

# Rafael Gonçalves

Carnegie Mellon University · Instituto Superior Técnico

✉ rafael.s.goncalves@tecnico.ulisboa.pt | 🏠 rafa1906.github.io | 📧 rafa1906 | 🌐 rafa1906

## 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 Frago 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 Frago Santos

## Publications

---

**R. Gonçalves**, F. Ramos, P. Adão, J. Frago 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. Frago 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

---

- 2022/2023 **Academic Merit Diploma**, Instituto Superior Técnico, University of Lisbon
- 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)