Sulyab Thottungal Valapu

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Research Interests

My research aims to strengthen the resilience and fairness of the internet's core infrastructure by advancing networking technologies that support decentralization and counteract consolidation. I am particularly interested in studying the cloud-centric internet to understand its dynamics and develop strategies that promote a more open and decentralized ecosystem. To achieve these goals, I draw on methods from disciplines such as internet measurement, distributed systems, and applied cryptography.

Experience

2021 – ◇ **University of Southern California** | Graduate Teaching Assistant
• Teaching Assistant for *Fundamentals of Computation* (Spring '21, Fall '24), *Intro to Algorithms and Theory of Computing* (Fall '21), *Intro to Computer Systems* (Spring '25), *Intro to Computer and Network Security* (Spring '22), and *Database Systems* (Summer '24)

2018 – 2020 ◇ **Arista Networks** | Software Engineer
• Developed Network Layer software for Arista EOS®
• Involved in all stages of software development process including design, development, deployment, debugging and maintenance

Education

2021 – ◇ **Ph.D., University of Southern California** Computer Science.
• Advised by Prof. Bhaskar Krishnamachari
• Member of Autonomous Networks Research Group
• GPA: 3.96/4.0

2014 – 2018 ◇ **B.Tech., IIIT Allahabad** Information Technology.
• GPA: 9.37/10. Graduated with Honors.

Publications

Conference Proceedings

1. **Sulyab Thottungal Valapu**, Aritri Saha, Bhaskar Krishnamachari, Vivek Menon, and Ujjwal Guin. "Reward-based Blockchain Infrastructure for 3D IC Supply Chain Provenance". In: *2025 IEEE International Symposium on Hardware Oriented Security and Trust (HOST)*. To appear.

2. **Sulyab Thottungal Valapu**, Tamoghna Sarkar, Jared Coleman, Anusha Avyukt, Hugo Embrechts, Dimitri Torfs, Michele Minelli, and Bhaskar Krishnamachari. "DARSAN: A Decentralized Review System Suitable for NFT Marketplaces". In: *Blockchain – ICBC 2023*. Ed. by Qin Wang, Jun Feng, and Liang-Jie Zhang. Cham: Springer Nature Switzerland, 2023, pp. 3–20. ISBN: 978-3-031-44920-8. DOI: 10.1007/978-3-031-44920-8_1.

Technical Reports

1. **Sulyab Thottungal Valapu** and Bhaskar Krishnamachari. *A Survey of Probabilistic Micropayment Schemes*. Tech. rep. IEEE Blockchain Technical Briefs, Mar. 2022.

Skills

Languages	◇ Proficient: Python • C • C++ Familiar: Rust • WebAssembly • Java
Tools / Technologies	◇ Linux System Programming • Virtualization (Containers, VMs) • Linux Kernel Networking Stack • OpenWRT

Miscellaneous Experience

Internships

2017/05 - 2017/07 ◇ **Yonsei University, South Korea**
• Designed and implemented a blockchain-based protocol for intelligent autonomous vehicles to exchange messages and purchase services.
• Explored the concept of blockchain branching to tackle scaling limitations

Awards and Achievements

2017 ◇ Dean's Merit List, IIIT Allahabad

Activities

2017 ◇ Core Team member of Hack In The North, the largest student-led hackathon in India

2022, 2023 ◇ Research Coach for the Viterbi Summer Institute, a program by the USC Viterbi School of Engineering designed to offer incoming freshmen from underrepresented backgrounds an introductory research experience.

Selected Coursework

Systems	◇ Advanced Computer Networking Networked Systems in Cloud Computing Internet Measurement Autonomous Cyber-Physical Systems Applied Cryptography Network Security Operating Systems
Algorithms	◇ Advanced Analysis of Algorithms
AI	◇ Cognitive Science Natural Language Processing Artificial Intelligence