Arwa Ali

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Education

University of Central Florida, (Burnett Honors College - Spring 2026) Orlando, Fl
Bachelor of Science in Computer Science, Minor in Mathematics, GPA: 3.75 *Expected Graduation: 2028*

Experience

Undergraduate Research Assistant - ISUE Lab May 2025 – Present
University of Central Florida *Orlando, Fl*

- Architected a Python backend integrating **5** modules (Unity, ASR, LLM, VLM, TTS) to power real-time multimodal interactions in VR.
- Improved VLM captioning accuracy by by benchmarking **30+** models to optimize for real-time speed and performance
- Built a Python API for high-throughput data streaming between Unity and the VLM backend, enabling real-time image and text exchange.

Undergraduate Research Assistant June 2025 – Present
Research with Prof. Jongouk Choi, University of Central Florida *Orlando, FL*

- Investigating the fault-tolerance of LLMs on embedded systems (**NVIDIA Jetson/Gem5**) by deploying models with **Swift/MLC Chat** and simulating security attacks like bit-flips.

Supplemental Instruction Leader - Computer Science 1 Aug. 2024 – Present
University of Central FLorida *Orlando, Fl*

- Mentored peers in DSA(C), recognized as the **most difficult course** for computer science majors at UCF.
- Authored all quiz and exam materials covering advanced C, **complex data structures, and algorithm analysis**.
- Led **four** weekly sessions and hosted major exam reviews, consistently attracting crowds of **70+** students.

Projects

VR Conversational AI Agent | *Unity, Python, C Sharp, LLMs, VLMs, LM Studio, HuggingFace* May 2025 – Present

- Architecting a multimodal AI agent in **Unity** capable of real-time, human-like dialogue and interaction in a dynamic VR world.
- Optimized a low-latency conversational pipeline (ASR→LLM→TTS) using **Python** and **C Sharp**, achieving **sub-500ms** response times for fluid dialogue.
- Leveraged Visual Language Models (**VLMs**) to interpret visual context and user gestures, achieving over **90 percent accuracy** in non-verbal cue recognition.

LinguaLens | *VisionOS, Swift, Python, FastAPI, Gemini API* October 2025

- Developed and presented a first-of-its-kind immersive language tutor for the Apple Vision Pro at **HackHarvard 2025**, competing against **100+** international teams.
- Invented a novel learning pipeline that transforms a user's physical environment into dynamic, AI-generated verbal quizzes using **VisionOS**.
- Engineered a **Python/FastAPI** backend to process spatial imagery with the **Gemini API** and provide real-time pronunciation analysis via a **Swift/UI** frontend.

C Code Memory Visualizer | *React, Monaco, API, SVG, Node.js+Express, HTML, CSS, Javascript* June 2025

- Architected an AI-powered tutor that analyzes C code and generates dynamic, interactive memory diagrams to explain complex pointer relationships.
- Built a full-stack application using **React** and **Node.js**, integrating the Monaco editor for code input and the **Gemini API** for conversational code analysis.
- Utilized the tool as a teaching aid for **50+** students in SI sessions, leading to a **20 percent increase** in weekly attendance.

VISION | *Python, OpenCV, Pygame, Speech Recognition* Oct 2024

- Secured **Honorable Mention** against **80+** competing teams at **KnightHacks 2024**.
- Engineered a hands-free UI using real-time eye-tracking with **OpenCV** and **10+** voice commands.
- Implemented calibration and filtering algorithms to solve for high-precision eye-tracking and reliable voice command recognition in noisy environments.

Technical Skills

Languages: C/C++, Java, Python, JavaScript, HTML/CSS, Swift, C Sharp
Frameworks: React, Node.js, WordPress, Django, FastAPI, Express.js, Unity
Developer Tools: Git,GitHub, VS Code, CLion, PyCharm, Ollama, LM Studio, Apple VisionOS, VR SDKs, IntelliJ, Eclipse
Libraries: OpenCV, Hugging Face Transformers, Pygame, Gemini APi, pandas, NumPy, Matplotlib, Speech Recognition

Leadership and Activities

- **Student Government Senator - College of Engineering and Computer Science** - Representing **15,500+** students and managing financial funding allocations for **650+** registered student organizations.
- **STEM Ambassador** - Fostering interest in technology by leading engaging presentations and technical demonstrations for over **100** K-12 students.