

Ashrith Reddy Thukkaraju

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SUMMARY

Software Engineer specializing in **Generative AI**, **LLMs**, **agentic AI systems**, and **distributed systems**. Led the development of **Turbo**, powering contextual prompt recommendations across **Bing**, **Edge Search**, and **Microsoft 365 Copilot** at production scale.

Architected AI platforms using **Azure**, **AWS**, **Retrieval-Augmented Generation (RAG)**, and cloud-native infrastructure to improve **answer quality**, **latency**, and **scalability**. Published research in **AI** and **cybersecurity**, combining strong fundamentals in **machine learning**, algorithms, and software engineering to build intelligent systems with real-world impact.

EDUCATION

- Virginia Tech** Blacksburg, VA
• *Masters in Computer Science and Applications; GPA: 3.77* Jan 2022 - Dec 2023
Thesis: Interdependent Mission Impact Assessment of an IoT System with Hypergame-Theoretic Attack-Defense Behavior Modeling
- Indian Institute Of Information Technology Allahabad** Allahabad, India
• *B.Tech & M.Tech in Information Technology; CGPA: 8.93 (B.Tech: 8.67 & M.Tech: 9.70)* Sep 2016 - Jul 2021
Thesis: Multi Agent Framework to Detect in Progress False Data Injection Attacks for Smart Grid

SKILLS

- **Languages:** Python, C/C++, Java, C#, Rust, PHP, JavaScript, Typescript, Bash scripting
- **Tools and Frameworks:** Git, Docker, Jenkins, Tensorflow, Keras, PyTorch, Heroku, MATLAB, Pandas, Numpy
- **Cloud:** Kubernetes, AWS CDK (Cloud Formation, Lambda, API Gateway, Route 53, S3, SQS, DynamoDB, DocumentDB)
- **Web/App Development and Database:** Django, Flask, React.js, Node.js, Angular.js, Vue.js, D3.js, Express.js, ASP.NET, Playwright, Selenium, REST API, HTML, CSS, MySQL, SQLite, MongoDB, Postgres, Flutter, Android Studio
- **Cyber Security:** BurpSuite, Metasploit, Wireshark, GDB, Reverse Engineering, Cryptography, Steganography, Web Exploitation, Penetration Testing, Network Security
- **Version Control and CI/CD:** Jenkins, GitOps, Git, Bitbucket, Azure Devops

EXPERIENCE

- Microsoft** Redmond, WA
Software Engineer II Sept 2025 - Present
 - **M365 Copilot Growth:**
 - Built and scaled **Turbo**, a contextual prompt recommendation platform powering **Bing**, **Edge Search**, and **Microsoft 365 Copilot**, driving **tens of thousands of daily user referrals** into Copilot. Developed **agentic prompt generation and evaluation pipelines** with Bing Grounding, automated quality scoring, multilingual support (24 languages), and trending news-aware prompt enrichment.
 - Engineered **large-scale content and metadata pipelines** using **Azure Synapse** and implemented end-to-end contract testing between Python data producers and C# consumers, preventing schema-breaking changes and improving platform reliability.
 - Built **workflow mining and recommendation systems** that analyze Microsoft 365 activity signals to identify recurring multi-step workflows and surface contextual automation opportunities across Copilot experiences.
 - Developed a **real-time intent classification and inline recommendation system** serving **millions of daily Copilot conversations**, identifying opportunities for users to leverage custom AI agents and driving **Agent Builder discovery and agent creation** through contextual recommendations.
- Ellucian** Reston, VA
Software Engineer I & II Jan 2024 - Aug 2025
 - **Ellucian IQ GenAI:**
 - **Architected and developed** a scalable, production-grade **Agentic Generative AI platform** using AWS Serverless (Lambda, DynamoDB) and AWS Bedrock, **laying the foundation for company-wide AI integration**.
 - **Implemented Retrieval-Augmented Generation (RAG)** using AWS OpenSearch vector search, **improving answer relevance by 60%** through contextual grounding and semantic enrichments.
 - **Reduced perceived latency from 10s to under 1s** through asynchronous processing with SNS streaming and WebSockets, significantly **enhancing user experience**.
 - **Delivered an AI-powered rich text editor in React.js**, using the GenAI platform for context-aware content generation, and personalized AI interactions with **support for rich text formats** like HTML and Quill Delta.

- **Employed Test-Driven Development (TDD)** and authored automation tests using **Playwright**, ensuring **reliable, high-performance backend services and UI**, which reduced bugs and improved software quality.

Software Engineer Intern

May 2023 - Aug 2023

- **Ellucian Elevate:**

- Built a robust course selection shopping cart service using AWS Lambda and DynamoDB with a React.js frontend, **scaling to handle over 10,000 peak concurrent users (PCU) during registration periods**.
- Developed WebSocket APIs and SQS queues for real-time pricing and availability updates via DynamoDB streams, **eliminating registration conflicts and improving user experience**.

Trustworthy Cyberspace Lab (tClab), Virginia Tech

Blacksburg, VA

Graduate Research Assistant

Jul 2022 – May 2023

- **“DALNIM: Dependency-based Assessment of Litigious Network events Impacting the Mission”:** Worked with Dr. Jin-Hee Cho on an Interdependent Mission Impact Assessment (iMIA) framework using Bayesian reasoning to infer the performance and game-theoretic enemy behavior modelling to simulate the attack-defense interactions with the mission system. The project was funded by the Agency for Defense Development (ADD), South Korea

Philips

Bangalore, India

Software Development Engineer

Aug 2021 - Jan 2022

- **Acute Care Patient Monitoring Platform:**

- Migrated a monolithic patient-monitoring application to a **microservices architecture** using **Java Spring Boot, Spring Cloud, and Hibernate**, improving scalability and long-term maintainability.
- Built a **real-time analytics platform** using **Kafka Streams and Elasticsearch**, paired with comprehensive **JUnit/Mockito test suites** integrated into **Jenkins CI/CD** (Snyk, SonarQube), achieving **35% faster clinical response times, 50% lower regression testing time, and 90% test coverage**.

Philips

Bangalore, India

Research Intern

Feb 2021 - Jul 2021

- **Philips AI Research:**

- Developed a novel approach using **GANs** for **Non-Uniform Rotational Distortion (NURD)** correction in the intravascular ultrasound images using **PyTorch**.
- Received the **Philips spot award** for my contribution.

AWARDS AND ACHIEVEMENTS

- **Best MS Research Award**, Department of Computer Science, Virginia Tech, 2024
- Selected for **CERN openlab** Summer student programme 2020 out of 1840 applications
- **All India Rank 1343** (98.62 percentile) in Graduate Aptitude Test in Engineering Computer Science 2020
- Received the **Merit Incentive Award** for securing 2nd rank in my junior year at IIIT Allahabad
- Secured the **5th place** in the **Cyber Security Awareness Week (CSAW) CTF 2018 World Finals**

PUBLICATIONS

- A. Sinha, **A.R. Thukkaraju**, O.P. Vyas, “A Multi Agent Framework to Detect in Progress False Data Injection Attacks for Smart Grid,” *Advanced Network Technologies and Intelligent Computing (ANTIC’2021)*, Communications in Computer and Information Science, vol 1534. Springer, Feb. 2022: **[Published]**
- **A. R. Thukkaraju**, H. J. Yoon, S. Matsumoto, J. F. Ferrari, D. Lee, M. K. Ahn, P. Costa and J.H. Cho, “Interdependent Mission Impact Assessment of an IoT System with Hypergame-Theoretic Attack-Defense Behavior Modeling,” *The 31st International Symposium on the Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS’2023)*, Oct. 2023. (AR: 30%): **[Published]**
- S. Matsumoto, J. F. Ferrari, H. J. Yoon, **A. R. Thukkaraju**, D. Lee, M. K. Ahn, J.H. Cho, and P. Costa, “Software-Friendly Subjective Bayesian Networks: Reasoning within a Software-Centric Mission Impact Assessment Framework,” *IEEE FUSION 2023*: **[Published]**
- **A. R. Thukkaraju**, H. J. Yoon, S. Matsumoto, J. F. Ferrari, P. Costa, D. Lee, M. K. Ahn, and J.H. Cho, “CYBER-MIRA: Cyber Mission Impact Resilience Assessment Framework for Tactical Mission Systems,” *Autonomous Cyber Resilience* (Editors: Dr. Kamhoua, et al.), IEEE Press (under press, 2024): **[Accepted]**
- H. J. Yoon, **A. R. Thukkaraju**, S. Matsumoto, J. F. Ferrari, D. Lee, M. K. Ahn, P. Costa and J.H. Cho, “iMIA: Interdependence-based Mission Impact Assessment for Unmanned Aerial Vehicle-Assisted Vehicular Networks,” *IEEE/IFIP Network Operations and Management Symposium (NOMS)*, May 2024. (AR 20%): **[Published]**
- H. J. Yoon, **A. R. Thukkaraju**, S. Matsumoto, J. F. Ferrari, P. Costa, D. Lee, M.K. Ahn, and J.H. Cho, “Subjective Bayesian Network-based Interdependent Mission Impact Assessment with Game-Theoretic Attack-Defense Interactions,” submitted to the *IEEE IoT Journal*, Feb. 2024 (2022 JCR IF 10.6): **[Published]**
- H.J. Yoon, **A.R. Thukkaraju**, J.-H. Cho, S. Matsumoto, J. Ferrari, P. Costa, D. Lee, M.K. Ahn, “iMIA: Assessing Mission Risk in Uncertain, Interdependent AI Systems,” *ACM Transactions on Intelligent Systems and Technology (TIST)*, vol. 17, no. 2, Article 41, Apr. 2026.: **[Published]**
- M. I. Emon, B. Das, **A. R. Thukkaraju**, L. Zhang, “DeePSP-GIN: identification and classification of phage structural proteins using predicted protein structure, pretrained protein language model, and graph isomorphism network,” submitted to the *Proceedings of the 15th ACM International Conference on Bioinformatics, Computational Biology and Health Informatics*, Nov. 2024: **[Published]**