

Rafael Gonçalves

Carnegie Mellon University · Instituto Superior Técnico

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Profile & Research Interests

Broadly, I am interested in **software security** and **formal methods**. I am particularly interested in static and dynamic program analysis, and in developing tools that allow developers to efficiently analyze real-world software.

Education

Carnegie Mellon University

Pittsburgh, PA

VISITING STUDENT

Oct. 2023 - Dec. 2023

- Worked on extending NODEMEDIC, a dynamic taint analysis tool, to detect prototype pollution vulnerabilities
- Host: Prof. Limin Jia

Instituto Superior Técnico, University of Lisbon

Lisbon, Portugal

MSc IN COMPUTER SCIENCE & ENGINEERING

Sep. 2021 - Nov. 2023

- GPA: 18/20
- Specializations: Cybersecurity · Distributed Systems
- Master Thesis: Specification-Driven Synthesis of Summaries for Symbolic Execution (advised by Prof. Pedro Adão & Prof. José Fragoso Santos)

Instituto Superior Técnico, University of Lisbon

Lisbon, Portugal

BSc IN COMPUTER SCIENCE & ENGINEERING

Sep. 2018 - Jul. 2021

- GPA: 17/20

Experience

INESC-ID

Lisbon, Portugal

RESEARCH ASSISTANT

Jan. 2024 - present

- Group: Automated Reasoning and Software Reliability (ARSR)
- Project: "RIGA: Reasoning Over Indirect Discrimination" (DOI: 10.54499/2022.03537.PTDC)
- Supervisor: Prof. José Fragoso Santos

Publications

R. Gonçalves, F. Ramos, P. Adão, J. Fragoso Santos. Poster: Specification-Driven Synthesis of Summaries for Symbolic Execution. Presented at: ISSA/ECOOP 2023, Seattle, WA, USA, 2023.

IN REVIEW

R. Gonçalves, F. Ramos, P. Adão, J. Fragoso Santos. Specification-Driven Generation of Summaries for Symbolic Execution. In Review. Submitted in: July 2024.

Teaching

- Spring 2023 **Highly Dependable Systems (MSc)**, Teaching Assistant
- Spring 2024 **Highly Dependable Systems (MSc)**, Teaching Assistant
- Summer 2024 **Compilers (BSc)**, Teaching Assistant

Courses

Instituto Superior Técnico, University of Lisbon

BINARY ANALYSIS WITH APPLICATIONS TO MACHINE AND DEEP LEARNING

- Taught by: Prof. Michele Ianni (University of Calabria)

Lisbon, Portugal

Feb. 2023 - Mar. 2023

Honors & Awards

2020/2021 **Academic Excellence Diploma**, Instituto Superior Técnico, University of Lisbon

2019/2020 **Academic Merit Diploma**, Instituto Superior Técnico, University of Lisbon

2018/2019 **Academic Merit Diploma**, Instituto Superior Técnico, University of Lisbon

Skills

Programming C · Python · Haskell · Java · Rust

Frameworks Spring · gRPC · PyTorch · Flask

Cybersecurity Binary Exploitation · Reverse Engineering

Languages Portuguese (native) · English (fluent) · French (basic)