



Michael Sun

L2 Machine Learning Engineer @ TikTok (Aug 2022-present)
Research @ Stanford (Summer 2022)

Profile

I'm an aspiring research engineer and/or AI academic who has:

- strong industry + research expertise in machine learning
- built end-to-end full stack web/mobile applications
- strong theoretical background from competitions and research

I love tackling hard problems that require creative solutions. I'm always open to exciting opportunities in research and applied AI.

Education

BS (with Honors) Mathematical & Computational Science, MS Computer Science, Stanford University

September 2018 — June 2022

Internships

MS Researcher @ Stanford Network Analysis Project and Stanford Artificial Intelligence Laboratory

March 2021 — Present

- Accelerating large-scale PDE & particle-in-cell simulations with deep learning, working with Tailin Wu under Jure Leskovec
- Devise SOTA representation learning approaches to continual learning settings, working with Ananya Kumar under Percy Liang
- Deep recommender systems and knowledge augmented language models, working with Antonie Bosselut under Jure Leskovec

Machine Learning Engineer Intern @ Spotify

June 2021 — July 2021

- One of 3 inaugural interns in Spotify's ML Platform team
- Began Bayes optimization feature in ML Home, Spotify's productivity hub for all company applied ML teams
- Proposed pipeline to identify causes for underperforming user segments, used Kubeflow Pipelines for end-to-end ML workflows

Machine Learning Intern @ Samsung Research America, Think Tank Team (SRA, TTT), Mountain View

June 2020 — September 2020

- Trained the SARAM Botchef, TTT's in-home kitchen robot concept, to stir kitchen pots in a goal-based **OpenAI gym** simulation environment using the mujoco physics engine
- Used ray and tune (RL libraries) to train >100 iterations of the PPO algorithm, a gradient-based actor-critic approach, following two OpenAI papers which showed its feasibility for sim2real transfer
- Extended a new **deep reinforcement learning** environment for an open-ended reformulation of pot stirring

Details

650-285-9287

msun415@cs.stanford.edu

Links

[Portfolio](#)

Education

MCS is an interdisciplinary quantitative major which is a combination of math, statistics, machine learning, which allowed me to take advanced/graduate CS courses early on in my undergrad years. I'm coterminating in CS, expecting to graduate with both BS and MS spring 2022 or fall 2022.

I am open to PhD programs, though I may work in industry for a while first to support myself / gain some experience.

Skills

Languages: C/C++, Python, JavaScript, Swift, Java

ML Frameworks: TensorFlow, Keras, TFLite, PyTorch

Frameworks: Django (+REST), Flask, Vue.js, ReactJS, React Native, iOS native

Services: AWS EC2, RDS, S3, Heroku, Git, iOS App Store

Paradigms: Client-server, MVC, MapReduce

- **Proved a concept** with this re-formulation, getting the robot to successfully perform the task in simulation

BS Researcher @ Stanford Quantitative Imaging and AI Lab

January 2020 — Present

- Supervised by Professor Daniel Rubin at the Quantitative Imaging and Artificial Intelligence Lab (see portfolio for more details on approach)
- Did work as part of two projects
 - Investigated a hybrid **text embedding + image multi-modal representation learning** approach on chest X-rays and radiology reports with the MIMIC-CXR dataset
 - Familiarized with a deep learning based **video event specification** framework and world's largest video/EEG dataset for seizure detection

Software Engineer, Machine Learning Intern @ Synaptics, San Jose

July 2019 — September 2019

- Ran *hundreds* of experiments training state of the art on and **deployed a realtime video object detection model**, mostly using the Single Shot Multibox Detector (SSD), for company tasks
- Gained valuable machine learning intuition/expertise by balancing latest ideas from research papers and trial-and-error
- Deployed an end-to-end inferencing pipeline for **realtime detection** into an Android APK
- Experimented in **Keras, TensorFlow** and converted to TFLite ops with attention to performance-speed tradeoffs
- **Demo'ed at International Broadcast Conference 2019** on Synaptic's new SOC (VSR 371)
- See demo clip and slide deck I presented to the CTO team [here](#)

📁 Employment History

Machine Learning Engineer @ TikTok (US Search), Mountain View

ML Research Associate @ Stanford SLAC, Palo Alto

June 2022 — September 2022

- Drove a large-scale simulation research project by combining neural solvers and first-principles solvers to model the multi-scale dynamics of laser-plasma ion acceleration
ing Hybrid Particle-Continuum (LHPC) models from the data of first-principles simulations of laser-plasma interaction
- Collaborated closely with physicists to translate scientific hypotheses into experimental ablations or tests, learned about latest research in high-energy density physics, and shared findings with rest of department

Co-founder, Tech Lead @ Demodraft

July 2020 — Present

- Led a team of part-time volunteers to deploy our Beta within 1.5 months (subscribe on demodraft.org to get access to the Beta!)

- Got accepted into Berkeley SkyDeck, **one of nation's top college accelerators with <10% acceptance rate**

★ Software Projects

demodraft.com

July 2020 — Present

- **Django REST + Vue.js** full stack web platform hosted on **AWS EC2, S3, RDS** and **Route 53** services

PixelCNN (CS236 final project)

October 2019 — December 2019

- Designed different latent representations of captions for training conditional generative models on caption-to-image generation
- Evaluation on different generative model metrics

Quizkly.com (Live Web App)

October 2018 — October 2020

- Helped deploy a **full-stack NLP application** that takes in corpuses of text and generates MCQ quizzes with blanks (see portfolio)
- Deployed pipeline involves text extraction, classification, segmentation and word2vec
- Developed **full-stack MVC app with the Django REST, React, AWS**
- Built as a member of Pear Garage, a VC accelerator program, as **one of two dozen selected out of hundreds** of Stanford applicants

GoodNews (CS229 final project)

April 2019 — June 2019

- News popularity/virality prediction with machine learning with article metadata (~60 numerical features) and article content/keywords/title
- Applied many **supervised classification** techniques (kernelized SVMs, random forests, neural networks, etc.) and NLP practices

aiRoute (iOS App Store)

June 2018 — September 2018

- An end-to-end running app that auto-generates running routes
- Embedded map views, live navigation, and voice controller SDKs
- Deployed **RESTful API in Flask** hosted on Heroku with **Firestore NoSQL**

aiFood (iOS App Store)

April 2018 — November 2018

- An end-to-end meal generation app that automates macro-counting
- Generates ingredient lists that precisely satisfies nutritional needs

KnowledgeTree (C++ and Python console app)

February 2019 — Present

- Uses word2vec, wikipedia scraper, and Stanford's triplet-extraction python libraries to build a concept tree of any input topic

MealApp (Flask API)

May 2018 — January 2019

- Data science project that helped me construct algorithms for aiFood, including interesting unsupervised clustering results

★ Major Academic Achievements

Intel International Science and Engineering Fair (ISEF)

October 2016 — April 2017

Second Place Grand Award, Category of Mathematics, at World's largest science/engineering exhibition, project titled "Bounds on metric dimension for families of planar graphs" ([arXiv link](#))

United States of America Mathematical Olympiad (USAMO)

May 2017

Earned median score on USA's most prestigious math competition (~250/50000 qualify each year), first in school history to qualify

American Invitational Math Examination

March 2017

Top 30 nationwide among ~1,000 who sat the invitation-only exam and Distinguished High Honor Roll for both AMC 10 & 12 (top 1%)

★ Relevant Courses

For Stanford undergrad courses taken, see a subset on my [website](#).

In my past spare time, I completed deeplearning.ai's Deep Learning specialization ([see here](#)), Alberta ML Institute's Reinforcement Learning specialization, and self-learned all the tech stacks mentioned in my projects.