

# SAI LALITH KUMAR AKA

+1-7206677920    SaiLalithKumar.Aka@colorado.edu    LinkedIn    Github

## EDUCATION

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- **PhD in computer science, University of Colorado Boulder** Boulder, CO  
*Advisor: Dr. Gowtham Kaki;* *Aug 2025 - Present*  
*Field: Security verification and formal methods*  
*Courses: Computer Aided Verification, Static Analysis*
- **Bachelor of Technology, Shiv Nadar University** Delhi NCR, India  
*Major: Electronics and Communication Engineering; GPA: 8.31* *Jul 2019 - Jul 2023*  
*Minor: Computer Science and Engineering*  
*Courses: Artificial Intelligence, Cryptography, Operating Systems, Software Engineering*

## RESEARCH PUBLICATIONS

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- **Ransomware Criminal Smart Contract** Copenhagen, Denmark  
*2024 IEEE International Conference on Blockchain (Blockchain)* *Aug 2024*  
Authors: Aka Sai Lalith Kumar and Sweta Mishra

## EXPERIENCE

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- **Industry Solutions Delivery, Microsoft** Hyderabad, India  
*Consultant* *Aug 2023 - Jul 2025*
  - **Lead Security Architect:** Acted in this capacity for MTN EVA program which was a major undertaking with more than 35 consultants. Increased the cloud security posture by 30% and reduced critical vulnerabilities from over 120 to 0. Also responsible for all security costing and vendor audits
  - **Cloud Security Engineer:** Acted in this capacity for LSEG voyager program where I implemented secure configurations for 40+ cloud services using Azure policies, developed CI/CD pipelines for streamlined deployments, and spearheaded the standardization of cryptographic protocols to enhance cloud security and efficiency.
- **Applied Cryptography Lab, Shiv Nadar University** Delhi NCR, India  
*Undergraduate Researcher, Advisor: Dr. Sweta Mishra* *Mar 2021 - Jun 2023*
  - **Ransomware Criminal Smart Contract:** Proposed a cryptographic protocol using Smart Contracts, demonstrating the feasibility of ransomware attackers adopting this technology. Modeled the protocol as a Discrete Time Markov Chain and verified it using Probabilistic Checking.
  - **Collaborative Cyber Crime:** Designed and verified a formal mathematical model to evaluate the efficacy of collaborative cyber crime.
  - **Random Number Generator:** Created an experimental, NIST test suite passing Pseudo Random Number Generator using Collatz conjecture's hailstone patterns.
- **MyEra** Remote  
*Software Development Intern* *Dec 2021 - Feb 2022*
  - **Backend Architecture:** Made significant changes to the Backend architecture, wrote new documentation and optimized API performance by 10%.
  - **Admin Page:** Implemented API's for getting user insights and displayed them on Django's admin page.
  - **Twitter API:** Created a crawler to pull the latest trending topics from different sources like Twitter API and integrated it with the backend.
- **Orangewood Labs (Y Combinator W18)** Delhi NCR, India  
*Software Engineering Intern* *Apr - Jul 2021*

- **3D data:** Created linear algebra libraries for visualizing and processing 3D point cloud data applications.
- **Spray painting automation:** Engineered an algorithm to automate and process point cloud data, optimizing the robot arm's path for efficient spray paint distribution.
- **Optimization:** Handled massive datasets and accelerated the run time from 20 minutes to 1 minute per point cloud using Support Vector Machine, wrote a white paper summarizing the results.

## TEACHING EXPERIENCE

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- **Teaching Assistant** Boulder, Colorado  
*CSCI 1300, Intro to computing* *Fall 2025*
- **Teaching Assistant** Delhi NCR, India  
*EED308, Embedded Systems Hardware* *Spring 2023*
- **Course Grader and Capstone Advisor** Delhi NCR, India  
*CSD451, Applied Cryptography* *Fall 2022*

## PROJECTS

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- **Formal Verification of Needham-Schroder:** Formalized the Needham-Schroder protocol in Lean to demonstrate susceptibility to Lowe's man-in-the-middle attack, utilizing incorrectness logic to derive and verify the attack trace. [**Lean, Abstract Interpretation, Incorrectness Logic**]
- **Target Automated Architecture:** Implemented a tool to draw solution architecture diagrams with project-specific style using input fed from an Excel file. Encapsulated the core graphics module into a Gen AI based web application to make it interactive and ease the usage. [**C#, Dotnet ASP.NET Core Web API, React, Azure Open Ai**]
- **Format Preserving Encryption:** Engineered a Python implementation of the NIST standard FF3-1 algorithm for format-preserving encryption from scratch, enhancing its performance through optimization. Developed tests and packaged the solution for future utilization. [**Python, PyCrypto, Sockets**]
- **Noised based Random Number Generation:** Designed a two-layer algorithm leveraging signal noise to improve bit generation rates by 25%, overcoming limitations of traditional methods for secure randomness extraction. [**Python, PyTorch, GSP Toolbox**]

## COMMUNITY INVOLVEMENT

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- **IEEE Student Chapter Secretary** Delhi NCR, India  
*Conducted online and offline technical training impacting over 100 students* *Jan 2022 - Feb 2023*
- **Volunteer, Rural Organization for Social Empowerment(ROSE)** Hyderabad, India  
*STEM education for children from underprivileged backgrounds* *May 2022 - Jul 2022*

## AWARDS & HONOURS

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- **Innovation Maestro, London Stock Exchange Group** Hyderabad, India  
*Awarded for creatively solving critical requirements by Microsoft LT* *Aug 2024*
- **Rise Award, Microsoft** Hyderabad, India  
*Awarded for well rounded contribution to Microsoft's Mission* *Jun 2024*
- **Dean's list, Shiv Nadar University** Delhi NCR, India  
*Awarded for exemplary academic efforts* *2022 Spring, 2023 Monsoon*

## SKILLS SUMMARY

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- **Programming Languages:** Lean, Ocaml, C#, Python, C/C++, Terraform, PowerShell
- **Tools & Frameworks:** Git, L<sup>A</sup>T<sub>E</sub>X, ASP.NET, PyTorch, OpenCV, Django