Alex Eftimiades

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Work Experience

FINRA Rockville, MD
Data Scientist (Contract) June 2019 - Dec 2019

- Kickstarted production monitoring R&D project; developed state of the art technique for measuring concept drift from samples
- Used random forests, gradient boosted trees, deep neural networks, logistic regression, and ensembles to predict insider trading from trading patterns of potential suspects.
- Designed and implemented deep neural network to identify market manipulation from raw market trades, 90% ROC AUC
- Developed best practices for model testing and monitoring with Jupyter notebook based examples
- Developed novel embedding techniques using deep learning
- Developed novel techniques to compare sample distributions
- Gave talk on using normalizing flows for anomaly detection
- Implemented normalizing flow (BNAF) in Jax

Deepsig Arlington, VA
Machine Learning Engineer Jan 2019 - March 2019

- Designed and implemented deep learning based signal detector and classifier
- Compared and reported on deep learning approaches benchmarked against classical clustering algorithms for signal identification and classification
- Gave talk on semisupervised learning

Catalist LLC Washington DC
Analytics Engineer Feb 2018 - Jan 2019

- Optimized, parallelized, and deployed NLP Keras model
- Wrote SQL parser that refactored over 1 million lines of legacy SQL scripts
- Designed and wrote real time data processing pipeline
- Wrote internal technical guides on parallel processing
- Fixed Keras's tokenizer

Comsol Burlington, MA
Developer Feb 2016 - May 2017

- Researched models and techniques to simulate physical phenomena of interest to engineers and scientists
- Wrote technical specifications of model, algorithm, and graphic interface
- Implemented algorithms used for numerical simulations and user interfaces in java
- Helped customers create and optimize simulations

Freelance Software Engineer March 2013 - Pres

- American Dental Association Foundation - performed data visualization and image processing with python, named 2nd author on resulting paper
- University of Maryland Baltimore County - Reduced run time of quantum computing simulation from 5 days to 50 minutes
- Tor - Wrote code to tunnel Iranians through google chat to reach the uncensored internet

Skills

Programming Languages:	Python, Bash, SQL, Javascript
Frameworks:	Pytorch, Numpy/Scipy, Cython, Pandas, Scikit-learn
Tools:	Git, Vim, AWS, Jupyter, Seaborn, Docker

Projects

Convolutional Decision Tree *Python, Keras, scikit-learn*
https://gist.github.com/aeftimia/5587286cb844953528b92bea0cd80bdb
Decision trees are universal approximators just like neural networks. It turns out making decision trees convolutional does not help in the same way it does neural networks, but I had to try!

Pseudoinvertible Neural Network *Tensorflow, Python*
https://gist.github.com/aeftimia/045d1cd04a24f9c1b78baad5b2d5b73e
Modified deep convolutional neural network classifier to only use [psuedo]invertible transformations. Achieved near SOTA accuracy with approximately half as many parameters.

Toy Q Learning *Python* https://github.com/aeftimia/Reinforcement-TicTacToe
Trained two bots to learn to play tic tac toe via Q learning.

Semisupervised Learning *Keras, Matplotlib, Jupyter, AWS* https://github.com/aeftimia/Deepsig
Experimented with autoencoder based semi supervised clustering. 80% accuracy on 10% labeled mnist data

Discrete Exterior Calculus Framework *Python, Cython, Cuda* https://github.com/aeftimia/kahler
Developed and reported on efficient and parallelized finite elements framework

Publications

Enhancing the Three-Dimensional Structure of Adherent Gingival Fibroblasts and Spheroids via a Fibrous Protein-Based Hydrogel Cover. Cells Tissues Organs
Published with biologists at American Dental Association Foundation Aug. 2016

Kahler: An Implementation of Discrete Exterior Calculus on Hermitian Manifolds
http://arxiv.org/abs/1405.7879
Independent research and implementation of finite elements framework May 2014

Education

UMBC Catonsville, MD
BS Physics 2013 - 2015