

Mark Ibrahim

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EXPERIENCE

New York, NY

Facebook Artificial Intelligence Research (FAIR), Senior Research Engineer

July 2019 – Present

- Researching methods to measure and improve the robustness of deep learning vision models
 - Designing generalization mechanisms in self-supervised learning, led to a +10% in classification robustness
 - Authoring research papers to [explain and structure](#) representations learned by large scale models
- Architected tooling to track and launch experiments with distributed multi-GPU training in PyTorch
- Mentor for multiple research interns/AI Resident and an instructor for Georgia Tech's Deep Learning course
- Led creation of [Ridge Sketch](#) library for large-scale ridge regression and contributor to [CrypTen](#)

Center for Machine Learning at Capital One, Senior Machine Learning Engineer

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

Insight Data Science, Data Engineering Fellow (2016) & Technical Advisor

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)

UBS, Quantitative Portfolio Risk Analyst

Jun 2012 – Aug 2014

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

SELECT RESEARCH

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

“Global Explanations of Neural Networks: Mapping the Landscape of Predictions”—*M Ibrahim et al. AAAI 2019.*

“Mixed Membership Recurrent Neural Networks”—*G Fazel, M Ibrahim, C Modarres, K Wu, J Paisley. ACM ICAIF 2019.*

“Connecting Every Bit of Knowledge: [Wikipedia's First Link Network](#)”—*M Ibrahim et al. J. Computational Science 2017*

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

Select Talks: NeurIPS Spotlight (2021), PyCon (2020), AAAI Spotlight Talk (2019), NYC Python Meetup (2018), Tom Tom Machine Learning Conf (2018), [Data Driven](#) at George Washington U. (2017), NYC Data Wranglers (2017).

COMMUNITY

Reviewer for NeurIPS (2022, 2021), academic journal *IEEE Transactions on Network Science*, 2017-2018.

Mentor for Columbia U. Data Science Masters Capstone (2019-2018). **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