Naïm Moussaoui Remil

PhD Candidate in Computer Science

École Normale Supérieure | PSL & Inria Paris

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GitHub · Google Scholar · DBLP · LinkedIn · Paris, France

Research Interests

My research focuses on providing **mathematical guarantees about program behavior**. I explore the verification of **temporal properties** of sequential C-like programs. Specifically, I use **abstract interpretation** to develop static analyses proving **CTL properties** of programs in **adversarial contexts**, including termination resilience and vulnerable variable detection.

Education

PhD in Computer Science *2023 – Present*
Inria Paris & École Normale Supérieure | PSL, Paris France
Supervisor: Caterina Urban (ENS & Inria).
Topic: *Static Analysis by Abstract Interpretation for CTL Properties in Adversarial Contexts.*

Master 2 – MPRI (Master Parisien de Recherche en Informatique) *2022 – 2023*
ENS Paris · École Polytechnique · Université Paris-Cité · ENS Paris-Saclay France
Courses: Abstract Interpretation, Type Systems and Functional Programming, Deductive Verification (Why3, Separation Logic), Semantics, Proof Assistants (Rocq).

Normalien Élève – Computer Science (Master) *2019 – 2023*
École Normale Supérieure de Rennes – admitted via second concours France

Double Major Bachelor in Mathematics and Computer Science,
summa cum laude *2017 – 2019*
Université Paris-Est Créteil (UPEC) France

Publications

[1] **Naïm Moussaoui Remil**, Caterina Urban.
Termination Resilience Static Analysis.
In **VMCAI 2026** – International Conference on Verification, Model Checking, and Abstract Interpretation.
doi:10.1007/978-3-032-15700-3_11 · Artifact: Zenodo 17176433

[2] **Naïm Moussaoui Remil**, Caterina Urban.
ReFuncTion: Conditional Termination by Abstract Interpretation of Numerical C Programs (Competition Contribution).
In **TACAS 2026** – International Conference on Tools and Algorithms for the Construction and Analysis of Systems.
doi:10.1007/978-3-032-22749-2_33

[3] **Naïm Moussaoui Remil**, Caterina Urban, Antoine Miné.
Automatic Detection of Vulnerable Variables for CTL Properties of Programs.
In **LPAR 2024** – International Conference on Logic for Programming, Artificial Intelligence and Reasoning.
doi:10.29007/dnpx · Artifact: Zenodo 10964500

Research Experience

Research Intern – M2 *Mar 2023 – Aug 2023*
Inria Paris, Équipe Antique, École Normale Supérieure Paris, France
Supervisors: Caterina Urban & Antoine Miné. Topic: *Vulnerable variable detection for CTL properties by abstract interpretation.* Led to LPAR 2024 publication and to the PhD position.

Research Intern – M1 *May 2022 – Jul 2022*
Max Planck Institute for Software Systems (MPI-SWS) Kaiserslautern, Germany
Supervisor: Viktor Vafeiadis. Topic: *Extending the GenMC Model-Checker.*

Research Intern *Sep 2021 – May 2022*
École Normale Supérieure de Rennes Rennes, France
Supervisors: Martin Quinson & Thierry Jéron. 9-month research project in computer science.

Research Intern – L3 *May 2021 – Jul 2021*
LACL (Laboratoire d'Algorithmique, Complexité et Logique), Université Paris-Est Créteil Créteil, France
Supervisor: Antoine Spicher. Topic: *Visualising Global Graph Transformation.*

Teaching

Teaching Assistant (Chargé de TD) *Jan 2024 – 2025*
École Normale Supérieure | PSL, Paris France
Practical sessions for second-year students in CPES (Cycle Pluridisciplinaire d'Études Supérieures). Topics included Lustre synchronous programming.

Academic Service

Sub-reviewer 2026
OOPSLA 2026

Sub-reviewer 2026
SAS 2026

Artifact Evaluation Committee Member 2024
SAS Artifacts Track, SPLASH 2024

Talks & Seminars

Invited Talks

- *Termination Resilience Static Analysis*
  LACL Seminar, Université Paris-Est Créteil, February 2026
- *Static Program Analysis Across Trust Boundaries*
  Dagstuhl Seminar 25421 – Sound Static Program Analysis in Modern Software Engineering, Schloss Dagstuhl, October 2025
- *Termination Resilience Static Analysis*
  SemAntique, Inria/Antique, Paris, March 2025
- *Termination Resilience Static Analysis by Abstract Interpretation*
  Inria PhD Seminar, Paris, March 2025
- *Automatic Detection of Vulnerable Variables for CTL Properties of Programs*
  SemAntique, Inria/Antique, Paris, March 2024

Conferences & Symposia

- *Termination Resilience Static Analysis*
  VMCAI 2026, Rennes, January 2026
- *ReFuncTion: Conditional Termination by Abstract Interpretation* (Tool Demo, SV-COMP)

TACAS 2026, ETAPS, 2026

- *Static Program Analysis Across Trust Boundaries*
  iFM 2025 PhD Symposium, Paris, November 2025
- *Automatic Detection of Vulnerable Variables for CTL Properties of Programs*
  LPAR 2024, Port Louis, Maurice, May 2024

Open-Source Software

FuncTion / FuncTion-V / ReFuncTion

Abstract Interpretation-based static analyzer for (conditional) Alternating-time Temporal Properties (including classical termination, non-termination and CTL properties) of C-like numerical programs. Written in OCaml. Extension of `FuncTion` by Caterina Urban.

Marsh

Small language for probabilistic programming with exact inference. Written in OCaml.

Technical Skills

Languages: OCaml, Python, C, Rust, Bash, HTML/CSS, JavaScript, Lustre
Formal Methods: Abstract Interpretation, Static Analysis, Temporal Specification, Program Logic, Taint Analysis, Software Security, Synchronous Programming
Tools: Git, LaTeX, Linux
Languages spoken: French (native), English (fluent), Arabic