

KARAN NEWATIA

(607) · 697 · 3749 ◊ knewatia@seas.upenn.edu

Website: <https://karannevatia.github.io/>

Github: <https://github.com/karannevatia>

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.