Tarun Mangla

Contact Information

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Research Interests

Network Measurements, Broadband Equity, Video Streaming

Employment History

Assistant Professor, Department of Computer Science and Engineering, IIT Delhi
September 1, 2023 - *Present*

Postdoctoral Scholar, Department of Computer Science/ Data Science Institute, UChicago
Mentor: Nick Feamster — September 1, 2020 - July 31, 2023

Education

College of Computing, Georgia Institute of Technology, USA,
MS and Ph.D., School of Computer Science (4/4 and 3.9/4) — August, 2014 - July, 2020

- *Advisors*: Mostafa Ammar and Ellen W. Zegura
- *Thesis*: Video QoE Estimation using Network Measurement Data

Indian Institute of Technology, Delhi, India
B.Tech. in Computer Science and Engineering (8.6/10) — July, 2010 - May, 2014

Current Research Projects

Mapping and Mitigating Internet Inequity

- Understanding the accuracy of existing datasets on Internet access
- Developing methods and systems to measure Internet availability, and performance

QoE-aware Network Management

- Developing techniques to infer video QoE using passive network measurements
- Systems development for large-scale network monitoring and QoE inference

Teaching Experience

Instructor
Machine Learning for Networking (Special Topics), COL867, IIT Delhi — Spring 2024

Conference Publications (*in chronological order*)

Estimating WebRTC Video QoE Metrics without Using Application Headers
Taveesh Sharma, Tarun Mangla, Arpit Gupta, Junchen Jiang, Nick Feamster. IMC 2023

AMIR: Active Multimodal Interaction Recognition from Video and Network Traffic in Connected Environments
Shinan Liu, Tarun Mangla, Ted Shaowang, Jinjin Zhao, John Paparrizos, Sanjay Krishnan, Nick Feamster. Ubicomp 2023

A Comparative Analysis of Ookla Speedtest and Measurement Labs Network Diagnostic Test (NDT7)
Kyle Macmillan, Tarun Mangla, James Saxon, Nicole Marwell, Nick Feamster. SIGMETRICS 2023

Benchmarks or Equity? A New Approach to Measuring Internet Performance
Ranya Sharma, Tarun Mangla, James Saxon, Marc Richardson, Nick Feamster, Nicole P Marwell. TPRC, September 2022

Best Practices for Collecting Speed Test Data
Kyle MacMillan, Tarun Mangla, Marc Richardson, Nick Feamster TPRC, September 2022

Internet Inequity in Chicago: Adoption, Affordability, and Availability
Tarun Mangla, Udit Paul, Arpit Gupta, Nicole P Marwell, Nick Feamster. TPRC, September 2022

A Tale of Three Datasets: Characterizing Mobile Broadband Access in the US
Tarun Mangla, Esther Showalter, Vivek Adarsh, Kipp Jones, Morgan Vigil-Hayes, Elizabeth Belding, Ellen Zegura. Communications of the ACM, March 2022

Measuring the performance and network utilization of popular video conferencing applications
Kyle MacMillan, Tarun Mangla, James Saxon, Nick Feamster. ACM IMC, 2021

Coverage is Not Binary: Quantifying Mobile Broadband Quality in Urban, Rural, and Tribal Contexts
Vivek Adarsh, Michael Nekrasov, Udit Paul, Tarun Mangla, Arpit Gupta, Morgan Vigil-Hayes, Ellen Zegura, Elizabeth Belding. IEEE ICCCN, 2021

Drop The Packets: Using Coarse-grained Data to detect Video Performance Issues
Tarun Mangla, Emir Halepovic, Ellen Zegura, Mostafa Ammar. ACM CoNEXT, 2020

eMIMIC: Estimating HTTP-based Video QoE Metrics from Encrypted Network Traffic
Tarun Mangla, Emir Halepovic, Ellen Zegura, Mostafa Ammar. IFIP Traffic Measurement and Analysis (TMA), 2018 ***(Best paper)***

VideoNOC: Assessing Video QoE for Network Operators using Passive Measurements
Tarun Mangla, Emir Halepovic, Rittwik Jana, Kyung-Wook Hwang, Marco Platania, Ellen Zegura, Mostafa Ammar. ACM Multimedia Systems (MMSys), 2018

TANGO: Toward a More Reliable Mobile Streaming through Cooperation between Cellular Network and Mobile Devices
Nawanol Theera-Ampornpunt, Tarun Mangla, Saurabh Bagchi, Rajesh Panta, Kaustubh Joshi, Mostafa Ammar, Ellen Zegura. IEEE Symposium on Reliable Distributed Systems (SRDS), 2016

Optimal radius for connectivity in duty-cycled wireless sensor networks Amitabha Bagchi, Cristina M. Pinotti, Sainyam Galhotra, Tarun Mangla. ACM Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWIM) 2013.

Journal Publications

Using Session Modeling to Estimate HTTP-Based Video QoE Metrics From Encrypted Network Traffic
Tarun Mangla, Emir Halepovic, Ellen Zegura, Mostafa Ammar. IEEE Transactions on Network Service and Management, (TNSM) June 2019 ***(Invited paper)***

Optimal radius for connectivity in duty-cycled wireless sensor networks
Amitabha Bagchi, Cristina M. Pinotti, Sainyam Galhotra, Tarun Mangla. ACM Transactions on Sensor Networks (ToSN) 2015.

Workshop Publications

MIMIC: Using passive network measurements to estimate HTTP-based adaptive video QoE metrics
Tarun Mangla, Emir Halepovic, Mostafa Ammar, Ellen Zegura. IEEE/IFIP Workshop on Mobile Network Measurement (MNM) 2017

Video Through a Crystal Ball: Effect of Bandwidth Prediction Quality on Adaptive Streaming in Mobile Environments
Tarun Mangla, Nawanol Theera-Ampornpunt, Mostafa Ammar, Ellen Zegura, Saurabh Bagchi. ACM Workshop on Mobile Video Delivery (MoVid) 2016.

Patents

Method and apparatus for estimating quality of experience from network data Inventors
Inventors: Emir Halepovic, Tarun Mangla, Mostafa H Ammar, Ellen Witte Zegura. US17079907

Estimating video quality of experience metrics from encrypted network traffic Inventors
Inventors: Emir Halepovic, Tarun Mangla, Mostafa H Ammar, Ellen Witte Zegura. US10757220

Internships

AT&T Research Labs, NJ, USA Sep 2016 - Dec 2016, May 2018 - Aug 2018
Hosted by *Emir Halepovic*

Microsoft Research India, Bangalore, India
Hosted by *Venkat Padmanabhan* May 2016 - August 2016

Yahoo Inc., Sunnyvale, CA, USA May 2015 - August 2015
Hosted by *Ahmed Mansy & Partha Kanuparthy*

Microsoft India (R&D) Private Limited, Hyderabad, India May 2013 - July 2013
Software Engineering

Cavium Networks, Hyderabad, India May 2012 - July 2012
Software Engineering

Professional Service

Reviewer: SNIP2+ 2023, MMSys 2023, 2022, 2021 (Datasets and Software Track), CoNEXT 2021, ACM S3 2019 (Mobicom workshop), ACM IMC 2018 (Shadow PC), IFIP TMA 2018 (Shadow PC)

Technical Skills

C++, Python, Java, Matlab, JavaScript, Hadoop, Hive, SQL

Scholastic Achievements

- Best paper award, IFIP TMA 2018
- Recipient of Student Travel Grant for IFIP TMA PhD School in 2018
- Recipient of Student Travel Grant for IEEE ICNP in 2015
- All India Rank 79 in IIT-JEE 2010 among over 500,000 students
- All India Rank 16 in AIEEE 2010 among over 1,000,000 students
- Merit certificate in 3/5 subjects for being among the top 0.1% nationwide (by CBSE in 2010)
- Recipient of the prestigious National Talent Search Examination(NTSE)-2008 scholarship