Nikolai Nekrutenko

nan34@cornell.edu • 814-852-9256 • nekrutnikolai.com

Education

Cornell University | Ithaca, NY

- **Master of Engineering | Electrical and Computer Engineering** Aug 2024 - May 2025
  Relevant Coursework: Analog Integrated Circuit Design, Spaceflight Mechanics, Foundations of Robotics, Multi-Agent Systems
- **Bachelor of Arts | Physics** Aug 2021 - Dec 2024
  Relevant Coursework: Electronic Circuits, Embedded Systems, Signals & Systems, Data Science, Radar Remote Sensing, Electro/Magnetostatics & Electrodynamics, Analytical Mechanics

Skills & Licenses

- Programming Lang. & Tools: Python, C++, Linux, Bash Scripting, Git, NumPy, SciPy, Observable JS
- Embedded & Electrical Systems: Microcontrollers, Sensor Interfacing, Circuit Design, Signal Processing
- Prototyping Skills: CAD, KiCad, Electronics Prototyping, SLS/SLA/FDM 3D Printing
- Fluent in Russian, French, English — FAA Part 107 Remote Pilot License, General FCC Radio License
- Other Skills: Problem Solving, Team Collaboration, Technical Documentation, Project Management

Work Experience

Systems Integration Intern | Formlabs | Somerville, MA Jun 2024 - Aug 2024

- Devised an experimental setup and methods to evaluate thermopile array infra-red (IR) sensors for next-gen SLS printing technology to maximize performance and dimensional accuracy
- Calculated the off-axis projection of sensor pixels and made an interactive tool in Observable JavaScript
- Developed test and alignment scripts in Python, automating the test setup to characterize IR sensors
- Built analysis Jupyter Notebooks in Python to compare the performance of sensors across varying environmental conditions and sensor configurations using NumPy and SciPy

Gimbals R&D Intern | Freefly Systems | Woodinville, WA Jun 2023 - Apr 2024

- Developed a motion control beta embedded firmware release in C++ with Git version control for the Movi Pro gimbal based on IMU data, gimbal physics, and user input to be used in cinema productions
- Created an intuitive menu with user feedback on the Movi Controller to interact with the beta firmware
- Wrote user-friendly, interactive documentation outlining the beta firmware in Observable Javascript
- Derived a forward and inverse kinematics model of a non-orthogonal gimbal to evaluate the viability of a potential gimbal design and determine gimbal lock mitigation techniques

Student Researcher | Fatemi Lab @ Cornell AEP | Ithaca, NY Mar 2022 - Feb 2024

- Wrote automated installation scripts and Jupyter Notebooks to setup a Linux enviroment for interfacing with lab equipment over the GPIB interface with Python and QCoDeS
- Saved tens of thousands of dollars in lab equipment by enabling interfacing with existing equipment
- Simulated variations in resonance due to EM fields, informing the design of microwave resonators to measure impurities in substrates, in collaboration with grad students, increasing cleanroom efficiency
- Presented project updates at weekly lab meetings and to collaborators

Teaching Assistant | Cornell University | Ithaca, NY Aug 2022 - Dec 2022

- Led a weekly lab section of 15 or so students and held weekly office hours
- Graded problem sets and labs, giving constructive feedback to help students understand key ideas
- Mentored students about future course/career advice

Project Experience

Drone Development Member | Cornell University Sep 2023 - Present
Developing a robust, low-cost quadcopter platform to be used in mechanical, aerospace, and electrical engineering course labs as a supplementary hands-on lab component in a team of engineers.

NeoPixel FFT Audio Visualizer | Personal Project Jun 2022 - Jan 2023
Co-designed and wrote a program that visualizes the waveform and intensity of music for a custom-built individually-addressable RGB led matrix using Fast Fourier Transforms in Python on a Raspberry Pi.

Rocket Sensor Payload | Penn State University Outreach Sep 2020 - Jun 2021
Developed and programmed in Python a 3D printed lightweight Raspberry Pi sensor and imaging payload as part of a PSU outreach with Dr. McEntaffer's lab. Simulated model rocket trajectory in OpenRocket.

Extracurricular Activities

First Degree Black Belt | A Mountain Wind Martial Arts | State College, PA Feb 2013 - Present
Instruct, help lead class and aid students with the practical and philosophical applications of the martial art at a local studio. First Degree Black Belt in Tang Soo Do, a Korean martial art.