

Jugal Gajjar

MS in Computer Science, The George Washington University

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RESEARCH INTERESTS

Intelligent Autonomous Systems, Large Language Models, Natural and Programming Language Analysis, Anomaly Detection, Agentic AI, Human-AI Interaction, Explainable AI

EDUCATION

MS in Computer Science (Machine Intelligence and Cognition)

The George Washington University, *Washington, DC*

May 2026

GPA: 3.95/4.0

Thesis: "AI That Detects, Exploits & Fixes: Autonomous Vulnerability Remediation"

Advisor: Dr. Shi Feng

B.Tech. in Computer Science and Engineering

Navrachana University, *Vadodara, India*

May 2024

CGPA: 9.39/10

PUBLICATIONS

MalCodeAI: Autonomous Vulnerability Detection and Remediation via Language Agnostic Code Reasoning

IEEE 26th International Conference on Information Reuse and Integration (IRI 2025)

Aug. 2025

Multimodal Sentiment Analysis on CMU-MOSEI Dataset using Transformer-based Models

arXiv preprint (cs.CL)

May 2025

Building Trust: The Sentient AI Framework for Emotionally Intelligent AI

International Journal of Creative Research Thoughts (IJCRT)

Nov. 2024

RESEARCH PROJECTS

MalCodeAI: AI-Powered Malicious Code Detection

Jan. 2025 – May 2025

- Designed a dual-stage LLM pipeline using fine-tuned Qwen2.5-Coder-3B-Instruct for semantic code understanding and vulnerability detection and remediation suggestion.
- Integrated exploit reasoning, CVE scoring, and automated patch generation.
- Inspired ongoing thesis work and published and presented at the IEEE IRI Conference 2025.

Multimodal Sentiment Analysis using Transformers

Mar. 2025 – May 2025.

- Utilized transformer-based early fusion on the CMU-MOSEI dataset for multimodal sentiment analysis.
- Achieved 97.87% 7-class accuracy and a 0.9682 F1-score by integrating text, audio, and visual modalities.
- Published the preprint on arXiv (cs.CL).

EzyCart: Computer Vision Powered E-Cart System

Jul. 2023 – May 2024

- Engineered a patent-pending embedded system using real-time computer vision for autonomous object detection and pricing.
- Trained and deployed lightweight CV models (YOLOv5) on edge devices for efficient, low-latency inference.
- Demonstrated applied skills in CV, embedded ML, and hardware-software integration.

RELEVANT EXPERIENCE

Independent Researcher

- The George Washington University, *Washington, DC* Jun. 2025 – May 2026
- Conducting thesis research on autonomous AI systems for vulnerability detection, exploitation, and remediation in software.
 - Designing a secure code analysis pipeline using LLMs, reasoning models, and agent-based simulation architectures.
 - Exploring exploit generation and patching strategies using dynamic analysis techniques.

Teaching Assistant

- Navrachana University, *Vadodara, India* Jan. 2025 – May 2025
- Mentored 80+ undergraduate students through code review, grading, and structured feedback on 750+ lab reports.
 - Assisted in designing rubrics, evaluating technical writing, and improving student understanding of test-driven development.
 - Supported curriculum delivery in collaboration with faculty, focusing on code quality, documentation, and debugging.

NVIDIA Jetson AI Project Coordinator

- Navrachana University, *Vadodara, India* Mar. 2022 – Jun. 2022
- Conducted workshops on CV and NLP using the Jetson Nano platform, introducing students to embedded AI and real-time inference.
 - Mentored 5+ student research projects selected by the NVIDIA Deep Learning Institute.
 - Promoted student research initiatives and hands-on learning in edge AI systems.

SELECTED TECHNICAL PROJECTS

SciChat: PDF-Aware Contextual LLM Interface

- Built a domain-adaptive LLM using Mistral7b, Ollama, LangChain, and Pinecone to provide grounded responses over scientific PDFs.
- Showcases toolchain integration, retrieval-augmented generation (RAG), and prompt engineering.

Crypt Chat: Secure Android Messenger with AES-256 & Steganography

- Designed a privacy-preserving mobile chat app employing AES-256 encryption and LSB image steganography for covert message transmission.
- Demonstrates understanding of secure communication protocols and applied cryptography.

CERTIFICATIONS & HONORS

GW SEAS Dean's Award Scholarship	2024
Runner-Up, Tinkerthon 2.0 Hackathon	2023
NVIDIA Jetson AI Specialist	2022
Gold Medalist, International Karate Championship (Team India)	2019

SKILLS

Languages: Python, Java, C/C++, Scala, SQL, JavaScript, HTML/CSS

Frameworks: TensorFlow, PyTorch, Scikit-learn, LangChain, HuggingFace Transformers

Tools: Git, Flask, OpenCV, Pydantic, Power BI, Ollama, Pinecone, Spark, Docker, Zotero

Areas: AI/ML, LLMs, Cyber Security, Deep Learning, Computer Vision, NLP, Software Engineering