CHRISTOPHER MORAN

cmoran@cmoran.xyz | (860) 997-9261
https://github.com/quietlychris | https://cmoran.xyz

PROFESSIONAL EXPERIENCE

SOFTWARE SYSTEMS ENGINEER
Johns Hopkins Applied Physics Laboratory
Maritime Robotics Group

Laurel, MD
Apr 2022 – Present

- Group coordinator for Internal Research and Development (IRAD)
- Testing and evaluation (T&E) of autonomous surface vessel (ASV) autonomy and navigation

Research and Development

- Cybersecurity-focused modifications of operating systems, including userspace initialization processes and filesystem
- Cooperative multi-agent area search of normalized probability grid spaces

RESEARCH & DEVELOPMENT ENGINEER II
UC Santa Barbara Earth Research Institute

Santa Barbara, CA
Sep 2018 – Aug 2021

ARPA-E Scalable Aquaculture Monitoring System (SAMS), Underwater Kelp Farm Monitoring

- Built, tested, and piloted Blue Robotics BlueROV2 Heavy, including sensor integration
- Tested and operated microUUV, including ZED stereo camera integration and sonar post-processing, using C++ and Python on embedded Linux
- Served as primary test lead of prototype autonomous surface vessel using Mavlink and QGroundControl, including upgrade to 900 MHz Ethernet radio for long-distance networking
- Developed a novel deep learning image segmentation pipeline for submerged kelp imagery using FastAI/PyTorch, eliminating the need for external development and resulting in a cost savings of over $25,000

COAST Lab

- Provided consulting for lab safety, Export Control office, and general lab maintenance
- Network sysadmin, including automated backups, vehicle networking, and general tech support for other lab personnel (Linux, Windows 7/10, and Mac)

NSF Santa Barbara Channel Long-Term Ecological Research (SBC LTER)

- Maintained oceanographic equipment, including ADCPs, CTDs, and thermistors, including scientific diving operations for mooring deployment and maintenance

SYSTEMS TEST CO-OP
iRobot (Terra Robotic Lawnmower)

Bedford, MA
Jul 2017 – Jan 2018

- Developed test fixture for and conducted thermal performance analysis of brushless DC motors
- Contributed to the design, coding, and operation of automated software smoke tests of embedded Linux systems
- Conducted accelerated lifetime testing on prototypes, including diagnosing and logging various failure modes

MECHANICAL ENGINEERING CO-OP
Accion Systems (Electrospray Ion Thruster Propulsion)

Boston, MA
Jun 2016 – Jan 2017

- Led mechanical design and development of planned flight product for CubeSats and small satellites
- Supported environmental testing of products, including vibration & thermal vacuum tests
- Machined scale mass models, lab-scale prototypes, and fixtures for in-house testing using Tormach CNC mill
- Designed and created CAD renderings of products and concepts, then edited and reviewed final proposal packages

ELECTROCHEMICAL ENGINEERING CO-OP
Nuvera Fuel Cells (Hydrogen Fuel Cell Stack R&D)

Billerica, MA
Jul 2015 – Jan 2016

- Built, installed, and operated fuel cell stacks and test benches to collect and process performance data
- Worked with external vendors to ensure correct design implementation and quality control
- Developed preliminary design drawings and FEA for hydrogen fuel cells stack components using SolidWorks

OPEN SOURCE CONTRIBUTIONS

- Founding member and contributor to the Rust-ML machine learning working group
  - Individual contributor to Rust mnist and cifar-ten crates
  - Writes documentation and code walkthroughs for multiple algorithms in Rust-ML Book
- Contributed updates and documentation to Rust BMP280 and BNO055 #![no_std] device crates
- Experimental robotics-focused middleware with star-shaped network topology communicating over UDP and TCP, with example applications using Bevy game engine and physics plug-ins

EDUCATION & CERTIFICATIONS

BACHELOR OF SCIENCE, MECHANICAL ENGINEERING AND PHYSICS
Northeastern University

Boston, MA
Jul 2017 – Jan 2018

Senior Capstone Project: Design, fabrication, and testing of a modular passive thermal management system prototype for CubeSats, in collaboration with the NASA Jet Propulsion Laboratory

JOHNS HOPKINS APPLIED PHYSICS LABORATORY STRATEGIC EDUCATION

Sep 2022 – Present

Courses: Fluid Dynamics for Vehicles, Undersea Warfare

FAA PART 107 UAS Remote Pilot Certificate

Nov 2022 – Present

PUBLICATIONS

C. Moran, "**Machine Learning, Ethics, and Open Source Licensing (Part II/II)**", *The Gradient*, 2021.
C. Moran, "**Machine Learning, Ethics, and Open Source Licensing (Part I/II)**", *The Gradient*, 2021.
Bell et al., "**The Utility of Satellites and Autonomous Remote Sensing Platforms for Monitoring Offshore Aquaculture Farms: A Case Study for Canopy Forming Kelps**", *Frontiers In Marine Science*, 2020.

ADDITIONAL SKILLS & INTERESTS

TECHNICAL SKILLS
Languages: Rust, Python, C++, Bash, MATLAB, Javascript, HTML
Software Frameworks: Linux, Git, CMake, OpenCV, MOOS-IvP, DDS, ROS/2, Docker
CAD/FEA: SolidWorks, Inventor, FreeCAD, Ansys
Fabrication: CNC milling (manual and CAM), CNC lathe (manual), 3D printing, soldering, crimping, spot-welding; aluminum, thermoplastics, and stainless steels

MISCELLANEOUS
Professional Interests
- High-reliability systems, composable behaviors, autonomous navigation and controls

Accomplishments
- Founding member of the Rust-ML open source working group
- Eagle Scout (2013)