Sarthak Gupta

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Education

University of Florida — Gainesville, FL
Bachelor of Science in Computer Science, Minor in Accounting ***(GPA: 3.68)*** — *Aug. 2024 – Dec. 2027*

Relevant Coursework

Introduction to Software Engineering	Computer Organization
Advanced Programming Fundamentals	Data Structures and Algorithms
Introduction to Virtual Reality	Computational Linear Algebra
Multivariable Calculus (III)	Discrete Structures
Information and Database Systems Design	Engineering Statistics
Operating Systems	Business Finance

Technical Skills & Certifications

Languages:	Java, Python, JavaScript, C++, R, MATLAB
Frameworks & Platforms:	TypeScript, Angular.js, React.js, Node.js, Express.js, LangChain, FastAPI, TensorFlow, Robotics Operating System 2 (ROS2), PyTorch, React Native, Expo, Firebase, MongoDB, GIS
Tools & Technologies:	Git, NVIDIA Isaac Sim, OpenCV, OpenMV, AWS Polly, Figma, Ubuntu/Linux, QGIS, ArcGIS Pro
Methodologies:	SDLC, Agile, Scrum
Certifications:	AWS Certified AI Practitioner (AWS), AWS Certified Cloud Practitioner (AWS), Building Transformer-Based NLP Applications (NVIDIA), Fundamentals of Deep Learning (NVIDIA), Intermediate Web Development (CodePath)

Experience

Robotics Software Developer — Jan. 2025 – Present
Machine Intelligence Lab @ University of Florida

- Developing a C++ Gazebo plugin within the **ROS2 control framework** for the SubjuGator 9 submarine's gripper, integrating **JointController** and **JointTrajectoryController** for **2-DOF** velocity and position control; enabling full open–close actuation and trajectory-based manipulation in simulation.
- Integrated a Water-Linked Doppler Velocity Log (DVL) into the submarine using Bash, Linux, Python and C++; increased localization update rate to **10 Hz** and reduced drift from **12 m/hr** to **4 m/hr** during sea trials.
- Contributed to the Software Team in advancing SubjuGator 9 to the **semifinals of RoboSub 2025**, ranking **12th of 55** international teams by enhancing autonomy, sensor fusion, and reliability.

Undergraduate Researcher — May. 2025 – Present
Virtual Experiences Research Group (VERG) Lab @ University of Florida

- Developing an end-to-end AI video generation pipeline in **ComfyUI** for the US Air Force, producing training content for cadets on sexual assault prevention.
- Deploying and scaling the pipeline on **Hipergator High Performance Computing (HPC)**, processing **500 GB** of raw video and image data and generating **200 training videos** with automated text, voice, and visual effects.
- Submitted and had a research abstract accepted to the **2nd Annual Digital Health Symposium: "Accelerating Real-World Application in Informatics, AI, and Innovations"** hosted by the UF Department of Epidemiology & FSU College of Nursing (CSTA Hub).

AI Developer Intern — Oct. 2025 – Present
Florida Resource Map Project @ Florida Community Innovation (FCI) Foundation

- Designing and deploying **LLM-driven agentic pipelines** using **LangChain, OpenAI APIs, and Python** to autonomously extract, validate, and structure non-profit and government service data from unstructured web sources.
- Building **web scraping and data-cleaning pipelines** to process over **5,000 resource listings** related to food, housing, and mental health; improving data coverage by **35%**.
- Implementing a **retrieval-augmented generation (RAG)** system with vector search for resource recommendations, increasing query accuracy and contextual relevance by **40%**.

Projects

Audionomous | *Python, OpenCV, MediaPipe FaceMesh, PyCAW, Arduino Nicla Vision* — Oct. 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.
- Implemented facial dynamics using **MediaPipe FaceMesh** (468 landmarks) to compute mouth aspect ratio, jaw displacement, and rotation; applied temporal filtering achieving ∼95% stable detection under **200 ms** latency.
- Designed a multi-threaded **PyCAW** subsystem managing ISimpleAudioVolume sessions with asynchronous ramping, atomic cancellation, and safe restoration under concurrent process changes.

PlayCast | *React-Native, Expo, Node.js, Express.js, Google Gemini API, Firebase* — September 2025

- Built a cross-platform mobile app delivering TikTok-style real-time highlight reels from live sports, using **React Native**.
- Developed a **Node.js + Express.js** backend serving highlight videos and normalized metadata through REST APIs using **CORS middleware** and range-enabled media streaming.
- Designed a live-to-highlight processing pipeline using **FFmpeg** for automated clip trimming, SportsRadar API play-by-play for timestamp alignment, and **Google Gemini API** for NLP-based scoring summaries and contextual captions.