

Ojas Mediratta

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EDUCATION

Georgia Institute of Technology <i>M.S. Robotics</i> Specialization in Artificial Intelligence, Perception, and Controls	Atlanta, GA Expected May 2027
Georgia Institute of Technology <i>B.S. Computer Engineering</i> Graduated with High Honors	Atlanta, GA May 2025

EXPERIENCE

Graduate Research Assistant <i>Georgia Institute of Technology - Contextual Computing Group</i>	Aug 2024 – Present Atlanta, GA
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- Led field-robotics work with an aquarium and a nonprofit, running controlled pool trials and open-water deployments of a custom marine robot to advance real-time dolphin communication and enrichment research.
- Designed and built a 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 Python tools for autocorrelation, waveform reconstruction, and spectrogram analysis that turned raw recordings into testable stimulus libraries and reduced manual preprocessing.
- Packaged analysis pipelines and documentation so collaborators could reproduce results and generate new stimuli without engineer support during field and lab research sessions.

Graduate Teaching Assistant <i>Georgia Institute of Technology - College of Computing</i>	May 2025 – Present Atlanta, GA
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- 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

Cetacean Research ROV <i>C++, ESP32, Raspberry Pi, Python, Fusion, KiCAD</i>	Aug 2024 – Present
<ul style="list-style-type: none">Built a remotely operated vehicle (ROV) 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.Designed and implemented an 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 that parsed dolphin vocalizations using advanced signal processing techniques on audio with Raspberry Pi to generate robot control commands, enabling an animal controlled interface.Engineered PCBs unifying microcontroller, power, and sensor interfaces, cutting wiring volume and failure points.Designed parts in Fusion, iterating and fabricating rapidly for waterproofing and durability for field deployment.	

TurtleBot3 Autonomy <i>ROS2, Python, OpenCV, Gazebo, Control, Motion Planning</i>	Aug 2025 – Present
<ul style="list-style-type: none">Developed a ROS2 vision pipeline with OpenCV for real-time object tracking and following 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 across multi-waypoint maze runs.Fused odometry and sensor data, maintaining <10 cm localization error over runs with moving obstacles.	

Smart Guitar Effects Processor <i>C, C++, Arduino, Fusion, DSP</i>	May 2024 – Aug 2024
<ul style="list-style-type: none">Designed a self-contained, guitar-mounted effects processor that digitizes and manipulates sound directly on the instrument, enabling portable, cable-free live performance with onboard digital signal processing.Engineered a Teensy-based DSP audio chain in C++ that converted analog guitar input to digital, running six real-time effects (drive, chorus, octave, delay, reverb, filter) with low-latency playback.Developed an integrated LCD and rotary-encoder interface for intuitive control and on-the-fly effect switching.	

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