Formal Methods PhD Intern

Formal Methods and Programming Languages

Highlights

- Fully Remote (Global)
- ≥ $5k / month
- Reports to FM Team
- 21 Week Minimum Term
- Gym Allowance
- Learning Allowance

About Us

At ***Formal***, we're rethinking serverless *from scratch*: we're building a new computing stack for instant, globally available, truly elastic, soundly isolated execution. We want anyone to be able to easily deploy their software on our machines and have it instantly react to inbound requests with bare-metal performance. We leverage formal methods and languages to build OS interfaces with low overhead, formally verified isolation without containers or VMs. Our stack is simultaneously more secure and performant than anything else out there. Our immediate goal is to build the world's first serverless networking infrastructure.

We believe in moving deliberately, with care, and breaking nothing. Incredible developer experiences govern how we think about the software we write.

Our Tech Stack

We write in Rust and Rocq, use `git`, prefer CLIs to GUIs and love OSS.

Equal Opportunities

Formal is an equal opportunity workplace. We understand, accept, and value differences amongst people and their backgrounds. We provide everyone fair opportunities to attain their full potential and actively promote a sense of belonging and wellness.

Expectations

You'll work with published researchers and engineers in the Formal Methods team to formally verify a new low-level, production programming language and compiler. You'll write formal specifications and complex mechanized proofs in Rocq. Expect strong mentorship, clear milestones, and real autonomy to explore, with opportunities to publish and open-source artifacts.

Responsibilities

- Contribute to the design, development, and maintenance of mechanized theorems and proofs in Rocq.
- Propose and validate solutions to problems.
- Actively participate in code reviews and design discussion.
- Actively anticipate and communicate roadblocks.

Qualifications

- Ability to commit to a full-time 21+ week term.
- Enrolled in a PhD program in Formal Methods or Programming Languages working with Rocq.
- Some professional software engineering experience.
- Understanding of type systems and logic systems.
- Ability to read, write, and understand formal programming language specifications and implementations.
- Ability to formally articulate, reason about, and verify low-level security, safety, and correctness properties of programming languages like Rust and C/C++.
- Some familiarity with SMT / constraint solving.
- Familiarity or willingness to learn Rust and OCaml.
- High level of independence and autonomy.

Compensation & Benefits

Compensation is comprised of a competitive market salary. Benefits include unlimited vacation time, comprehensive medical, dental, and vision insurance, a $120 monthly gym allowance, and $250 to spend on anything educational.