

Nitika Saran

CS Ph.D Student, Cornell University

Email : nsaran@cs.cornell.edu

Mobile : +1 (607) 262-3553

EDUCATION

Cornell University

Ph.D. in Computer Science

Ithaca, NY

August 2021 – 2026 (expected)

Indraprastha Institute of Information Technology

B.Tech in Computer Science and Engineering

Delhi, India

July. 2014 – May. 2018

RESEARCH INTERESTS

Networking, Systems for ML, Distributed Systems

RESEARCH EXPERIENCE

Reconfigurable Datacenter Networks

Cornell University

Ithaca, NY

Jan 2023 - present

Emerging optical circuit switches can fundamentally reduce networking costs by reconfiguring direct connections between endpoints within micro- or nanoseconds. This work studies the theoretical and practical guarantees/limits of such reconfigurable networks, constructing scalable designs for datacenters and ML clusters. Published at SIGCOMM'24, STOC'24, HotNets'24.

A Decentralized Software-Defined WAN Architecture

Google Systems Research Group

Sunnyvale, CA

May 2022 - Feb 2024

Worked towards simplifying Google's backbone wide area network, by decentralizing the software-defined control plane for improved availability. I developed decentralized traffic engineering solutions and characterized availability impact, to show that a decentralized software-defined WAN can improve availability by an order of magnitude over existing centralized designs. Published at SIGCOMM'24.

Low-cost, Scalable training of Large Language Models

Microsoft Research

Bangalore

Sep 2019 - July 2021

Research Fellowship in the MSR Systems group. I built Varuna, a training framework for large language models such as GPT and BERT. Varuna implements *elastic* training, that enables these models to use low-priority preemptible VMs and commodity networking, reducing cost by about 5x compared to custom supercomputers. I was the co-primary author of an award-winning paper we wrote on Varuna, published at EuroSys 2022.

PUBLICATIONS

Semi-Oblivious Reconfigurable Networks

Nitika Saran, Daniel Amir, Tegan Wilson, Robert Kleinberg, Vishal Shrivastav, Hakim Weatherspoon
HotNets 2024

dSDN: A Decentralized SDN Architecture for the WAN

Alex Krentsel, Nitika Saran, Bikash Koley, Subhasree Mandal, Ashok Narayanan, Sylvia Ratnasamy, Ali Al-Shabibi, Anees Shaikh, Rob Shakir, Ankit Singla, Hakim Weatherspoon
SIGCOMM 2024

Shale: A Practical, Scalable Oblivious Reconfigurable Network

Daniel Amir, Nitika Saran, Tegan Wilson, Hakim Weatherspoon, Vishal Shrivastav, and Robert Kleinberg,
SIGCOMM 2024

Breaking the VLB Barrier: Improving Oblivious Reconfigurable Networks with High Probability

Tegan Wilson, Daniel Amir, Nitika Saran, Vishal Shrivastav, Robert Kleinberg, and Hakim Weatherspoon
STOC 2024

Varuna: Scalable, Low-cost Training of Massive Deep Learning Models

Nitika Saran, Sanjith Athlur, Muthian Sivathanu, Ram Ramjee, Nipun Kwatra
EuroSys 2022, *Awarded Best Paper!*

INDUSTRY EXPERIENCE

Microsoft Development Centre

Software Engineer

Bangalore

July 2018 - Aug 2019

Teams is a collaborative app in the Office365 suite. I worked on a new calendaring experience in Teams using ReactJS and Apollo Client. Contributed towards key performance and accessibility features in the app before it's launch. Re-designed parts of the DOM tree and react rendering to bring down page load times.

Inkers Robotics

Engineering Intern

Bangalore

May - July 2017

Integration and optimization of visual SLAM techniques for drones. Worked on Direct Sparse Odometry, ORB-SLAM.

TEACHING

- Head TA, Computer Architecture 2024
- Head TA, Introduction to Networking 2023
- Head TA, Operating Systems 2022
- TA, Data Structure & Algorithms IIT Delhi, 2017
- TA, Discrete Math IIT Delhi, 2017
- Dance Teacher for 5-10 year olds 2018, 2016
- Tutor, ASTHA Classes and recreational activities for disabled children after school hours. 2015

AWARDS

- EuroSys Best Paper Award 2022
- Cornell University Fellowship 2021-22
- Conference Travel Grants: NSDI, SIGCOMM 2023-24
- Microsoft Research Fellowship 2019-21
- Finalist, KVPY Fellowship, Dept. of Science & Technology, Govt. of India 2014