

# Nicklas Stockton

## CONTACT & PROFILES



## PROGRAMMING LANGUAGES

- Rust
- Python
- C
- C++
- Bash
- $\text{\LaTeX}$
- Asm (PowerPC, MIPS)
- Matlab

## TECHNOLOGIES

Linux/FreeBSD • Unix coreutils  
OpenSSH • Gnuplot • Vim  
Git • Cross-compilation  
GNU Make • CI/CD (Gitlab/Github)  
CMake • Docker/Podman

## INTERESTS/PASSIONS

- Open source software/contribution
- Homemade pasta
- Pottery
- Woodcarving
- Barefoot running
- Music
- Robotics/Simulation (ROS)

## NORTHROP GRUMMAN

### PRINCIPAL FTL ENGINEERING AND SCIENCE (SOFTWARE)

Future Technical Leaders (FTL) is highly competitive three-year technical and professional development program aimed at identifying and developing high-potential engineers and technologists to become future industry leaders

#### 2023–Present

Boulder, CO

- Develop and maintain algorithms to support the national missile defense mission
- Facilitate team migration to modern tools and infrastructure from legacy system
- Root cause analysis for software and algorithmic bugs in large code base

#### 2022–2023

Annapolis, MD

- Designed and implemented modernized versions of legacy applications
  - Replaced Windows VB application with Qt 5
  - Replaced legacy communication middleware with modern OSS frameworks
  - Ported non-realtime hardware controller components from RTOS to Linux
- Led team of software engineers

#### 2021–2022

Fairfield, OH

- Modernized developer toolset and workflow to enable better collaboration and automation, eliminating mundane tasks and reducing developer merge times (from days to minutes)
- Mentored new developers and provided technical guidance for software design and implementation
- Developed Linux kernel module modifications to support customized Xilinx FPGA data acquisition hardware
- Developed RF data visualization tools to support data validation and verification activities

### CYBER SOFTWARE ENGINEER

#### 2019–2021

Fairfield, OH

- Technical and project lead for team of 6 engineers supporting multiple customer deliveries
- Implemented crucial pieces of automated pipeline to streamline product test and release cycle
- Passionately pushed for more streamlined processes and better automation of mundane tasks to improve developer quality of life

## AIR FORCE RESEARCH LABORATORY

### AEROSPACE ENGINEER

#### 2017–2019

WPAFB, OH

- Received Scientific and Technical Achievement Team Award – F-16 Auto-Strafe “Death Claw”
- Learned and modified legacy OpenGL codebase to produce custom simulated aircraft HUD symbols within three weeks
- Successfully refactored simulation code base for increased modularity, portability, and maintainability enabling simulation to run in a variety of environments
- Manually translated Simulink models into C++, validating model behavior against original

## UAV MASTER LABS – UNIVERSITY OF CINCINNATI

CINCINNATI, OH

### RESEARCH ASSISTANT

#### 2015–2017

- Introduced real-time simulation capabilities to the lab using ROS and Gazebo softwares, thus enabling quick develop-simulate-fly cycles
- Developed unmanned system platform for mobile autonomous landing operation using a genetically-tuned fuzzy logic controller
  - Using a genetically-tuned fuzzy controller to control actuation.
- Developed self-navigation autonomous quadcopter for tunnel exploration using 2-D lidar sensor and API to third party contractor code
  - Self-localized using a 2-D lidar sensor.
  - Self-navigating using API to third party contractor code.
- Integrated camera motion capture system with flight controllers for indoor autonomous flight using ROS

## EDUCATION

### Master of Science — Aerospace Engineering

UNIVERSITY OF CINCINNATI

2016–2018

- ACCEND Master's Program - Advisor: Dr. Kelly Cohen  
Thesis: Genetic Fuzzy Systems for Coupled Dynamic Systems

### Bachelor of Science — Aerospace Engineering

UNIVERSITY OF CINCINNATI

2013–2017

- GPA: 3.87 overall, 3.90 in Aerospace Engineering — Dean's list
- Engineer of the Month (Dec 2015); Knowlson and Irene Byar Scholarship Recipient (Jun 2015)

## RESEARCH

### University of Cincinnati — Thesis Research

2015–2017

- Developed iterative simulation ability for the purpose of machine learning intelligent control.  
Simulation is complete with simulated sensors and mock up environment.
- Wrote custom fuzzy logic module using pure Python by using efficient inference/defuzzification.  
Extended with additional genetic algorithm for genetic fuzzy learning.
- Created genetic fuzzy library in C for dynamic system control learning.  
Focused on speed and correctness for use in real-time, low-latency situations.

### AUVSI-SUAS Competition Member — Association for Unmanned Vehicle Systems International

2017

- Competition required submitting a technical design paper, flight readiness review, and mission demonstration.
- Placed 34<sup>th</sup> out of 59 total teams as 1<sup>st</sup> time competitors.
- Led flight software and algorithm development, integrating high-level mission control with low-level flight controller.
- Developed mission-fidelity simulation to test mission performance.

### Undergraduate Research — National Science Foundation

2013

- Analyzed a benchmark structural stability problem to devise a control methodology using fuzzy-genetic systems.
- System model exhibited both flexible and rigid body modes. Designed controller performed within 3% of theoretically ascertained limit of stability.
- Presented findings before a peer audience at multiple conferences.
- Demonstrated the ease of using fuzzy control to tame highly non-linear systems with intuition.
- All work was done using Matlab.

### Asymmetric Inc./ University of Cincinnati — Advanced Red Team - Technical Support and Operations Analysis Demonstration

2016

- Delivered prototype on a demanding schedule due to a pressing deadline.
- Interfaced multiple sensors and software packages to control exploration mission.
- Integrated flight controller to on-board flight computer using Python and Robot Operating System (ROS).
- Demonstrated prototype to a group of servicemen for use in dangerous environments.

## PUBLICATIONS AND PRESENTATIONS

- Stockton, N., "Hybrid Genetic Fuzzy Systems for Control of Dynamic Systems", *Thesis (MS) University of Cincinnati*, 2018
- Lamping, A., Ouwerkerk, J., Stockton, N., Cohen, K., Kumar, M., Casbeer, D., "Multi-UAV Control and Supervision with ROS", *Aviation Technology, Integration, and Operations Conference*, AIAA, Atlanta, GA, 2018.
- Stockton, N., Kumar, M., Cohen, K., "A Fuzzy-Logic-Based Solution to Dynamic Target Interception and Landing with a Small Multirotor Aircraft", *SciTech*, AIAA, Grapevine, TX, 2017.
- Janson, A., Stockton, N., Cohen, K., "Genetic Optimization of Fuzzy Logic Control for Coupled Dynamic Systems", *SciTech*, AIAA, Kissimmee, FL, 2015.
- Brown, B., Crowell, C., Feie, B., Hartmann, J., Hutchins, B., Kukreti, S., Mummidivarapu, S., Redmond, B., Sathyan, A., Stockton, N., Stubblebine, A., Kivelevitch, E., Cohen, K., "Development and Validation for the First Annual AAVC Competition by the University of Cincinnati Autonomous Vehicle Group", *Autonomous Aerial Vehicle Conference*, AFRL, Wright-Patterson Air Force Base, OH, 2014.