

# Filipe Marques

## Curriculum Vitae

Leiria, Portugal  
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### Experience

- 2022 – Present **First Stage Researcher**, INESC-ID, Portugal  
October  
*Unit* ARSR: Automated Reasoning and Software Reliability  
*Supervisors* José Fragoso Santos and Nuno Santos
- 2021 – 2022 **Early Stage Researcher**, INESC-ID, Portugal  
December September  
*Project* INFOCOS: Intelligent Feedback for Content Students  
*Supervisor* José Fragoso Santos

### Education

- 2022 – Present **Ph.D. in Computer Science and Engineering**, *Instituto Superior Técnico*, Portugal  
October  
*Supervisors* Profs. José Fragoso Santos (IST), Limin Jia (CMU), and Nuno Santos (IST)
- 2019 – 2021 **M.Sc. in Computer Science and Engineering**, *Instituto Superior Técnico*, Portugal,  
September December GPA: 17/20  
*Thesis* Robust Symbolic Execution for WebAssembly  
*Supervisor* Prof. José Fragoso Santos and Prof. Nuno Santos  
*Jury* José Borbinha (DEI), José Fragoso (DEI), Mikoláš Janota (CIIRC)
- 2016 – 2019 **B.Sc. in Computer Science and Engineering**, *Instituto Superior Técnico*, Portugal,  
September July GPA: 16/20

### Honors & Awards

- 2022 **CMU Portugal Affiliated Ph.D. Program Scholarship**
- 2018–2020 **Academic Merit Diploma**, *Instituto Superior Técnico, Universidade de Lisboa*

### Publications

- KLEE'22 **Poster: Empirical Study on Applying Program Analysis and Testing Tools to Student Code**  
F. Ramos, F. Marques\*, P. Adão, N. Santos, and J. F. Santos.  
In KLEE Workshop 2022
- RV'22 **TestSelector: Automatic Test Suite Selection for Student Projects**  
F. Marques\*, A. Morgado, J. F. Santos, and M. Janota  
In Proc. of Intl. Conf. on Runtime Verification. 2022.

ECOOP'22 **Concolic Execution for WebAssembly**  
F. Marques\*, J. F. Santos, N. Santos, and P. Adão.  
In Proc. of European Conference on Object-Oriented Programming. 2022.

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## Research Talks

### **Symbolic Analysis for Detecting Injection Vulnerabilities in Node.js Applications**

Jun 2023 Invited talk to Amazon Prime Video Automated Reasoning Team, London

May 2023 Invited talk to Prof. Limin Jia's Group @ CyLab, CMU

### **Concolic Execution for WebAssembly**

Dec 2022 OutSystems AI Reading Group, Lisbon.

Sep 2022 Software Verification Group, Imperial College London.

Hosted by Prof. Philippa Gardner

Jun 2022 ECOOP'22

### **Empirical Study of C Analysis Tools on Student Code**

Sep 2022 Invited talk to Meta's Infer Team Led by Dr. Jules Villard, London

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## Software

**WASP** **The Wasm Symbolic Processor**, WASP, is a symbolic execution engine for testing Wasm modules, built on a standard-compliant Wasm reference implementation.

*Role* Co-creator

*Url* <https://github.com/formalsec/wasp>

**OWI** **The OCamlPro Wasm Interpreter**, OWI, is a specialized Wasm toolkit, incorporating symbolic program execution techniques from the WASP engine, with marked improvements in speed and maintenance.

*Role* Contributor

*Url* <https://github.com/OCamlPro/owi>

**Encoding** An OCaml abstraction layer for constraint solvers.

*Role* Creator and Maintainer

*Url* <https://github.com/formalsec/encoding>

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## Other Skills

**Programming** OCaml, Rust, Python, C/C++, Java, JavaScript, WebAssembly, Haskell

**Scripting** Bash, Python, Perl (basic)

**Linux** CLI (intermediate), Revision Control Tools, Configuration Management Tools

**Program Analysis** Formal Verification, Symbolic Execution, Type Checking, Testing

**Cyber Security** Computer and network security. (intermediate)

**Languages** Portuguese (Native), English (Fluent)