

Sarthak Gupta

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EDUCATION

University of Florida

Bachelor of Science in Computer Science, Minor in Accounting (GPA: 3.55)

Gainesville, FL

Aug. 2024 – Dec 2027

RELEVANT COURSEWORK

Introduction to Software Engineering
Introduction to Information Systems
Introduction to Computer Organization
Multivariable Calculus
Principles of Macroeconomics
Financial Accounting

Introduction to Virtual Reality
Data Structures and Algorithms
Computational Linear Algebra
Discrete Structures
Principles of Microeconomics

EXPERIENCE

Robotics Software Developer

January 2025 – Present

Machine Intelligence Lab @ University of Florida

- Integrated the Water-Linked Doppler Velocity Log (DVL) into the SubjuGator 9 autonomous maritime system using ROS2, Bash, Linux, Python, and C++, enabling enhanced navigation and localization capabilities.
- Resolved symbolic link installation issues in colcon build by addressing path resolution and build dependencies to ensure an error-free compilation environment.
- Advanced to the **semifinals of RoboSub 2025** with SubjuGator 9, competing against international teams in autonomous underwater robotics.

Human-Computer Interaction (HCI) Research Intern

May 2025 – Present

Virtual Experience Research Group (VERG) Lab @ University of Florida

- Designing an interactive virtual human training system for the U.S. Air Force focusing on sexual assault prevention workflows.
- Leveraging AWS Polly for speech synthesis and Synthesia for avatar-driven video modules to deliver scalable training content.
- Prototyping conversational UI and user flows in Figma to align with human-centered design principles.

Geospatial AI Intern

May 2025 – August 2025

Ecosystem Services AI Lab @ University of Florida

- Created image annotations and spatial labels using QGIS and ArcGIS Pro to support supervised model training and validation.
- Developed Python ETL scripts to acquire, clean, and process spatial datasets (Google Street View, OpenStreetMap, Flickr, U.S. Census, Google Earth Engine).
- Produced GIS visualizations and outreach assets using Matplotlib, ggplot2, and ArcGIS tools.

PROJECTS

Audionomous | Python, OpenCV, MediaPipe FaceMesh, PyCAW, Arduino Nicla Vision

October 2025 – Present

- Developed an AI-driven real-time vision-audio modulation system that adjusts headphone volume based on facial motion cues from an Arduino Nicla Vision Pro camera.
- Built a high-throughput USB-serial pipeline (30 FPS JPEG stream) with NICL framing, 32-bit big-endian length fields, buffered reads, and checksum validation for robust frame recovery under serial jitter.
- Implemented a facial dynamics pipeline using MediaPipe FaceMesh (468 landmarks) to compute mouth aspect ratio, jaw displacement, and rotation; applied temporal filtering (deque, EMA) achieving ~95% stable detection within <200 ms latency.
- Designed a multi-threaded PyCAW subsystem managing ISimpleAudioVolume sessions with asynchronous ramping, atomic cancellation, and safe restoration under concurrent process changes.

- Developed a mobile-first app delivering real-time TikTok/Instagram-style highlight reels from live sports, with a React Native frontend (expo-av, Reanimated) supporting low-latency playback, vertical reel navigation, and swipe-right panels for play context.
- Implemented a Node.js + Express backend serving highlight videos and normalized metadata via REST endpoints, with per-sport directory mapping and range-enabled static media delivery.
- Engineered a live-to-highlight pipeline with FFmpeg for ingest/trim, SportsRadar play-by-play for timestamp alignment, and Google Gemini API for NLP-based scoring and context generation.
- Integrated Firebase Firestore to persist likes/skips/favorites, powering real-time personalization and adaptive feed ranking.

- Engineered a multithreaded Python voice assistant using pvporcupine for low-latency wake-word detection and Vosk + sounddevice for offline real-time speech-to-text over raw audio streams.
- Integrated Google's Gemini API via REST for contextual NLP interactions and WeatherAPI with IP-based geolocation; optimized TTS using pyttsx3 with voice customization.
- Developed a multithreaded PyQt6 interface featuring a real-time OpenGL-based waveform visualizer and animated UI elements for conversational feedback.
- Implemented extensible voice-command handlers supporting file system operations and common system controls (lock, screenshot, app launch, etc.).

TECHNICAL SKILLS

Languages: Java, Python, JavaScript, C++, MATLAB

Frameworks & Platforms: React.js, Node.js, Express.js, ROS2, GIS, React Native, Expo, Firebase, Supabase

Tools & Technologies: OpenCV, AWS Polly, Figma, Ubuntu, Linux

Developer Tools: Git, VS Code, PyCharm, IntelliJ, Eclipse

Methodologies: SDLC, Agile, Scrum

CERTIFICATIONS

Building Transformer-Based Natural Language Processing Applications | *NVIDIA*

July 2025

- Completed hands-on projects on fine-tuning Transformer-based LLMs and developing NLP pipelines using PyTorch.
- Credential ID: pF329a7-SwSyOeTLS-WONQ

Fundamentals of Deep Learning | *NVIDIA*

July 2025

- Gained practical understanding of deep learning workflows, covering neural networks, CNNs, and transfer learning using PyTorch.
- Credential ID: OeT9FHBJR-CqIfoSys60yw

Intermediate Web Development Course (WEB102) | *CodePath*

May 2025

- Completed intermediate-level training in web development, focusing on modern front-end frameworks, backend integration, and responsive design principles.
- Credential ID: 293245