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

★ Research Intern (Supervisor: Dr. Rishabh Uppal) — Nov 2025 – April 2026

SpectorAI — *San Jose, CA*

Design, develop, and deploy high-quality industrial AI agents that align with the company's vision of advancing agentic AI technologies.

★ Neuro-symbolic AI Research Intern (Supervisor: Dr. Cory Henson) — May 2025 – Sept 2025

Robert Bosch LLC — *Pittsburgh, PA*

Developed 'CausalPulse', an intelligent multi-agent-based solution for anomaly detection, root cause analysis, and causal reasoning in manufacturing as part of Bosch's next-generation AI solutions. (Demo)

★ 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 the "SmartPilot", an industrial co-pilot system for intelligent manufacturing.*

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 (link).*

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).*

★ Senior Engineer-Big Data and Data Science — August 2019 – July 2022

Mobitel, Sri Lanka — *Colombo, Sri Lanka*

Project: Big Data and Data Science Project: *Developed 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: *Developed a tool compliant with XACML 3.0 specifications and provide a UI-based approach for creating and evaluating fine-grained access control policies (link).*

PUBLICATIONS [*Complete List* [Google Scholar](#)].

Selected Journal Publications

- A Comprehensive Survey on Rare Event Prediction. [ACM Computing Surveys] [[paper]](#)
- RI2AP: Robust and Interpretable 2D Anomaly Prediction in Assembly Pipelines [Sensors] [[paper]](#)
- Evaluating the Role of Data Enrichment Approaches Towards Rare Event Analysis in Manufacturing. [Sensors][[paper]](#).

Selected Conference Publications

- CausalTrace: A Neurosymbolic Causal Analysis Agent for Smart Manufacturing [Accepted at AAAI-IAAI 2026]
- DETONATE: A Benchmark for Text-to-Image Alignment and Kernelized Direct Preference Optimization [Accepted at AAAI 2026]
- CausalPulse: Agentic Copilot for Root Cause Analysis in Smart Manufacturing [Accepted at AAAI-Demo 2026]
- AssetOpsBench-Live: Privacy-Aware Online Evaluation of Multi-Agent Performance in Industrial Operations [Accepted at AAAI-Demo 2026]
- In-Situ Eval: A Modular Framework for Custom and Real-Time RAG Benchmarking [Accepted at AAAI-Demo 2026]
- NSF-MAP: Neurosymbolic Multimodal Hybrid Fusion for Robust and Interpretable Anomaly Prediction in Assembly Pipelines. [IJCAI 2025][[paper]](#)
- SmartPilot: Agent-Based CoPilot for Intelligent Manufacturing. [IEEE CAI 2025][[paper]](#)
- SmartPilot: Agent-Based CoPilot for Intelligent Manufacturing. [AAMAS 2025 [[paper]](#)
- Time Series Foundational Models: Their Role in Anomaly Detection and Prediction. [AAAI 2025][[paper]](#)
- Towards Rare Event and Anomaly Prediction in Manufacturing: Bridging Methodological Gaps in Industrial Applications. [NeurIPS 2024] [[paper]](#)
- Pic2Prep: A Multimodal Conversational Agent for Cooking Assistance, [AAAI Demo 2025] [[paper]](#)
- AssemAI: Interpretable Image-Based Anomaly Detection for Manufacturing Pipelines.[ICMLA 2024] [[paper]](#)
- Causal Event Graph-Guided Language-based Spatiotemporal Question Answering. [AAAI-Make 2024] [[paper]](#)

TUTORIALS AND ENGAGEMENTS

- AAAI 2026, **From Inception to Productization: Hands-on Lab for the Lifecycle of Multimodal Agentic AI in Industry 4.0,** https://ibm.github.io/AssetOpsBench/aaai_website/ [Collaboration with IBM]
- AAAI 2025, **Developing explainable multimodal AI models with hands-on lab on the life-cycle of rare event prediction in manufacturing**, https://aiisc.ai/aaai25/AAAI-Lab-Rare-Event-Prediction/
- AAMAS 2025, **Multiagent CoPilot in Industrial AI Applications**, https://aiisc.ai/tutorials/AAMAS_Tutorial_Multiagent_CoPilot_in_Industrial_AI_Applications/
- **CODS 2025 Agentic AI Challenge**, Co-organizer with IBM, https://ikdd.acm.org/cods-2025/data-challenge.php
- **AssetOpsBench-Live:** https://www.codabench.org/competitions/10206/ [Collaboration with IBM]

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, Neo4J
Database - MYSQL, MSSQL   **ML Framework**s - Tensorflow, Keras, PyTorch

ACHIEVEMENTS AND AWARDS

- Best Paper Award at IEEE-CAI 2025: Paper: "SmartPilot: Agent-Based CoPilot for Intelligent Manufacturing" ([link](#))
- 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] and Vice Chancellor's List - KDU, Sri Lanka [2014- 2017]
- Hackathons: KDU_FOC[2016] 2nd place, HackX (2016), BeThemChallenge (2017), SimCtHackNight(2019)