

Tarun Mangla

CONTACT INFORMATION

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RESEARCH INTERESTS

Video Streaming and QoE, Network Measurements, Cellular Networks

CURRENT POSITION

Postdoctoral Scholar, Center for Data and Computing, UChicago
Mentor: Nick Feamster

September 1, 2020 - *Present*

EDUCATION

College of Computing, Georgia Institute of Technology, Atlanta, Georgia, USA,
PhD student, School of Computer Science August, 2014 - July, 2020
• *Cumulative Grade Point Average:* 4.0/4.0
• **Advisors:** Prof. Mostafa Ammar and Prof. Ellen W. Zegura

Indian Institute of Technology, Delhi, India

B.Tech in Computer Science and Engineering

July, 2010 - May, 2014

- *Cumulative Grade Point Average:* 8.50/10
- *Thesis Title:* Analysing highly directional antennas' mesh network

PUBLICATIONS

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

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

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

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

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

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.

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.

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.

RESEARCH
PROJECTS

Mapping Broadband Access in the Urban and Rural USA

- Understanding the accuracy of existing Broadband access datasets in mapping the Digital Divide in the US

QoE measurement and enhancement in HTTP-based video streaming

Mostafa Ammar and *Ellen Zegura*, Georgia Institute of Technology August 2014 - Present

- Using passive network measurements to infer and manage end-user video quality of experience
- Towards using network bandwidth predictions for bitrate adaptation

Analyzing highly directional 60GHz mesh networks

Amitabha Bagchi and *Vinay Ribeiro*, IIT Delhi

Jan 2013 - May 2013

- Investigated the connectivity conditions and latency in mesh networks formed by directional antennas.
- Investigated the possibility of using 60GHz directional antenna mesh network for secure communication and used simulation for evaluating results.

Optimal Radius for Connectivity in Duty-Cycled Wireless Sensor Networks

Amitabha Bagchi, IIT Delhi

India Jan 2013 - May 2013

- Investigated the transmission radius for connectivity by modelling the network as random geometric graph.
- Simulated large graphs using efficient data structures and algorithms (kd-tree, union find algo).

PROFESSIONAL
EXPERIENCE

AT&T Research Labs, NJ, USA

Sep 2016 - Dec 2016, May 2018 - Aug 2018

Research Intern hosted by *Emir Halepovic*

Video QoE inference in cellular networks using passive network measurements.

Microsoft Research India, Bangalore, India

Research Intern hosted by *Venkat Padmanabhan*

May 2016 - August 2016

Using Multipath for improving the QoE in Real-Time Streaming.

Yahoo Inc., Sunnyvale, CA, USA

May 2015 - August 2015

Software Engineering Intern hosted by *Ahmed Mansy & Partha Kanuparth*

Worked on a performance-based traffic engineering system for video workloads.

Microsoft India (R&D) Private Limited, Hyderabad, India

May 2013 - July 2013

Software Engineering Intern

Developed a prototype to infer social reference in a search query utilizing user's social graph.

Cavium Networks, Hyderabad, India

May 2012 - July 2012

Software Engineering Intern

Worked on removing bottlenecks and reducing runtime of compiler for Neuron Search Processor launched in Oct 2012.

PROFESSIONAL
SERVICE AND
TEACHING
EXPERIENCE

Reviewer: CoNEXT 2021, MMSys 2021 (Datasets and Software Track), ACM S3 2019 (Mobicom

workshop), ACM IMC 2018 (Shadow PC), IFIP TMA 2018 (Shadow PC)

Teaching Assistant

Advanced Computer Networks, CS6250 OMSCS, Georgia Tech

Summer 2019

- Part of the course content designing team for a revised version of the course
- Designed and scripted lecture modules on transport and application-layer

Guest Lecture on Inter-domain routing for undergraduate Computer Networking

Spring 2019

Teaching Assistant

Advanced Computer Networks, CS6250, Georgia Tech

Spring 2016, Fall 2017, Fall 2018

- Guest Lecture on Bitrate Adaptation Algorithms in Video Streaming (Fall 2017)

Teaching Assistant

Introduction to Probability and Stochastic Processes, MAL250, IIT Delhi

Spring 2014

- Prepared and conducted tutorial to discuss course concepts and homework
- Graded exams and quizzes

TECHNICAL SKILLS Programming : C++, Python, Java, Matlab, JavaScript, Hadoop, Hive, SQL
Libraries and Platforms : Android Programming, PlanetLab, Emulab, Phantomnet, MPI, OpenMP.

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