

Chathurangi Shyalika

Ph.D. Student, AI Institute, University of South Carolina



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EDUCATION

University of South Carolina

Columbia, South Carolina, USA

Ph.D. in Computer Science | GPA: 3.8/4.0

August 2022 – Present

Research Interests: Deep learning, Time series analysis, Multimodal AI, Generative AI, Neurosymbolic AI

University of Moratuwa

Sri Lanka

M.Sc. in Artificial Intelligence | GPA: 3.59/4.0

2018 – 2021

Dissertation: An Integrated Approach for Uncertainty Scheduling in Adaptive Environments using MARL ([link](#))

General Sir John Kotelawela Defence University

Sri Lanka

B.Sc. in Information Technology | GPA: 3.96/4.2 | Batch Top

2014 – 2018

Dissertation: ALLDS: An Image Processing Application for the Diagnosis of Acute Lymphoblastic Leukemia ([link](#))

WORK EXPERIENCE

★ Graduate Research Assistant (Research Advisor: [Dr. Amit Sheth](#))

August 2022 – Present

Artificial Intelligence Institute of South Carolina (AIISC)

South Carolina, USA

Projects: 1. **Rare Events and Anomaly Prediction in Smart Manufacturing:** Leading the smart manufacturing project ([link](#)) at AIISC, focusing on implementing supervised learning models, data enrichment techniques, 2D-based prediction, multimodal hybrid fusion techniques, and custom, compact neurosymbolic co-pilot system for rare event and anomaly prediction.

2. **Enhancing the Security and Mitigating Bias in Vision Language Models (VLMs) to Combat Hateful Image Generation and Detoxify Hateful Images:** Developing methods for preventing and mitigating toxic and biased content generation in VLMs through DE-HATE techniques.

3. **Causal Event Graph-Guided Language-based Spatiotemporal Question Answering:** Implementation of an ontology and reasoning approach to handle physics-based spatiotemporal reasoning for CLEVRER and CLEVRER-Humans datasets ([link](#)).

4. **QA-RAG: Leveraging Question and Answer-Based Retrieved Chunk Re-Formatting for Improving Response Quality During Retrieval-augmented Generation:** Integrating QA-formatted databases to enhance context representation and response quality, supported by experimental evidence on benchmark RAG datasets, demonstrates improved performance compared to state-of-the-art text retrieval methods ([link](#)).

★ Senior Engineer-Big Data and Data Science

August 2019 – July 2022

Mobitel, Sri Lanka

Colombo, Sri Lanka

Project: Big Data and Data Science Project: Developing AI-driven solutions for customer churn prediction, broadband tower optimization, customer segmentation, seasonal recommendations, fraud detection, conversational AI, mAdvertising, M2M classification, smartphone recommendation, and predictive analytics for international calling.

★ Software Engineer-Artificial Intelligence

May 2018 – August 2019

SimCentric Technologies, Sri Lanka

Colombo, Sri Lanka

Project: "SmartTrainer"—An Adaptive Framework to Prevent Real-Time Injuries: Smart wearable and Android-based application for human activity recognition and alerting to prevent real-time injuries ([link](#)).

★ Software Engineer Intern

July 2017 – December 2017

WSO2

Colombo, Sri Lanka

Project: XACML Development Tool: Develop a tool compliant with XACML 3.0 specifications and provides a UI-based approach for creating and evaluating fine-grained access control policies ([link](#)).

PUBLICATIONS

Selected Journal Publications

- **Shyalika, C.**, Wickramarachchi, R., & Sheth, A. (2024). A Comprehensive Survey on Rare Event Prediction. [ACM Computing Surveys] [\[paper\]](#)
- **Shyalika, C.**, Roy, K., Prasad, R., Kalach, F.E., Zi, Y., Mittal, P., Narayanan, V., Harik, R. and Sheth, A., 2024. RI2AP: Robust and Interpretable 2D Anomaly Prediction in Assembly Pipelines. Sensors, 24(10), p.3244 [\[paper\]](#) [Won the Best Poster Award at DiscoverUSC 2024].
- Roy, K., Zi, Y., **Shyalika, C.**, Prasad, R., Murali, S., Palit, V. and Sheth, A., 2024. QA-RAG: Leveraging Question and Answer-based Retrieved Chunk Re-Formatting for Improving Response Quality During Retrieval-augmented Generation. MAKE Journal [\[paper\]](#) [Under Review]
- **Shyalika, C.**, Wickramarachchi, R., El Kalach, F., Harik, R., & Sheth, A. (2024). Evaluating the Role of Data Enrichment Approaches Towards Rare Event Analysis in Manufacturing. Sensors, 24(15), 5009 [\[paper\]](#).

Selected Conference Publications

- **Shyalika, C.**, Prasad, R., Zand, R., El Kalach, F., Venkataramanan, R., Harik, R., Sheth, A. NS-HyMAP: Neurosymbolic Multimodal Hybrid Fusion for Robust and Interpretable Anomaly Prediction in Assembly Pipelines. [Submitted to AAAI-IAAI 2025]
- **Shyalika, C.**, Prasad, R., Wickramarachchi, R., & Sheth, A. Towards Rare Event and Anomaly Prediction in Manufacturing: Bridging Methodological Gaps in Industrial Applications. WiML Workshop at NeurIPS 2024.
- Prasad, R., **Shyalika, C.**, R., Venkataramanan, R., Sheth, A., Pic2Prep: A Multimodal Conversational Agent for Cooking Assistance, AAAI Demo 2025.
- Prasad, R.*, **Shyalika, C.***, Zand, R., El Kalach, F., Venkataramanan, R., Harik, R., Sheth, A. AssemAI: Interpretable Image-Based Anomaly Detection for Manufacturing Pipelines. arXiv preprint arXiv:2408.02181, ICMLA 2024, [\[paper\]](#)
- Kaushik, R., Oltramari, A., **Shyalika, C.**, Zi, Y., Narayan, V., Sheth, A. Causal Event Graph-Guided Language-based Spatiotemporal Question Answering. AAAI-Make 2024. [\[paper\]](#)

Please see my [Google Scholar](#) profile for the rest of the publications.

TUTORIALS

- **Chathurangi Shyalika**, Ruwan Wickramarachchi, Revathy Venkataramanan, Dhaval Patel, Amit Sheth. **Developing explainable multimodal AI models with hands-on lab on the life-cycle of rare event prediction in manufacturing**, AAAI 2025, February 2025, <https://aiisc.ai/aaai25/AAAI-Lab-Rare-Event-Prediction/>

TECHNICAL SKILLS

- Languages -Python, Java SE, Java EE, React, C, C#, Node JS, PHP, ASP.NET
- Big Data Frameworks- Hadoop, Spark, Hive, MapReduce
- ETL Tools- Informatica, PowerCenter
- Ontology Development Frameworks- Protege
- Database - MYSQL, MSSQL
- Frameworks - AWS, Hibernate, Spring, Struts2, Bootstrap, MVC
- ML Frameworks - Tensorflow, Keras, PyTorch
- UI - React, HTML, CSS, Angular, Ionic
- Build Systems -SBT, Maven

ACHIEVEMENTS AND AWARDS

- Best Poster Award at DiscoverUSC 2024 Conference: Research poster on “RI2AP: Robust and Interpretable 2D Anomaly Prediction in Assembly Pipelines.” [\(link\)](#)
- Gold Medal for the Best Overall Performance in B.Sc. (Hons) Information Technology, KDU, Sri Lanka [2018]
- Vice Chancellor’s List - KDU, Sri Lanka [2014- 2017]
- Hackathons: KDU_FOC[2016] 2nd place, HackX (2016), BeThemChallenge (2017), SimCtHackNight(2019)