ANKIT KUMAR

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Address: Khoury College of Computer Sciences, Northeastern University, Boston

PROFESSIONAL SUMMARY

Applied Scientist with proven expertise across finance and technology sectors, having delivered impactful solutions at Rivos, Amazon, Morgan Stanley, and Olacabs. Specializes in formal methods, theorem proving, and software verification with demonstrated success in translating cutting-edge research into practical, industry-ready applications.

TECHNICAL SKILLS

Programming Languages: C, C++, Java, Rust, Lisp, ACL2 Sedan, Coq, Haskell
Development Tools: Git, GitHub, Emacs, LaTeX, Shell Scripting
AI & Machine Learning: Agentic AI, Open AI, Claude, Cline, Amazon Q, LLMs, Prompt Engineering
Verification Tools: Jaspergold, ACL2, ACL2 Sedan
Specializations: Formal Methods, Theorem Proving, Software Verification, Security Analysis, Dataflow Analysis, Taint Analysis

PROFESSIONAL EXPERIENCE

Applied Scientist Intern — Amazon — Santa Clara, CA — Summer 2025

- Pioneered Agentic AI methodology to auto-generate Rust code specifications from Java codebases
- Leveraged dataflow analysis techniques to eliminate hallucinations and improve code correctness
- Technologies: Java, Rust, Claude, Cline, Amazon Q, Agentic AI, Soot

Member of Technical Staff, Intern — Rivos Inc. — Portland, OR — Summer 2023

- Architected comprehensive formal verification framework for RISC-V hypervisor page walk algorithm security properties that helped accelerate proof verification by 10x (days to hours) through strategic lemma transfer from high-level models
- Technologies: ACL2, ACL2 Sedan, Jaspergold

Applied Scientist Intern — Amazon — Minneapolis, MN — Summer 2022

- Engineered innovative taint-analysis framework for enterprise-scale tracking of sensitive data across AWS infrastructure that earned return offer and recognition
- Technologies: Java, Grails, GitHub, Shell Scripting

Software Development Engineer II — Olacabs — Bengaluru, India — 2012-2014

- Architected inaugural Olacabs Android consumer application, capturing 80% of total cab booking volume
- Eliminated 60% of driver app crashes through systematic debugging and optimization strategies
- Implemented robust cashless payment and digital wallet systems, enhancing user transaction experience
- Technologies: Java, Android, Git, Ruby on Rails

Associate — Morgan Stanley Advantage Services — Mumbai, India — 2010-2012

- Transformed legacy derivatives trading platform architecture to support multi-regional deployment
- Expanded platform reach to Hong Kong and Singapore markets, doubling transaction processing capacity
- Technologies: .NET, Java, Spring, Perforce

EDUCATION

PhD in Computer Science — Northeastern University — Boston, MA — 2018-2025

- Thesis: Refinement-based reasoning of P2P protocols is feasible and useful
- Additional Contributions: Automated homework feedback and checking systems, proof verification frameworks, string equation solvers

M.Tech in Computer Science — IIT Kanpur — Kanpur, India — 2015-2017
B.Tech in Electrical Engineering — IIT (BHU) Varanasi — Varanasi, India — 2006-2010

PUBLICATIONS

1. A Formalization of the Correctness of the Floodsub Protocol - ACL2 Workshop 2025 - Best Student Paper Award
2. A Formalization of the Correctness of the Floodsub Protocol - arXiv preprint arXiv:2507.19013, 2025
3. Formal Model-Driven Analysis of Resilience of GossipSub to Attacks from Misbehaving Peers - IEEE Symposium on Security and Privacy 2024
4. Verification of GossipSub in ACL2s - ACL2 Workshop 2023 - Best Student Paper Award
5. Automated Grading of Automata with ACL2s - Electronic Proceedings in Theoretical Computer Science 2023
6. Proving Calculational Proofs Correct - ACL2 Workshop 2023
7. Calculational Proofs in ACL2s - arXiv preprint 2023
8. Mathematical Programming Modulo Strings - Formal Methods in Computer Aided Design 2021

AWARDS AND HONORS

Best Student Paper Award, ACL2 Workshop 2025
Dissertation Completion Fellowship, Summer 2024
Invited Talk, Syracuse University 2024
Best Student Paper Award, ACL2 Workshop 2023
Invited Talk, IPFS Camp Lisbon 2022
Student Travel Fellowship, PLMW at POPL 2019
First Prize, Droidcon India Hackathon 2013