William Frederick Koch III

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EDUCATION

BOSTON UNIVERSITY, Boston, MA 9/2014 - 9/2019
PhD Computer Science
Thesis: *Flight Controller Synthesis via Deep Reinforcement Learning*

- Created Neuroflight, the world's first open source neural network based flight control firmware. Developed GymFC, an open source OpenAI Gym for synthesizing neuro-flight controllers. Work published in ACM Transactions on Cyber-Physical Systems 2019.
- Developed the Software-defined Secure Server Bindings protocol to defend against application layer attacks. Deployed implementation to AWS with controller and CoreDNS module implemented in Go with a C++ NGINX server module. Results published and presented at IEEE ICDCS 2018.
- Designed and implemented the Real-time Automation to Discover, Detect and Alert of Ransomware (RADDAR) pipeline to automate the collection of 713 of the most dangerous ransomware in order to test the effectiveness of our ransomware defensive mechanism called Paybreak. Work published in ACM ASIACCS 2017.

STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, NJ 1/2012 - 12/2013
M.S. Computer Engineering
Thesis: *A framework for assisting learners by incorporating knowledge to aid in predicting nerve guidance conduit performance*

UNIVERSITY OF RHODE ISLAND, Kingston, RI 9/2003 - 5/2008
B.S. Computer Engineering, Minor in Mathematics

WORK EXPERIENCE

MERLIN LABS, Remote 9/2019 - Present
Autonomous Navigation Lead / Senior Staff Software Engineer, (12/2023 - Present)

- Team lead for Merlin's autonomous navigation system capable of autonomous flight, in dynamically changing environments, from takeoff to touchdown. Designed and implemented the core flight planner, mission monitor, emergency descent, and data bridges.
- Responsible for coordination and planning between engineering, flight operations, and human factors in the development of new features and flight testing.
- Designed and implemented Labsicle, an automated ETL pipeline for MongoDB written in Python to maintain up-to-date ARINC-424 navigation

data used by our autonomous navigation system. Integrated as part of CI and deployed as a Docker image.
- Implemented REST APIs using OpenAPI, NodeJS and MongoDB for geospatial constraint and navigation data.

Senior Flight Controls Software Engineer, (9/2019 - 12/2023)
- Developed Project Cookie Monster, a data pipeline converting flight data in ROS bags to parquets to support model development and data analysis.
- Controls lead for lateral/directional control, landing and controls software. Responsible for design, modeling, tuning, validation and analysis using model-based design in Simulink/Matlab and Python.
- Core developer of ROS-based flight autonomy system written in C++ and Python. Implemented flight mode manager, VectorNav IMU/INS driver, and landing autothrottle.

MIT LINCOLN LABORATORY, Lexington, MA 1/2016 - 6/2016
Security Research Intern
- Invented the Persona Hijacking attack that breaks identity bindings in software defined networks (SDN). Attack and defense published in the top tier security conference USENIX Security 2017.

CAPSULES, LLC, Weehawken, NJ 6/2013 - 8/2014
CEO / Co-founder
- Led company in the development and launch of an Android mobile application called Capsules.io. Capsules.io is a social platform that provides its users the freedom to augment the world around them using virtual containers called capsules. They can be dropped at any location and are accessible to anyone in proximity.

SIKORSKY AIRCRAFT, Shelton, CT 6/2006 - 1/2012
Software Engineer (Subcontractor for CH53-K King Stallion Program)
- Implemented various SOAP web services to support the Integrated Support System (ISS). Responsible for system integration with 3rd parties.
- Developed Java application to automatically synchronize aircraft maintenance databases.
- Developed web application to digitize aircraft maintenance work card process to improve organization and accessibility of work cards for aircraft mechanics.

SKILLS

Programming Languages: Python, C++, JavaScript, Java, Go, Bash
Software: ROS, Matlab/Simulink, Docker, MongoDB, VS Code, Git, Wireshark, Jira