

Luis Vargas

<http://luisvargas.me>

Education

University of Florida, Gainesville, FL

Doctor of Philosophy, Computer Engineering
Emphasis: Cybersecurity
Advisor: Patrick Traynor

Summer 2021

University of Florida, Gainesville, FL

Master of Science, Computer Science

Fall 2020

Florida International University, Miami, FL

Bachelor of Science, cum laude, Computer Engineering

Fall 2015

Research Experience

Graduate Research Assistant

June 2016 – August 2021

University of Florida

- Developed a detection tool that leverages behavior patterns of social media accounts to uncover online disinformation campaigning activity
- Performed a comprehensive measurement study of a real hospital network in order to detect and classify potentially compromised devices by using passive DNS and SSL/TLS data
- Researched the SMS usage of many online services based on 900,000 messages sent to public gateways. We uncovered phone verification fraud, poor entropy generation of one-time codes and sensitive information being sent over an insecure medium
- Proposed and implemented a system that uses time, instead of a secret, as the encryption mechanism (i.e., fast encryption/slow decryption) to protect long-term data at rest
- Designed a system that can detect caller ID spoofing before a person picks up the phone using strong cryptographic authentication
- Developed a filtering mechanism that prevents attackers from injection commands to voice assistants (e.g., TV activating a Google Home/Alexa)

Supervised Research

August 2014 – December 2015

Florida International University

- Created a wearable watch that included a custom made printed circuit board with the capabilities to gather information from a three-electrode gas sensor, calibrate to the sensor connected, and connect to a custom made Android application for mobile devices via Bluetooth
- Investigated security and privacy implication of the “Do Not Track” HTTP header field for web browsers

Flight Controls R&D Intern

Fall 2014 and Summer 2015

NASA Ames Research Center

- Researched possible function allocations in aircraft separation assurance to support future growth for air traffic controllers
- Created MATLAB automated scripts to compare and streamline the metric analysis process of multiple simulations with various parameters
- Developed scripts (JavaScripts) to dynamically view simulated air traffic to identify bottleneck points and macro patterns in an airspace
- Gave multiple technical presentation to a room full of researchers to convey ideas and progress

Industry Experience

Data Scientist (Remote)
Alethea

October 2021 – Present

- Developed machine learning/deep learning tools (NLP and network modeling techniques) to automatically label, tag, and visualize large data corpora to uncover online disinformation attempts
- Designed an analytic dashboard to help track trends, network coordination, and statistical changes of disinformation narratives.
- Created a roadmap for the data science team that identifies critical research efforts that help support the development of new features based on clients' needs.
- Communicated (presentation/reports) results of analytic and data science tools to executives and analysts of non-technical backgrounds
- Collaborated in a cross-functional team to design, develop, test, and deploy models into SaaS platform

Data Science - Threat Intelligence Intern
FireEye

Summer 2019 and Summer 2020

- Developed python-based analysis tools to extract and visualize key insights from a large corpora of unstructured data to improve intelligence reports
- Developed and analyzed deepfake image detection models using Keras to enhance intelligence reporting
- Created web crawlers with a database integration to record historical events and streamline the threat intelligence analysis process
- Communicated (presentations/reports) results from the analysis tools to audiences with multiple non-technical backgrounds

Management Assistant and IT Support Technician
PAL Supports & Services Corp

June 2013 – August 2016

- Quoted and purchased aircraft parts as part of the procurement process
- Managed a secure wireless network and made software/hardware upgrades to the computers in the office
- Performed troubleshoot and solved technical problems ranging from printer issues to back up of data and installment of new operating systems

Manufacturing Engineering Systems Intern
Ford Motor Company

Summer 2014

- Processed and refined Big Data from the Connected Vehicle Analytic Challenge using High Performance Computing and SQL scripting
- Trained Natural Language Processing models (entity recognition) to support more accurate business output from Securities and Exchange Commission files
- Installed a distributive computing network that allowed faster processing of manufacturing Big Data that improved processing to 60% of the original time

Awards and Honors

- Gartner Group Graduate Fellowship 2020
- NSF Travel Grant 2017,2018,2019
- Best Poster award: "AuthentiCall: Efficient Identity and Content Authentication for Phone Calls" received the Distinguished Poster Award at NDSS 2017
- Board of Education Summer Fellowship 2016
- Gartner Award 2016
- Graduate School Fellowship Award 2016

Patents

- US20220036904A1: Detecting deep-fake audio through vocal tract reconstruction
- US11176960B2: Method and apparatus for differentiating between human and electronic speaker for voice interface security
- US10764043B2: Identity and content authentication for phone calls

Relevant Skills

- Tools: \LaTeX , Git, MongoDB, Spark, Audacity, NLP packages (Gensim, SpaCy, Huggingface, SparkNLP), TensorFlow (Keras), Dash, Ansible, NetworkX, Zeek, Docker, FastAPI
- Programming Languages: Proficient: Python, SQL. Familiar: Java, MATLAB
- Language: English (fluent), Spanish (fluent)
- Relevant Graduate Courses: Introduction to Data Science, Computer Networks, Computer Networks Security, Introduction to Cryptography, Computer Information Security, Mobile Security, Engineering Entrepreneurship

Service and Extracurricular Activities

- 2021 Reviewer: IEEE S&P Magazine
- 2020 External Reviewer: USENIX, NDSS
- 2019 External Reviewer: USENIX, EUROSP, NDSS
- 2018 External Reviewer: TOPS
- 2017 External Reviewer: WiSec, CCS, USENIX

Professional Societies

- Society of Hispanic Professional Engineers
- Tau Beta Pi Engineering Honor Society

Publications

- [1] Logan Blue, Kevin Warren, Hadi Abdullah, Cassidy Gibson, **Luis Vargas**, Jessica O'Dell, Kevin Butler, and Patrick Traynor. Who Are You (I Really Wanna Know)? Detecting Audio DeepFakes Through Vocal Tract Reconstruction. In *31st USENIX Security Symposium (USENIX Security 22)*, 2022.
- [2] **Luis Vargas**, Patrick Emami, and Patrick Traynor. On the Detection of Disinformation Campaign Activity with Network Analysis. In *Proceedings of the 2020 ACM SIGSAC Cloud Computing Security Workshop, CCSW '20*, 2020.
- [3] **Luis Vargas**, Logan Blue, Vanessa Frost, Christopher Patton, Nolen Scaife, Kevin R.B. Butler, and Patrick Traynor. Digital Healthcare-Associated Infection: A Case Study on the Security of a Major Multi-Campus Hospital System. In *Proceedings of the 2019 Network and Distributed System Security Symposium, NDSS '19*, 2019.
- [4] Bradley Reaves, **Luis Vargas**, Nolen Scaife, Dave Tian, Logan Blue, Patrick Traynor, and Kevin R.B. Butler. Characterizing the Security of the SMS Ecosystem with Public Gateways. *ACM Transactions on Privacy and Security*, 2018.
- [5] Logan Blue, Hadi Abdullah, **Luis Vargas**, and Patrick Traynor. 2MA: Verifying Voice Commands via Two Microphone Authentication. In *Proceedings of the 13th ACM Symposium on Information, Computer and Communications Security, ASIACCS '18*, 2018.
- [6] Logan Blue, **Luis Vargas**, and Patrick Traynor. Hello, Is It Me You're Looking For? Differentiating Between Human and Electronic Speakers for Voice Interface Security. In *In Proceedings of the 11th ACM Conference on Security and Privacy in Wireless and Mobile Networks*, 2018.

- [7] **Luis Vargas**, Gyan Hazarika, Rachel Culpepper, Kevin R.B. Butler, Thomas Shrimpton, Doug Szajda, and Patrick Traynor. Mitigating Risk while Complying with Data Retention Laws. In *Proceedings of the 2018 ACM SIGSAC Conference on Computer and Communications Security, CCS '18*, 2018.
- [8] Bradley Reaves, Logan Blue, Hadi Abdullah, **Luis Vargas**, Patrick Traynor, and Tom Shrimpton. AuthentiCall: Efficient Identity and Content Authentication for Phone Calls. In *Proceedings of the 26th USENIX Security Symposium*, 2017.
- [9] Alexander Pons, Andrew De La Rosa, Silvia Vidaurre, **Luis Vargas**, and Eugene Pons. Security and Privacy Implications of 'Do Not Track'. *International Journal of Information Privacy, Security and Integrity*, 3(2):117–133, 2017.