Atharva Nayak

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EDUCATION

Northeastern University (NEU), Boston, MA
May 2026
Master of Science in Robotics, Concentration: Electrical and Computer Engineering
GPA: 3.85
Coursework: Robot Sensing and Navigation, Robot Mechanics and Control, Mobile Robotics, Pattern Recognition and Computer Vision

Vivekanand Education Society's Institute of Technology (VESIT), Mumbai, India
May 2024
Bachelor of Technology in Electronics and Telecommunication
GPA: 8.55
Coursework: Signals & Systems, Linear Integrated Circuits, Embedded Systems, Digital Communication, Sensor Tech

Veermata Jijabai Technological Institute (VJTI), Mumbai, India
Aug 2018 - Jun 2021
Diploma in Electronics Engineering
Percentage: 93.32%

SKILLS

Programming Languages: Python, C++, Embedded C, Verilog, MATLAB
Software and OS: VS Code, Eclipse, Xilinx ISE, Vivado, Linux, Git
Protocols and Technologies Known: VLSI, Embedded Systems, Machine Learning, Image Processing, Robotics and Automation, IoT, SPI, UART, I2C, USB
Libraries and Boards: ROS, ROS2, Arduino, Raspberry Pi, TurtleBot 3, NodeMCU, Tensorflow, OpenCV, ARM, FPGA

WORK EXPERIENCE

Vivekanand Education Society's Institute of Technology (VESIT), Mumbai, India
Jun 2023 - Dec 2023
Research Intern

- Optimized PWM control for brushless DC motors using Verilog, improving motor operation and precision in speed control for enhanced energy efficiency
- Developed an FPGA-based Electronic Speed Controller (ESC), eliminating the external microcontroller and enhancing computational efficiency and communication between processor and components

PROJECTS

Point-LIO SLAM Development, NEU
Oct 2024 - Nov 2024
Designed and implemented a high-performance SLAM system using LiDAR and IMU data for precise real-time mapping and navigation

- Integrated LiDAR and IMU sensors with an EKF-based fusion approach, ensuring accurate localization and mapping even during rapid or aggressive movements
- Validated the system on Boston Dynamics Spot, overcoming data collection challenges and showcasing high-bandwidth performance in real-world scenarios

Navigation with IMU and GPS with Dead Reckoning, NEU
Oct 2024 - Nov 2024
A navigation system combining GPS and IMU data for real-time, precise trajectory estimation

- Built and deployed Python-based ROS2 drivers for real-time sensor data acquisition from GPS and IMU, enabling robust localization, navigation, and dead reckoning
- Analysed IMU noise characteristics through Allan Variance and calibrated magnetometer for hard/soft iron distortions along with error compensation in IMU and GPS data
- Compensated for accelerometer bias to estimate vehicle's forward velocity, and fused yaw angle computed from gyroscope and magnetometer data to estimate heading for Dead Reckoning with IMU
- Performed sensor fusion by implementing Extended Kalman Filtering (EKF) to get an improved estimate of the vehicle's overall trajectory including GPS-lacking environments

GPS Signal Analysis and Mapping, NEU
Oct 2024 - Nov 2024
Analyzed GPS data accuracy from a GNSS puck and visualized trajectories to understand signal drift, improving reliability during motion and stationary conditions

- Identified environmental factors such as signal reflections and satellite corrections impacting accuracy, and quantified differences in performance between stationary and dynamic states
- Mapped GPS trajectories to validate data reliability, demonstrating superior accuracy and stability during movement compared to stationary conditions

Non-Invasive Glucometer, VESIT
Jun 2023 - Apr 2024
Developed a device to monitor blood glucose levels without finger pricks

- Developed a machine learning model for non-invasive glucose prediction by collecting and processing training data using an Arduino and PPG sensor; tested and validated reliable glucose level analysis
- Designed and implemented a PHP and SQL-based webpage to log user data and provide real-time data visualization through an intuitive interface