REUBEN SAMSON RAJ

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CAREER SUMMARY

Ph.D. candidate in Computer Science specializing in programmable network security for Smart-Grid/ICS/OT with 7+ publications in top-tier IEEE/ACM venues and Best Paper Award recognition. Combines research expertise in programmable networks, security frameworks with industry experience in cloud orchestration, 5G networks, and software validation.

EDUCATION

Ph.D. in Computer Science, University of Arkansas, Fayetteville, AR — Aug 2021 – Sep 2026

M.S. in Computer Engineering, University of Arkansas, Fayetteville, AR — Aug 2021 – Dec 2024
GPA – 4.0/4.0

B.E. in Electronics and Communication Engineering, College of Engineering, Guindy, Anna University, Chennai — Aug 2006 – June 2010

SKILLS

Languages	:	Python, P4(Tofino, bmv2), C, Bash
Networking	:	SDN, P4, 5G Core, EPC, TCP/IP, Mininet, Wireshark, iperf
Cloud & Orchestration	:	Kubernetes, Docker, OpenStack
Security	:	ICS/OT (Modbus, DNP3) Network Security, IDA Pro, PE Studio
Tools	:	Linux, Git, FastAPI, OpenCV, NVIDIA GPU Stack

WORK EXPERIENCE

University of Arkansas, Fayetteville, AR
Graduate Research Assistant — Aug 2021 – Present

- Independently research on secure Smart Grid/ICS networks using P4-programmable switches (Tofino, bmv2)
- Act as the go-to person for P4-related issues, including Tofino setup, coding and advising lab peers on technical solutions
- Mentor and provide research directions for undergrads on thesis projects
- Recognized by advisor for research independence, peer-level contributions, and leadership, including stepping in to teach and moderate discussions for class

Nokia Bell Labs, New Providence, NJ
Network Architecture Intern — Jun 2023 – Aug 2023

- Deployed Kubernetes clusters on Nokia Airframe servers, simulating multi-cloud setups
- Optimized YoLov7-based object detection by transforming it into a FastAPI REST service, reducing RTT latency from 500 ms to 30 ms
- Integrated NVIDIA GPU plug-ins with Kubernetes to enhance GPU utilization for inference pods
- Scaled the video inference system, enabling real-time webcam feed processing with OpenCV

Cisco Systems, Bangalore
Software Engineer — Jun 2020 – Jul 2021

- Conducted integration and end-to-end testing for Cisco's 5G Core Network Functions – SMF, UPF, PCF, and SGW
- Deployed and managed Kubernetes-based software deployments in production environments
- Uncovered several critical bugs on RADIUS interface

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Parallel Wireless, Bangalore
Member of Technical Staff Oct 2018 – May 2020

- Performed QA validation for Parallel Wireless' gateway products – TWAG (WiFi gateway) and SAEGW
- Validated different call models in TWAG – SIM based, portal authentication, end-to-end qualification
- Developed Python automation for SAEGW Gx-interface tests; reduced manual test execution time by ~60%

Nokia Networks, Bangalore
R & D Engineer Apr 2015 – Oct 2018

- Software validation for Nokia's Home Subscriber Server (HSS) and 5G UDM Network Function
- Hands on experience with VNF bring up on OpenStack, Nokia CBAM (Cloud Band Application Manager)
- Led test strategy for HSS/5G UDM VNFs, improving defect detection before customer deployments and reducing field issues

Cisco Systems, Bangalore
Software Engineer Apr 2012 – Apr 2015

- Performed software verification on Cisco StarOS ASR 5000, ASR 5500 SGSN gateway nodes
- Developed and maintained automated regression test suites for SGSN features using TCL scripting, enhancing Cisco's test automation framework for improved efficiency

SELECTED PUBLICATIONS

1. **Reuben Samson Raj** and Dong Jin. *A Framework to Evaluate PMU Networks for Resiliency Under Network Failure Conditions*, 2022 IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm)
2. **Reuben Samson Raj** and Dong Jin. *Dynamic Data Driven Security Framework for Industrial Control Networks using Programmable Switches*. 5th International Conference on Dynamic Data Driven Application Systems (DDDAS 2024)
3. **Reuben Samson Raj** and Dong Jin. *Leveraging Data Plane Programmability Towards a Policy-driven In-Network Security Framework for Industrial Control Systems*. 16th ACM International Conference on Future and Sustainable Energy Systems (e-Energy 2025)
4. Sarvesh Bidkar, Rakesh Abbireddy, Maryam Amiri, **Reuben Samson Raj**, Anil Rana, Jeff McLaird, Paul Rea, Meryem Simsek and Jesse E. Simsarian. *Demonstration of Multi-Provider Network and Cloud Service Provisioning with Blockchain Smart Contracts*. The 51st European Conference on Optical Communication (ECOC 2025)

Full list here.

AWARDS AND HONORS

- **2nd place** - *Best Paper Award*, DDDAS 2024
- *Reginald R. Barney & Jameson A. Baxter Graduate Scholarship* (2023, 2022)
- *Department of Electrical Engineering and Computer Science Scholarship* (2023)
- *You Amaze* and *You Inspire* awards (2020), *CAP Award* (2013), Cisco
- *Best Feature Team* Award (2016), Nokia

ACADEMIC SERVICE

- Journal Reviewer, *ACM Transactions on Modeling and Computer Simulation (TOMACS),* 2025

VOLUNTEERING

- Key Organizer, *EECS High-School Programming Contest* (2024, 2025 and 2026)
- In charge of technical liaison with coding platform vendor, testing and onboarding group of volunteer judges