

Mansi Sood

Curriculum Vitae

Department of Electrical and Computer Engineering,
Carnegie Mellon University, Pittsburgh.

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Research Interests: Network Science, Optimization, Learning, Game Theory and Privacy.

EDUCATION

Carnegie Mellon University, Pittsburgh, PA:

Fall '18 - ongoing

- *PhD Candidate* in Electrical & Computer Engineering (ECE) **GPA: 4.0/4.0**
Advisor: Prof. Osman Yağan

Indian Institute of Technology (IIT) Bombay, India:

Jul '13 - Jul '18

- *Integrated Bachelors and Masters of Technology* in Electrical Engineering with *Minor in Design*.

AWARDS & HONOURS

- **Best Paper Award**, Communication Theory Symposium, IEEE International Conference on Communications (ICC) 2021. '21
- **Philip and Marsha Dowd Fellowship**, College of Engineering, CMU (Awarded to top 3 applicants at College of Engineering, CMU). '20 - '21
- **Presidential Fellowship**, CyLab Security & Privacy Institute, CMU. '20 - '21
- **Knight Fellowship**, Center for Informed Democracy and Social Cybersecurity (IDeaS), CMU. '20
- **David H. Barakat & LaVerne Owen-Barakat CIT Dean's Fellowship**, CMU. '19
- Invited to participate in the User Anonymity & Data Privacy project at Women in Data Science & Mathematics (WiSDM), ICERM, Brown University. '19
- **Carnegie Institute of Technology (CIT) Dean's Fellowship**. '18 - '19
- **Certificate of Excellence** at IIT Bombay for '*Exceptional research as an undergraduate and contributions towards the Academic Mentorship Program*' (Awarded to 1 student in the graduating batch.) '18
- **Excellence in Teaching Assistantship**, Electrical Engineering Department, IIT Bombay. '18
- **All India Rank 6** amongst 1,100,000 students in All India Engineering Entrance Examination. '12
- Kishore Vaigyanik Protsahan Yojana (KVPY) Fellowship by Government of India. '11
- Junior Science Talent Search Scholarship by Science Branch of Education, New Delhi, India. '09

PUBLICATIONS

In Peer-reviewed Conferences/Journals

- **M. Sood**, O. Yağan, '*On the Minimum Node Degree and k -connectivity in Inhomogeneous Random K -out Graphs*', to appear in IEEE Transactions on Information Theory 2021.
- **M. Sood**, A. Sridhar, R. Eletreby, C. Wu, H.V. Poor, O. Yağan, '*Epidemic Spreading of Mutating Contagions over Multi-layer Contact Networks*', to appear in International Conference on Network Science (Netsci) 2021.
- **M. Sood**, O. Yağan, '*Tight bounds for Connectivity of Random K -out Graphs*', IEEE International Conference on Communications (ICC) 2021 (**recipient of best paper award**).
- E. Elumar, **M. Sood**, O. Yağan, '*On the Connectivity and Giant Component Size of Random K -out Graphs Under Randomly Deleted Nodes*', IEEE International Symposium on Information Theory (ISIT) 2021.
- **M. Sood**, O. Yağan, '*On the Size of the Giant Component in Inhomogeneous Random K -out Graphs*', IEEE International Conference of Decision and Control (CDC) 2020.

- **M. Sood**, O. Yağan, '*k-Connectivity in Random Graphs induced by Pairwise Key Predistribution Schemes*', IEEE International Symposium on Information Theory (ISIT) 2020.
- **M. Sood**, O. Yağan, '*Towards k-connectivity in Heterogeneous Sensor Networks under Pairwise Key Predistribution*', IEEE Global Communications Conference (GLOBECOM) 2019..
- **M. Sood**, S. Moharir, A. A. Kulkarni, '*Pricing and Commission in Two-Sided Markets with Free Upgrades*', Springer's Lecture Notes in Computer Science (LNCS) 2018.
- **M. Sood**, S. Moharir, A. A. Kulkarni, '*Pricing in Two-Sided Markets in the Presence of Free Upgrades*', IEEE International Conference on Communication Systems and Networks (COMSNETS) 2018.
- **M. Sood**, A. A. Kulkarni, S. Moharir, '*Platform Competition for Throughput in Two-sided Freelance Markets*', IEEE International Conference on Signal Processing and Communications (SPCOM) 2018.

Various Travel Awards

- CMU GSA/Provost Office Conference Funding for IEEE ICC 2021. '21
- CMU ECE GHC Scholarship for Grace Hopper Celebration of Women in Computing. '20
- Travel support for Women in Data Science & Mathematics (WiSDM), ICERM, Brown University. '19
- Travel support for IEEE COMSNETS 2018. '18

TEACHING & MENTORSHIP

- Undergoing comprehensive training in teaching as part of the **Future Faculty Program** at the Eberly Center for Teaching Excellence & Educational Innovation, CMU. '20 - ongoing

Graduate Teaching Assistant & Recitation Leader, Electrical and Computer Engineering, CMU

- 18665: Advanced Probability & Statistics for Engineers. Spring '20
- 18751: Applied Stochastic Processes. Spring '19

Graduate Teaching Assistant, Electrical Engineering, IIT Bombay

- EE706: Communication Networks (**awarded excellence in teaching assistantship**) . Spring '18
- EE759: Applied Mathematical Analysis in Engineering. Fall '17
- Mathematical Preliminaries. Jul'17
- **Science Communication Fellow**, Phipps Conservatory and Botanical Gardens. Summer '20
- **Mentor**, Society of Women Engineers (SWE), CMU. Fall '20
- **Department Academic Mentor** to 11 undergraduate students; awarded **Certificate of Excellence** by the Department of Electrical Engineering, IIT Bombay. '16 - '18

RESEARCH EXPERIENCE

- **Topology Design and Spreading Dynamics in Complex Networks**, CMU. Aug'18 - ongoing
Supervisor: Prof. Osman Yağan

- Analyzing the role of mutations in the spread of infectious diseases over multilayer contact networks.
- Provided formal guarantees for desinging reliable connected topologies in distributed peer-to-peer networks.

- **Hiding the Metadata of Communications**, ICERM, Brown University. Aug'19 - Dec'20
Joint work with collaborators from Women in Data Science and Mathematics (WiSDM) 2019

- Analyzed delay-anonymity tradeoffs of anonymity mixes for facilitating sender-receiver unlinkability.

- **Masters Thesis: Pricing in Two-sided Markets**, IIT Bombay. Jan'17 - Jul'18
Supervisors: Prof. Sharayu Moharir, Prof. Ankur A. Kulkarni

- Modeled and analyzed online markets with multiple platforms and service classes.

- **Biases in Cognition**, Industrial Design Centre, IIT Bombay. Jan'17 - Jun'17
Supervisor: Prof. Venkatesh Rajamanickam

- Organized over 150 biases into tractable categories with illustrative examples for a learning toolkit.

CONFERENCE & INVITED TALKS

- *'Tight Bounds for the Probability of Connectivity in Random K-out Graphs.'*
Communication Theory Symposium, IEEE International Conference on Communications. Jun '21
- *'Epidemic Spreading of Mutating Contagions on Multi-layer Contact Networks.'*
 - Center for Informed Democracy & Social - cybersecurity (IDeaS) Summer Institute, CMU. Jun '21
 - Computing Research Association's- Widening Participation (CRA-WP) Grad Cohort for Women. Apr '21
- *'On the Size of the Giant Component in Inhomogeneous Random K-out Graphs.'*
IEEE International Conference of Decision and Control (CDC) 2020 2020. Dec '20
- *'Transmission Dynamics of Infectious Diseases over Contact Networks: Implications for Intervention Policies.'*
Dowd Fellowship Seminar, CMU. Nov '20
- *'Transmission Dynamics of Misinformation over Coupled Social Networks.'*
Center for Informed Democracy & Social - cybersecurity, Annual Conference, CMU. Nov '20
- *'k-Connectivity in Random Graphs induced by Pairwise Key Predistribution Schemes.'*
IEEE International Symposium on Information Theory. Jun '20
- *'Towards k-connectivity in Heterogeneous Sensor Networks under Pairwise Key Predistribution.'*
Communication Theory and Networking Symposium, IEEE Global Communications Conference. Dec '19
- *'Pricing in Two-Sided Markets in the Presence of Free Upgrades.'*
IEEE International Conference on Communication Systems and Networks. Jan '18

SERVICE & OUTREACH

- Reviewer, Journal of Communications and Networks 2021, ICML 2021, IEEE Transactions on Communication 2020, IEEE GLOBECOM 2019.
- Volunteer, Society of Women Engineers (SWE) Middle School Day, CMU. Mar '20, Mar '21
- Donated original artworks for raising funds for Angels' Place Pittsburgh, an organization providing early childhood care and education for families in need of support. '20
- Cultural Activities Coordinator, Indian Graduate Student Association, CMU. Spring '20
- Member, Seminar Committee, Energy and Information Systems (EIS) Seminar Series, ECE, CMU. Fall '19
- Amongst the **nationwide 50** students selected by selected by Ministry of Youth and Sports Affairs, Govt. of India to represent the country in cultural exchange programs in South Asia. Mar '17
- Secretary, Institute Cultural Council, IIT Bombay. Initiated weekly art classes for children of transient migrant labourers employed at construction sites across the IIT Bombay campus. '15 - '16
- Part of the core team responsible for leading the SPIC MACAY 3rd International Convention bringing together 300 artists and 1800 delegates for celebrating Indian cultural heritage. '15
- Awarded the *Hostel Cultural Colour* for outstanding contribution to cultural activities at IIT Bombay. '14
- Panellist and illustrator for the IIT Bombay newsletter *InsIghT* on articles pertaining to student life. '14

COURSEWORK

Introduction to Machine Learning PhD, Foundations of Privacy, Foundations of Cloud & Machine Learning Infrastructure, Optimization, Graph Theory (audit), Technical Writing for Engineers: Genre & Linguistic Foundations, Markov Chains & Queueing Theory, Advanced Concentration Inequalities, Data Analysis & Interpretation, Linear Algebra, Probability & Random Processes, Real Analysis, Calculus, Computer Programming, Communication Networks, Information Theory & Coding, Control Systems, Signal Processing.

PROGRAMMING SKILLS

Python, Pytorch, Tensorflow, Matlab, C++.

Last updated on June 10, 2021.