SARTHAK GUPTA

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EDUCATION

University of Florida — Gainesville, FL
*Bachelor of Science in Computer Science, Minor in Accounting (**GPA: 3.55**)* — *Aug. 2024 – Dec. 2027*

RELEVANT COURSEWORK

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

TECHNICAL SKILLS & CERTIFICATIONS

Languages:	Java, Python, JavaScript, C++, MATLAB
Frameworks & Platforms:	TypeScript, Angular.js, React.js, Node.js, Express.js, FastAPI, TensorFlow, Robotics Operating System 2 (ROS2), PyTorch, React Native, Expo, Firebase, Supabase, GIS
Tools & Technologies:	Git, NVIDIA Isaac Sim, OpenCV, OpenMV, AWS Polly, Figma, Ubuntu/Linux, QGIS, ArcGIS Pro
Methodologies:	SDLC, Agile, Scrum
Certifications:	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.

Human-Computer Interaction (HCI) Research Intern — May 2025 – Present
Virtual Experience Research Group (VERG) Lab @ University of Florida
- Engineered an interactive virtual human training platform for the U.S. Air Force to train personnel in sexual assault prevention and response scenarios, enabling instruction for over **1,000** participants annually.
- Developed scalable training modules by integrating **AWS Polly** for speech synthesis and Synthesia for avatar-driven instruction, generating over **50** video formatted scenarios to support large-scale virtual training initiatives.
- Prototyped **4** conversational UI flows and user journeys in **Figma**, applying human-centered design principles to improve engagement and retention in training scenarios.

Geospatial AI Intern — May 2025 – Aug. 2025
Ecosystem Services AI Lab @ University of Florida
- Created **8000+** image annotations and spatial labels in QGIS and ArcGIS Pro to train AI models for classifying **Cultural Ecosystem Services (CES)** and human–nature activity patterns.
- Developed Python ETL pipelines to acquire, clean, and process **5** spatial datasets: Google Street View, OpenStreetMap, Flickr, U.S. Census and Google Earth Engine to provide robust inputs for the CES classification model.
- Generated GIS visualizations to analyze **CES model outputs** using Matplotlib, ggplot2, and ArcGIS, improving F1 score by $\sim$**15% (0.71 $\to$ 0.82)** through spatial error detection and feature distribution analysis across **250,000** predictions.

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 $\sim$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.
- Integrated **Firebase Firestore** to persist user engagement data (likes, skips, favorites), powering a dynamic feed that increased personalized content relevance by an estimated **25%**.