

ANEESH KRISHNA

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EDUCATION

University at Buffalo, The State University of New York

PhD in Computational and Data Enabled Sciences

Advisor: Dr. Ashlee Ford N. Versypt

Jan 2026 – Present

Buffalo, NY

University at Buffalo, The State University of New York

Master of Science, Majors: Data Science (GPA: 3.63/4)

Aug 2023 – Dec 2024

Buffalo, NY

Visvesvaraya Technological University

Bachelor of Engineering in Computer Science

Aug 2016 – Aug 2020

India

PUBLICATIONS

- Aneesh Krishna, Rudra Prasad Bakshi, Mangolika Bhattacharya, and Shambhu Upadhyaya. (2026). "SCARLeT: System-Call Analysis for Robust AI Learning-based Detection of Advanced Persistent Threats." Preprint. – ([link](#))
- Aneesh Krishna and Moksh Gupta. (2025). "Next-Gen 3rd Party Cybersecurity Risk Management Practices: AI Enablement." In Advancing IT Audits Through Integrative Approaches and Emerging Technologies, Eds: Gupta et al. (ISBN: 9798337330785), IGI Global, Hershey, Pennsylvania. – ([link](#))

CONFERENCE PRESENTATIONS

- Aneesh Krishna, Temitope Benson, Khansa Khanam Umer Sultan, Ashlee N. Ford Versypt. "Efficient Parameter Estimation in Agent-Based Models of Collective Cell Invasion via Gaussian Process Surrogates and Bayesian Optimization." Poster, **FOPAM 2026 (Foundations of Process/Product Analytics and Machine Learning)**, Decatur, GA, July 2026.
- Aneesh Krishna, Temitope Benson, Khansa Khanam Umer Sultan, Ashlee N. Ford Versypt. "Efficient Parameter Estimation in Agent-Based Models of Collective Cell Invasion via Gaussian Process Surrogates and Bayesian Optimization." Poster, **SIAM Conference on the Life Sciences (LS26)**, Cleveland, OH, July 2026. – ([link](#))
- Aneesh Krishna and Moksh Gupta. (2025). "AI-Driven Innovations in Third-Party Risk Management." In Proceedings of the 20th Annual Symposium on Information Assurance (Academic track of the **2025 NYS Cybersecurity Conference**), Pages 147-161, June 3-4, 2025, Albany, NY. – ([link](#))

TECHNICAL SKILLS

- **Languages:** Python, SQL, R.
- **ML & Statistics:** scikit-learn, PyTorch, Gaussian processes, Bayesian optimization, NLP
- **Scientific Computing:** CompuCell3D, ImageJ, NumPy/SciPy, agent-based modeling
- **Tools:** Git, Linux/HPC, Bitbucket

RESEARCH EXPERIENCE

Research Assistant | Supervisor: **Dr. Ashlee N. Ford Versypt**

Aug 2025 – Present

University at Buffalo

Buffalo, NY

- Developed a **constrained Bayesian optimization framework for black-box parameter estimation in stochastic agent-based models (ABMs)**, addressing a gap in CompuCell3D and other ABM platforms, which offer no native calibration tools.
- Implemented the full BO pipeline in Python: Latin hypercube + fixed-grid initial design, multi-output Gaussian process surrogates (RBF kernel), and a **feasibility-aware acquisition function** combining Expected Improvement with probability of feasibility.
- Engineered quantitative calibration objectives from simulation and microscopy data: **max invasion distance** and **cluster circularity** (ImageJ), formulated as weighted RMSE and circularity error.
- Calibrated a CompuCell3D model of **collective cancer cell invasion** against experimental imaging data, recovering parameter sets (cell-cell adhesion, chemoattractant secretion rate, chemotactic strength) that reproduce both invasive (network) and non-invasive (spheroid) phenotypes in **far fewer simulator evaluations than grid or Monte Carlo search**.

Research Assistant | Supervisors: **Dr. Shambhu Upadhyaya** and **Dr. Rudraprasad Bakshi**

Aug 2024 – July 2025

University at Buffalo

Buffalo, NY

- Developed a **process-lineage labeling method** for Windows system-call (Procmon) telemetry, deriving ground truth from each attack's reconstructed process tree and labeling events by causal origin (PID / parent-PID / time) rather than surface text, recovering living-off-the-land activity executed through trusted binaries such as powershell and cmd.
- Engineered the labeler for robustness on real host telemetry: a **time-windowed process-instance model** resolving PID reuse, parent attribution bound to the process alive at each child's spawn, and command-line anchoring for payloads predating capture; diagnosed and corrected two attribution defects, then validated all 20 process trees via an automated cross-contamination audit.
- Constructed a leakage-free dataset of **4.4M events across 20 APT and ransomware families** — harness-separated, fingerprint-scrubbed, with instance- and family-level metadata, and benchmarked TF-IDF classifiers (logistic regression, linear SVM, naive Bayes, random forest) under **leave-one-family-out evaluation** on unseen families.

PROFESSIONAL EXPERIENCE

Machine Learning Engineer Intern

Advance2000

Sep 2024 – Dec 2024

Buffalo, NY

- Built and deployed a **retrieval-augmented (RAG) helpdesk assistant** that surfaces resolutions from historical tickets to draft responses for incoming ones: Hugging Face embeddings, a Pinecone vector store, and Llama 3.1 served through Groq for low-latency inference.
- Improved retrieval and answer quality through **prompt engineering** (chain-of-thought, few-shot exemplars) and metadata filtering at the retrieval layer, evaluated against the support team's historical ticket resolutions.

Senior Systems Engineer

Oct 2020 – Apr 2023

Infosys Ltd

Remote, India

- Built Python ETL pipelines, validation workflows, and SQL data-quality monitoring for an enterprise document migration to Azure cloud storage, covering 10M+ files across 90+ sites.

PROFESSIONAL ORGANIZATIONS

- Society for Industrial and Applied Mathematics (SIAM)
- American Institute of Chemical Engineers (AIChE)