

# Ritvik Garimella

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Portfolio : <https://ritvikg.com>

Location : Columbia, SC

## Summary

Ritvik Garimella is an AI researcher and full-stack developer specializing in enterprise AI models, knowledge graphs, and large language model optimization.

## Experience

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| <b>Graduate Research Assistant</b><br>AI Institute, University of South Carolina  | July 2024 to Present<br><i>Columbia, SC</i>        |
| <ul style="list-style-type: none"><li>Working on building a custom, compact and in-device framework for Enterprise AI models that focus on alignment, grounding, and instructability by integration of Semantic Web over Neural Networks through Knowledge graphs.</li><li>Working towards building a hallucination mitigation framework in Large Language models for Images and Videos via Direct Preference Optimization and Saliency Maps.</li></ul>   |  |
| <b>Research Specialist</b><br>AI Institute, University of South Carolina  | Jan 2024 to May 2024<br><i>Columbia, SC</i>        |
| <ul style="list-style-type: none"><li>Developed a <b>mesh extraction system</b> and <b>Flask-based full-stack application</b> for <b>GEAR-UP</b> (Generative AI External Knowledge-based Retrieval), boosting scholarly article searches by <b>60%</b> in retrieval efficiency and <b>23%</b> in accuracy and reduced manual review time by <b>90%</b>, streamlining systematic reviews.</li><li>Developed Alleviate 2.0, a <b>NeuroSymbolic</b> integration of <b>knowledge graphs</b> and <b>semantic search</b> for chatbot to assist school mental health professionals. Improved retrieval accuracy by <b>45%</b> and reduced response time by <b>80%</b>.</li></ul>   |  |
| <b>Research Affiliate</b><br>AI Institute, University of South Carolina   | Sept 2022 to Dec 2023<br><i>Columbia, SC</i>       |
| <ul style="list-style-type: none"><li><b>Published <a href="#">FACTIFY3M</a> at EMNLP 2023</b>, a benchmark for multimodal fact verification with explainability through <b>5W Question-Answering</b>, leveraging 5 datasets (Fever, Snopes, Politifact, HoVer, FaVIQ). Achieved <b>55%</b> increase in textual verification dataset and <b>70%</b> increase in Question Answering verification datasets.</li><li>Crafted a detailed visual hallucination analysis that included <b>3.2 million images</b>, providing a richer context for findings and elevating the paper's overall impact by <b>52%</b>.</li></ul>   |  |
| <b>Google Developer Student Clubs Lead</b><br>Google Inc  | July 2022 to March 2023<br><i>Bengaluru, India</i> |
| <ul style="list-style-type: none"><li>Led a <b><a href="#">team of 40 developers</a></b> to build a community of <b>11,000+ participants</b> focused on solving global challenges using <b>Google's technology</b>, emphasizing <b>cost-effective solutions</b>.</li><li><b><a href="#">Delivered keynote sessions</a></b> and organized <b>Winter School</b>, inspiring and mentoring the next generation of coders.</li><li><b>Taught programming</b> and <b>full-stack development</b> through guest lectures, engaging and guiding over <b>450 freshman</b> and <b>sophomore students</b> in foundational coding skills.</li></ul>  |  |
| <b>Software Development Researcher</b><br>Indian Institute of Science   | July 2022 to March 2023<br><i>Bengaluru, India</i> |
| <ul style="list-style-type: none"><li>Developed a <b>Full-Stack website</b> for <b><a href="#">Kreeda.AI</a></b>, an AI-powered postural and sports biomechanical analysis platform, using the <b>React.js + MySQL</b> stack. Achieved a <b>65%</b> increase in user engagement and reduced system latency by <b>98%</b> for real-time posture assessments.</li><li>Integrated and <b>fine-tuned</b> the <b>Bloom chatbot</b> for fitness and nutrition-based question answering, resulting in <b>44%</b> improvement in response accuracy and a <b>85%</b> reduction in query resolution time.</li><li>Domain-adapted the <b>MoveNet Computer Vision</b> model for enhanced body posture analysis, boosting precision by <b>27%</b> and enabling real-time feedback with <b>80%</b> faster processing compared to previous models.</li></ul> |  |

## Software Development Engineer

Indian Institute of Technology - Madras

July 2022 to Aug 2022

Chennai, India

- Developed a **Full-Stack website for [Kaatru.Org](https://Kaatru.Org)** using the **MERN stack** (MongoDB, Express, React.js, Node.js), delivering a scalable platform for real-time travel route optimization. Improved overall system engagement by **125%**.
- Integrated real-time vehicle monitoring and statistical data** onto interactive maps for **route suggestion** using **APIs**, achieving a **14%** reduction in route calculation time and a **37%** improvement in route accuracy.

## Artificial Intelligence Researcher

Indian Institute of Science Education and Research

May 2022 to July 2022

Bhopal, India

- Fine-tuned** and **domain-trained 7 CNN models** for smoker vs. non-smoker **classification**, utilizing Mendeley's & a custom created dataset of 400 images sourced from open documents. Implemented **data augmentation**, **noise reduction**, & **contrast enhancement** techniques, leading to a **48%** increase in classification accuracy and a **82%** reduction in errors (false positives) compared to existing models.

## Artificial Intelligence Developer

Deep Element AI

Nov 2021 to Dec 2021

Remote

- Developed **PyTorch programs** for both **search ranking** and **information retrieval**. Utilized SentenceTransformer to rank web pages by complex keywords, and implemented **NLTK**, **BeautifulSoup**, and **spaCy** for efficient web scraping and data extraction. Achieved a **18%** improvement in ranking accuracy.

## Python Programming Mentor

Tekie

Oct 2020 to March 2021

Remote

- Taught Python** programming language to **180 students** ranging from grade 6 to 12.

## Publications

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[Exploring The Potential of Large Language Models for Assisting with Mental Health Diagnostic Assessments: The Depression and Anxiety Case](#)

ACM Transactions on Computing for Healthcare

ACM 2025

[FACTIFY3M: A benchmark for multimodal fact verification with explainability through 5W Question-Answering](#)

ACL Anthology

EMNLP 2023

## Projects

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### [GearUP](#) : Artificial Intelligence + Full Stack Development

AI Institute - University of South Carolina

Jan 2024 to May 2024

Columbia, SC

- Developed a **mesh extraction system & Flask-based full-stack application** (React.Js, Flask, Node.Js, Express) boosting scholarly article searches by **60%** in retrieval efficiency and **23%** in accuracy and reduced manual review time by **90%**, streamlining systematic reviews

### [Kaatru.org](https://Kaatru.org) : Full Stack Development

Indian Institute of Technology - Madras

July 2022 to Aug 2022

Chennai, India

- Built a Full-Stack website for Kaatru utilizing the **MERN stack** (MongoDB, Express, React.js, Node.js), creating a scalable platform for real-time travel route optimization and boosting overall system engagement by 125%.

### [AlmaConnect](#) : Full Stack Development

National Institute of Technology

Oct 2021 to June 2022

Andhra Pradesh, India

- Transformed the university's alumni reach through creation of an interactive portal consisting of alumni search, events, digital IDs, giveback program features using **MERN stack** (MongoDB, Express.js, React.js, Node.js)

## Education

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|---|---|
| <b>University of South Carolina</b><br>Masters of Science in Computer Science                         | Aug 2024 to Present<br><i>Columbia, SC</i>            |
| <b>National Institute of Technology</b><br>Bachelor of Technology in Computer Science and Engineering | June 2020 to May 2024<br><i>Andhra Pradesh, India</i> |
| <b>Sri Kumaran Children's Home</b><br>Senior High with Computer Science                               | June 2018 to May 2020<br><i>Bangalore, India</i>      |

## Certifications

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- NPTEL - Applied Accelerated Artificial Intelligence
- MoE Government of India - Overview of Blockchains
- Nvidia Deep Learning Institute - Deep Learning
- NPTEL - Natural Language Processing
- Coursera [Stanford Online] - Machine Learning
- EICT IIT Roorkee - Python for Machine Learning
- Microsoft Technical Associate - Introduction to Python

## Skills

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- **Programming Languages** : Python, Java, Javascript, C, C++
- **Databases** : MongoDB, MySQL, Firebase, Oracle DB, Postgresql
- **Domain of Expertise** : Artificial Intelligence, *Neuro-Symbolic AI*, *Natural Language Processing*, *Computer Vision*, *Deep Learning*, *Machine Learning*, Knowledge Graphs, Full Stack Development, *Frontend Development*, *Backend Development*, *Server-side Deployment*, *Code Integration*, Data Science, *Web Scraping*, *Data Visualization*, *Data Collection*, *Data Engineering*, *Data Wrangling*, UI/UX Design, Human-Computer Interaction
- **Front End Development Frameworks** : React.JS, Node.JS, Django, Material UI, Bootstrap
- **Development Tools** : Git, Github, Kaggle, Docker, Visual Studio Code, Nginx, Apache Server, Pytorch, Tensorflow, Flask, SCRUM, Agile
- **Soft Skills** : Leadership, Communication, Teamwork, Problem-Solving, Adaptability, Time Management, Critical Thinking, Emotional Intelligence, Conflict Resolution, Networking, Creativity, Negotiation, Decision-Making, Stress Management, Interpersonal Skills, Work Ethics, Organization

## Achievements - Extracurriculars

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- Featured in 2 articles in AIM (top AI magazine in India)
- AlmaConnect founding member & Student Coordinator - 2023 to 2024
- Google Developer Student Clubs Lead 2023 - NIT Andhra Pradesh
- Voluntary Guest Lecturer for Python and Full Stack Development courses - NIT Andhra Pradesh
- Outstanding Delegate Award in International Model United Nations 74.0 representing Ethiopia
- Best Parliamentarian Award in Model Parliament of Sweven, NIT Andhra Pradesh