Eric Mugnier

emugnier
Looking for full time job
Interested in Formal Methods, Security, Systems, and LLMs

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Education

- **UC San Diego** USA, Sept 2020-Fall 2025(Expected)
  - Ph.D. student in security and formal methods advised by Pr. Yuanyuan Zhou
- **Bordeaux INP, Grandes Ecoles System** France, Sept 2014-Dec 2019

Experience

- **Research Scientist Intern** AWS Seattle, June-Sept 2023
  - Developed a plugin to enable portofolio solving in Dafny, with Z3, CVC5 and Vampire
  - Demonstrated that the porfolio approach improves solving time by 25%, while increasing the proof stability
  - Presented the work at the Dafny workshop, advocating for more support for different solvers
- **Research Scientist Intern** AWS Seattle, June-Sept 2022
  - Proved the correctness of part of the AWS authorization library
  - Tested the compilation from Dafny to the target languages and fixed 11 bugs in the compiler
- **Security Software Engineer** Whova San Diego, Oct–July 2019–2020
  - Improved the security of APIs receiving 10M requests per day by automating penetration tests
  - Led the transition from Python2 to Python3 for the entire codebase
  - Trained the engineering team on cybersecurity by giving talks, writing newsletters and organizing quizzes

Research Experience

- **VOOST: Speeding-up verification start with LLM Agents** In progress
  - Designing VOOST, a tool that adapts Rust code to the Verus subset and generates specifications using LLM agents
  - Exploring LLMs' memory and self-learning capabilities to capture and adapt to the nuances of the Verus verifier
  - Applying VOOST to verify real-world crates, including an IBAN parser, an HTTP server, and an HTTP library
- **On the Impact of Formal Verification on Software Development** OOPSLA 2025
  - Interviewed 14 Dafny users about their use of verification in large scale projects
  - Used grounded theory to understand the expectations and practices of verification tools
  - Identified opportunities to simplify verified development such as the need for more adapted review tools
- **Laurel: Unblocking Automated Verification with Large Language Models** OOPSLA 2025
  - Designed Laurel, a tool that generates assertions by leveraging Large Language Models (LLMs) with 60% accuracy
  - Built a dataset Dafny lemmas with 202 helper assertions extracted from 3 real-world codebases
  - Proposed techniques to improve the accuracy of the LLM leveraging in-context examples and prompt placeholders
- **ACSym: Detecting Access Control Change with Symbolic Execution** In submission
  - Developed a tool that leverages symbolic execution to evaluate access control changes in system software
  - Designed a technique combining static analysis and selective execution that run software of 200,000 lines in 5 min
  - Evaluated on users and real-world issues showing its effectiveness on Apache, Iptables, Nginx and Redis

Additional publications

- **Effective Bug Detection with Unused Definitions.** Eurosys 24. Zhong *et al.*
- **Give and Take:** An End-To-End Investigation of Giveaway Scam Conversion Rates. IMC 24. Liu *et al.*

Skills

- Python, Dafny, C, C++, LLVM, Rust, Git, Docker, JavaScript, NodeJS, MySQL