

Parishruthi Ganesh

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Profile

Ph.D. candidate in Computer Science at Auburn University conducting research in Large Language Models, Natural Language Processing, Computer Vision, and Machine Learning. First-author of a systematic evaluation of 41 open-weight LLMs for zero-shot intent classification (submitted to AAAI) and a controlled study of interaction representations for early violence detection in video (submitted to WACV). Experience building AI-powered applications including Retrieval-Augmented Generation (RAG) systems, conversational agents, and scalable data frameworks, with deep expertise in transformer architectures, model evaluation and benchmarking, and weakly-supervised learning using PyTorch and Hugging Face. Passionate about advancing AI research that bridges rigorous empirical evaluation with real-world applications.

Education

Auburn University, Alabama Fall 2025 – Present

Ph.D. in Computer Science and Software Engineering

Research Focus: Artificial Intelligence, Large Language Models, Natural Language Processing, Machine Learning, Computer Vision

Auburn University, Alabama | GPA: 3.82 Aug 2023 – Aug 2025

Master of Science in Computer Science and Software Engineering

Relevant Courses: Advanced Topics in Algorithms, Advanced Topics in Operating Systems, Artificial Intelligence, Data Mining

Visvesvaraya Technological University | CGPA: 7.7 Aug 2017 – Aug 2021

Bachelor of Engineering in Computer Science

Relevant Courses: Data Structures and Algorithms, Java Programming, Python Programming, Operating Systems, DBMS

Publications

- **Parishruthi Ganesh**, Gerry Dozier, Cheryl Seals. "Selecting Open-Weight Language Models for Zero-Shot Intent Classification: A Systematic Evaluation of 41 Models." Submitted to AAAI. arxiv.org/abs/2607.27421
- **Parishruthi Ganesh** et al. "What Do Interaction Representations Actually Measure? Pre-Event Separability in Weakly-Supervised Violence Detection." Submitted to WACV. arxiv.org/abs/2608.27879

Experience

Auburn University Auburn, AL

Graduate Research & Teaching Assistant Jan 2024 – Present

- Delivered hands-on Python and MATLAB lab sessions to undergraduate students, fostering programming proficiency, analytical problem-solving skills, and academic support through mentoring and assignment guidance.

AUSME Faculty Expertise RAG System | Python, RAG, LangGraph, Web Scraping, LLMs

- Designed and built a Retrieval-Augmented Generation (RAG) system to generate contextual summaries of faculty research papers, enabling an interactive chatbot-like interface for exploring expertise and potential collaborations across 50+ faculty members.
- Collected and pre-processed a dataset of ~25,000 research papers by scraping metadata and full texts, achieving a complete retrieval pipeline processing time of 30 minutes for the entire corpus.
- Built the data ingestion and preprocessing pipeline using LangGraph, integrating document parsing, metadata structuring, and embedding generation to support semantic retrieval over large-scale research collections.
- Proposed deployment architecture for faculty and research groups to query publications in natural language, enhancing visibility of research domains and supporting interdisciplinary team formation.

DEMA – Digital Engineering Data Management Platform | React, Electron, Vite, Java, Spring Boot

- Architecting a full-stack desktop application for engineering data lifecycle management using React, Electron, and Vite for the frontend with Java/Spring Boot backend services.
- Implemented the complete CIM4DE (Conceptual Information Model for Digital Engineering) specification, designing data models for entity relationships, classification hierarchies, and metadata schemas.

- Developed automated data quality classification logic to identify and categorize engineering records based on completeness and validation criteria.
- Collaborating on system integration with engineering workflows, enabling traceability and consistency across digital engineering processes through standardized metadata management.

Interactive Rocket Simulation for Science Education | Unity, C#, Physics Simulation

- Developed an interactive rocket simulation in Unity to enhance science education, enabling students to modify rocket parameters (fuel capacity, thrust) and observe real-time outcomes in a virtual environment.
- Built multi-user interaction support across PC and tablet platforms, integrating realistic physics calculations for velocity and altitude tracking while refining UI, level generation, and environmental interactions.

Emids Technologies Pvt Ltd

Bangalore, India

Associate Software Developer

Dec 2021 – July 2023

- Led development of a comprehensive CRM solution enhancing marketing, product development, customer service, and sales operations, enabling efficient customer acquisition and relationship management.
- Designed and developed key modules including Leads, Contacts, Email API, Reports, and Accounts, implementing CRUD operations, Spring Boot configurations, and RESTful APIs for optimized functionality and system reliability.
- Built dynamic user interfaces using JSP and JSTL tags, integrated email-sending services, and streamlined server-side functionality with Servlets, ensuring a scalable, secure, and user-friendly application.

Projects

Sentiment Analysis with Deep Learning using BERT | PyTorch, Transformers, BERT, NLP

- Built a multi-class sentiment classification model by fine-tuning a pre-trained BERT transformer (bert-base-uncased) on the SMILE annotation dataset using PyTorch.
- Implemented end-to-end NLP pipeline including tokenization, encoding (input IDs, attention masks), and DataLoader creation for efficient batch processing during training and evaluation.
- Applied advanced optimization techniques including AdamW optimizer and linear learning rate scheduler with warm-up steps, achieving strong validation accuracy through transfer learning.
- Demonstrated effectiveness of transformer-based transfer learning for NLP tasks, showcasing attention mechanisms and fine-tuning best practices.

Circular Trade Fraud Detection using Graph Neural Networks | Python, Node2Vec, DBSCAN, Graph Algorithms

- Developed a graph-based fraud detection system to identify circular trading patterns in iron dealer transaction data using multi-graph representation techniques.
- Engineered suspicion score calculation based on cycle detection (2-cycles and 3-cycles) and trading amounts, utilizing hash functions for efficient storage of scores across cycle nodes.
- Generated node embeddings using Node2Vec on constructed undirected graphs derived from suspicion scores and cycle frequencies.
- Applied DBSCAN clustering algorithm to identify dense regions of potentially fraudulent nodes, successfully detecting anomalous trading behavior patterns.

Technical Skills

Languages: Python, Java, C++, SQL, JavaScript, HTML5/CSS3

ML/DL Frameworks: PyTorch, Scikit-learn, Hugging Face Transformers, XGBoost, LightGBM, Deep Graph Library (DGL), Graph Neural Networks (GNNs), TensorFlow

Deep Learning: CNNs, RNNs, LSTMs, Transformer Architectures, Attention Mechanisms, Graph Neural Networks (GNNs), Optimization (Adam, SGD, Learning Rate Scheduling), Fine-tuning & Transfer Learning

LLM & AI Agents: LangGraph, Retrieval-Augmented Generation (RAG), Agentic Orchestration, LLM Code Generation, Multi-turn Conversational Systems, Tool-Augmented LLMs, vLLM, LangFuse, LiteLLM

Cloud & Infrastructure: AWS (S3, Athena, EKS, EC2), Docker, Kubernetes, Jenkins, Airflow, Ray, DeepSpeed

Databases: PostgreSQL/Pgvector, MongoDB, MySQL, Oracle, SQL Server, OpenSearch, SQLite

Visualization & Tools: Matplotlib, Seaborn, Tableau, Grafana, Streamlit, Gradio, Weights & Biases, Jupyter Notebook

Web Frameworks: Django, Flask, Spring Boot, React.js, Bootstrap, RESTful APIs, Git/GitHub (CI/CD)

Core Competencies: NLP, Computer Vision, Predictive Analytics, Data Modeling, System Design, Statistical Analysis, OOP, Data Structures & Algorithms

Leadership Experience

Treasurer | The Society for Responsible Artificial Intelligence

Dec 2024 – Present