

Zeezoo Ryu

PH.D. STUDENT · *Computer Science*

Georgia Institute of Technology, Atlanta, GA

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Research Interests

My primary research interest lies at the intersection of AI Safety and Security, with a specific focus on evaluating and benchmarking Large Language Models (LLMs). My work aims to develop rigorous evaluation frameworks to assess the robustness of AI-generated code and explore the impact of AI on privacy and security.

Education

Ph.D. in Computer Science, GEORGIA INSTITUTE OF TECHNOLOGY, *Atlanta, GA* Aug. 2023 – Present

- Graduate Research Assistant for Dr. Sukarno Mertoguno

M.S. in Computer Science, VIRGINIA TECH, *Blacksburg, VA* Aug. 2021 – May 2023

- Graduate Research Assistant for Dr. Matthew Hicks

B.S. in Computer Science, UNIVERSITY OF GEORGIA, *Athens, GA* Aug. 2018 – Dec. 2020

- Research Assistant for Dr. In Kee Kim and Dr. Paul Xie

B.A. in International Studies, EWHA WOMANS UNIVERSITY, *Seoul, South Korea* Mar. 2012 – Feb. 2017

- Double Major: Political Science and International Relations

Publications

Alexiou, M., **Ryu, Z.**, Abawe, G., Mertoguno, S. J., “Recognizing Binary Code Semantics Towards Achieving Software Segmentation,” *In Proceedings of the 36th International Conference on Tools with Artificial Intelligence (ICTAI 2024)*, pp. 399-406, IEEE, 2024

Hendrix, S. G., Chang, K. Y., **Ryu, Z.**, Xie, Z.-R., “DeepDISE: DNA Binding Site Prediction Using a Deep Learning Method,” *International Journal of Molecular Sciences*, 2021

Ryu, Z., Chung, S., Jiang, N., Tan, L., Mertoguno, S., “SpaceWarp: Enabling LLMs to Detect Use-After-Free Under Context Window Constraints,” *in submission*, 2026

Ryu, Z., Chung, S., Karim, M. F., Raymaker, A., Jodha, K. S., Chaturvedi, Y., Mertoguno, S., “Beware EviLLM: Enabling Vulnerability Injection via Large Language Models,” *in submission*, 2025

Research Experience

Georgia Institute of Technology

Atlanta, GA

GRADUATE RESEARCH ASSISTANT

Aug. 2023 – Present

- Designed SpaceWarp, a graph-based system leveraging LLM reasoning to detect vulnerabilities in large C codebases, establishing a new benchmark for LLM-based static analysis performance.
- Evaluated model capabilities using call graph-augmented chain-of-thought prompting, achieving 100% CVE-level recall and outperforming traditional static analysis tools (CodeQL) in robustness and accuracy benchmarks.
- Developed EviLLM, a framework for assessing LLM safety and robustness against adversarial attacks in code generation pipelines.
- Designed and conducted human-in-the-loop evaluation protocols, revealing that 87.5% of injected vulnerabilities went undetected by users, providing insights into failure modes of current AI coding assistants.

Virginia Tech

GRADUATE RESEARCH ASSISTANT

Blacksburg, VA

May 2021 – May 2023

- Worked on identifying the best-of-breed crypto algorithms for ultra-low SWaP devices in an energy harvesting context.
- Created a testbed to experiment with multiple ultra-low SWaP devices and measured the execution time and power usage.

University of Georgia

UNDERGRADUATE RESEARCH ASSISTANT

Athens, GA

Sep. 2020 – Dec. 2020

- Implemented the address-carryover algorithm to track anonymized Bluetooth Low Energy devices.
- Analyzed the results of tracking Bluetooth Low Energy devices and found possible vulnerabilities.

Computational Drug Discovery Lab at UGA

UNDERGRADUATE RESEARCH ASSISTANT

Athens, GA

Jan. 2020 – May 2021

- Worked in the programming team to implement a ligand-binding site prediction program in Python.
- Analyzed and improved the accuracy of the LISE project by applying a 3D convolutional network.

Teaching Experience

CS 3001 - Computing & Society, Teaching Assistant, *Georgia Institute of Technology*

Summer 2025

ELEE 2040 - Programming for Engineers, Student Grader, *University of Georgia*

Fall 2020

Professional Experience

The Georgia Games

INTERN FOR THE COMPUTER SCIENCE COMMITTEE

May 2020 – Aug. 2020

- Researched and implemented email security measures to ensure deliverability by working on improving email protocols, including DKIM, SPF, Reverse DNS, and DMARC.
- Analyzed web statistics and implemented improvements on the website.
- Managed the database for the website using MySQL.

Relevant Coursework

Deep Learning, Advanced Machine Learning, Data Mining, Data Science I, Database Management, Network Security, Privacy, Technology, Policy & Law, Human-Computer Interaction, Usability Engineering

Leadership & Involvement

Vice President for the SCP Graduate Student Association (GSA)

GEORGIA INSTITUTE OF TECHNOLOGY

Atlanta, GA

May 2025 – Present

- Organized events to build a connection between students and faculty.
- Advocated for student rights in meetings with the Dean of the College of Computing.

Communications Chair for the SCP Graduate Student Association (GSA)

GEORGIA INSTITUTE OF TECHNOLOGY

Atlanta, GA

May 2024 – Apr. 2025

- Facilitated communication by designing promotional materials and distributing event notifications.
- Participated in leadership summits and served the student community by hosting multiple events.

IT Specialist for the Korean Student Association (KSA)

UNIVERSITY OF GEORGIA

Athens, GA

Jan. 2020 – Dec. 2020

- Developed, managed, and solved security issues of the website for the KSA.
- Participated in leadership summits hosted by the International Student Life (ISL) at UGA and served the Korean community at UGA by hosting multiple events.

Public Relations Chair for the ACM Council on Women in Computing Chapter*Athens, GA*

UNIVERSITY OF GEORGIA

Sep. 2019 – Apr. 2020

- Built a social media marketing strategy to promote the organization internally and externally.
- Designed flyers and posted them on social media platforms to advertise the organization and its core values.

Student Volunteer for Girls Who Code*Athens, GA*

UNIVERSITY OF GEORGIA

Sep. 2019 – Dec. 2019

- Organized and facilitated lessons at Coile Middle School to help students work on coding projects using Scratch.

General Affairs Chair for the Ewha International Law Club*Seoul, South Korea*

EWhA WOMANS UNIVERSITY

Sep. 2014 – Aug. 2015

- Designed and published an annual booklet for the club to record important achievements of the club.
- Coordinated and organized a mock trial event with other schools.

Student Ambassador for the Korean Association for Supporting SDGs for the UN*Seoul, South Korea*

ASSOCIATION FOR SUPPORTING THE SDGs FOR THE UN

Sep. 2014 – Dec. 2014

- Promoted Sustainable Development Goals (SDGs) through various social media platforms by writing articles and creating video content.
- Organized the team as a team leader to better promote SDGs.

Certification _____**Applied Data Science**, University of Georgia

Dec. 2020

Course Requirements Fulfilled: Cyber Security, Discrete Mathematics for Computer Science, Data Science I, Database Management, Data Mining

Technical Skills _____**Programming Languages:** C/C++, Python, Java, HTML/CSS/JavaScript, PHP**Database Platforms:** MySQL