

# Costain Nachuma

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## Professional Summary

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PhD candidate in Computer Science (4.0 GPA) researching AI-assisted software engineering, interactive software visualization, and large-scale empirical analysis of open-source ecosystems. Published at top venues including MSR 2025 and ACM SAC. Experienced building reproducible data pipelines, applying statistical modeling, and shipping production systems supporting 300+ users. Seeking roles at the intersection of research, data science, and software engineering.

## Education

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### Idaho State University

*Ph.D. in Computer Science — Software Engineering & Cybersecurity | GPA: 4.0*

Pocatello, ID

Aug 2023 – May 2027

- Dissertation: Interactive IDE-integrated software visualization tools for code comprehension
- Research areas: Empirical Software Engineering, AI-assisted development, Software Supply Chain Security

### University of New Orleans

*M.Sc. in Computer Science*

New Orleans, LA

2021 – 2023

### University of Zambia

*B.Sc. in Computer Science*

Lusaka, Zambia

2007 – 2011

## Research & Publications

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### When AI Teammates Meet Code Review: Collaboration Signals Shaping the Integration of Agent-Authored Pull Requests — *MSR 2026*

Nachuma, C. & Zibran, M. F.

23rd International Conference on Mining Software Repositories

### Decoding Dependency Risks: A Quantitative Study of Vulnerabilities in the Maven Ecosystem — *MSR 2025*

Nachuma, C., Hossan, M. M., Turzo, A. K. & Zibran, M. F.

22nd International Conference on Mining Software Repositories

### ChatGPT in Software Development: Insights from Empirical Analysis — *MSR 2024*

Champa, A., Rabbi, M., Nachuma, C. & Zibran, M.

21st ACM International Conference on Mining Software Repositories

### Evaluating SBOM Generation Tools: A Deep Dive into the npm Ecosystem — *ACM SAC 2024*

Rabbi, M., Champa, A., Nachuma, C. & Zibran, M.

ACM Symposium on Applied Computing

## Professional Experience

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### Graduate Research & Teaching Assistant · *Idaho State University, Pocatello, ID*

Aug 2023 – Present

- Designed and implemented an Eclipse plugin for interactive software visualization, enabling developers to explore structural relationships and software metrics directly within the IDE.
- Conducted a Systematic Mapping Study (Kitchenham's guidelines) synthesizing literature on software visualization tools, identifying research gaps in IDE-integrated code comprehension.
- Built reproducible data pipelines to extract and model pull request and dependency data from GitHub and Maven at scale using Python (Pandas, NumPy).
- Applied regression analysis to study AI agent behavior in code review workflows, producing a peer-reviewed publication at MSR 2026.
- Mentored 20+ students in advanced OOP, algorithms, and database systems.

### Senior ICT Officer / Software Engineering Lead · *National Assembly of Zambia, Lusaka, Zambia*

Jun 2012 – Sep 2023

- Directed mission-critical IT operations supporting 300+ users across government departments, maintaining high system reliability.
- Led end-to-end development and modernization of parliamentary web platforms and digital workflow systems serving internal and public stakeholders.
- Reduced issue resolution time by 30% through infrastructure optimization and workflow redesign.
- Planned and managed sectional training budgets; delivered technical training to staff and senior management on newly deployed systems.

**Systems Librarian Intern** · *Prosentient Systems Pty*, Sydney, Australia

May 2019 – Jul 2019

- Developed a Java-based real-time communication tool improving cross-institutional research collaboration.
- Administered Linux servers and open-source platforms (DSpace, Openfire) using Git and SSH.

## Technical Skills

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<b>Languages</b>	Python, Java, C#, JavaScript, SQL
<b>Data &amp; ML</b>	Pandas, NumPy, Statistical Modeling (Linear/Logistic Regression), Feature Engineering, Data Preprocessing
<b>Databases</b>	PostgreSQL, MySQL, Oracle, Neo4j (Graph Databases)
<b>DevOps &amp; Systems</b>	Linux, Git, Docker, GitHub Actions
<b>Research Methods</b>	Empirical Software Engineering, Systematic Mapping Studies, HCI Methods
<b>Cybersecurity</b>	Software Supply Chain Risk Analysis, Threat Intelligence, SBOM Evaluation, Cyber Resilience

## Awards & Recognition

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- **Best Oral Presentation Award** — Idaho State University Research and Creative Works Symposium, 2026
- **Best Poster Award** — Idaho State University Research and Creative Works Symposium, 2026
- **Best Poster Award** — 4th Annual Intermountain Engineering, Technology & Computing Conference, 2024
- **Best Oral Presentation Award** — Idaho State University Research and Creative Works Symposium, 2024

## Leadership & Volunteering

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- **Team Lead**, TechEquity AI Summit, Plug and Play Tech Center, Sunnyvale, CA (Nov 2025) — Led 50+ volunteers supporting 2,000+ attendees; coordinated exhibitor and executive stakeholder engagement.
- **CS Mentor**, Idaho State University (2023–Present) — Provide mentorship in programming fundamentals, career development, and technical interview preparation.
- **President**, University of Zambia Computer Society (UNZACS), 2010 — Organized coding bootcamps and workshops, increasing student participation in computing initiatives.

## Certifications

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- IBM / Coursera: Python for Data Science, AI & Development (2026)