Mark Ibrahim

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TECHNICAL

• Python (scikit-learn, numpy, object-oriented, PyTest), Git, TensorFlow, Linux bash, SQL, JavaScript, LaTex, VIM
familiar: Java, AWS, Neo4j, ElasticSearch, D3.js, Spark. Interests: Deep Learning Interpretability, Knowledge Graphs

EXPERIENCE

New York, NY

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

- Leading Explainable AI team to build tools and research for explaining black-box deep learning models
  - Building open-source Python library to generate global explanations for neural network predictions
  - Published 2 interpretability research papers (NeurIPS workshop 2018 and ACM AAAI 2019)
- Engineering a real-time notification system for predicting mistaken charges on 10 million transactions per day
  - Architecting Lambda microservices in Java and Python to serve machine learning predictions in production
- Developing recurrent neural network (RNN) + LDA customer archetype model in partnership with Columbia U.

Data Engineering Fellow (2016) & **Technical Advisor**, Insight Data Science — May 2016 – Present

- 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)

Freelance Software Engineer, Condé Nast — Oct 2014 – Aug 2015

- Created an Applescript and Python app to tag and shorten Facebook/Twitter posts reaching 4 million followers
- Built a Google Calendar Extension to sync production sheet across team of writers/editors at ArchDigest

Quantitative Portfolio Risk Analyst, UBS — 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

RESEARCH

"Towards Explainable Deep Learning for Credit Lending"—*Accepted NeurIPS 2018 FEAP Workshop, Spotlight Award.*

- NeurIPS 2018 workshop speaker; research in collaboration with Professor John Paisley at Columbia U.

"Global Explanations of Neural Networks: Mapping the Landscape of Predictions"—*Accepted ACM AAAI 2019*

"Understanding the predictions of deep neural networks"—*Invited Speaker.*
Data Driven 2017 at *George Washington University*; Applied Machine Learning, 2018 *Tom Tom Conference*

"Connecting Every Bit of Knowledge**:** *Wikipedia's First Link Network*." 2017, *Journal of Computational Science.*

- Developed graph algorithm to measure article influence in directed cyclic graphs

COMMUNITY

Reviewer for academic journal *IEEE Transactions on Network Science and Engineering*, 2017-2018.

Mentor for Columbia U. Data Science Masters Capstone (2018). **Co-organizer** Vermont Python User Group (2016)

EDUCATION

M.S. Applied Mathematics, University of Vermont (2016) — Burlington, VT
Course Instructor: Calculus I (72 students) and Calculus II (38 students)

Honors B.A. Mathematics, *Magna Cum Laude*, Hamilton College (2012) — Clinton, NY
19th Gold Scholar for student of "highest standards." *Phi Sigma Iota*: highest honor for foreign languages