Roy Finkelberg

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Education

Georgia Institute of Technology Atlanta, GA

Joint Bachelor and Master of Science in Computer Science

- **M.S in Computer Science (Jan. 2020 - May. 2021)**: GPA: 4.0/4.0; Specialization: Machine Learning
- **B.S in Computer Science (Aug. 2016 - Dec. 2019)**: GPA: 3.85/4.0 (Highest Honors)
  Concentrations: Artificial Intelligence, Embedded Computing

Experience

NVIDIA Austin, TX

Data Science - AI Infrastructure Intern (RAPIDS AI) May 2019 - Aug. 2019

- **Applied Research**: Adapted deep representation learning methods (graph autoencoders) to develop scalable network analysis and link prediction methods for large cybersecurity networks
- **cuML**: Developed pure GPU implementations for ordinal feature encoding and data train/test split modules, giving up to 290x speedups over CPU implementations on large ($\sim 10^7$ row) datasets
- **cuDF**: Constructed, profiled, and optimized fundamental data science primitives such as one-hot encoding and scalar-vector binary operations in Cython and Numba, improving performance by 1.5x on wide datasets

Pindrop Security Atlanta, GA

Software Engineering Intern - Research May 2018 - Aug. 2018

- **Test Engineering**: Developed an automated testing harness for a cloud based machine learning platform
- **Scalable System Design**: Designed an abstract schema to streamline creation and integration of new models
- **Health Monitoring**: Created a standardized interface for reporting and viewing model performance metrics through Datadog, reducing manual Research Scientist intervention by ~ 70 hours per week
- **Model Optimization**: Scaled Scikit-Learn's DBSCAN algorithm to $\sim 10^6$ dimensional feature vectors using Spotify's open source Annoy library

Projects and Publications

Piazza Automated Related Question Recommender Published: *ACM Learning @ Scale 2019*

Georgia Tech Contextual Computing Group Aug. 2018 - Present

- Developed a natural language understanding pipeline for a recommendation engine which leverages the collective memory of online forums to prevent duplicate posts
- Conducted A/B testing of model performance and impact across 1000+ users
- Published as *PARQR: Augmenting the Piazza Online Forum to Better Support Degree Seeking Online Masters Students*, showing a 40% reduction in duplicate posts

Towards Scalable Cybersecurity Network Analysis with Graph Autoencoders

NVIDIA - RAPIDS AI Aug. 2019

- Investigated the use of autoencoder based methods for large scale cybersecurity network analysis
- Adapted existing graph autoencoder architectures in Tensorflow and PyTorch to static and dynamic cybersecurity networks
- Published as an internal NVIDIA whitepaper, demonstrating up to 4x performance increases and 9x speedups on link prediction tasks

Model Based Intention Detection for Intelligent Prostheses

Georgia Tech Exoskeleton Prosthetic and Intelligent Controls Lab Aug. 2017 - Dec. 2017

- Collected and analyzed biometric sensor data to determine features important to gait speed detection
- Preprocessed data and engineered features using Python's Scikit-Learn library
- Presented a preliminary offline gait speed detection model demonstrating the effectiveness of these features
- Assisted in the design of a Kivy GUI which interfaced with ROS to visualize and adjust a prosthetic's control parameters during operation

Skills

- **Languages**: Python (advanced), Java (intermediate), C (intermediate)
- **Tools/Technologies**: Numpy/Scipy, PyTorch, Pandas, Numba (with CUDA), Cython, Pytest, LaTeX, Software Integration, Hardware Prototyping, Linux Environments