

# Ojas Mediratta

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## EDUCATION

### 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** | Specialization in Distributed Systems and Cybersecurity

*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

### Graduate Research Assistant

Aug 2024 – Present

*Georgia Institute of Technology - Contextual Computing Group*

*Atlanta, GA*

- 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.
- Annotated hours of audio data in Audacity and curated datasets to fine-tune Google's Dolphin Gemma LLM, improving model training and accuracy.

### Graduate Teaching Assistant

May 2025 – Present

*Georgia Institute of Technology - College of Computing*

*Atlanta, GA*

- 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 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.
- Hosted office hours and asynchronous feedback sessions, guiding students through technical and research hurdles.

## PROJECTS

### Cetacean Research AUV | *ESP32, Android, C, C++, Python, TensorFlow*

Aug 2024 – Present

- 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.
- 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.
- Implemented a MobileNet-style CNN with Pixel 9 to classify dolphin whistles from FFT-generated spectrograms of live audio, running efficiently on-device with TensorFlow Lite and accelerating inference using built-in T4 TPU.
- Designed and fabricated parts in Fusion, iterating rapidly for waterproofing and durability for field deployment.
- Coded multi-threaded ESP32 firmware for PID-based closed-loop control of an underactuated system, enabling stable 4 DOF underwater maneuvering at depths up to 7m.

### Smart Guitar Effects Processor | *C++, Arduino, Teensy*

May – Aug 2024

- 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.

### Raspberry Pi Motion Game | *Raspberry Pi, Python, Linux*

Aug – Dec 2021

- Built a Wii-style video game using Raspberry Pi, IMU sensor fusion, and UDP-linked Sense-Hat controllers.
- Integrated smart lighting and GUI on the server Pi, with real-time feedback and motion-based gameplay.
- Enabled synchronized multiplayer gameplay with real-time motion input sharing across Raspberry Pi devices.

## SKILLS

**Hardware & Protocols:** Arduino, Raspberry Pi, ESP32, ARM, I2C, UART, SPI, Serial, USB, PWM

**Software:** C, C++, Java, MATLAB, Python, Pandas, Pytorch, TensorFlow, Android, Kotlin, ROS2, Fusion, Git, Docker

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

**Advanced Topics:** Firmware Programming, Control Systems, Autonomous Systems, Embedded ML