

# 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*. 5<sup>th</sup> 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

- **2<sup>nd</sup> 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