SIVANA HAMER

Ph.D. Student in Computer Science | Researching Software Supply Chain Security

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Second-year Computer Science Ph.D. Student at North Carolina State University. I am researching the **state of software supply chain security** as a community **to help improve the security posture of industry and open-source projects**. I look forward to opportunities to conduct software supply chain security research.

RESEARCH INTERESTS

Software Supply Chain Security • Software Security • Empirical Software Engineering • Software Measurement • Software Security • Mining software repositories

FEATURED RESEARCH PROJECTS

Reduce your risk of being Solarwinds, Log4j, or XZ Utils

- Analyzing the attack techniques in SolarWinds, Log4j, and XZ Utils to systematically map software supply chain framework tasks to provide software organizations with a recommended list of tasks. Collaboration with **Yahoo**.
- **Methods:** Qualitative Analysis, Incident Analysis, Mapping.
- **Tools:** MITRE ATT&CK, Threat Modeling, P-SSCRM.
- **Publication:** In Submission.

Reputation Measures to Review Dependencies

- Investigated if network centrality measures, proxying contributor reputation, can be used as a signal to inform developers of dependency changes that require additional examination.
- **Methods:** Mixed-Methods, Statistical Models, Social Networks.
- **Results:** Network centrality measures are a significant factor in explaining how developers review dependencies in Rust.
- **Tools:** Python, R, SQL, GitHub API.
- **Publication:** In IEEE Transactions on Software Engineering, 2025.

Comparing Vulnerabilities ChatGPT and StackOverflow

- Compared the vulnerabilities of ChatGPT and StackOverflow to help raise software developers' awareness of the security implications when selecting code snippet platforms.
- **Method:** Quantitative Analysis, Statistical Methods.
- **Results:** ChatGPT generated less vulnerable code. Yet, insecure code propagation can happen in both platforms.
- **Tools:** Python, R, ChatGPT API, StackOverflow API, CodeQL.
- **Publication:** In IEEE Security and Privacy Workshops 2024.

AWARDS

- *Goodnight Doctoral Fellowship (2023-2027).*
- *RSA Conference Security Scholar (2024).*
- *North Carolina State University Provost's Doctoral Fellowship (2023).*
- *Best Postgraduate Grade Universidad de Costa Rica* (2020).

EDUCATION

Ph.D. Computer Science

North Carolina State University

Aug 2023 – Expected 2028

Advisor: Dr. Laurie Williams

M.Sc. Computer Science

Universidad de Costa Rica

2023

Thesis: Mining software repositories to automatically measure developer code contributions.
Advisor: Dr. Christian Quesada-López

B.Sc. Computer Science

Universidad de Costa Rica

2020

EXPERIENCE

Graduate Research Assistant

North Carolina State University

Aug 2023–Present

Researcher and Interim Instructor

Universidad de Costa Rica

2020-2023

Student Visitor Research Internship

Carnegie Mellon University

Jan 2022–March 2022

PUBLICATIONS

Conferences & Workshops

- **Hamer, Sivana**, M. d'Amorim, and L. Williams, "Just another copy and paste? comparing the security vulnerabilities of chatgpt generated code and stackoverflow answers," in *Deep Learning Security and Privacy Workshop*, IEEE Security and Privacy Workshops (SPW), 2024.
- C. Quesada-López, **Hamer, Sivana**, and M. Jenkins, "Exploring students' behaviors and perceptions in continuous measurement of software projects," in *Latin American Computing Conference (CLEI)*, IEEE, 2024.
- **Hamer, Sivana**, C. Quesada-López, and M. Jenkins, "Students' perceptions of integrating a contribution measurement tool in software engineering projects," in *IEEE International Conference on Software Engineering Education and Training*, 2023.
- E. Kuhlmann, **Hamer, Sivana**, and C. Quesada-López, "Visualización de software como ciudad: Un análisis de percepciones y experiencias de estudiantes," in *Latin American Computing Conference (CLEI)*, IEEE, 2023.
- **Hamer, Sivana**, C. Quesada-López, and M. Jenkins, "Automatically recovering students' missing trace links between commits and user stories," en, in *Conferencia Iberoamericana de Software Engineering (CIbSE)*, 2021.
- **Hamer, Sivana**, C. Quesada-López, and M. Jenkins, "Students projects' source code changes impact on software quality through static analysis," in *Quality of Information and Communications Technology*, Springer International Publishing, 2021, pp. 553–564, ISBN: 978-3-030-85347-1.
- **Hamer, Sivana**, C. Quesada-López, A. Martínez, and M. Jenkins, "Measuring Students' Source Code Quality in Software Development Projects Through Commit-Impact Analysis," en, in *International Conference on Information Technology & Systems*, Springer International Publishing, 2021, pp. 100–109, ISBN: 978-3-030-68417-4 978-3-030-68418-1. DOI: 10.1007/978-3-030-68418-1_11.
- **Hamer, Sivana**, C. Quesada-López, A. Martínez, and M. Jenkins, "Measuring students' contributions in software development projects using Git metrics," in *2020 XLVI Latin American Computing Conference (CLEI)*, IEEE, 2020.

Journals

- **Hamer, Sivana**, N. Imtiaz, M. Tamanna, P. Shabrina, and L. Williams, "Trusting code in the wild: Exploring contributor reputation measures to review dependencies in the rust ecosystem," *IEEE Transactions on Software Engineering*, 2025.

- L. Williams, G. Benedetti, **Hamer, Sivana**, *et al.*, "Research directions in software supply chain security," *ACM Transactions on Software Engineering and Methodology*, 2024.
- **Hamer, Sivana**, C. Quesada-López, A. Martınez, and M. Jenkins, "Using git metrics to measure students' and teams' code contributions in software development projects," en, *CLEI Electronic Journal*, 2021.

PRESS RELEASES

- **The Register (2025).** Too many software supply chain defense bibles? Boffins distill advice.
- **InfoWorld (2025).** Developers: apply these 10 mitigations first to prevent supply chain attacks.

INDUSTRY PRESENTATIONS

- **NC Pace (2025).** Closing the Chain: How to reduce your risk of being SolarWinds, Log4j, and XZ Utils.
- **S3C2 Software Supply Chain Community Day (2024).** Closing the Chain: How not to be Solarwinds, Log4j, or XZ utils.

POLICY

- **MITRE ATT&CK (2025).** Improvements to MITRE ATT&CK techniques being revised and scheduled to be released in a new version.
- **P-SSCRM (2025).** Improvements to software supply chain frameworks tasks scheduled to be released in a new version.

MENTORSHIP

- Jacob Bowen (MS Student). Now at Department of Defense (DoD).

SERVICE

- Reviewer: Transactions of Software Engineering (2024).
- Shadow Reviewer: International Conference on the Foundations of Software Engineering (2025).
- Student Officer in the WSPR laboratory.
- Student Officer at LA/CSC (Computer Science Organization for Latin American students).
- Computer Science Doctoral Recruiting Event Student Volunteer for North Carolina State University (2024, 2025).
- Student Volunteer Hackpack Capture the Flag (2024, 2025).
- Maintainer of the se-deadline web page to keep track of the deadlines of software engineering research venues.

TEACHING

Interim Instructor

Escuela de Ciencias de la Computación e Informática, Universidad de Costa Rica

- Software Design (CI-0136)
- Databases (CI-0127)
- Software Engineering and Database Integrator Project (CI-0128)
- Programming 1 (CI-0112)
- Computer principles (CI-0202)

Undergraduate Teaching Assistant

Escuela de Ciencias de la Computación e Informática, Universidad de Costa Rica

- Integrated project of software engineering and databases (CI-0128).
- Software engineering (CI-0126).
- Probability and statistics (CI-0115).

SKILLS

- *Languages:* English, Spanish.
- *Programming languages:* Python, Java, R, C#, JavaScript, Bash, SQL.
- *Software tools:* Git, Jenkins, JIRA, Visual Studio Code, CodeQL, SonarQube, LLM.
- *Frameworks and libraries:* ASP.NET, Flask, Bootstrap, jQuery, React, Unity.
- *Research methods:* Quantitative, Qualitative, Mining Software Repositories, Machine Learning, Statistical Models.