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
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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 coterming 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 Quanitative 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 Firebase **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.