KARAN NEWATIA

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Website: https://karannewatia.github.io/
Github: https://github.com/karannewatia

EDUCATION

University of Pennsylvania *Jul 2020 - May 2025 (Expected)*
PhD in Computer and Information Science
Advised by Profs. Andreas Haeberlen and Linh Thi Xuan Phan
Research interests: privacy, security, distributed systems

Cornell University
Bachelor of Arts in Computer Science *Aug 2016 - Dec 2019*
Master of Engineering in Computer Science *Jan 2020 - May 2020*

PUBLICATIONS

Mycelium: Large-Scale Distributed Graph Queries with Differential Privacy.
E. Roth, **K. Newatia**, Y. Ma, K. Zhong, S. Angel, and A. Haeberlen.
Proceedings of the 28th ACM Symposium on Operating Systems Principles (**SOSP'21**), Virtual, October 2021.

RESEARCH EXPERIENCE

Mycelium Oct 2020 - Aug 2021
Supervised by Profs. Andreas Haeberlen and Sebastian Angel *University of Pennsylvania*

· Developed Mycelium, the first system to process differentially private queries over large graphs that are distributed across millions of user devices. Mycelium accomplishes strong privacy guarantees for users with a combination of cryptographic techniques (Fully Homomorphic Encryption, Zero Knowledge Proofs, Multi Party Computation), as well as a novel, semi-centralized mix network with telescoping circuits.

Vegvisir Jun 2019 - Dec 2019
Supervised by Profs. Robbert van Renesse and Hakim Weatherspoon *Cornell University*

· Developed Vegvisir, a partition-tolerant blockchain for use in power-constrained IoT environments with limited network connectivity. Built Android apps for emergency response and healthcare using the blockchain system. Integrated Vegvisir into Farmval.io (a startup which provides digital credit score evaluation of soil quality) using machine learning algorithms trained on agricultural datasets.

Fabric Aug 2018 - May 2019
Supervised by Prof. Andrew Myers *Cornell University*

· Implemented a distributed version of Scrabble with security guarantees using Fabric, a high-level programming language for building distributed applications with strong security.

Cislunar Explorers Jun 2018 - Aug 2018
Supervised by Prof. Mason Peck *Cornell University*

· Implemented flight software for the Cislunar spacecraft which will be carried as a secondary payload on NASA's Artemis 1 mission (scheduled to launch in December 2021). Collaborated with JPL to implement flight telemetry using JPL's FPrime framework.