Debopam Bhattacherjee

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KEY HIGHLIGHTS

- Known for trend-setting research on broadband low-Earth orbit satellite networks like SpaceX Starlink and OneWeb. *Hypatia* (best paper award at the top Internet measurement conference, IMC'20) serves as a vehicle for networking research in this area.
- Authored the 4^{th} most downloaded ($3K+$ as of Aug'23) ACM CoNEXT paper (started in 2005) in 2019. This work on satellite network topology design also received IRTF's Applied Networking Research Prize in 2020 (4 awardees across the globe in 2020).
- Exhaustive network of collaborators. In random order: Duke University, UC Irvine, VMware Research, UIUC, Akamai, Harvard, UCSC, VU Amsterdam, Yale, Emerald Technologies, Max Plank Institute, Google, Oracle Labs, Azure Space, IIIT Delhi, IIT Kanpur, ETH Zürich, Linköping University, Aalto University, Airbus, OneWeb, Univ. of Surrey, Telefonica.
- Community contributions: Co-organized LEOCONN'21, LEOCONN'22, IETF-111 side-meeting on SATCOM. Currently co-organizing a Webinar series: LEOCONN WS which hosts tech-talks from eminent industry players and academic institutions.
- PhD from a top CS school – ETH Zürich CS department ranks (global) #7 on CSRankings (2013 - 2023), #9 on QS World University Rankings (2023), and #4 on Times Higher Education World University Rankings (2023). 7 papers in top networking conferences and workshops during PhD; multiple awards.
- Exhaustive teaching and mentoring experience: 6 different courses, 11 semesters of teaching. 7 bachelor theses, 9 master theses, and 2 internship supervision. Currently mentoring 1 intern and 2 pre-doctoral research fellows at Microsoft Research.

EDUCATION

PhD — Computer Science (Networked Systems)
ETH Zürich, Switzerland, 2021
Thesis title: Towards Performant Networking from Low-Earth Orbit
Committee: Dr. Ankit Singla (Staff Software Engineer, Google; ex Asst. Prof. ETH Zürich),
Prof. Adrian Perrig (ETH Zürich),
Dr. Ranveer Chandra (Managing Director, Research for Industry, Networking Research, Microsoft)

M.S. — Security and Mobile Computing (NordSecMob)
KTH Royal Institute of Technology, Sweden + Aalto University, Finland, 2016
Thesis title: Stepping Stone Detection for Tracing Attack Sources in Software-Defined Networks
Committee: Prof. Tuomas Aura (Aalto University),
Prof. Markus Hidell (KTH Royal Institute of Technology),
Prof. Andrei Gurtov (Linköping University)

B.E. — Computer Science & Engineering
Jadavpur University, India, 2009

EMPLOYMENT

11/2021 –	Microsoft Research Lab, India Senior Researcher
10/2016 – 09/2021	Systems Group, Department of Computer Science, ETH Zürich, Switzerland PhD Candidate, Network Design Lab PhD supervisor: Prof. Dr. Ankit Singla
06/2019 – 08/2019	Max Planck Institute for Informatics, Saarbrücken, Germany Research Fellow at Internet Architecture group Supervisor: Prof. Dr. Anja Feldmann
06/2015 – 07/2016	Computer Science and Engineering Dept., Aalto University, Finland Research/Teaching Assistant Supervisor: Prof. Dr. Tuomas Aura, Prof. Dr. Andrei Gurtov
08/2009 – 08/2014	PwC & Deloitte, India Senior Technology Consultant, Technology Consultant

RESEARCH INTERESTS

Low-Earth orbit satellite networks, Internet architecture, low-latency networks & applications, transport & congestion control, network measurement.

PUBLICATIONS

Refereed Publications

2023 *Exploring Low-Earth Orbit Network Design* [ACM MobiCom LEO-NET]
Suvam Basak, Amitangshu Pal, DB

2022 *cISP: A Speed-of-Light Internet Service Provider* [USENIX NSDI]
(DB, Waqar Aqeel), Sangeetha Abdu Jyothi, Ilker Nadi Bozkurt, William Sentosa, Muhammad Tirmazi, Anthony Aguirre, Balakrishnan Chandrasekaran, P. Brighten Godfrey, Gregory P. Laughlin, Bruce M. Maggs, Ankit Singla

2020 *In-orbit computing: an outlandish thought experiment?* [ACM HotNets]
(DB, Simon Kassing), Melissa Licciardello, Ankit Singla

2020 *"Internet from Space" without Inter-satellite Links?* [ACM HotNets]
Yannick Hauri, DB, Manuel Grossmann, Ankit Singla

2020 *Exploring the "Internet from space" with Hypatia* [ACM IMC]
(Simon Kassing, DB), André Baptista Águas, Jens Eirik Saethre, Ankit Singla
Best Paper Award

2020 *A bird's eye view of the world's fastest networks* [ACM IMC]
DB, Waqar Aqeel, Gregory Laughlin, Bruce M. Maggs, Ankit Singla

2020 *Untangling Header Bidding Lore* [PAM]
Waqar Aqeel, DB, Balakrishnan Chandrasekaran, P. Brighten Godfrey, Gregory Laughlin, Bruce Maggs, Ankit Singla
Best Dataset Award

2019 *Network topology design at 27,000 km/hour* [ACM CoNEXT]
DB, Ankit Singla
IRTF Applied Networking Research Prize 2020

2019 *Watch your step! Detecting stepping stones in programmable networks* [IEEE ICC]
DB, Andrei Gurtov, Tuomas Aura

2018 *Gearing up for the 21st century space race* [ACM HotNets]
DB, Waqar Aqeel, Ilker Nadi Bozkurt, Anthony Aguirre, Balakrishnan Chandrasekaran, P Godfrey, Gregory Laughlin, Bruce Maggs, Ankit Singla

2017 *A Cloud-based Content Gathering Network* [USENIX HotCloud]
DB, Muhammad Tirmazi, Ankit Singla

Preprints

2023 *On viewing SpaceX Starlink through the Social Media Lens* [arXiv:2307.13441]
Aryan Taneja, DB, Saikat Guha, Venkata N Padmanabhan

2019 *Measuring and exploiting the cloud consolidation of the Web* [arXiv:1906.04753]
DB, Muhammad Tirmazi, Ankit Singla

2018 *Dissecting Latency in the Internet's Fiber Infrastructure* [arXiv:1811.10737]
Ilker Nadi Bozkurt, Waqar Aqeel, DB, Balakrishnan Chandrasekaran, Philip Brighten Godfrey, Gregory Laughlin, Bruce M Maggs, Ankit Singla

TALKS

- *Low-Earth Orbit Broadband Opportunities and Challenges* [APNIC55, 2023]
- *Towards measuring Low-Earth Orbit network performance* [LEOCONN'22, Oct 2022 & U. Surrey, July 2022]
- *Towards Performant Networking from Low-Earth Orbit* [AINTEC'21, U Cambridge, Dec, 2021 - Jan, 2022]
- *On improving low-Earth orbit satellite network performance* [LEOCONN'21, Microsoft Research, Juniper Networks, Feb - Jun, 2021]
- *In-orbit computing: an outlandish thought experiment?* [ACM HotNets 2020]
- *"Internet from Space" without Inter-satellite Links?* [ACM HotNets 2020]
- *Exploring the "Internet from space" with Hypatia* [ACM IMC 2020]
- *A bird's eye view of the world's fastest networks* [ACM IMC 2020]
- *Network topology design at 27,000 km/hour* [ACM CoNEXT 2019, APNIC-50, IETF-109]
- *Gearing up for the 21st century space race* [ACM HotNets 2018]
- *Speeding up the Internet* [ETH Zürich Systems Group Retreat 2018]
- *A Cloud-based Content Gathering Network* [USENIX HotCloud 2017]
- *Detection of Stepping Stones in Software Defined Networks* [Invited talk at ETH Zürich, 2016]

TEACHING

- *Future Internet*, Spring 2021, Spring 2020, Spring 2019, ETH Zürich [Graduate]
- *Computer Networks*, Spring 2021, Spring 2020, Spring 2019, ETH Zürich [Undergraduate]
- *Advanced Computer Networks*, Spring 2018, Spring 2017, ETH Zürich [Graduate]
- *Big Data*, Autumn 2016, ETH Zürich [Graduate]
- *Network Security*, Autumn 2015, Aalto University [Graduate]
- *Information Security*, Autumn 2015, Aalto University [Graduate]

SUPERVISION (COMPLETED)

Internship/ Research Fellowship (RF)

2023 *Enabling LEO network experiments at scale*, S. Tiwari (RF), MSR - India
2023 *Enabling LEO network experiments at scale*, A. Taneja, MSR - India
2022 *Mining social media to quantify network performance and user perception*, A. Taneja, MSR - India
2022 *Detecting wind and solar parks with multi-modal data*, P. Singh, MSR - India

Master Thesis

2021 *BBR congestion control in LEO satellite networks*, C. Ettlin, ETH Zürich
2021 *Routing over dynamic Low Earth Orbit satellite networks*, D. B. Irani, ETH Zürich
2021 *Analyzing the Impact of GEO Arc Avoidance on LEO Constellation Performance*, F. Zafar, ETH Zürich
2020 *Routing for a satellite mega-constellation*, M. Grossmann, ETH Zürich
2020 *Simulating LEO satellite networks*, B. A. André, ETH Zürich
2019 *Fast Web Browsing Over The Tor Network*, A. Isac, ETH Zürich
2019 *Web browsing with privacy-enhanced MITM*, T. Krebs, ETH Zürich
2018 *Assessing unfairness in the Internet/Web ecosystem*, O. Butz, ETH Zürich
2018 *Turning Web page delivery upside down*, J. Purtschert, ETH Zürich

Bachelor Thesis

2021 *Sun synchronous low Earth orbit satellite constellation design*, P. Eigensatz, ETH Zürich
2020 *Internet from space without inter-satellite laser?*, H. Yannick, ETH Zürich
2019 *Simulations of Satellite-based low-latency Internet*, J. E. Saethre, ETH Zürich
2019 *Performance of fetching web pages on mobile devices*, A. Köpe, ETH Zürich
2019 *Customizing QUIC/HTTP2 for Web servers*, A. Benelli, ETH Zürich
2018 *Optimizing a Smart Proxy*, J. Gallmann, ETH Zürich
2018 *Customizing QUIC for Web servers*, C. Neukom, ETH Zürich

COMMUNITY SERVICE

2024 ACM MobiCom'24 *Publicity Co-Chair*
2023 The Networking Channel (Panel discussion on LEO networks) *Co-organizer*
2023 LEO-NET (MobiCom'23) *Advisory Board Member, TPC Member*
2023 LEOCONN WS (Webinar Series on LEO satellite networks) *Co-organizer*
2022 LEOCONN'22 (1-day tutorial on satellite-based networking) *Co-organizer*
2021 IETF-111 side-meeting on SATCOM activities *Co-organizer*
2021 LEOCONN'21 (Webinar on satellite-based networking) *Co-organizer*
2018 ACM IMC *Shadow PC member*

AWARDS AND HONORS

2020 Best Paper Award at ACM IMC, *Exploring the "Internet from space" with Hypatia*.
2020 Best Dataset Award at PAM, *Untangling Header Bidding Lore*.
2020 IETF/IRTF Applied Networking Research Prize.
2019 Selected for PhD Workshop on Next-Generation Cloud Infrastructure organized by Microsoft Research, Cambridge.
2014 Awarded NordSecMob (Erasmus Mundus Master's program) Consortium Scholarship.

2005 Ranked 60/70,000 in West Bengal Joint Entrance Examination (WBJEE).
2003 Awarded National Merit Scholarship by Government of India [2003 – 2009].

SELECTED MEDIA COVERAGE

Complete listing and links available at https://bdebopam.github.io

04/2022 *Wireless Microwave Internet could mean the end of lag*. SYFY Wire.
12/2019 *Laser-Linked Satellites Could Deliver 'Internet from Space'*. Washington Daily Report.
12/2019 *A new network design for the "internet from space"*. TechXplore.
08/2017 *A cloud-based content gathering network*. The morning paper.