

# Varshika Srinivasavaradhan

780 Acacia Walk, Goleta, California 93117

404-884-9747 | [varshika@ucsb.edu](mailto:varshika@ucsb.edu) | [varshikavaradhan.github.io](https://varshikavaradhan.github.io) | [github.com/varshikaa](https://github.com/varshikaa)

## EDUCATION

---

### University of California, Santa Barbara

*Doctor of Philosophy in Computer Science, GPA: 4.0/4.0*

Santa Barbara, CA

*Sep 2022 – Present*

### Purdue University - Main Campus

*Master of Science in Computer Science, GPA: 3.8/4.0*

West Lafayette, IN

*Aug 2018 – May 2020*

### Anna University

*Bachelor of Engineering in Electronics and Communication, GPA: 9.63/10*

Tamil Nadu, India

*June 2014 – May 2018*

## RESEARCH INTERESTS

---

I am an internet measurement researcher with expertise in network performance measurement and analysis of large-scale datasets, seeking postdoctoral opportunities in internet measurement and performance modeling areas. I have experience designing edge-network measurement studies and applying statistical and machine learning methods to both crowdsourced and controlled datasets to characterize network behavior, particularly in cellular networks, and to quantify coverage quality. A key aspect of my work is the use of performance insights to identify and address digital access disparities, shaping data-driven policy decisions. My works have been published at peer-reviewed and non-peer reviewed conferences such as ACM SIGCOMM, PAM, and TPRC, and I have industry experience from Google and Amazon.

## PUBLICATIONS

---

- **V. Srinivasavaradhan**, J. Liu and E. Belding., "Broadband Access: Assessing the Interplay Between Wireline, Fixed Wireless, and Mobile Networks in the U.S.", TPRC 2025.
- **V. Srinivasavaradhan**, "Measuring the Mobile Gap: From Network Performance to Infrastructure Criticality", ACM MobiSys Rising Stars Forum 2025.
- **V. Srinivasavaradhan**, J. Liu and E. Belding, "5G Performance: A Multidimensional Variability Analysis", Passive and Active Measurement, PAM 2025.
- **V. Srinivasavaradhan**, O. Park and E. Belding., "Mapping Cellular Network Evolution and Infrastructure Criticality: A Nationwide Analysis", TPRC 2024.
- H. Manda\*, **V. Srinivasavaradhan\***, L. Koduru, K. Zhang, X. Zhou, U. Paul, E. Belding, A. Gupta and T. Narechania, "Assessing the Efficacy of the Connect America Fund in Addressing Internet Access Inequities in the US", ACM SIGCOMM 2024.
- A.Paul, **V. Srinivasavaradhan**, S.Selvi, and C. Pandu Rangan., "A CCA-Secure Collusion Resistant Identity-Based Proxy Re-encryption Scheme", ProvSec'18

## PUBLISHED ARTICLES

---

- Quality of Coverage (QoC): A New Paradigm for Quantifying Cellular Network Coverage Quality, Usability and Stability, <https://arxiv.org/abs/2510.21162>.
- Measuring Broadband Policy Success, Harvard Law Review Blog, July 16, 2024.
- Poster: Beyond the Bars: Decoding the Complexities of Cellular Network Performance through Speedtest Data, *HotMobile 2024*
- Poster: Characterizing Cellular Speed Test Performance: An In-Depth Analysis of What Matters, *N2Women Workshop, ACM SIGCOMM 2023*

## RESEARCH EXPERIENCE

---

### Graduate Student Researcher

University of California, Santa Barbara

Sep 2022 – Present

Santa Barbara, CA

#### Quality of Coverage (QoC): Framework and Estimation

- **The QoC Framework:** Developed QoC, a threshold-based framework that abstracts the diverse set of factors that affect cellular performance by modeling network behavior as a performance time series, decomposing measurements into usable and unusable states to quantify application-specific usability and stability over time and space.
- **QoC Measurement Infrastructure:** Designed and implemented end-to-end automated Android measurement experiments across multiple phones to collect dense time series required for QoC computation, efficiently storing ~100M network performance measurements via a self-hosted server pipeline.
- **Spatiotemporal QoC Estimation:** Developing novel statistical methods to infer quality of cellular coverage through sustained usability and resilience (survival analysis) from instantaneous sparse crowdsourced Speedtests using hierarchical spatiotemporal and Markov models.

#### Measurement-Driven 5G Performance Characterization

- **Infrastructure-Level Cellular Variability:** Applied statistical and machine learning techniques to infer infrastructure-driven performance variation from crowdsourced 5G measurements with device and radio context, including comparative characterization of 5G non-standalone (NSA) and standalone (SA) deployments.
- **5G Performance Variability [PAM 2025]:** Analyzed ~2M 5G crowdsourced Speedtests across 8 U.S. cities (2021-2024), characterizing 4G-to-5G evolution and urban-rural performance gaps. Developed statistical divergence techniques to isolate the impact of network-level and device-level factors in realizing the potential of 5G.
- **5G Behavior in Crowded Events:** Designed controlled multi-phone cross-layer measurement experiments to quantify load-induced 5G performance degradation under crowded events, jointly analyzing physical layer telemetry with application-layer performance metrics across traffic types (bulk throughput tests, UDP pings, and video streaming and conferencing flows) to attribute impacts across layers.

#### Broadband Policy and Infrastructure Analysis

- **Connect America Fund (CAF) Evaluation [ACM SIGCOMM 2024]:** Curated a 500K-address dataset to analyze the impact of CAF on broadband deployment; found that competition was more effective than subsidies at improving service quality. **IRTF Applied Networking Research Prize 2025.**
- **Broadband and Cellular Infrastructure Analysis [TPRC 2024, 2025]:** Analyzed 100M+ Speedtest measurements integrated with FCC broadband maps and cellular infrastructure data to track 5G rollout evolution and assess broadband availability. Identified strong FWA-cellular performance correlation and quantified urban-rural gaps in deployment progress and performance.
- **Spectrum Auctions and Performance Attribution:** Developing novel econometric, and statistical methods to attribute cellular performance changes to infrastructure deployments following spectrum auctions.
- **Retrieval Augmented Generation for Broadband Policy Intelligence:** Curated ~15,000 U.S. broadband policy textual documents and built a LLM-assisted transformer-based Retrieval Augmented Generation (RAG) pipeline using vector databases to translate policy developments into actionable measurement guidance.

### Student Research Intern

Google LLC

Oct 2024 – Mar 2025

Cambridge, MA

- Conducted analysis of large-scale, real-time latency measurements collected from hosts within Google's internal network infrastructure. Designed and implemented service level objective (SLO) definitions aimed at accurately capturing the diverse customer experiences across various service classes. This involved leveraging advanced statistical methods to interpret latency variation patterns under different operational scenarios and network loads, enabling the formulation of meaningful performance targets that capture end-user perception.

### Internet Quality Barometer Fellow

Measurement Lab

Jun 2024 – Sep 2024

Remote, CA

- Contributed to the development of an application-specific metric for Internet quality that moves beyond raw speed by translating Quality of Service (QoS) into Quality of Experience (QoE) scores. Designed algorithms to aggregate and assign importance scores to QoS metrics based on their statistical importance for different applications, creating a nuanced framework that better represents user experience across network conditions. Currently refining the model for broader applicability and policy relevance.

## Researcher, The CellWatch Project

Sep 2022 – Present

*Georgia Institute of Technology, University of California, Santa Barbara*

*Remote, CA*

- Collaborating with Prof. Ellen Zegura from Georgia Institute of Technology and Prof. Morgan Vigil-Hayes from Michigan State University on an open-source cellular network measurement suite designed for FCC-compliant speed test measurements to be used in challenge claims. The project includes a public data portal for aggregated anonymous data, a community coordination tool for organizing measurement campaigns, and a prediction engine that synthesizes multiple datasets to estimate coverage quality in a given area.

## C-STARS Research Intern

May 2019 – July 2019

*Oak Ridge National Laboratory*

*Oak Ridge, TN*

- Researched, implemented, and tested unsupervised machine learning algorithms to automatically classify cloud types using climate data from sky cameras and ceilometers.

## Indian Academy of Sciences Summer Research Fellow

May 2017 – April 2018

*Indian Institute of Technology Madras*

*Chennai, India*

- Developed a collusion-resistant Identity-Based Proxy Re-Encryption (IB-PRE) scheme satisfying adaptive Chosen Ciphertext Security (CCA) under the decisional bilinear Diffie-Hellman assumption. Designed to prevent unauthorized access to the delegator's secret key by a colluding proxy and delegatee. **Accepted at ProvSec 2018**

## PROFESSIONAL EXPERIENCE

---

### Software Development Engineer

July 2020 – Jun 2022

*Amazon Inc.*

*Bellevue, WA*

- Worked on the Amazon Enterprise Access(AEA) mobile application for Amazon employees that offers secure access to Amazon's internal services without the use of VPN.
- Designed and implemented the key feature to enforce AEA for Amazon internal email access on mobile devices.
- Developed features and workflows for Prime Referrals, Prime Gift cards, Prime Incentives for Amazon Prime customers.

## TEACHING EXPERIENCE

---

### Graduate Teaching Assistant, University of California, Santa Barbara

Sep 2022 – May 2023

- Courses: Introduction to Computer Science and Introduction to Computer Networks.

### Graduate Teaching Assistant, Purdue University-Main Campus

July 2020 – Jun 2022

- Courses: Information Systems and Computing for Science and Engineering.

Responsibilities included designing homework assignments, leading discussion sections, grading, and holding office hours.

## TECHNICAL SKILLS

---

**Languages:** Python, C/C++, Java, Kotlin, MySQL, PostgreSQL, JavaScript, HTML/CSS, R, Go

**Libraries/Frameworks:** React, Node.js, Flask, JUnit, Spark, TensorFlow, PyTorch, Hadoop

**Developer Tools/Technologies:** Git, Docker, Google Cloud Platform, Amazon Web Services, Android Studio

## ACADEMIC ACHIEVEMENTS

---

- UC Santa Barbara CS Department Outstanding Publication Award, 2025.
- Selected to present my work at the MobiSys Rising Stars Forum, 2025.
- SIGCOMM'24 work received the Internet Research Task Force-Applied Networking Research Prize, 2025.
- Internet Quality Barometer Fellowship from Measurement Lab, 2024.
- Graduate Fellowship from UC Santa Barbara, 2022.
- CS Departmental scholarship from Purdue University, 2018-2020.
- Gold Medal for Best Student award from Thiagarajar College of Engineering, Anna University, 2018.
- Indian Academy of Sciences Summer Research Fellow, 2017.