Jonathan Marty

Research CV

Contact Information

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Education

2019-Present **BS of Computer Science:** School of Engineering, Columbia University, New York, NY
GPA: 3.7631

2015-2019 **High School Education:** Holmdel High School, Holmdel, NJ
GPA: 4.6/5.0

Research Experience

2020-Present **Student Researcher, Bionet Lab, Columbia University:**

Summer 2020 **Intern, AT&T CSO:** Researched and created a graph visualization of cloud account configurations for the Astra portal with additional cybersecurity analysis features in KeyLines. Will be integrated into the Astra product. Performed a holistic analysis of novel FirstNet data, including leveraging KeyLines to create interactive visuals of network structure, using the Triad Census algorithm to analyze trends in graph structure, and the development of an ensemble decision tree model that detected 32% of all suspected malicious HTTP source devices with a 25% true positive rate.

Summer 2018 **Intern, Bionet Lab, Columbia University:** Performed development and research at the Columbia University Bionet lab, whose mission is to develop computation models of brain function (http://www.bionet.ee.columbia.edu). Packaged Fruit Fly Brain Observatory software using Docker which led to the adoption of the research platform by other universities and is currently being used as the basis for a graduate class. Implemented a model of the fruit fly early visual system using Keras and Tensorflow.

2017-2019 **Adjunct Employee, Perspecta Labs, Red Bank, NJ:** Participating in DARPA RADICS (https://www.darpa.mil/news-events/2015-12-14) project focused on securing our nations critical infrastructure. Developed methods to collect, clean, and normalize power grid network threat metrics. Evaluated data in unsupervised machine learning outlier detection algorithms. Developed novel method to enhance network intrusion detection techniques using neural spike train measures.

Summer 2017 **Intern, Vencore Labs, Red Bank, NJ:** Secured paid internship to participate in developing system for electric power grid control network security. Developed interface to dynamically add new threat detection metrics to power grid network security monitoring system. Contributed improvements to authentication and entitlements to support dynamic configuration. Invited to continue employment during 2017-2018 school year.

2016-2018 **Student Researcher, Holmdel High School and Vencore Labs, Red Bank, NJ:** Developed a method to reduce peak electrical power grid load from Personal Electric Vehicles (PEV) by employing distributed battery storage at charging stations. Performed large-scale power grid simulations to show that its adoption reduces average daily peak power levels by between 14% and 24% for typical urban and suburban grids. Presented results at IEEE conference.

Publications

Not Published J. Marty, G. Di Crescenzo, âĂİJAnalysis of Temporal Point Events for Network Intrusion Detection using Neural Spike Train Distance MeasuresâĂİ.

2018 J. Marty, S. Pietrowicz, âĂİEconomic Incentives for Reducing Peak Power Utilization in Electric Vehicle Charging StationsâĂİ, IEEE PES Innovative Smart Grid Technologies Conference, Washington DC, Feb 19-22, 2018

https://ieeexplore.ieee.org/document/8403377

Technical Skills

Languages

Python, R, Java, Golang, LaTeX, Processing, CUDA, Javascript, C++

Operating Systems

Linux, Windows, Mac, Cisco IOS

Tools

Docker, Ansible

Libraries

Tensorflow, PyTorch

Other

Interesting video of me: https://www.youtube.com/watch?v=CZv1PpTdIZ4