

Abhijeet Solanki

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🌐 [chiefaj23.github.io/](https://github.com/ChiefAj23)
<https://github.com/ChiefAj23> (GitHub)

Education

- 2023 - 2025 **Tennessee Technological University, MS in Computer Engineering (AI)**
Advisor - Dr. Syed Rafay Hasan
- 2017 - 2020 **Tennessee Technological University, BSc in Electrical and Computer Engineering**

Experience

- Sep 2025 – **Senior Software Engineer, Arctera**
Present
 - Built GenAI-powered internal troubleshooting assistant using Python and Azure OpenAI, enabling SREs to auto-diagnose failures and reducing mean time to root cause (MTTR) by 45%.
 - Integrated natural-language GenAI interface over ElasticSearch and Grafana APIs to query logs, improving incident response velocity by 35%.
- Nov 2023 – **AI Researcher, Tennessee Technological University**
Aug 2025
 - Investigated adversarial machine learning vulnerabilities in Ouster LIDAR and camera sensor fusion, engineering novel defenses that increased attack detection accuracy from 72% to 93%.
 - Developed hardware-efficient adversarial defenses optimized for resource-constrained edge environments, achieving a 21% performance improvement over existing baseline models.
- Sep 2021 – **Senior Software Engineer, Deloitte**
Nov 2023
 - Built a distributed Python and Apache Spark ETL pipeline that ingested 10M+ PPP loans, validated schemas, and loaded data to CortexAI.
 - Deployed containerized security microservices (AKS/Docker) and engineered high-performance ASP.NET backend systems, resolving 50+ production bugs.
- Apr 2021 – **Software Engineer, Protech Solutions**
Sep 2021
 - Integrated a secure payment API into a high-traffic C#/ASP.NET system, implementing tokenized security.
 - Optimized backend data flow to reduce transaction processing latency by over 50%.
- Jan 2019 – **Undergrad Student Researcher, Tennessee Technological University**
May 2020
 - Architected and deployed a secure, decentralized platform for electronic health records utilizing Docker containerization and an IPFS cluster.
 - Engineered core backend functionalities with cryptography-based policy controls, directly contributing to a co-authored publication at IEEE CBMS 2020.

Publications

- 2026 **Abhijeet Solanki**, Faiq Khalid, Drew Phelps, Syed Rafay Hasan, Terry Nan Guo, and Uvais Qidwai. Raid: Real-time xai-guided adversarial attacks for edge-deployed neural networks. *TechRxiv*.
- 2026 Tahmid Hasan Sakib, **Abhijeet Solanki**, Wesam Al Amiri, Syed Rafay Hasan, Syed Ali Asad Rizvi, and Terry N Guo. Vulnerability assessment of adversarial image attacks in a miniaturized autonomous vehicle testbed without relying on way-point information. *TechRxiv*.
- 2025 **Abhijeet Solanki**, Ryan Taylor Thornton, Syed Rafay Hasan, and Uvais Qidwai. Gnapping on the job: Attacking and defending facial detection on edge devices. In *SoutheastCon 2025*, pages 918–923.
- 2025 **Abhijeet Solanki**, Parth Patel, Faiq Khalid, Syed Rafay Hasan, and Uvais Qidwai. Input-slice attacks and defense against pseudo-model-parallelism-based collaborative dnn. *TechRxiv*.
- 2025 **Abhijeet Solanki**, Luke Beirne, Syed Rafay Hasan, and Wesam Al Amiri. Real: Machine learning detection of reflective attacks against lidarometry. In *SoutheastCon 2025*, pages 1309–1313.

- 2025 **Abhijeet Solanki**, Wesam Al Amiri, Marim Mahmoud, Blaine Swieder, Syed Rafay Hasan, and Terry N. Guo. Survey of navigational perception sensors' security in autonomous vehicles. *IEEE Access*, 13:104937–104965.
- 2025 **Abhijeet Solanki**, Wesam Al Amiri, Syed Rafay Hasan, and Terry N Guo. Blinded by the beam: A unified real-time defense against laser-based attacks on navigational perception of autonomous vehicles. *TechRxiv*.
- 2025 Chernchao Tai, W. Al Amiri, **A. Solanki**, D. A. Talbert, T. N. Guo, and S. R. Hasan. Towards trustworthy ai: Analyzing model uncertainty through monte carlo dropout and noise injection. In *Proc. of The International FLAIRS Conference*.
- 2025 Chern Chao Tai, **Abhijeet Solanki**, Wesam Al Amiri, Douglas A. Talbert, Syed Rafay Hasan, and Terry N. Guo. Towards trustworthy ai: Real-time uncertainty monitoring and adversarial detection. *TechRxiv*.
- 2025 Tahmid Hasan Sakib, Wesam Al Amiri, **Abhijeet Solanki**, Syed Rafay Hasan, Terry N. Guo, and Syed Ali Asad Rizvi. Investigating adversarial image attacks in a sensor fusion framework using a scaled autonomous vehicle testbed. Available from researchgate.net.
- 2025 Thomas D. Robertson, Wesam Al Amiri, **Abhijeet Solanki**, Syed Rafay Hasan, and Terry N. Guo. Realistic gps spoofing via customized carla gps navigation and controller systems. In *2025 IEEE 68th International Midwest Symposium on Circuits and Systems (MWSCAS)*, pages 720–724.
- 2025 Yago Romano Martinez, Carter Brady, **Abhijeet Solanki**, Wesam Al Amiri, Syed Rafay Hasan, and Terry N. Guo. Mitigation of camouflaged adversarial attacks in autonomous vehicles—a case study using carla simulator. In *2025 IEEE International Symposium on Circuits and Systems (ISCAS)*, pages 1–5.
- 2025 Marim Elhanafy, Srivaths Ravva, **Abhijeet Solanki**, and Syed Rafay Hasan. Towards machine learning based fingerprinting of ultrasonic sensors. In *SoutheastCon 2025*, pages 1332–1333.
- 2024 **Abhijeet Solanki**, Syed Rafay Hasan, and Terry N Guo. Investigate the effects of laser attack on intelligence of the av perception. In *2024 IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, pages 779–782.
- 2020 Denis Ulybyshev, Christian Bare, Kristen Bellisario, Vadim Kholodilo, Bradley Northern, **Abhijeet Solanki**, and Timothy O'Donnell. Protecting electronic health records in transit and at rest. In *2020 IEEE 33rd International Symposium on Computer-Based Medical Systems (CBMS)*, pages 449–452.

--- Honors and Awards

- Active **Member (Top 10%)**, *IEEE-ETA Kappa NU*
- Active **Member (Top 20%)**, *Tau Beta Pi*
- 2020 **1st Place Award (Graduate Presentations)**, *ACM Mid-Southeast Chapter Conference*
- 2024 **1st Place Award**, *Research Enquiry Day, Tennessee Tech*

--- Service

- 2026 **Reviewer**, *IEEE Dallas Circuits and Systems Conference (DCAS)*
- Spring 2019 **Teaching Assistant**, *CS1310: Data Structures and Algorithms*

--- Talks

- Mar 2025 **Conference Presentation**, *IEEE SoutheastCon 2025*, Charlotte, NC
Presented: "GNAPing On the Job: Attacking and Defending Facial Detection on Edge Devices"
- Mar 2025 **Conference Presentation**, *IEEE SoutheastCon 2025*, Charlotte, NC
Presented: "ReAL: Machine Learning Detection of Reflective Attacks against Lidarometry"
- Oct 2020 **Research Talk**, *ACM Mid-Southeast Chapter Conference*, Virtual
Presented: "Data Protection in Transit and at Rest" (1st Place Graduate Presentation Award)

Apr 2020 **Award Presentation**, *Research Enquiry Day*, Tennessee Tech
Topic: Optimizing Airfare Forecasting via Machine Learning (1st Place Award)

Other Research Projects

- 2024 Academic Text Summarizer: Abstractive Summarization using DistilBART - [code]
- 2024 Movie Recommender System: Content-Based Filtering via TMDB API - [code]
- 2020 Optimizing Airfare Forecasting: A Comprehensive Analysis of ML Techniques - [Research Enquiry Day #1 Award]
- 2019 Electronic Health Records on IPFS Cluster with Docker Containerization - [code]
- 2018 BlueStacks: ML-based Display Customization and SVG Automation Tool

Technical Skills

- Programming Python, C++, C#, Golang, MATLAB, CAD, Bash, SQL
- ML & AI PyTorch, TensorFlow, LangChain, Azure OpenAI, RAG, Flower (Federated Learning)
- Optimization ONNX Runtime, TensorRT, ExecTorch, TVM, Quantization (PTQ/QAT), Model Pruning
- Robotics & Edge ROS, CARLA, Ouster LIDAR, NVIDIA Jetson (Orin & Nano), ARM64 Optimization
- Cloud & Data Docker, Kubernetes (AKS/EKS), AWS, Azure, Terraform, Apache Spark, Airflow, Vector DBs