Aditya Gawali

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EDUCATION

Virginia Polytechnic Institute and State University, Blacksburg **Exp: May 2024**
Master of Science in Computer Engineering

Veermata Jijabai Technological Institute, Mumbai **Sept 2020**
Bachelor of Technology in Electronics Engineering

EXPERIENCE

Graduate Engineer Trainee - Larsen and Toubro Limited **Nov 2020- Aug 2021**

- Conducted various testing operations of individual electronic and controller units
- Integrated sub-modules and units into the complete system for trials and operations.
- Designed and deployed highly reliable and robust electronics systems and units for heavy-engineered products.

Embedded software intern - Magnes Motors Pvt. Ltd **May 2019 - Jul 2019**

- Implemented data logging automated solutions using wifi-equipped ESP32 and transmitting data to a centralized unit for future data analysis and testing
- Launched an Android GUI app for the user to visualize the health and essential data of the vehicle.
- Developed intelligent modules using microcontroller for Battery Management System (BMS) increasing operational efficiency by ~20%
- Refactored legacy round-robin architecture to real-time architecture using FreeRTOS resulting in decreasing latency by ~15%

SKILLS

- **Programming Languages:** C, C++, Python, JavaScript, HTML, Java
- **Software:** Robot Operating System, FreeRTOS, Linux, Git, ESP-IDF, Android Studio
- **Hardware:** ESP-32, STM-32, Raspberry-PI, Kintex-7, Lidar, ATMega-128

PROJECTS

AVITRA: Surveillance and Disaster Mitigation Robot **[ROS, Kinematics, SLAM, ESP-32, PCL]**
Centre of Excellence in Complex and Nonlinear Dynamical Systems, VJTI

- Developed an autonomously navigating Omnidirectional robot capable of performing mobile manipulation for disaster mitigation operations.
- Designed velocity controller using optical encoders, thus optimizing base locomotion of the bot and improving the overall efficiency of the locomotion,
- Upgraded manipulator to 6-Degrees of Freedom from 5-Degrees of Freedom by designing a manipulator model along with its necessary software to control and execute the operation.
- Implemented Publisher and Subscriber ROS nodes in Python for the robot to detect and reach the target destination.

Self-Balancing and Line Following Robot **[ESP32, HTTP WebServer, FreeRTOS, MPU, Filters]**
Society of Robotics and Automation, VJTI

- Designed a Line-Following and Self-Balancing robot using ESP32 microcontroller and developed the code base in C using FreeRTOS.
- Launched an HTTP WebServer on the ESP32 to tune and change the control parameters dynamically.
- Interfaced MPU6050, an Inertial Measurement Unit along with a Complementary filter to get a stable pose for self-balancing.
- Integrated Complementary filter with the readings to get the stable pose of the robot
- Designed and Implemented PD controller(Proportional and Derivative controller) to achieve stable results with minimal errors.

Localization of Differential-Driven Robot **[ESP32, Encoder, FreeRTOS]**
Society of Robotics and Automation, VJTI

- Successfully localized a differential driven robot in a 2D floor plan using ATmega 128 as the main controller for computation
- Filtered and processed the ticks obtained from optical encoders to obtain the distance traversed data by the robot.
- Developed multiple algorithms to process the ticks from encodes to useful RPM with minimal error margin.

ABU Robocon, 2018 **4th Rank/ 107 teams, 3rd Fastest completion time**
Society of Robotics and Automation, VJTI

- Involved in the creation of an autonomous robot that travels to the shooting location and throws the object through a hoop after picking up a rack of ball-like objects with a manual robot.
- Developed electronic interfaces on the Atmega128 platform, together with the required peripherals and associated drivers.