Jason Cusati

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Professional Summary

- Computer Science PhD candidate and applied researcher who bridges large-scale software engineering with empirical AI/ML research. Two decades architecting Azure data platforms and SaaS systems now grounds research that is reproducible, deployable, and measured against real workloads, spanning LLM-assisted software engineering, security classification, and mechanistic interpretability. Published at ICSE 2026, with hands-on depth in ML pipelines, evaluation design, and the engineering rigor that industry R&D depends on.

Professional Experience

April 2026 – May 2026 • **Virginia Tech — Blacksburg, VA** *Graduate Research Assistant – ARCADE Lab (PI: Dr. Afsari)*

- Designed and built cloud infrastructure for the **Multi Robot System (MRS)** for Remote Construction Progress Monitoring, including network architecture, mesh VPN, REST API, and Web UI.
- Hardened the platform with 2FA on the Web UI, secured video streaming, and instrumented audit logging across services.

2024–2025 • **Yoh, A Day & Zimmerman Company — Remote, SC** *ADF Solution Architect – Core Specialty Insurance*

- Led a small SDE team delivering V1 of an **Insurance Data Ingestion Platform** for a specialty carrier: extended Microsoft's Common Data Model into a domain schema for the carrier's data types; reduced time-to-ingest by **50%**.
- Used **Claude as engineering partner** to scaffold pipeline code and generate ADF source-to-target mappings; hand-implemented the more complex transformation and validation logic.

2021–2023 • **Duck Creek Technologies — Columbia, SC** *Senior Technical Architect – OnDemand SaaS Operations*

- Developed Python algorithm to predict Sev 1 incidents from logs.
- Coordinated in PEN testing and consulted on risk mitigation options for pre go-live security assessment.

• Earlier employment history includes tenure as Principal Engineer – Sustained Engineering, Blackbaud; Solution Architect – Enterprise Professional Services, Blackbaud; Software Engineering Consultant, DJJayNet Consulting.

Education

2027 (exp.) • **Ph.D., Computer Science (SE with AI/ML/MI)**, Virginia Tech, Blacksburg, VA
2026 (exp.) • **M.S., Engineering**, Virginia Tech, Blacksburg, VA
• **B.S., Economics**, Virginia Tech, Blacksburg, VA

Research Publications

Journal Articles

1. **J. Cusati** and C.-S. Chuang, "Virginia tech transportation safety index (vttsi)," *arXiv preprint arXiv:2606.21154*, 2026.
   https://arxiv.org/abs/2606.21154.
2. C. Brown and **J. Cusati**, "Exploring the evidence-based se beliefs of generative ai tools," *arXiv preprint arXiv:2407.13900*, 2025.
   https://arxiv.org/abs/2407.13900.

Conference Proceedings

1. **J. Cusati** and C. Brown, "From papers to progress: Rethinking knowledge accumulation in software engineering," in *Proceedings of the IEEE/ACM 48th International Conference on Software Engineering (ICSE 2026)*, Accepted; to appear, 2026.
   https://doi.org/10.1145/3793657.3793888.

Selected Projects & Research

- **Agentic Knowledge Graphs for Research Progression** — Orchestrated agent system (Navigator / Extractor / Continuation) building an **LLM-curated research KG** — problems, assumptions, constraints, evidence spans, datasets, metrics — as the provenance substrate for downstream research-assistant responses. Denario agent framework; Python / FastAPI; staging deployed on Cloud Run. Approaching experimental comparison against LLM-generated KGs.
- **VTTSI — LLM-Adaptive Intersection Safety Scoring** — Distributed rewrite of a CS6604 traffic-safety application: provenance-tracked evidence ingestion (NWS weather, VDOT/511 cameras) → deterministic RT-SI + MCDM baselines → **Claude Opus** adaptive adjustment with grounding guardrails and deterministic fallback → honest-null ablation eval (Spearman / Pearson). Python ports-and-adapters microservices; live-Claude integration wired; ~97% offline coverage.
- **Construction-AI: LLM- and KG-backed Material Takeoff** — Web app parsing architectural drawings (DWG / DXF / PDF), extracting geometry via PyTorch / OpenCV / EasyOCR, producing JSON material takeoffs with OR-Tools cut-list optimization backed by a Neo4j **LLM-curated KG**. Phase 1 MVP deployed on Cloud Run; Phase 5 in progress adds a **VVUQ** (verification / validation / uncertainty quantification) layer for engineering-simulation reproducibility.

Technical Skills

Platforms

- Windows; Linux; IIS; Apache; Tomcat

AI/ML

- scikit-learn; TensorFlow; LLM; RNN; CNN; LSTM; SVM; Random Forest; Feature Engineering

Tools

- Azure; Azure API; AWS; Docker; PostgreSQL; SQL Server; FastAPI; Streamlit; VS Code; PyCharm; Wireshark

Languages

- Python; C#; Java; JavaScript; Bash; PowerShell; T-SQL; C++; Node.js