

Ricardo Andrés Calvo Méndez

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RESEARCH INTERESTS

My research focuses on the design and analysis of methods and tools that provide rigorous guarantees of software correctness. I am particularly interested in formal verification techniques, theoretical and practical foundations for reasoning about program behavior, and advanced approaches to code analysis.

My research interests include:

- **Formal verification:** Foundations and tools for establishing provably correct behavior in complex software systems.
- **Program analysis and testing:** Static, dynamic, and hybrid methods for understanding, validating, and rigorously evaluating code.
- **Optimization and efficiency:** Techniques for improving performance, reducing resource consumption, and identifying near-optimal implementations.

EDUCATION

Ph.D. in Electrical and Computer Engineering

Purdue University, West Lafayette, IN

B.Sc. in Systems and Computer Engineering

Universidad Nacional de Colombia, Bogotá D.C, Colombia.

Top-ranked university in Colombia. Class rank 2/49.

RESEARCH EXPERIENCE

Graduate Research Assistant

Purdue University — Advised by James Davis

- Serving as a researcher on *AutoUP*, an automatic unit-proof generation system for formal verification, contributing to its design and development.

Undergraduate Visiting Scholar (UREP-C)

Purdue University — Advised by James Davis

- Contributed to the design and implementation of *EmNetTest*, a framework for testing embedded network stacks.

PROFESSIONAL EXPERIENCE

Test Engineer & QA Analyst

Kravata SAS, Bogotá D.C, Colombia

Sep 2024 – Jul 2025

- Designed and implemented the testing practice from scratch—end-to-end, integration, and unit test automation with CI/CD pipelines in DevOps.

Software Developer

Fit Ideas SAS, Bogotá D.C, Colombia

Fullstack Software Developer

Aug 2023 – Aug 2024

- Led the development team (3 engineers) in the strategic planning, management, and deployment of mobile and web applications.

- Developed custom features with Django, React, and PostgreSQL.

REFEREED CONFERENCE PUBLICATIONS

- [C-1] P. Amusuo, D. Liu, R.A.C. Méndez, J. Metzman, O. Chang, and J.C. Davis. *Lessons from Mitigating False Positives in Google's OSS-Fuzz-Gen*. Proceedings of the ACM International Conference on the Foundations of Software Engineering (FSE) (FSE-Industry'26). 39% acceptance rate (66/171). 5 pages. *Presenting author*.
- [C-2] H. Peng, A. Zhong, R.A.C. Méndez, K.G. Kalu, and J.C. Davis. *How Do Agents Perform Code Optimization? An Empirical Study*. Proceedings of the 23rd International Mining Software Repositories Conference — Mining Challenge track (MSR-Mining'26). 53% acceptance rate (62/116). 5 pages. *Presenting author*.
- [C-3] P.C. Amusuo, R.A.C. Méndez, Z. Xu, A. Machiry, and J.C. Davis. *Systematically Detecting Packet Validation Vulnerabilities in Embedded Network Stacks*. Proceedings of the 38th IEEE/ACM International Conference on Automated Software Engineering (ASE'23). 21% acceptance rate (134/629). 13 pages.

OTHER WORKS

- [W-1] P.C. Amusuo, D. Liu, R.A.C. Méndez, J. Metzman, O. Chang, and J.C. Davis. *FalseCrashReducer: Mitigating False Positive Crashes in OSS-Fuzz-Gen Using Agentic AI*. arXiv preprint arXiv:2510.02185 (2025).

ACADEMIC COMMUNITY SERVICE

Volunteer Service

Student volunteer, ICSE 2026	2026
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Reviewing Service

Reviewer, MSR 2026	2026
Sub-reviewer, USENIX 2026	2026
Sub-reviewer, ICSE 2026	2026

CONFERENCE ATTENDANCE

ACM International Conference on the Foundations of Software Engineering (FSE 2026) <i>Montreal, Canada</i>	<i>July 5–9, 2026</i>
ACM/IEEE 48th International Conference on Software Engineering (ICSE 2026) <i>Rio de Janeiro, Brazil</i>	<i>April 2026</i>
39th IEEE International Conference on Software Maintenance and Evolution (ICSME 2023) <i>Bogotá, Colombia</i>	<i>October 2023</i>

TALKS AND PRESENTATIONS

Lessons from Mitigating False Positives in Google's OSS-Fuzz-Gen <i>Industry Papers, FSE 2026, Montreal, Canada</i>	July 8, 2026
How Do Agents Perform Code Optimization? An Empirical Study <i>Poster, Mining Challenge Track, MSR 2026, Rio de Janeiro, Brazil</i>	April 14, 2026

EXTERNAL GRANTS

[G-1] **Travel Support for the ICSE 2026 Student Mentoring Workshop (SMeW)**

National Science Foundation (NSF) and ACM SIGSOFT

Rio de Janeiro, Brazil. April 2026

[G-2] **“Ser Pilo Paga” National Scholarship**

Ministry of Education of Colombia

Bogotá D.C, Colombia.

Merit-based scholarship covering 100% of undergraduate tuition (top 99th-percentile national exam).