

# ANNA RAYMAKER

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<https://annaraymaker.dad/>

## RESEARCH SUMMARY

Ph.D. researcher working on empirical measurement and analysis of globally distributed systems. My work uses large-scale data collection, statistical analysis, and human-centered methods to study real-world behavior, reliability, and security of networked and AI-enabled infrastructure.

## RESEARCH INTERESTS

- Network and system security, with a focus on securing cyber-physical and safety-critical infrastructures across transportation and energy systems.
- Large-scale data analysis and network measurement for uncovering real-world cyber risks, including GPS spoofing, sensor manipulation, and exposure of distributed energy resources.
- Human-centered and operational technology security, integrating usability, operator workflows, and domain constraints into practical and deployable defenses.

## EDUCATION

### Ph.D. in Electrical and Computer Engineering

Georgia Institute of Technology

[Cyber-Physical Systems Security Lab](#)

Advisor: Professor Saman Zonouz

Fall 2022 - Present

Atlanta, GA

### M.S. in Electrical and Computer Engineering

Georgia Institute of Technology

Spring 2025

Atlanta, GA

### B. S. in Computer Engineering

University of Florida

Spring 2022

Gainesville, Florida

## HONORS & AWARDS

### Spark Award Scholarship

November 2025

Awarded to Georgia Tech graduate students demonstrating outstanding leadership in advancing student engagement in energy research and broader service impact.

### President's Fellowship

August 2022

Offered to the top 10% of the Georgia Institute of Technology's doctoral program applicants.

### Commencement Speaker at the University of Florida [\[link\]](#)

Spring 2022

(52:00 - 57:00 approx.)

### Presidential Service Award at the University of Florida

Spring 2022

### National Merit Scholar

2018

### Benacquisto, Bright Futures, and Vicar's Landing Scholarships

2018 - 2022

## PUBLICATIONS

**Raymaker, A.**, Kumar, A., Wong, M., Pickren, R., Chhotaray, A., Li, F., Zonouz, S., Beyah, R., "A Sea of Cyber Threats: Maritime Cybersecurity from the Perspective of Mariners," in *The ACM Conference on Computer and Communications Security (CCS)*, 2025

**Raymaker, A.**, Von Brock, R., Pickren, R., Chhotaray, A., Li, F., Zonouz, S., Beyah, R., "She Spoofed Sea Ships by the Sea Shore: Characterizing GPS Anomalies in Global Maritime Positioning Data," in *submission*, 2025

Kumar, A., **Raymaker, A.**, Specter, M., "Security and Privacy Analysis of Tile's Location Tracking Protocol," to appear at *USENIX Security*, 2026

Pickren, R., **Raymaker, A.**, Chhotaray, A., Li, F., Zonouz, S., Beyah, R., "Mutiny!, Compromising Maritime Systems via Weaponized Situational Awareness Broadcast Messages," in *submission*, 2025

Ashebo, B., Asiamah, R., Talkington, S., **Raymaker, A.**, Chhotaray, A., Zonouz, S., Molzahn,

	D., "Analyzing Cyber Resilience of Distribution Systems with High Penetrations of Inverter-Based Resources," <i>in submission</i> , 2025	
	Ryu, Z., Chung, S., Karim, M., <b>Raymaker, A.</b> , Jodha, K., Chaturvedi, Y., Mertoguno, S., "Beware EviLLM: Enabling Vulnerability Injection via Large Language Models," <i>in submission</i> , 2025	
RELEVANT COURSEWORK	Advanced Computer Security, Empirical Computer Security, Cybersecurity of Drones, Network Security, Advanced Malware Analysis, Linear Systems and Controls, Advanced Programming Techniques	
TECHNICAL SKILLS	Python, C, C++, Internet and network measurement, distributed systems analysis, statistical modeling, large-scale data pipelines, version control (Git)	
RESEARCH EXPERIENCE	<p><b>Graduate Research Assistant - CPSec Lab</b> Georgia Institute of Technology</p> <p><b>Energy and Critical Infrastructure Security (Department of Energy Funded)</b></p> <ul style="list-style-type: none"> <li>Developed scalable techniques for discovering exposed Distributed Energy Resources (DERs), particularly solar inverters, using Censys data collection, web scraping, and active scanning.</li> <li>Led a team of master's students to build a global pipeline that has already uncovered thousands of exposed inverters, with grid-impact simulations underway for Oahu, Hawaii to evaluate risks to real-world power systems.</li> </ul> <p><b>Maritime and Transportation Cybersecurity</b></p> <ul style="list-style-type: none"> <li>Built a large-scale maritime data analysis tool to detect GPS spoofing by combining Kalman filtering, geodesic deviation checks, and spatial clustering across global, Internet-scale data; identified persistent spoofing zones worldwide (paper under submission).</li> <li>Led a user study identifying key cybersecurity gaps in mariner mental models and training (CCS 2025).</li> <li>Built a maritime cybersecurity testbed to evaluate cyber threats and defenses.</li> <li>Contributed to a research project on AIS-based malware propagation, assisting in the development and evaluation of situational message-based attack vectors (paper under submission).</li> <li>Reverse engineered NMEA 2000 messages over CAN bus to support analysis of vessel controller behavior.</li> </ul> <p><b>Binary Analysis for Software Supply Chain Security (Department of Defense Funded)</b></p> <ul style="list-style-type: none"> <li>Applied machine learning models (e.g., Trex, GNNs) for binary similarity analysis to support automated Bill of Materials (BA-BOM) extraction in large-scale binaries.</li> </ul>	<p>Spring 2024 - Current</p> <p>Atlanta, GA</p>
	<b>Graduate Research Collaborator - D2I Lab</b> Georgia Institute of Technology	<p>Spring 2024</p> <p>Atlanta, GA</p>
	<ul style="list-style-type: none"> <li>Led a project on data preprocessing pipelines for large-scale ML analytics.</li> </ul>	
	<b>Graduate Research Collaborator - COEUS</b> Georgia Institute of Technology	<p>Fall 2023</p> <p>Atlanta, GA</p>
	<ul style="list-style-type: none"> <li>Helped develop efficient binary analysis tools, experimenting with regex and code lifters.</li> </ul>	
	<b>Graduate Research Assistant - CyFI Lab</b> Georgia Institute of Technology	<p>Fall 2022 - Fall 2023</p> <p>Atlanta, GA</p>
	<ul style="list-style-type: none"> <li>Studied web-based malware, focusing on botnet hijacking and remediation.</li> </ul>	
	<b>Undergraduate Research Assistant - ARC lab</b> University of Florida	<p>August 2021 - May 2022</p> <p>Gainesville, Florida</p>
	<ul style="list-style-type: none"> <li>Developed an FPGA-accelerated genetic programming tool in VHDL.</li> </ul>	
	<b>Undergraduate Research Assistant - FICS lab</b>	<p>June 2020 - Feb 2022</p>

	University of Florida • Conducted fault injection attacks on FPGAs to assess FSM vulnerabilities.	Gainesville, Florida
	<b>Undergraduate Research Assistant - SWAMP lab</b> University of Florida • Analyzed SiGe diffusion using TCAD modeling.	August 2019 - 2020 Gainesville, Florida
TEACHING	<b>Head Graduate Teaching Assistant, Georgia Institute of Technology</b> ECE 3030: Physical Foundations of Computer Engineering	Spring 2024
	<b>Graduate Teaching Assistant, Georgia Institute of Technology</b> ECE 6100: Advanced Computer Architecture	Fall 2023
	<b>Undergraduate Teaching Assistant, University of Florida</b> EEL 4712: Digital Design EEL 4744: Microprocessor Applications EEL 3701C: Digital Logic and Computer Systems	Fall 2021 - Spring 2022 Fall 2021 Spring - Summer 2021
INVITED TALKS	<b>Cyber Security Agency of Singapore Talk (Atlanta, GA)</b> Will demonstrate the maritime cybersecurity testbed and present research findings to government officials at the <a href="#">Cyber Security Agency of Singapore</a> .	Nov 2025
	<b>SecurityWeek ICS Cybersecurity Conference (Atlanta, GA)</b> <i>From Ship to Shore: Real-World Threats and Zero-Day Attacks in Maritime Operational Technology</i> <a href="http://icscybersecurityconference.com">icscybersecurityconference.com</a>	Oct 2025
	<b>ACM CCS 2025 Conference Presentation (Taipei, Taiwan)</b> <i>A Sea of Cyber Threats: Maritime Cybersecurity from the Perspective of Mariners</i>	Oct 2025
	<b>Guest Lecture for Critical Infrastructure Security class (Atlanta, GA)</b> Presented research on maritime cybersecurity to a class of graduate and undergraduate students at Georgia Tech	Oct 2025
	<b>Fireside Chat with Dmitri Alperovitch (Atlanta, Georgia)</b> As President of the GSA for the School of Cybersecurity and Privacy (SCP), I hosted distinguished alumnus Dmitri Alperovitch (co-founder of CrowdStrike) for a fireside chat with Georgia Tech graduate students, discussing his career and insights on cybersecurity.	Sept 2025
	<b>Georgia Institute of Technology - CPSec Lab Testbed Tour</b> Demonstrated the maritime cybersecurity testbed and research to faculty members, the School of Cybersecurity and Privacy (SCP) Chair, and distinguished visitors including <a href="#">John Tien</a> (former Deputy Secretary of DHS) and <a href="#">Ann Dunkin</a> (former CIO, U.S. Department of Energy).	Aug 2025
	<b>TEDxGeorgiaTech Talk</b> <i>The Invisible War: Protecting Our Future from Cyber Threats</i> <a href="http://tedxgeorgiatech.com/conference2025">tedxgeorgiatech.com/conference2025</a>	Mar 2025
PROFESSIONAL EXPERIENCE	<b>FPGA Electrical Engineering Intern</b> L3Harris • Developed SpaceVPX test card in Vivado SPI IP. • Defined FPGA requirements & collaborated with a multi-specialty engineering team.	May 2021 - August 2021 Melbourne, Florida
SERVICE	<b>External Reviewer</b> Conference on Computer and Communications Security (CCS) European Symposium on Research in Computer Security (ESORICS)	2023 2023

**EXTRA-  
CURRICULAR  
ACTIVITIES**

IEEE S&P Workshop on Language-Theoretic Security (LangSec)	2023
IEEE International Conference on Trust, Privacy and Security (TPS)	2022
<b>President of SCP Graduate Student Association (GSA)</b> Georgia Institute of Technology	May 2025 - Present Atlanta, Georgia
• Lead the executive board and oversee all GSA initiatives across the SCP.	
• Plan and organize inter-college and campus-wide engagement events for the COC.	
• Serve as the sole student representative on the SCP Chair Search Committee, ensuring graduate student perspectives are included in the hiring process.	
<b>Student and Faculty Affairs Chair for SCP GSA</b> Georgia Institute of Technology	May 2024 - April 2025 Atlanta, Georgia
• Organized faculty-student engagement events.	
• Advocated for a graduate student ombudsperson and mental health resources.	
<b>Presencia Volunteer</b> Presencia	May 2024 - August 2024 Atlanta, Georgia
• Assisted immigrant youth in nutrition & fitness programs.	
<b>Engineering Ambassador</b> University of Florida	January 2021 - May 2022 Gainesville, Florida
• Gave tours for the college and acted as a student engineering leader.	
<b>IEEE HKN</b> University of Florida	August 2020 - May 2022 Gainesville, Florida
• Held exam reviews and tutored students in the ECE department.	
<b>Alpha Phi Omega</b> University of Florida	August 2018 - May 2022 Gainesville, Florida
• Volunteered for over 1,000 hours at various local organizations (e.g., the Humane Society, Salvation Army, UF student gardens, CADE Museum for Science and Creativity, local nursing homes).	