Rohit Nilesh Mehta

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EDUCATION

Virginia Polytechnic Institute and State University, Blacksburg, VA **GPA: 3.78**

Master of Science in Computer Engineering *Aug* 2022 - May 2024

Related Coursework: Computer Architecture, Compiler Optimization, Computer Vision, Advanced Machine Learning, Advanced Real-Time Systems

University of Mumbai, Mumbai, India **GPA: 3.2**

Bachelor of Engineering in Electronics *Aug* 2017 - June 2021

Related Coursework: Microprocessors and Microcontrollers, Embedded System and RTOS, Design with Linear Integrated Circuits, Object Oriented Programming Methodology, Digital System Design, Internet of Things (IoT)

EXPERIENCE

Embedded Systems Intern, KidyFit Care Feb 2021 – Apr 2021

- Developed Register Level firmware for Atmega328p in Biotech Wearables for betterment of infants suffering with heart disorders which calculated the heart's rhythm and electrical activity using Electrocardiography.
- Interfaced Atmega328p with serial peripherals for communication with biometric sensors which detected pulse rate in infants.
- Conducted a survey study of microcontrollers and processors suitable to improve performance, efficiency, and power consumption for future prototypes.

Research Assistant, Robotics Lab: K.J Somaiya Institute of Engineering and IT Aug 2017 – June 2021

- Researched and developed more than 25 robotic systems for annual Asia-Pacific Broadcasting Unit (ABU) ROBOCON Competition held in India.
- Integrated Real Time Systems using device level communication protocols such as I2C, SPI, CAN, UART and USART which improved communication between different robotic systems to reduce the time taken for completion of tasks by approx. 25%.
- Designed various software and circuit boards. For example, PCB for Servos & LEDs, H-Bridge for Motor Control via communication over main controller which were used in ABU ROBOCON for completing 100% of the tasks.

SKILLS

Programming: *C, C++, Python, Embedded C, Assembly, VHDL* | ***Tools:*** *MATLAB, Linux, RTOS, Keil, LabVIEW, Autodesk Eagle, MS Office* | ***Framework:*** *FreeRTOS, LLVM, Robot Operating System (ROS), OpenCV, Numpy, GIT* | ***Hardware:*** *Arduino, Atmel 8051, Raspberry Pi, STM32*

PROJECTS

Hardware Prefetcher

- Implemented a hardware prefetcher using C++ to work in the context of a well-defined memory hierarchy using two different prefetching algorithms: Sequential Prefetching & Stride Prefetching.
- Improvement of memory performance by reducing average memory access time with speedup of 1.182 for Sequential prefetcher and 1.519 for Stride prefetcher as compared to baseline prefetcher.

Partial Redundancy Using Lazy Code Motion

- Utilized C++ and LLVM framework to develop custom analysis passes and transformations for Partial Redundancy Elimination using LCM, resulting in a 30% reduction in the number of instructions executed.
- Conducted study on comparison between LCM and LICM passes to understand usage of both the techniques.

Quadruped Robot

- Developed walking gait algorithms and programmed Arduino Mega with IR Proximity, Encoders, and Servos for the robot and provide 3DOF for each leg overall achieving 12DOF for the entire robot.
- Interfaced 3-axis ROHM accelerometer sensor for positioning of robot which helped in clearing obstacles and successful climbing of 16° slope.

Supermarket Shelf Monitoring using ROS based Robot.

- Deployed the robotic system using Robot Operating System (ROS) and successfully implemented Path Planning and Robotic Vision to help the robot navigate and avoid up to 80% of the obstacles in a closed simulated environment.
- Designed the robot model in Solidworks and created SDF Models for the Gazebo environment.
- Developed algorithms to simulate the robot in the gazebo environment using python and generate Map for Simultaneous Localization and Mapping (SLAM).
- Successfully implemented OpenCV and YOLOv3 detected objects with an accuracy of 90% in simulated environment.

PUBLICATION

R. N. Mehta, H. V. Joshi, I. Dossa, R. Gyanch Yadav, S. Mane and M. Rathod, "Supermarket Shelf Monitoring Using ROS based Robot," 2021 5th International Conference on Trends in Electronics and Informatics (ICOEI), 2021, pp. 58-65, doi: 10.1109/ICOEI51242.2021.9452895.

EXTRA CURICULLAR ACTIVITIES

- *All India Rank – 3 in National ABU ROBOCON 2018 (Second Runner-Up)*
- *All India Rank – 5 in National ABU ROBOCON 2020.*
- *Undergraduate Teaching Assistant for Summer Training Program under Department of Electronics.*