# NICHOLAS PETOSA

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## EDUCATION

**Georgia Institute of Technology,** M.S. in Computer Science                        August 2018 – December 2019
Specialization in Machine Learning                                                                              **GPA: 4.0/4.0**

**Georgia Institute of Technology,** B.S. in Computer Science                             August 2015 – May 2018
Concentrations in Artificial Intelligence and System Architecture                                    **GPA: 4.0/4.0**

## EXPERIENCE

**Two Sigma.** *Software Engineer – Core AI.*                             *New York, NY*. February 2020 – Present

**Two Sigma.** *Software Engineer Intern – Alpha Insights.*         *New York, NY*. May 2019 – August 2019
- **Gradient-Boosted Trees.** Created a Python package that trains gradient-boosted tree classifiers to automate thousands of human decisions about data quality. Best model achieves an AUC of .70 on the noisy, limited data available. Package automates retraining with hyperparameter search on new data, so models can improve over time. Used scikit-learn and xgboost.
- **Language Model Fine-tuning.** Used ULMFiT natural language transfer learning to predict data quality from free-text descriptions.

**Microsoft.** *Software Engineer Intern – PowerBI Advanced Analytics.*         *Redmond, WA.* May 2018 – August 2018
- **Deep Learning.** Designed and trained a deep LSTM classifier to predict English descriptions of arbitrary data visualizations with 95% accuracy. Trained on generated synthetic data and validated on real-world data.
- **Interpretable AI.** Created a web app that won 2nd place in the AI & Ethics category of Microsoft's 2018 week-long global company hackathon. The web app trains and visualizes deep PyTorch general additive models (GAMs) to build human-interpretable models.

**Amazon.** *Software Development Engineer Intern – Customer Account Protection.*         *Seattle, WA*. May 2017 – July 2017
- **Fraud Detection.** Integrated a random forest classifier into Amazon's production sign-in systems, which handle millions of sign-ins per day. Model predicts if a customer cluster is malicious and surfaces predictions to fraud investigators. Used scikit-learn and Weka.
- **Data Visualization.** Created an account cluster d3.js visualization within dashboard used by hundreds of Amazon fraud investigators.

**Cisco.** *Software Engineer Intern – Global Support Experience.*         *Research Triangle Park, NC*. May 2016 – August 2016
- **Data Science.** Created an R web app that visualizes partner performance. Executives estimated the tool would save $150k/quarter.
- **Web Development.** Redesigned a service wrapper with high visibility within Cisco with Java Spring.

## RESEARCH & ADDITIONAL EXPERIENCE

**Georgia Tech Graduate Research Assistant,** Quantitative Software Research Group         January 2018 – December 2019
Researched deep learning for quantitative finance under Dr. Tucker Balch, focused on reinforcement learning & simulation realism.

**Georgia Tech Graduate Teaching Assistant,** CS 7646 Machine Learning for Trading         August 2018 – December 2019

## PUBLICATIONS

*Multiplayer AlphaZero.* **(2019)**                                                                 https://arxiv.org/abs/1910.13012
Petosa, N. and Balch, T.
NeurIPS 2019, Deep Reinforcement Learning Workshop (Poster).

*Get Real: Realism Metrics for Robust Limit Order Book Market Simulations.* **(2019)**         https://arxiv.org/abs/1912.04941
Vyetrenko, S., Byrd, D., Petosa, N., Mahfouz, M., Dervovic, D., Veloso, M. and Balch, T.
NeurIPS 2019, Workshop on Robust AI in Financial Services (Poster).

## AWARDS

Bose Prize (HackGT 2019) • 2nd Place (Home Depot Deep Learning Hackathon 2018) • FINRA Data Analysis Prize (HackGT 2017)
1st Place (Coca-Cola Hackathon 2016) • Firebase Prize (MHacks Hackathon 2016) • 1st Place (SwampHacks Hackathon 2016)

## SKILLS

**Programming Languages** – Python, Java, JavaScript, C
**Tools & Frameworks** – PyTorch, Keras, TensorFlow, d3.js, scikit-learn, REST, WebSocket, Flask, Git
**Areas of Interest** – Quantitative Finance, Deep Learning, Machine Learning, Artificial Intelligence, Data Visualization