

Abrar Rahman Protyasha

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

- GPA: 3.80 out of 4.00; Research and Innovation Grant (RIG) recipient.

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

Investigating probabilistic graphical models to infer distributions of parametrized controllers for underactuated robots under the supervision of [Dr. Thomas Howard](#).

- 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, solutions bring-up, design collateral generation for IEEE 1588 timing modules.

- Developed a PPS/ToD stream alignment tool on an ARM Cortex-M4 based EFM32 MCU.
- Established procedure to demonstrate PTP synchronization of IEEE 1588 modules using the W32Time networking module in MS Windows. Reduced demo bring-up cost by $\gg 100\%$.

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.

- Developed channel selection, IPV6 support, and improved debugging infrastructure in a wireless network emulating testbed used to evaluate mobile ad-hoc network protocols.

RELEVANT COURSEWORK, PROJECTS *Notable projects:*

- [Autonomous mobile robot software architecture](#): Developed ROS packages 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++14, CMake, SLAM, Sampling-based motion planning, Pure pursuit.
- [Remotely operated vehicle](#): Designed 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 algorithm to use image segmentation, intensity transformation, and morphological analysis techniques to extract circular petrifilm agar sections and identify/count number of bacterial colonies in input images.
Keywords: Python3, NumPy, scikit-image, SciPy, Digital image processing.

Lab experience:

- Development of embedded systems and digital data acquisition systems on MIPS32 M4K core microcontrollers. Explored interrupts, timers, ADCs, DACs, various sensors/actuators, and communication protocols (UART, SPI, I2C).
- Numerical analysis and modeling of stochastic systems, and extensive data visualization using MATLAB and scientific computation libraries in Python (Numpy, Scipy, Matplotlib).

Coursework:

Autonomous mobile robots	Digital image processing	Embedded systems
Stochastic processes	Linear algebra	Machine learning

TECHNICAL SKILLS *Languages*: C++, Python, C, MATLAB, Bash, L^AT_EX, HSpice, HTML/CSS.
Technologies: UNIX, ROS, CMake, Qt5, Vulkan, Git, NumPy, SciPy.