Mark Ibrahim

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EXPERIENCE

New York, NY

Staff AI Researcher, Fundamental AI Research (FAIR) at Meta Superintelligence Labs — July 2019 – Present

- Directing foundational research to measure and advance generalization in multimodal LLMs and AI agents
  - Published 30+ research papers at top AI conferences, earning 3 spotlight awards & 1 oral (top 1% at ICML 2024)
  - Led a team of 10 researchers to develop OpenApps, a research environment for computer-use agents
- Co-author of Self-Supervised Learning Cookbook w/ Yann LeCun + R. Balestriero, sets foundational recipes for SSL
- Architected a distributed GPU training pipeline in PyTorch, enabling multimodal training on 12 billion data samples
- Directed research for 13+ researchers (including 2 AI Residents, 6 Research Interns, and 4 visiting PhD Researchers)
- Instructor for Georgia Tech's Deep Learning course (+10k students); co-organized ICML tutorial with 400+ attendees

Senior Machine Learning Engineer, Center for Machine Learning at Capital One — Sep 2016 – June 2019

- Led Explainable AI team to build tools and research for explaining black-box deep learning models
  - Built open-source Python library to generate global explanations for neural network predictions
  - Published 2 interpretability research papers (NeurIPS workshop 2018 and ACM AAAI 2019) + Patent 16/855,685
- Engineered a real-time notification system for predicting mistaken charges on 10 million transactions per day
- Developed deep learning (RNN + LDA) customer archetype model in collaboration with Columbia Prof. John Paisley

Data Engineering Fellow (2016) & Technical Advisor, Insight Data Science — May 2016 – June 2018

- Developed a graph-based knowledge search engine parsing 5 million Wikipedia articles using Spark
- Advised incoming fellows on capstone projects, including problem selection and technical design

Quantitative Portfolio Risk Analyst, UBS — Jun 2012 – Aug 2014

- Applied unsupervised machine learning (PCA) to identify $570k in uncaptured sensitivity to a 0.01% move in rates
- Automated daily 2½ hour manual risk calculation for $658 million trading portfolio in Python

SELECT RESEARCH

Advancing Multimodal LLM Training and Evaluation

- Multimodal training objective with graph capturing cross-sample similarities w/ Yann LeCun *(ICLR)*
- LLIP a state-of-the-art open-weight vision-encoder (ViT-G) with optimized visual cross attention *(ICML)*
- Common-O multimodal reasoning *(NeurIPS, senior author)*, UniBench *(NeurIPS, senior author)*, Battle of backbones *(NeurIPS)*

Alignment for LLMs

- Multi-token any-to-any prediction for efficient knowledge encoding and maze navigation *(NeurIPS, senior author)*
- AbstentionBench *(NeurIPS, co-lead)* measuring LLMs' ability to say 'I don't know'; adopted in GPT-5's system card

Self-Supervised Learning (SSL) & Generalization

- Occam's Razor: a minimalist SSL method *(TMLR)* , SSL CookBook w/ Yann LeCun, ImageNet-X *(ICLR spotlight, senior author)*
- Whac-A Mole Shortcuts *(CVPR, senior author)*, Generalization across Geographies of vision systems *(ICLR, senior author)*

Computer-use Agentic Systems

- Led a team of 10 researchers to develop OpenApps, a research environment for computer use agents *(NeurIPS demo)*
- Directing research into post-training approaches for reliable computer use agents trained with world models

EDUCATION

Statistics MicroMasters, Massachusetts Institute of Technology (MIT)

M.S. Mathematics, University of Vermont
Course Instructor: Calculus I (72 students) and Calculus II (38 students)

Honors B.A. Mathematics, *Magna Cum Laude (19th Gold Scholar)*, Hamilton College