Tom Knowles

{linkedin.com/in/tom-knowles} {tomknowles.com}

Email: tomobknowles@gmail.com
Mobile : +1 650-382-9350

Education

Stanford University — Stanford, CA
M.S. Computer Science (AI track) and B.S. Mathematics (CS theory track) — GPA: 4.10 and 4.13 — *Graduated: 01/2022 and 06/2021*

J.E. Wallace Sterling Award: Top 25 4-year academic performance in School of Humanities and Sciences

Graduate CS Coursework: AI, Probabilistic Graphical Models, Machine Learning, ML with Graphs, Reinforcement Learning, Modern Algorithms, Optimization, Complexity Theory I and II, Meta-learning, Parallel Computing, Networking

Mathematics Coursework: Differential Geometry, Module Theory, Grad. Probability, Probabilistic Method, Stochastic Processes, Probabilistic Combinatorics, Functional Analysis, Linear Alg./Multivariable Calc./Diff Eq., Grad. Applied Statistics

Experience

Software Engineer, *ReSim* — Mountain View, CA
Robotics simulation at a seed-stage start-up — *March 2023 – Present*

- I simulate robots in open-source `C++`, do scalable systems engineering in `Go`, and write metrics frameworks in `Python`.

Software Engineer, *Aurora Innovation* — Mountain View, CA
Perception simulation for self-driving trucks — *February 2022 – March 2023*

- Worked on synthetic world and sensor simulation for self-driving trucks, as one of three people on the core physically-based raytracing and renderer team, using highly parallelized `C++`.

Teaching Assistant, *Machine Learning*; Head Teaching Assistant, *Complexity theory* — Stanford, CA
TA for Stanford's CS 229; Head TA for CS 154, 254, 254B — *September 2020 – December 2021*

- Taught Fall 2021 offering of *Machine Learning* (CS 229), with Moses Charikar, Chris Re, and Andrew Ng

ML Infra Intern, *X, the Moonshot Factory – (formerly Google[X])* — Mountain View, CA
ML engineering for Mineral: X's sustainable agriculture moonshot — *June 2021 – September 2021*

- Worked on NDA-ed perception and ML infra projectsusing `Tensorflow`, in a computational agriculture setting

Undergraduate Researcher, *Stanford AI Laboratory (IRIS Lab)* — Stanford, CA
Undergraduate AI research in meta-learning — *September 2019 – June 2021*

- Performed research into disentangling group symmetries in a meta-learning setting. Over Summer 2020, co-authored an ICLR 2021 paper entitled: **Meta-Learning Symmetries by Reparameterization** with Allan Zhou and Chelsea Finn
- Worked on domain adaptation and machine learning on long-tailed distributions, using `PyTorch`

Advanced Data Analytics and Data Engineering Intern, *Intuitive – (formerly Intuitive Surgical)* — Sunnyvale, CA
Intern on Intuitive's core internal machine learning and statistics team — *June 2019 – September 2019*

- Implemented modern Transformer models to improve existing NLP models in the RMA pipeline, using `PyTorch`.

Research Engineering Intern, *Alan Turing Institute* — London, UK
First non-PhD intern at the British national research institute for artificial intelligence — *February 2017 – June 2017*

Works

Zhou, Tajwar, Robey, *Knowles*, Pappas, Hassani, Finn. Do Deep Networks Transfer Invariances Across Classes? (ICLR 2022): See arxiv.org/abs/2203.09739.

Zhou, *Knowles*, Finn. Meta-Learning Symmetries by Reparameterization (ICLR 2021): See arxiv.org/abs/2007.02933.

Datasets for Developing Automated Data Wrangling Tools: Co-authored talk at *2017 UK Conference of Research Software Engineers*

Skills

Languages: C, C++ (some CUDA), Java, Javascript, Julia, Python (PyTorch/Tensorflow), R, SQL

Awards

Gold, Various Math/Science Olympiads: Gold/distinction or better in many national science competitions, including British Math/Chemistry/Physics Olympiads, and the Cambridge Chemistry Challenge.

Winner, Bay Area Google Tech Challenge (2019): 1st place out of 50+ Stanford and Berkeley teams in algorithms challenges