

Ojas Mediratta

+1(470)-909-4319 | omediratta3@gatech.edu | ojasmediratta.com | linkedin.com/in/ojas-mediratta | U.S. Citizen

EDUCATION

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| Georgia Institute of Technology | Atlanta, GA |
| M.S. Robotics Specialization in Artificial Intelligence, Perception, and Controls | Expected May 2027 |
| Coursework: Artificial Intelligence, Machine Learning, Computer Vision, Deep Learning, Deep Reinforcement Learning, Linear and Nonlinear Control Systems | |
| Georgia Institute of Technology | Atlanta, GA |
| B.S. Computer Engineering Graduated with High Honors | May 2025 |
| Coursework: Data Structures & Algorithms, Digital System Design, Circuit Analysis, Prototyping Intelligent Devices, Embedded Systems Design, Fundamentals of Machine Learning, Network Security, Cybersecurity | |

EXPERIENCE

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| Graduate Research Assistant | Aug 2024 – Present |
| Georgia Institute of Technology - Contextual Computing Group | Atlanta, GA |
| <ul style="list-style-type: none">Conducted field robotics research in collaboration with Georgia Aquarium and the Wild Dolphin Project nonprofit, contributing to real-time dolphin communication research initiatives and enrichment for captive cetaceans.Engineered a custom bone-conduction headset for underwater use by researchers, enabling clear audio playback for real-time dolphin vocalization translation and two-way communication between researchers and dolphins.Developed and optimized tools for dolphin vocalization analysis using autocorrelation, waveform reconstruction, and spectrogram visualization in Python, enabling researchers to accurately mimic essential sounds for testing. | |
| Graduate Teaching Assistant | May 2025 – Present |
| Georgia Institute of Technology - College of Computing | Atlanta, GA |
| <ul style="list-style-type: none">Served as a teaching assistant for Mobile and Ubiquitous Computing and Prototyping Intelligent Devices; graduate-level, project based courses on embedded systems, firmware development, and edge machine learning.Guided 8 student teams in developing mobile-based prototypes and custom microcontroller projects, providing mentorship on report authorship that contributed to higher project success rates and more polished deliverables.Hosted office hours and asynchronous feedback sessions, guiding students through technical and research hurdles. | |

PROJECTS

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| Cetacean Research AUV C++, ESP32, Raspberry Pi, Python, Fusion, KiCAD | Aug 2024 – Present |
| <ul style="list-style-type: none">Built an autonomous underwater vehicle (AUV) for dolphin research and enrichment, contributing across firmware, electronics, and mechanical design; successfully deployed in 15+ pool trials and 4 open-water trials in the Atlantic.Architected and implemented the ESP32 firmware stack, orchestrating a cascaded PID-based controller, ESC-driven thrusters, internal sensors, over-the-air telemetry, and LED signaling, unifying system operation in the field.Developed a real-time DSP pipeline, enabling advanced control of the robot in response to dolphin vocalizations, using advanced signal processing techniques on audio with Raspberry Pi to generate control commands.Engineered custom PCBs to integrate microcontrollers, power management, and sensors, tightening the system.Designed and fabricated parts in Fusion, iterating rapidly for waterproofing and durability for field deployment. | |
| TurtleBot3 Autonomy ROS2, Python, OpenCV, Gazebo, Control, Motion Planning | Aug 2025 – Present |
| <ul style="list-style-type: none">Built a computer vision ROS2 pipeline for real-time object detection, enabling visual servoing with >95% success.Designed and tuned PID controllers for differential-drive motion, reducing steady-state error by 35%.Programmed grid and probabilistic path planners with python and ROS2, in a multi-node architecture, raising navigation success from 60% to 95% and eliminating collisions.Fused odometry and sensor data with particle/Kalman filters, maintaining <10 cm localization error over multi-meter runs. | |
| Smart Guitar Effects Processor C, C++, Arduino, Fusion, DSP | May 2024 – Aug 2024 |
| <ul style="list-style-type: none">Built a guitar-mounted audio effects controller using C++ on the Teensy 4.1 for analog to DSP via ADC.Implemented 6 effects, including drive, chorus, octave, and reverb, mimicking real-world guitar pedals.Designed a physical UI with LCD, improving usability and enabling real-time effect switching for live performance. | |

SKILLS

Software: C, C++, Java, MATLAB, Python, Pandas, Pytorch, ROS2, Android, Kotlin

Hardware: Arduino, Raspberry Pi, ESP32, ARM, RISC-V

Protocols: TCP/IP, I2C, CAN, UART, SPI, Serial, USB, PWM

Developer Tools: VSCode, Arduino IDE, Android Studio, Fusion, Gazebo, KiCAD, Git, Docker

Lab Tools: Oscilloscope, Multimeter, Soldering, 3D Printing, CNC Mill, Laser Cutter, Logic Analyzer