

# Ojas Mediratta

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## EDUCATION

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

## EXPERIENCE

<b>Graduate Research Assistant</b> <i>Georgia Institute of Technology - Contextual Computing Group</i> <ul style="list-style-type: none"><li>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.</li><li>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.</li><li>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.</li></ul>	Aug 2024 – Present Atlanta, GA
<b>Graduate Teaching Assistant</b> <i>Georgia Institute of Technology - College of Computing</i> <ul style="list-style-type: none"><li>Served as a teaching assistant for <i>Mobile and Ubiquitous Computing</i> and <i>Prototyping Intelligent Devices</i>; graduate-level, project based courses on embedded systems, firmware development, and edge machine learning.</li><li>Guided 6–8 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.</li><li>Hosted office hours and asynchronous feedback sessions, guiding students through technical and research hurdles.</li></ul>	May 2025 – Present Atlanta, GA

## PROJECTS

<b>Cetacean Research AUV</b>   <i>C++, ESP32, Android, Python, Fusion, KiCAD</i> <ul style="list-style-type: none"><li>Built an autonomous underwater vehicle (AUV) controlled by dolphin vocalizations, enabling responsive, hands-free operation. Successfully deployed in 15+ controlled pool trials and 4 open-water trials in the Atlantic Ocean.</li><li>Programmed an Android app to enable real-time acoustic control of the AUV, using a DSP pipeline with autocorrelation dolphin click detection and Goertzel algorithms to detect tone patterns from hydrophone input.</li><li>Designed and fabricated parts in Fusion, iterating rapidly for waterproofing and durability for field deployment.</li><li>Engineered and fabricated custom PCBs for ESP32 and internal electronics, tightening integration of inner layout.</li><li>Programmed multi-threaded ESP32 firmware with PID-based closed loop control, stabilizing a 4-DOF underactuated vehicle at depths up to 7 m.</li></ul>	Aug 2024 – Present
<b>Hand-Wired Mechanical Keyboard</b>   <i>C++, Arduino, Fusion</i> <ul style="list-style-type: none"><li>Engineered a fully custom 55-key mechanical keyboard with hand-wired switch matrix, diodes, and enclosure; delivered a functional prototype from concept to finished hardware in 6 weeks.</li><li>Programmed with custom QMK firmware in C, enabling multi-layer keymaps and OLED live status display.</li><li>Validated hardware–firmware integration through continuity testing and debounce optimization, ensuring reliable key scanning and smooth user interaction through keys and a rotary encoder.</li></ul>	Aug – Dec 2024
<b>Smart Guitar Effects Processor</b>   <i>C, C++, Arduino, Fusion, DSP</i> <ul style="list-style-type: none"><li>Built a guitar-mounted audio effects controller using C++ on the Teensy 4.1 for analog to DSP via ADC.</li><li>Implemented 6 effects, including drive, chorus, octave, and reverb, mimicking real-world guitar pedals.</li><li>Designed a physical UI with LCD, improving usability and enabling real-time effect switching for live performance.</li></ul>	May – Aug 2024

## SKILLS

**Hardware:** Arduino, Raspberry Pi, ESP32, ARM, RISC-V, FPGA  
**Software:** C, C++, Java, MATLAB, Python, Pandas, Pytorch, TensorFlow, Android, Kotlin, ROS2  
**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