
For medical research (1 of 6)

Teaching Mode, 2018
Best research presentation in cohort of 30

Eagle Scout, 2018

ACTIVITIES

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

Ambassador, Caltech SURF
Advise research fellows

Fleming House Social Chair
Caltech Cannon Master
Caltech Water Polo Team