NISARG PATEL

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QUALIFICATION SUMMARY

- Extensive work on concurrency, decentralized systems and security.
- Multiple collaborations in industry and academia resulting in publications at top-tier conferences.
- Expertise with wide variety of programming languages and formal verification tools.
- Enhanced formal verification workflows with AI integrations for DeFi security.

WORK EXPERIENCE

Certora, Inc. *Aug 2024 - Present*
Formal Verification Researcher

- Conduct formal verification of smart contracts using Certora's verification tools, writing precise specifications and proofs to ensure security and correctness in complex DeFi systems.
- Collaborate with clients to deliver high-assurance formal verification reports, adapting to diverse architectures and providing actionable feedback to development teams.
- Integrate AI in formal verification workflows to enhance efficiency, resulting in 20% reduction in delivery time for formal verification reports.

NYU Analysis of Computer Systems Group, New York *Sept 2018 - Aug 2024*
Graduate Researcher, Advisor: Prof. Thomas Wies

- Introduced novel techniques to formally verify concurrent data structures that were out of reach from existing work. The techniques were formalized using a theorem prover for 100% guarantee.
- First to formally prove correct widely used key-value store implementations such as B-trees, hash tables, LSM trees, lock-free linked-lists and skiplists.
- Resulting in multiple publications at top conferences and a book with publishers *Morgan & Claypool.*
  - ◇ Raven: An SMT-Based Concurrency Verifier, *CAV2025*
  - ◇ Verifying Lock-free Search Structure Templates, *ECOOP2024*
  - ◇ Verifying Concurrent Multicopy Search Structures, *OOPSLA2021*
  - ◇ Automated Verification of Concurrent Search Structure Templates, *Morgan & Claypool, 2021*
  - ◇ Verifying Concurrent Search Structure Templates, *PLDI2020*

EDUCATION

New York University, New York, USA *Sept 2018 - Aug 2024*
Ph.D. in Computer Science CGPA: 3.914/4

Chennai Mathematical Institute, Chennai, India *Aug 2013 - June 2018*
M.Sc. in Computer Science CGPA: 9.62/10
B.Sc. in Mathematics and Computer Science CGPA: 8.64/10

SKILLS

- Programming Languages : Rust, Solana, Solidity, Python, Java, OCaml, Haskell.
- Program Verification Tools/Theorem Provers : Rocq, Iris, Dafny, Lean, Kani.
- BDD Libraries, SAT/SMT/QBF-solvers, NuSMV, Automata/Program Synthesis Tools.
- Miscellaneous : Agentic Coding, Latex, Git, bash, CSS, HTML.