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Christopher Miller

Education

September 2016 - June 2020 **BA, Computer Science with High Honors**, *Dartmouth College*, Hanover, NH.
- 3.86 Cumulative GPA, 3.91 Major GPA
- Senior Honors Thesis, "Optimizing Surrogate Models for Query-Free Adversarial Transfer"
- GRE: 336/340 (170V, 166Q, 6.0W), SAT: 2360/2400 (800V, 800Q, 760W)

Honors & Awards

- Phi Beta Kappa member (top 10% of graduating class)
- Sigma Xi scientific research honor society associate member
- Rufus Choate Scholar 2019-2020 (top 5% of all undergraduate students)
- Winner of the 2019 John G. Kemeny Computing Prize for Excellence in Innovation
- Citations for academic excellence in ENGS 20, "Introduction to Scientific Computing," and COSC 69.09, "Applications of Data Science"

Publications

- Miller, C., & Vosoughi, S. (2020). Query-Free Adversarial Transfer via Undertrained Surrogates. *arXiv preprint arXiv:2007.00806*. (Under review). `arxiv.org/abs/2007.00806`.
- Miller, C., & Bonfert-Taylor, P. (2020). Improving Automated Group Assignments in an Academic Setting. *2020 ASEE Annual Conference*. `peer.asee.org/34791`.
- Miller, C., & Vosoughi, S. (2020). Big Green at WNUT 2020 Shared Task-1: Relation Extraction as Contextualized Sequence Classification. *Proceedings of EMNLP 2020 Workshop on Noisy User-Generated Text (WNUT)*. `aclweb.org/anthology/2020.wnut-1.36`.

Skills & Abilities

- Programming languages: Experienced with Python and C#, prior work in Java, C, Bash, and SQL
- Tools & Technologies: Linux, PyTorch, Azure, GCP, Git, NumPy, Pandas, NetworkX, .NET Core, Kubernetes, and LaTeX
- Graduate level coursework in machine learning, computer vision, bioinformatics, applied data science, robotics, artificial intelligence, and network science/complex systems
- Undergraduate level coursework in data structures, algorithms, scientific computing, discrete math, software design & implementation, statistics, multivariable calculus, and neuroscience

Projects & Research

October 2020 - February 2020 **XPRIZE Pandemic Response Challenge**, *Dartmouth Machine Learning Lab.*
- Worked with a team to develop predictive models for COVID-19 spread and prescriptive models for regional intervention policies
- Designed random forest regression models which ranked fifth out of over 40 teams for predicting COVID-19 spread over a three month period
- Led the team in developing a reinforcement learning prescription model

August 2020 - September 2020 **Noisy Relation Extraction**, *Dartmouth Machine Learning Lab.*
- Developed a system for relation and event extraction from noisy text using BERT-based contextualized knowledge graph completion
- Applied system for the Workshop on Noisy User-Generated Text (WNUT) at EMNLP 2020, achieving competitive results that exceeded prior baselines

August 2019 - June 2020
Senior Thesis, *Dartmouth Machine Learning Lab.*
- Developed a state-of-the-art technique for transferring adversarial attacks
- Reduced post-attack accuracy by >75% from prior state-of-the-art across a variety of models
- Revealed significant flaws in existing methods for evaluating model security and developed improved alternatives
- Used PyTorch, Google Cloud Platform and AWS to enable scalable training and evaluation

September 2017 - June 2020
Group Assignment Tool, *Thayer School of Engineering.*
- Researched and developed a state-of-the-art group formation algorithm which improved diversity and student satisfaction in multiple Dartmouth College courses
- Worked with design and IT teams to integrate with the Dartmouth course management website for ongoing use
- Received the 2019 John G. Kemeny Computing Prize for Excellence in Innovation

March 2019 - June 2019
Code Clustering, *Thayer School of Engineering.*
- Developed a system to identify student approaches to coding assignments to identify areas where students struggle
- Built custom code to parse abstract syntax trees for over 200K student-submitted C programs
- Used Tensorflow to train a sequence to sequence deep learning model to convert C programs into semantic vectors

Work Experience

August 2020 - Present
Software Engineer, Azure DevTest Labs Team, *Microsoft*, Cambridge, MA.
-Improved service health and reliability by identifying and resolving service-impacting bugs
-Researched technology stack and implemented buildout and Kubernetes deployment management to support the development of a new Azure service
-Implemented reliable long-running operations via Durable Task Framework orchestrations
-Assisted with API development and implementation

June 2019 - August 2019
Business Consultant Intern, Data & Services, *Mastercard*, Arlington, VA.
- Improved advertising campaign ROI and accuracy of customer value & behavior forecasts by developing regression and time series analysis models and custom features
- Used SQL to load, modify, and analyze data on large scale Microsoft SQL Server databases

March 2018 - June 2020
Teaching Assistant, *Dartmouth College*, Hanover, NH.
- Worked with computer science courses in Java, C, and MATLAB
- Assisted students with class concepts and taught problem-solving skills relevant to programming
- Developed automated programs to provide student feedback and support when TAs were not available

January 2018 - June 2019
edX Course Developer, *Thayer School of Engineering*, Hanover, NH.
- Collaborated with an international team to create an online programming course on edX to provide high quality programming instruction to >50,000 students
- Developed scripts for automated grading of all course assignments which improved grading power and reliability for students
- Course won the 2019 edX Prize for Exceptional Contributions in Online Teaching and Learning