Mark Ibrahim

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EXPERIENCE

New York, NY

Staff Research Engineer, Fundamental Artificial Intelligence Research (FAIR) Lab, Meta AI — July 2019 – Present

- Researching methods to measure and improve common sense in deep learning vision/language models
  - Developed open state-of-the-art training methods for reliable self-supervised and multimodal models
  - Published 15+ research papers at top AI conferences, earning 2 spotlight awards & 1 oral (top 1%, ICML 2024)
- Co-author of The Self-Supervised Learning Cookbook with Randall Balestriero , Yann LeCun, and others
- Architected experiment launchers for distributed multi-GPU training for up to 2.5 billion data samples in PyTorch
- Advised 2 AI Residents, 5 research interns, and 3 visiting PhD students to projects featured by Meta/AI Conferences
- 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)
- 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 (*knowledgesearch.us*) powered by Wikipedia
  - Distributed parsing of all 5 million articles using Spark on Amazon Web Services (AWS)
- Designed a D3.js user interface powered by a graph database (Neo4j), Elasticsearch, and Python (Flask)

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

"Does Progress On Object Recognition Improve Real-World Generalization?"—*M Richards et al. ICLR 2024*.

"Modeling Caption Diversity in Contrastive Vision-Language Pretraining"—*S Lavoie, et al. ICML 2024.*

"ImageNet-X: understanding model mistakes with factor annotations"—*B Idrissi et al. ICLR Spotlight 2023.*

"Grounding inductive biases: invariance stems from data"—*D Bouchacourt, M Ibrahim, A Morcos*. *NeurIPS 2021.*

Patent*:* "Techniques to perform global attribution insights in neural networks"— *US Patent 16/855,685*

Select Talks: ICML Tutorial (2023), ICLR Spotlight (2023), NeurIPS (2021), PyCon (2020), AAAI Spotlight Talk (2019), NYC Python Meetup (2018), Tom Tom Machine Learning Conf (2018), *Data Driven* at George Washington U. (2017).

COMMUNITY

Researcher for the AI-Powered COVID-19 Forecasting Data for Good Program with Direct Relief non-profit org
Advisor for Columbia U. Data Science Masters Capstone (2019). **Co-organizer** Vermont Python User Group (2016)

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*, Hamilton College
19th Gold Scholar for student of "highest standards." *Phi Sigma Iota*: highest honor for foreign languages