

William Frederick Koch III

WFKoch@gmail.com | <https://wfk.io>

EDUCATION

BOSTON UNIVERSITY, Boston, MA

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. <https://github.com/wil3/neuroflight>
- Developed GymFC, an open source OpenAI Gym for synthesizing neuro-flight controllers. <https://github.com/wil3/gymfc>
- Researched featured in [TechTalks](#), [The Brink](#), [Futurity](#), [DroneBelow](#)
- Author of nine peer-reviewed papers in cyber security, and machine learning.
- Speaker at NESD 2016, IEEE HotWeb 2016, ACM SIGSOFT ISSTA 2017, IEEE ICDCS 2018, Swissnex Aerial Futures 2018, and [Reddit AMA](#) 2019.
- Competed on BU's 0xBU CTF team at NorthSec 2015.

STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, NJ

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

5/2008

B.S. Computer Engineering, Minor in Mathematics

TEACHING EXPERIENCE

BOSTON UNIVERSITY, Boston, MA

9/2017 to 5/2019

Teaching Fellow

- Developed lesson plans and taught weekly classes for Fundamentals of Computing Systems. Held office hours and graded assignments.

INTERNAL DRIVE TECH CAMPS, Princeton, NJ

6/2012 to 8/2012

Programming Instructor

- Developed lesson plans and taught middle school and highschool students to program in Java. Topics included: object oriented fundamentals, polymorphism, exception handling and third-party library integration.
- Placed emphasis on coding style and best practices not taught in academia.
- Advised students through final projects ranging from web crawlers to video games.

STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, NJ

1/2012 to 5/2012

Teachers Assistant

- Grader for Real-Time and Embedded Systems
- Grader for Mathematics for Electrical Engineers

PROFESSIONAL EXPERIENCE

MERLIN LABS, Remote

9/2019 - Present

Senior Flight Controls Software Engineer

- Key contributor to flight autonomy platform which raised \$133.5M in funding.
- 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, landing autothrottle and various control nodes.
- Implemented PX4 autopilot modules in C++ to support semi-automated control tuning and collision avoidance.
- Extensive flight test experience with over 50+ sorties across four aircraft.

BOSTON DRONE RACING, Boston, MA

1/2017 to 9/2019

Founder / Event Coordinator

- Boston Drone Racing (BDR) is a first-person view (FPV) unmanned aerial vehicle (UAV) racing and hacking club. Born from academia, BDR fosters a learning environment and community to teach others how to fly and the knowledge and skills needed to get into the sport. Additionally BDR actively applies theory and research to push the

performance of the technologies used in the sport.

- Secured funding for track equipment and supplies. Organized weekly races. Planned hack nights open to the public to teach electronics, soldering, and drone maintenance.

MIT LINCOLN LABORATORY, Lexington, MA

1/2016 to 6/2016

Security Researcher

- Researched and devised ways to break identity bindings in software defined networks (SDN).
- Developed the novel Persona Hijacking attack which appeared in the top tier security conference USENIX Security 2017.

CAPSULES, LLC

6/2013 to 8/2014

CEO / Co-founder

- 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.
- Developer of the Android application providing the portal to the Capsules.io dimension, and the REST API.
- Presented at AngelHack NYC 2013, Battle Hack New York 2013, and AngelHack Boston 2014.

CT HACKERSPACE, INC., Watertown, CT

8/2010 to 8/2011

Chairman / Co-founder

- Collaborated with a group to establish Connecticut's oldest and largest hackerspace.
- Facilitator of monthly board meetings.
- Administrator for cthackerspace.com website.

SIKORSKY AIRCRAFT, Shelton, CT

6/2006 to 9/2010

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.

SELECT PUBLICATIONS

1. **Koch, William**, Renato Mancuso, Richard West, and Azer Bestavros. "Reinforcement Learning for UAV Attitude Control." *ACM Transactions on Cyber-Physical Systems*, 2019.
2. **Koch, William**, Abdelberi Chaabane, Manuel Egele, William Robertson, and Engin Kirda. "Semi-automated discovery of server-based information oversharing vulnerabilities in Android applications." *In Proceedings of the 26th ACM SIGSOFT International Symposium on Software Testing and Analysis*, pp. 147-157. ACM, 2017.
3. **Koch, William**, and Azer Bestavros. "PROVIDE: hiding from automated network scans with proofs of identity." *2016 Fourth IEEE Workshop on Hot Topics in Web Systems and Technologies (HotWeb)*. IEEE, 2016.
4. Kolodenker, Eugene, **William Koch**, Gianluca Stringhini, and Manuel Egele. "PayBreak: defense against cryptographic ransomware." *In Proceedings of the 2017 ACM on Asia Conference on Computer and Communications Security*, pp. 599-611. ACM, 2017.
5. Jero, Samuel, **William Koch**, Richard Skowyra, Hamed Okhravi, Cristina Nita-Rotaru, and David Bigelow. "Identifier Binding Attacks and Defenses in Software-Defined Networks." *In 26th USENIX Security Symposium (USENIX Security 17)*, pp. 415-432. USENIX Association, 2017.
6. Maleki, Hoda, Saeed Valizadeh, **William Koch**, Azer Bestavros, and Marten van Dijk. "Markov modeling of moving target defense games." *In Proceedings of the 2016 ACM Workshop on Moving Target Defense*, pp. 81-92. ACM, 2016.

Please see [here](#) for a full list of publications.