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EXPERIENCE

White House Presidential Innovation Fellows, Washington, DC.

Entrepreneur in Residence

Jan 2019–Present

Summary: Senior Advisor helping the Federal Government develop strategy and policy for AI Innovation, Cybersecurity, and cutting edge research and technologies.

Selected Projects:

- Led a multidisciplinary team on the development of the Claims Attributes API, the first AI API deployed at the Department of Veterans Affairs. It uses Natural Language Understanding to analyze the information a Veteran provides in a Benefit Claim (526), infers the proper medical condition and automatically routes the claim to a specialist. Key Results:
 - 10 million dollars per year in recurrent saving to the Department of Veterans Affairs.
 - Reduced Veteran's decision wait time by 5-7 days.
 - Increased claim establishment by 27x.
 - Special Act Award - Technology Transformation Services
- Work with NSF Program Directors in formulating research strategies, developing collaboration and cooperation across the Foundation and among government, academe and industry, fostering outreach to underrepresented groups, and providing leadership within NSF and the innovation community. Some numbers:
 - Assist in the coordination and development of four NSF workshops with a budget of 100,000 USD each. Each with a core team of more than 15 members and more than 400 participants.
 - Serve as a coach for the Phase I, 27 million USD funded, Convergence Accelerator cohorts in AI for Innovation, and Quantum Technology.
 - Serve in NSF Convergence Accelerator review panel for workshops, Phase I, Phase 2 proposals, budget 100,000, 700,000, 1.5 million each respectively per project funded.
- Machine Learning Engineer assisting Defense Digital Service with the development of an AI security solution.
- Draft AI Strategy and Policy for Intelligent Transportation Systems Joint Program Office at the Department of Transportation.
- Assisted in the creation of the AI Community of Practice at the Technology Transformation Services at General Services Administration.
- Serve as Subject Matter Expert in review panels for contracts related to Data Quality, Natural Language Processing, Automation, Artificial Intelligence, and Fraud Waste & Abuse Investigations at the Department of Veterans Affairs.
- Serve as Subject Matter Expert in Data and Artificial Intelligence for the Office of American Innovation and the Office of Science & Technology Policy at the White House, the AI COP at GSA/TTS, and NASA.
- Security Subject Matter Expert assisting the federated email initiative with the purpose of facilitating meeting coordination across agencies. Currently being piloted by NASA and SBA.
- Transform Fraud Waste & Abuse operations at the Department of Veterans Affairs from post-mortem investigations to real-time detection and prevention by redesigning their infrastructure in a more scalable way and building API services on top of their existing AI predictive models to be used on demand.
- Lead the cloud migration of the Fraud Waste & Abuse operations at the Veterans Benefits Administration.

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EXPERIENCE

Microsoft, Redmond, WA / Humacao, P.R.

Data & Applied Scientist II - Intellectual Property Protection & Solutions

Feb 2018–Jan 2019

Summary: Developed algorithms to detect Microsoft product keys suspicious activations based on time and geospatial data using Topological Data Analysis and Time Series Anomaly Detection techniques. Built and maintained Machine Learning models to detect and prevent malicious and scripted registrations and attacks, with False Positive and False Negative rates of less than 2.5%, reducing manual revision by 87%.

- Developed algorithms to detect suspicious activations based on time and geospatial data using Topological Data Analysis and Time Series Anomaly Detection techniques. Built on Python with Pandas, NumPy and SciKit-Learn among other libraries.
- Built and maintained Machine Learning models to detect malicious and scripted registrations, with False Positive and False Negative rates of less than 2.5%, reducing manual revision by 87%.
- Developed SQL string matching algorithms to efficiently query entries in a database by similarity in fields of unstructured text, for example, columns corresponding to residential addresses.
- Created Time Series models in Python to detect and prevent scripted attacks.
- Automated daily data analysis revision reducing investigator's time from 30-45mins to under a minute.

Soteria - Security Consulting & Data Analytics, Charleston, S.C.

Senior Data Scientist

Jun 2016–Jan 2018

Summary: Led the development of the Machine Learning, Natural Language Processing and Understanding modules for Soteria's product suite for detection and classification of phishing attacks and brand infringement.

- Developed predictive models to detect Phishing emails and websites based on content and attributes.
- Built algorithms to detect large scale phishing campaigns with the use of clustering techniques and Natural Language Processing.
- Concocted machine learning classifiers to detect and correctly identify different phishing techniques such as Typosquatting, Spoofing, Whaling and Spear Phishing among others.
- Developed text classification models to assess risk of brand infringement.
- Develop predictive model to automate the detection of malicious websites with a 97% accuracy.

EDUCATION

University of Iowa, Iowa City, Iowa

Ph.D. in Mathematics

2016

M.Sc. in Mathematics

2014

University of Northern Iowa, Cedar Falls, Iowa

M.A. in Mathematics

2010

University of Puerto Rico, Rio Piedras Campus, San Juan, Puerto Rico

B.Sc. in Mathematics

2009

PUBLICATIONS,
HONORS &
AWARDS

The Localized Skein Algebra is Frobenius

Oct 2017

N. Abdiel and C. Frohman, *Algebraic and Geometric Topology*, Volume 17, Issue 6.

Frobenius Algebras Derived From The Kauffman Bracket Skein Algebra

Jan 2016

N. Abdiel and C. Frohman, *Journal of Knot Theory And Its Ramifications*, Volume 25, Issue 4.

Special Act Award - Technology Transformation Services, General Services Administration (GSA)