

Sageena Garg

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<https://sageena-portfolio-git-main-sagegargs-projects.vercel.app/>

INTRODUCTION

Undergraduate researcher passionate about applied machine learning and data analytics, with a focus on developing reliable AI systems that bridge technical rigor and real-world impact. Experienced in research involving retrieval-augmented generation (RAG), structured data integration, and analytical visualization for transportation applications. Enthusiastic about interdisciplinary research, collaborative problem-solving, and contributing to national research conversations through conferences and scholarly dissemination.

EDUCATION

Iowa State University, BS in Computer Science Aug 2023 - Dec 2026

- GPA: 3.52/4.0
- Ranked Top 2% academic ranking
- **Dean's List:** Fall'25, Spring'25, Fall'24, Spring'24, Fall'23
- **Coursework:** Advanced Programming Techniques, Theory of Computing, Database Management Systems

PUBLICATIONS

SignalVerse: Harnessing LLMs to Revolutionize Traffic Signal Management
Sageena Garg, Rishabh Jain, Christopher M. Day, David Hurwitz, Meenakshi Sumeet Arya, Anuj Sharma
Accepted for Oral Presentation, *8th Conference on Transportation Research and Governance (CTRG)*, 2025. Paper ID: 422.

CONFERENCES

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|---|------|
| • National Collegiate Research Conference (NCRC) - Harvard University | 2026 |
| • Conference on Transportation Research and Governance (CTRG) | 2025 |
| • National Conference on Undergraduate Research (NCUR) | 2025 |
| • MOVITE Research Symposium | 2025 |
| • ITS Heartland | 2025 |
| • MINK-WIC Conference | 2025 |
| • Forte College Fast Track to Finance Conference | 2025 |
| • AI4ward Symposium | 2025 |

EXPERIENCE

Fast Trac Intern, Iowa State University Research Park – Ames, IA Feb 2024 - Present

- Designed and implemented retrieval-augmented generation (RAG) pipelines using large language models to support evidence-grounded querying of domain-specific transportation datasets.
- Developed structured data ingestion and normalization workflows for tabular and semi-structured data (CSV, Excel, PDF), enabling reliable querying of performance metrics across sensors, testing stages, and locations.
- Built embedding-based similarity search and tiered data representations to preserve relationships between sensor functions and performance measures, reducing hallucinations and improving interpretability of AI-generated responses.
- Deployed and maintained a production-grade web application on AWS (EC2), managing environment configuration, data updates, and model integration for scalable research access.
- Designed interactive analytical dashboards using Tableau and Power BI to visualize trends, evaluation outcomes, and model results for researchers and stakeholders.
- Applied machine learning and computer vision techniques, including polynomial regression, R^2 evaluation, and OpenCV-based traffic signal detection, to analyze real-world transportation data.

- Automated client data cleaning and preprocessing pipelines using Python and Pandas, reducing manual reporting effort by 62% (8 hours to 3 hours) and improving data reliability.
- Rebuilt analytical dashboards in Tableau to visualize proposal win rates, client revenue trends, and project timelines, reducing bid response time by 15% and supporting executive decision-making.
- Designed and implemented a Node.js/Express API integrated with MongoDB to support real-time data updates and tracking of 20+ concurrent client projects.

- Led coding help sessions for COMS 1040 (Introduction to Programming - Python) and COMS 1130 (Spreadsheets and Databases), mentoring students in Python programming, database design, and problem-solving.
- Provided constructive feedback on coding assignments and database projects, improving student understanding of programming logic, debugging, and software design principles.
- In COMS 1130 course, guided students in effectively using Microsoft Office tools—Access for relational databases, Excel for data analysis, and Word for documentation—enhancing their proficiency in the full Microsoft Suite.

PROJECTS

TravelMate - Android Application

Jan 2025

- Designing a travel management app for group coordination with features like location sharing, expense tracking, and document management. Enabled real-time chat, notifications, and easy sign-in using Firebase. Integrated Google Maps API for geofencing and location tracking.
- Tools Used: Android Studio, Spring Boot, MySQL, Google Maps API, Firebase

SignalVerse - Web application

Feb 2024

- This project is a RAG (Retrieval-Augmented Generation) based Large Language Model (LLM) designed to answer user queries using domain-specific datasets. It leverages vector embeddings of PDF documents to provide accurate and contextual responses while storing user interactions and ratings in a MySQL database.
- Tools Used: Python, Flask, OpenAI GPT-4, LangChain, Chroma, MySQL, HTML, CSS.

Yellow Light Detection

May 2024

- Analyze traffic videos by processing CSV files with vehicle data (time, distance, speed), models vehicle trajectories using polynomial equations, and generates visualizations comparing actual and predicted data. It also marks yellow and red light phases and consolidates the results into an Excel file, detailing each vehicle's movement and decisions at the intersection.
- Tools Used: OpenCV, YOLOv8, NumPy, Pandas, Matplotlib, Scikit-learn, OS Module, Excel (via Pandas).

Element Quest

April 2024

- It is a 2D interactive game where various types of elements, including players, enemies, and platforms, interact within a dynamic game space. By leveraging key Java concepts such as inheritance, polymorphism, and encapsulation, the project was designed to allow smooth interaction between these elements. The use of abstract classes minimized code duplication and enhanced modularity, ensuring better code maintainability and scalability.
- Tools Used: Java, JavaFX, JUnit

TECHNOLOGIES

Languages: Java, Python, JavaScript HTML, CSS, Bootstrap

Technologies: : Android Studio, SpringBoot, Firebase, MySQL, AWS, Flask, GitHub, Gitlab, Canva, Adobe Spark, Adobe Illustrator, MS Access

LEADERSHIP

- Undergraduate Research Ambassador - Social Media & Outreach;
- Tutor: Calculus I & II – Mentored 80+ students, improving performance by 15%
- Industry Relations Chair, ISU Data Science Club – 5+ company relations, hosted 3 networking events with 50+ attendees

ACCOLADES

- Ivy Data Visualization and Storytelling Case Competition, 2025 – 1st Place
- ISU JPEC Startup Pitch-Off Competition, 2025 – 1st Place
- MOVITE 2024 Poster Competition, 2024 – 3rd Place