THIBAUT PÉRAM

I am a PhD student in Computer Science at the University of Cambridge. I have a particular interest and experience in system/bare metal and concurrent/GPU programming, low-level safety and security, compilers, programming languages and formal verification

>>> ACADEMIC STUDY

PhD

- D Currently working on formal models for virtual memory concurrency
- Implementing this and other models in Coq
- ${\ensuremath{\,\mathbb P}}$ Connecting such concurrent models to the well-tested Sail ISA semantics for Arm and RISC-V
- Supervised by Peter Sewell

Bachelor and Masters

ENS, Paris, Sep 2016 - Sep 2021

University of Cambridge, Oct 2021 - Now

- Masters in Computer Science : MPRI ("très bien" / Summa cum laude),
- Three bachelor degrees, in Computer Science ("très bien" / first class honours), Maths ("très bien" / first class honours), and Physics ("bien"/ upper second class honours)

INTERNSHIPS

Software engineering intern

DeepMind (remote), Apr - Aug 2021

University of Cambridge, Jan - July 2020

IMDEA Software, Madrid, June – Aug 2017

- ▶ Contributed to the S6 JIT for Python written in C++, supervised by James Molloy
- Implemented fast data-flow optimisations in a generic and reusable manner
- $\ensuremath{\,{\rm D}}$ Made significant contributions at all levels of the JIT compilation pipeline

Research Assistant (Masters internship)

- > Worked on a translation validation project in OCaml, supervised by Peter Sewell
- Combined instruction symbolic traces to symbolically evaluate entire functions
- ▶ Made a prototype type system for binary code to propagate DWARF typing information
- Interfaced with Z3 to make symbolic state simplification for the type system

Research intern in the EMSEC team IRISA, Rennes, Sep - Dec 2019

- Supervised by Clémentine Maurice and Sam Tomas
- > Automatic detection of secret password management binary code in common web server
- Gadget detection for SMoTherSpectre attacks, targeting those passwords

Intern in cavity quantum electrodynamics team LKB, Collège de France, Paris, July 2019

- Supervised by Igor Dotsenko and Pierre Rouchon
- > Worked on quantum tomography: determining quantum states from various measurements
- > Computed standard deviation of a max-likelihood estimator on quantum density matrices

Proof engineer intern at Trustworthy systems Data61, CSIRO, Sydney, Apr - Aug 2018

- > Worked on SeL4 code and proofs, supervised by Rafal Kolanski and Mattew Brecknell
- Fixed a longstanding incompatibility between the access rights model assumed by the proofs and the optimized code paths
- \blacktriangleright Implemented the fixed access rights model (30 LoC of C) and verified it (8 kLoc of Isabelle)

Cryptography verification intern

Supervised by Gilles Barthes

Developed a rewriting method to automatically verify multiparty computation protocols

 $\,$ Implemented a DSL and a tool to analyse and validate protocols using this method in C++

SIGNIFICANT COURSE PROJECTS

"Super OS"	C++ , Feb - June 2017
Toy x86_64 operating system with graphical display a	nd ext2 FS (2 people, 15Loc)
Reactive RS	Rust , Oct 2017 - Jan 2018
> A fast library for reactive programming in Rust, inspire	ed by Reactive ML (2 people, 8kLoc)
Mini ADA compiler	OCaml, Oct 2016 - Jan 2017
> A toy compiler from a subset of ADA to x86_64 asser	mbly. (2 people, 8kLoc)
"Bubbles"	C++, CUDA, Nov 2018

A real-times ray tracer of bubbles (and other objects) (2 people, 2kLoc)

INFO

🍽 French

• Cambridge, UK

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🗘 tperami

LANGUAGES

French: Native English: Fluent Spanish: Read-only

TECHNICAL SKILLS

C/C++, Rust, Ocaml, Python Coq, Isabelle, CMake, Cargo, Dune, Opam, x86_64, AArch64, CUDA, GDB, Valgrind, Qemu LaTeX, Tikz Vim, Emacs, Zsh

PROGRAMMING CONTESTS

Prologin 2017 : 20th over 82

SWERC 2018 : 1st over 89 teams

ICPC World Finals 2019 : 41th over 135 teams

Google Code JAM 2019 : reached round 2

SWERC 2019-2020 : 5th over 95 teams