

Praveen Tammana

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[Google scholar link](#)

Current position

I am currently an Assistant Professor in Computer Science Department at IIT-Hyderabad.

Research interests

Broadly, my research interests are at the intersection of Networking, Security, and Machine Learning for Networks. Currently, my focus is on designing robust, secure, and easy to manage real-world networked systems using exciting emerging technologies such as Software-Defined Networking (SDN) and P4-based programmable data planes. My research style is to first determine the real-world network problems, understand the practical constraints, then develop scalable and efficient solutions by redesigning the division of labor across network entities (e.g., hosts, network core, central management system, etc.) My recent work focuses on two aspects of network management: network telemetry and traffic engineering.

Education

Ph.D, University of Edinburgh, UK 2013-18
Thesis: Software-Defined Datacenter Network Debugging
Advisors: [Prof. Myungjin Lee](#), [Prof. Mahesh Marina](#)

Masters in Computer Science, IIT-Madras, India 2009-11
Thesis: Impact of node buffer on DTN Routing
Advisor: [Prof. C. Siva Ram Murthy](#)

B.E in Computer Science and Engineering 2005-09
Vasavi College of Engineering, Osmania University, India

Research Experience

Princeton University, NJ, USA May 2018- July 2020
Postdoctoral Researcher
Hosts: [Prof. Jennifer Rexford](#) and [Prof. David Walker](#)

University of Edinburgh, UK Aug 2017-April 2018
Research Assistant
Project: Network Measurement as a Service (NMaaS)
Co-PIs: [Prof. Myungjin Lee](#) and [Prof. Dimitrios Pezaros](#)

Cisco Systems, San Jose, USA May 2016-May 2017
Research Intern
Project: Cisco Network Assurance Engine
Host: [Dr. Ramana Kompella](#), [Dr. Sundhar Iyer](#)

Publications

Adaptive Weighted Traffic Splitting in Programmable Data Planes
Kuo-Feng Hsu, Praveen Tammana, Ryan Beckett, Ang Chen, Jennifer Rexford, David Walker
[SoSR'20] ACM Symp. on Software Defined Networking Research, CA, USA (A*)

Grasp the Root Causes in the Data Plane: Diagnosing Latency Problems with SpiderMon
Weitao Wang, Praveen Tammana, Ang Chen, T.S.Eugene Ng
[SoSR'20] ACM Symp. on Software Defined Networking Research, CA, USA (A*)

Tracking P4 Program Execution in the Data Plane (Best paper award)
Suriya Kodeswaran, Mina Tahmasbi Arashloo, Praveen Tammana, Jennifer Rexford
[SoSR'20] ACM Symp. on Software Defined Networking Research, 2020, CA, USA (A*)

Contra: A Programmable System for Performance-aware Routing
Kuo-Feng Hsu, Ryan Beckett, Ang Chen, Jennifer Rexford, **Praveen Tammanna**, David Walker
[NSDI'20] In USENIX Symp. on Networked Systems Design and Implementation, CA, USA (A*)

Distributed Network Monitoring and Debugging with SwitchPointer
Praveen Tammanna, Rachit Agarwal, and Myungjin Lee
[NSDI'18] In USENIX Symp. on Networked Systems Design and Implementation, WA, USA (A*)

Fault Localization in Large-Scale Network Policy Deployment
Praveen Tammanna, Ch. Nagarajan, Pavan Mamillapalli, Ramana Kompella, Myungjin Lee
[ICDCS'18] In IEEE Intl. Conference on Distributed Computing Systems, Vienna, Austria (A*)

Simplifying Datacenter Network Debugging with PathDump
Praveen Tammanna, Rachit Agarwal, and Myungjin Lee
[OSDI'16] In USENIX Symp. on Operating Systems Design and Implementation, GA, USA (A*)

CherryPick: Tracing Packet Trajectory in Software-Defined Datacenter Networks
Praveen Tammanna, Rachit Agarwal, and Myungjin Lee
[SoSR'15] In ACM SIGCOMM Symp. on Software Defined Networking Research, CA, USA (A*)

Buffer Dimensioning of Delay-Tolerant Network Nodes - A Large Deviations Approach
V. Mahendran, **Praveen Tammanna**, and C. Siva Ram Murthy
[ICDCN'12] In Intl. Conference on Distributed Computing and Networking, Hong Kong, China

Impact of Persistent Storage on the DTN Routing Performance
V. Mahendran, **Praveen Tammanna**, and C. Siva Ram Murthy
[ICDCN'12] In Intl. Conference on Distributed Computing and Networking, Hong Kong, China

**Patents
published in USA**

1. *Fault localization in large-scale network policy deployment*

<https://patents.google.com/patent/US20180351788A1/en>

2. *Associating network policy objects with specific faults corresponding to fault localizations in large-scale network deployment*

<https://patents.google.com/patent/US20180351782A1/en>

**Industry
Experience**

Juniper Networks, Bangalore, India Nov 2012-Jul 2013

Software Engineer
Team: SRX Series Network Firewalls

Intel Technology, Bangalore, India Aug 2011-Nov 2012

Graphics Software Engineer

Wipro Technology, Hyderabad, India Nov 2008 - May 2009

Developer Intern

**Mentoring
Experience**

Maruthi, Ph.D., IIT Hyderabad, 2020 - current

Weitao Wang, Ph.D., Rice University, 2018 - current

Suriya Kodeswaran, M.S., Princeton University, 2018 - 2020

Kuo-feng, Ph.D., Rice University, 2018 - 2020

Michal Mionkowski, UG, Univ. of Edinburgh, 2017 - 2018

Mohammad Raihan, UG, Univ. of Edinburgh, 2017 - 2018

Research talks	Redesigning How Networks Work to make the Net"work" Dec 2020: Princeton systems and networking group, IIT-Hyderabad Jan 2020: IIT-Bombay, IIT-Madras, IIT-Delhi, IIT-Kanpur, IIIT-Hyderabad, IIIT-Delhi Feb 2020: IISC-Bengaluru, MSR-Bengulur	
	Adaptive Weighted Traffic Splitting using Programmable Data planes Oct 2019: Network Programming Initiative (NPI) Annual Retreat, New York, USA	
	Distributed Network Monitoring and Debugging with SwitchPointer Feb 2019: Network Programming Initiative (NPI) Annual Retreat, New York, USA Nov 2019: Morgan Stanley, New York, USA March 2018: USENIX NSDI, Renton, Washington, USA Feb 2018: Network systems group, Edinburgh, UK	
	Fault Localization in Large-Scale Network Policy Deployment July 2018: IEEE ICDCS, Vienna, Austria June 2018: Networks and systems group, Princeton University, USA July 2017: Network systems group, Edinburgh, UK May 2017: Cisco Systems, San Jose, California, USA	
	Simplifying Datacenter Network Debugging with PathDump Nov 2016: AT&T Labs, California, USA Nov 2016: Open NFP DXDD, Mountain view, California, USA Nov 2016: USENIX OSDI, Savannah, Georgia, USA Oct 2016: Cisco systems, San Jose, California, USA Nov 2017: Indian Institute of Technology - Tirupathi, India	
	Tracing Packet Trajectory in Software-Defined Datacenter Networks Jun 2015: ACM SIGCOMM SOSR, Santaclara, California, USA Jun 2015: Scottish Networking Event, SCONE, Heriot-Watt University, UK	
	Towards Distributed Traffic Measurement in Datacenters Jul 2014: UK Academic Meeting on Systems and Networks, COSENNERS, Abingdon, UK	
	Program Committee	ACM SIGCOMM Posters and Demos , 2020, New York City, USA P4 Expert Roundtable Series , 2020, Virtual session SDN/NFV track for IEEE ICCCN , 2020, Hawaii, USA
	External Reviewer	Jrnl. of parallel and distributed computing, Infocom 2018, Eurosys 2018, IEEE ICDCS 2017, NetSoft 2017, IEEE IFIP-WWIC 2019, IEEE/ACM Transactions on Networking (ToN), and IEEE Transactions on Network and Service Mgmt (TNSM).
	Professional Activities	Invited to visit one of the Microsoft's Data centers in Washington, USA. Participated in ACM IMC 2017 shadow PC program. Student volunteer, PLDI 2014 conference. Volunteer of Swecha, Andhra pradesh chapter of free software movement, India (FSMI). Coordinated Free and open-source software (FOSS) workshops, IIT Madras.

**Awards/
Achievements**

Grant to attend conferences: SIGCOMM'17, SIGCOMM'18, NSDI'18, OSDI'16, SoSR'15, ICDCS'18.
Fully funded overseas research scholarship, University of Edinburgh.
Outstanding teaching assistance award, IIT Madras.
Graduate Aptitude Test in Engineering (GATE), All India Rank 194.
Awarded second best undergraduate project, Osmania University, Hyderabad.
State-level Engineering Entrance Examination (EAMCET), Rank 667.