

Nathan Rogers

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Professional Summary

Junior Software Engineer seeking to leverage hands-on experience in Sensor Processing, Mapping, Navigation. Building robust navigation and mapping systems for autonomous robots. This includes low level sensor processing on embedded devices.

Experience

Robotics Engineering Intern

West Warwick, RI

Smartapp

2021-2022

- Developed and tested a handheld sensor platform for the development of algorithms for mobile robotics applications.
- Interfaced with v4l2 camera driver to interface with a hardware trigger synchronized multiple camera setup to provide software synchronized frames to other processes.

Consulting Embedded Engineer

Remote

Freelance/Part-Time Role

2020 - 2023

- Designed Electronics hardware and programmed stm32h7 chips to drive and process data from absolute force sensor matrix.
- Built web ui for sensor data visualization and analysis speeding up data analysis and reducing expirement time by 87% over existing methods.
- Built a Camera integrated with an edge ai processor deployed with a distilled perfomant image segmentation for manufaturing quality control.

Education

Bachelor of Science in Robotics Engineering

Worcester, MA

Worcester Polytechnic Institute

2019-2023

Relevant Coursework: Robotics Manipulation, Robotics Design, Digital Electronics, Computer Vision, Machine Learning, Software Engineering

Skills

- **Programming Languages:** C/C++, Python, SQL, Cuda
- **Libraries:** OpenCV, PCL, Eigen, IntelTBB, Numpy
- **Robotics Technologies:** ROS/ROS2, Gazebo, Docker, KiCad
- **Machine Learning:** Pytorch, CuteDSL, Knowledge Distillation
- **Electronics:** I2C, CAN, SPI, UART, FPU, DMA, Analog Signal Processing

Projects

- **Sensor Agnostic Lidar SLAM ↗:** Developed a sensor agnostic lidar with optional odometry with an efficient and robust cpu based icp registration achieving an average of 40fps and a backend loop closure detection using birds eye view image matching and pose graph optimization for improved global positional accuracy.
- **Imu Estimation Kalman Filter ↗:** Developed an imu Extended Kalman Filter for sensor fusion of imu and odometry data. To determine accelerometer and gyroscope bias. To determine bias of an imu in conditions when lacking a warmup period for efficient imu integration.
- **Quadruped Learning to Walk ↗:** Teaching a Quadruped robot to walk using reinforcement learning through Proximal Policy Optimization. Utilizing real2sim techniques to bridge the gap between simulation and real world.
- **Cuda ICP Registration ↗:** Robust scan to map icp registration algorithm using cuda gpu for efficient registration of improving registration speed up by 3.75x on average with a max 8x speedup compared to 16 core cpu implementation.