Abrar Rahman Protyasha

Contact Information

Phone: +1 (917) 862-1504 Website: `https://aprotyas.github.io`
Email: `aprotyas@u.rochester.edu`

Education

University of Rochester Rochester, NY
B.S., Electrical and Computer Engineering **Aug 2017 – May 2021**

- GPA: 3.84 out of 4.00; Research and Innovation Grant (RIG) recipient.

University of Rochester Rochester, NY
M.S., Electrical and Computer Engineering **Aug 2021 – May 2022**

Relevant Coursework, Projects

Notable projects:

- **Central Pattern Generator (CPG) viewer**: Developed a Unix-specific simulation application in Qt5 (> C++11) for the 3-D visualization of arbitrary robot model locomotion under configurable CPG parameter sets.
  Keywords: C++, Qt, Eigen, CMake, Simulation, Inverse Kinematics.
- **Autonomous mobile robot software architecture**: Developed ROS packages (> C++11) for simulation, perception, occupancy grid mapping, path planning, localization, path following controls, and an OpenGL GUI to explore a partially known world using a TurtleBot2.
  Keywords: ROS, C++, CMake, SLAM, Sampling-based motion planning, Pure pursuit.
- **Remotely operated vehicle**: Designed and programmed (in C) a wirelessly controlled vehicle with an on-board Raspberry Pi and PIC32 MCU, driving two DC gear-motors through a dual motor driver carrier using a PID controller.
  Keywords: Embedded Linux, SPI communication, Feedback control, Mechanical assembly.
- **Automated bacterial colony counter**: Robust Python3.x package utilizing image segmentation and morphological analysis techniques to identify number of bacterial colonies in petrifilm images.
  Keywords: Python3, NumPy, scikit-image, SciPy, Signal processing.

Coursework:

Autonomous mobile robots	Digital image processing	Embedded systems
Machine learning	Stochastic processes	Integrated circuit design

Engineering Experience

Robotics and Artificial Intelligence Laboratory - Univ. of Rochester Rochester, NY
Undergraduate Research Assistant **Aug 2020 – Present**

- Investigated probabilistic graphical models to infer distributions of parametrized controllers for underactuated robots.
- Developed a simulation infrastructure (GUI + rendering) in modern C++ using Qt5 for the 3D visualization of locomotion of arbitrary robot models.

Silicon Labs Nashua, NH
Applications Engineering Intern **May 2020 – Aug 2020**

- Product validation and design collateral generation for IEEE 1588 timing modules.
- Developed embedded software tools (in C) for internal lab testing on an ARM Cortex-M4 based EFM32 MCU.
- Researched on PTP standards in several domains, presented findings to entire business unit.

Wireless Communication and Networking Group (WCNG) Rochester, NY
Xerox Engineering Research Fellow **May 2019 – May 2020**

- Researched on mobile ad-hoc network creation and management.
- Automated network data acquisition using socket programs in C and Bash scripts.

Technical Skills

Languages: C++, Python, C, MATLAB, Bash, Assembly.
Technologies: UNIX, ROS, CMake, Qt5, Vulkan, Git, NumPy, SciPy.