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Dean, Electrical, Electronics, and Computer Sciences Division
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CONTACT INFORMATION

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RESEARCH INTERESTS

Decision theory; communication, computation, and control over networks; cyber-social systems; and more recently, data-driven decision frameworks for public health responses.

PROFESSIONAL EXPERIENCE

Indian Institute of Science , Bangalore, India <i>Dean</i> , Electrical, Electronics, and Computer Sciences Division <i>Professor</i> , Electrical Communication Engineering <i>Member</i> , Centre for Networked Intelligence <i>Associate Faculty</i> , Robert Bosch Centre for Cyber-Physical Systems	Jun. 2005 - present Aug. 2021 - present
Indian Statistical Institute - Bengaluru Centre <i>Visiting Scientist</i> , Stat-Math Unit	Oct. 2017 - Sep. 2023 Feb. 2021 - Jul. 2021
Strand Life Sciences <i>Visiting Scientist</i>	Aug. 2020 - Jan. 2021
Université Paul Sabatier <i>Visiting Faculty</i> , Institut de Mathématiques de Toulouse	Sep. 2015 - Oct. 2015
University of Illinois at Urbana-Champaign , USA <i>Visiting Scholar</i> , Coordinated Science Laboratory	Aug. 2012 - Jul. 2013
Qualcomm Inc. , Campbell, California, USA <i>Visiting Faculty</i>	May 2007 - Aug. 2007
Qualcomm Inc. , Campbell, California, USA <i>Senior Staff Engineer / Manager</i>	Oct. 1999 - May 2005
Princeton University , Princeton, New Jersey, USA <i>Research/Teaching Assistant</i> , Department of Electrical Engineering	Sep. 1994 - Aug. 1999

EDUCATION

Princeton University , Princeton, New Jersey USA Department of Electrical Engineering	Ph.D. , September 1999 M.A. , May 1996
Indian Institute of Technology Madras , Chennai, India Department of Electrical Engineering	B.Tech. , EC, July, 1994

EDITORSHIPS AND GUEST EDITING	Associate Editor, Stochastic Systems Member, Editorial Board, Journal of the Indian Institute of Science Guest Co-Editor, 5G and Beyond, Journal of the Indian Institute of Science Associate Editor for Communications, IEEE Transactions on Information Theory, 2012-2015
PLENARIES AND INVITED TUTORIALS	SIGMETRICS/Performance 2022, IIT Bombay (2022) Keynote speaker at the 14th International Conference on COMmunication Systems & NETworkS (COMSNETS 2022), Bengaluru (2022) North American School on Information Theory Speaker, Texas A&M University (2018) Plenary speaker at the 15th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, Wireless Networks (WiOpt 2017)
HONOURS AND AWARDS	IISc Alumni Award for Excellence in Research in Engineering 2022 National Conference on Communications Best Paper Award 2015 Indo-US Science and Technology Forum Fellow 2012-2013 IETE K.S.Krishnan Memorial Best Paper Award 2006 Senior Member, IEEE, 2006
SOME DISTANT RECOGNITIONS	Princeton University Merit Prize, 1994 Notional Prize awarded by IIT Madras, for creditable performance in the Joint Entrance Examination, 1990 (All India Rank 49) Merit Prize awarded by the Central Board of Secondary Education, India, for being in the top 0.1% of successful candidates in Physics, 1990 National Talent Search Scholarship awarded by the National Council for Educational Research and Training, India, 1988
PUBLICATIONS: JOURNAL	D.Maity et al., MIDAS: a technology-enabled hub-and-spoke system for the collection and dissemination of high-quality medical datasets in India, <i>BMC Medical Informatics and Decision Making</i> , 25(1), p.252, 2025. A.Sood, et al., Challenges and recommendations for enhancing digital data protection in Indian Medical Research and Healthcare Sector. <i>npj Digital Medicine</i> , vol.8, no.48, 2025. A.Sharma, A.R.Pinjari, S.K.Nirmale, R.Sundaresan, A human factors-based modeling framework to mimic bus driver behavior, to appear in <i>Transportation Research Part C</i> . D.Maity et al., MIDAS: a new platform for quality-graded health data for AI-enabled healthcare in

India, *Nature Medicine*, 29 August 2024.

S.Yasodharan, R.Sundaresan, “A sufficient condition for the quasipotential to be the rate function of the invariant measure of countable-state mean-field interacting particle systems”, *Advances in Applied Probability*, vol. 56, no. 3, pp. 960-1003, 2024.

M.Moharrami, V.Subramanian, M.Liu, R.Sundaresan, “The Erlang weighted tree, a new branching process,” *Random Structures and Algorithms*, vol. 64, no. 3, pp. 537-624, May 2024.

B.Espinoza, et al., “Coupled models of genomic surveillance and evolving pandemics with applications for timely public health interventions”, *Proceedings of the National Academy of Sciences*, 120 (48) e2305227120, November 20, 2023.

P.N.Karthik, N.Rathod, S.Yasodharan, W.Lobo, A.Sahadevan, R.Sundaresan. P.Verma, “Bus priority lane in Bengaluru: A study on its effectiveness and driver stress,” *Transport Policy*, vol. 139, pp. 39-62, August 2023.

S.Athreya, G.I.Menon, R.Sundaresan, “COVID-19 modeling for India and a roadmap for the future,” *Communications of the ACM*, vol. 65, issue 11, pp. 82-87, November 2022,

G.R.Prabhu, S.Bhashyam, A.Gopalan, R.Sundaresan, “Sequential multi-hypothesis testing in multi-armed bandit problems: An approach for asymptotic optimality,” *IEEE Transactions on Information Theory*, vol.68, no.7, pp. 4790-4817, July 2022.

S.Yasodharan, R.Sundaresan, “Large deviations of mean-field interacting particle systems in a fast varying environment,” *Annals of Applied Probability*, vol. 32, no. 3, 1666-1704, June 2022.

S.Yasodharan, R.Sundaresan, “Large time behaviour and the second eigenvalue problem for finite state mean-field interacting particle systems,” *Advances in Applied Probability*, April 2022.

N.Rathod and R.Sundaresan, “Relay Placement Algorithms for IoT Connectivity and Coverage in an Outdoor Heterogeneous Propagation Environment,” *IEEE Access*, Volume 10, pp.13270-13289, 2022.

M.R.Padma, et al., “Second round statewide survey for estimation of the burden of active infection and anti-SARS-CoV-2 IgG antibodies in the general population of Karnataka, India,” *International Journal of Infectious Diseases – Regions*, Volume 1, pp.107-116, December 2021.

S.Athreya, et al., “COVID-19: Optimal design of serosurvey for disease burden estimation,” *Sankhya B*, pp.1-23, 19 October 2021.

Giridhara R. Babu, et al., “The burden of active infection and anti-SARS-CoV-2 IgG antibodies in the general population: Results from a statewide survey in Karnataka, India,” *International Journal of Infectious Diseases*, Volume 108, P27-36, July 01, 2021.

P.N.Karthik, R.Sundaresan, “Detecting an odd restless Markov arm with a trembling hand,” *IEEE Transaction on Information Theory*, vol.67, no.8, Aug 2021.

K.P.Naveen and R.Sundaresan, “Double-auction mechanisms for resource trading markets,” *IEEE/ACM Transactions on Networking*, vol.29, no.3, pp.1210-1223, June 2021.

S.Agrawal et al., “City-scale agent-based simulators for the study of non-pharmaceutical interventions in the context of the COVID-19 epidemic,” *Journal of the Indian Institute of Science*, vol. 100, pp. 809-847, November 2020.

P.N.Karthik, R.Sundaresan, "Learning to detect an odd Markov arm," *IEEE Transactions on Information Theory*, vol. 66, no. 7, pp. 4324-4348, July 2020.

N.Rathod, R.Subramanian, R.Sundaresan, "Coverage estimation in outdoor heterogeneous propagation environments," *IEEE Access*, vol. 8, pp. 31660-31673, 2020.

S.R.Athreya, V.S.Borkar, K.S.Kumar, R.Sundaresan, "Simultaneous small noise limit for singularly perturbed slow-fast coupled diffusions," *Applied Mathematics and Optimization*, 2019 Nov 21:1-48.

P.T.Akhil and R.Sundaresan, "Network utility maximization revisited: Three issues and their resolution," *Performance Evaluation*, Volume 136:102050, December 2019.

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D.Thirumulanathan, R.Sundaresan, Y.Narahari, "Optimal mechanism for selling two items to a single buyer having uniformly distributed valuations," *Journal of Mathematical Economics*, vol. 82, pp. 1-30, May 2019.

S.Krishnaswamy, Akhil P.T., A.Arapostathis, R.Sundaresan, S.Shakkottai, "Augmenting max-weight with explicit learning for wireless scheduling with switching costs," *IEEE/ACM Transactions on Networking*, vol. 26, no. 6, December 2018.

P.T.Akhil and R.Sundaresan, "A survey of algorithms for separable convex optimization with linear ascending constraints," *Sadhana, Academy Proceedings in Engineering Sciences*, 43:146, pp. 1-18, September 2018.

A.Kadavankandy, K.Avrachenkov, L.Cottatellucci, R.Sundaresan, "The power of side-information in subgraph detection," *IEEE Transactions on Signal Processing*, vol. 66, no. 7, pp. 1905-1919, April 2018.

N.K.Vaidhiyan and R.Sundaresan, "Learning to detect an oddball target," *IEEE Transactions on Information Theory*, vol. 64, no. 2, pp. 831-852, February 2018.

D.Thirumulanathan, H.Vinay, S.Bhashyam, and R.Sundaresan, "Almost budget balanced mechanisms with scalar bids for allocation of a divisible good," *European Journal of Operational Research*, vol. 262, no. 3, pp. 1196-1207, November 2017.

N.K.Vaidhiyan, S.P.Arun, and R.Sundaresan, "Neural dissimilarity indices that predict oddball detection in behaviour," *IEEE Transactions on Information Theory*, vol. 63, no. 8, pp. 4778-4796, August 2017.

S.Ramachandran, C.Singh, S.V.R.Anand, M.Hegde, A.Kumar, and R.Sundaresan, "Neighbor oblivious and finite-state algorithms for circumventing local minima in geographic forwarding," *Ad Hoc Networks*, vol. 50, pp. 1-12, 01 November 2016.

E.Altman, M.K.Hanawal, R.Sundaresan, "Generalising diagonal strict concavity property for uniqueness of Nash equilibrium," *Indian Journal of Pure and Applied Mathematics*, vol. 42, no. 2, pp. 213-228, June 2016.

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A.K.Chorppath, S.Bhashyam, and R.Sundaresan, "A convex optimization framework for almost budget balanced allocation of a divisible good," *IEEE Transactions on Automation Science and Engineering*, vol. 8, no. 3, pp. 520-531, July 2011.

M.K.Hanawal and R.Sundaresan, "The Shannon cipher system with a guessing wiretapper: General sources," *IEEE Transactions on Information Theory*, vol. 57, no. 4, pp. 2503-2516, April 2011.

M.K.Hanawal and R.Sundaresan, "Guessing revisited: A large deviations approach," *IEEE Transactions on Information Theory*, vol. 57, no. 1, pp. 70-78, January 2011.

S.K.Iyer, D.Manjunath, R.Sundaresan, "In-network computation in random wireless networks: A PAC approach to constant refresh rates with lower energy costs," *IEEE Transactions on Mobile*

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A.Padakandla and R.Sundaresan, “Separable convex optimization problems with linear ascending constraints,” *SIAM Journal on Optimization*, vol. 20, no. 3, pp. 1185-1204, 19 August 2009.

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INVITED ARTICLES C.R.Murthy, R.Sundaresan, 5G and beyond, Guest Editorial, *Journal of the Indian Institute of Science*, vol. 100, no. 2, pp. 259-261, April-June 2020.

Book review of *Game Theory and Mechanism Design* authored by Y. Narahari, *Current Science*, vol. 111, no. 6, 25 September 2016.

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P.Subrahmanya, R.Sundaresan, and D.Shiu, “An overview of high-speed packet data transport in CDMA systems,” *IETE Technical Review*, vol. 21, no. 5, Sept-Oct 2005.

DISSERTATION R.Sundaresan, *Coded communication over timing Channels*, Ph.D. dissertation, Department of Electrical Engineering, Princeton University, Princeton, NJ, Sept. 1999.

CONFERENCES W.Majumder, A.Kumar, C.R.Murthy, R.Sundaresan, “A Comparison of Scheduling Algorithms for Packet Voice in a 5G Cellular System and Their Impact on Full Buffer eMBB Flows,” *2025 National Conference on Communications (NCC)*, 6-9 March 2025.

S.Chakraborty, N.Chitta, R.Sundaresan, "Demonstration of Automation of Network Configuration Generation using Generative AI," Demo paper, *20th International Conference on Network and Service Management*, Prague, Czech Republic, 28-31 October 2024.

S.Chakraborty, N.Chitta, R.Sundaresan, "Automation of Network Configuration Generation using Large Language Models," *4th International Workshop on Analytics for Service and Application Management (AnServApp) 2024*, Prague, Czech Republic, 28 October 2024.

V.Kushwaha, A.R.Pinjari, T.Rambha, S.K.Shaukat, R.Sundaresan, P.Verma, "A city-scale framework for collaboration between ride-hailing and transit service providers," *17th International Conference on Travel Behaviour Research*, Vienna, Austria, 14-18 July 2024.

P.M.Hiremath, A.Joglekar, R.Sundaresan, D.Kulkarni, J.Tew, "Enabling Traceability of Manufactured Products in an Assembly Line," *The 2024 National Conference on Communications*, Chennai, 28 February - 02 March 2024.

K.V.Krishna Chaythanya, A.Chattopadhyay, A.Kumar, R.Sundaresan, "Quickest Change Point Detection with Measurements over a Lossy Link," *62nd IEEE CDC 2023*, Singapore, December 2023.

A.Adiga et al., "A multi-team multi-model collaborative COVID-19 forecasting hub for India," *Winter Simulation Conference 2023*, San Antonio, TX, USA, December 2023.

V.Kushwaha, A.R.Pinjari, S.K.Shaukat, R.Sundaresan, Y.Suzuki, P.Verma, "An auction mechanism to facilitate collaboration between rideshare and transit service providers for first- and last-mile services," in *The 16th International Conference on Travel Behaviour Research*, Santiago, Chile, December 2022.

A.Joglekar, G.Bhandari, R.Sundaresan, "ESD wrist strap-based EDA sensor cum ESD strap integrity monitor," *IECON 2021, the 47th Annual Conference of the IEEE Industrial Electronics Society*, October 2021.

S.Yasodharan and R.Sundaresan, "The four levels of fixed-points in mean-field models," *National Conference on Communications*, Online, July 2021.

P.N.Karthik, R.Sundaresan, "Learning to detect an odd restless Markov arm," *2021 IEEE International Symposium on Information Theory*, Online, July 2021.

A. Talekar, et al., "Cohorting to isolate asymptomatic spreaders: An agent-based simulation study on the Mumbai Suburban Railway." *The 20th International Conference on Autonomous Agents and Multiagent Systems, AAMAS-2021*, May 2021.

V.Kushwaha, A.R.Pinjari, R.Sundaresan, "Evaluating the benefit of collaboration between rideshare and transit service providers," *ITS Workshop, COMSNETS-2021*, Bangalore, India, January, 2021.

C.Kuruganti, et al., "A distributed hierarchy based framework for validating edge devices performing state estimation in a power system," *2020 IEEE International Conference on Power Systems Technology (POWERCON)*, Bangalore, India, 2020, pp. 1-6, September 2020.

P.N.Karthik, R.Sundaresan, "Detecting an odd restless Markov arm with a trembling hand," *2020 IEEE International Symposium on Information Theory*, Online, July 2020.

C-G. Jansson, et al., "Experiments in creating online course content for signal processing education," *ICASSP 2020*, Barcelona, Spain, pp. 9220-9223, May 2020.

G. Bhandari, P. M. Hiremath, A. Joglekar, A. Kulkarni, D. Kulkarni, C. Mahadeva, S. B. Mohanty, D. Raghunath, M. B. Raju, R. Shorey, R. Sundaresan, "An Implementation of an Industrial Internet of Things on an SMT Assembly Line," *COMSNETS 2020 - Demos and Exhibits*, Bengaluru, India, 2020.

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P.N.Karthik, R.Sundaresan, "Learning to detect an odd Markov arm," *Proceedings of the 2019 IEEE International Symposium on Information Theory 2019*, Paris, France, July 2019.

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B.Amrutur, M.S.Mohan Kumar, K.R.Sheetal Kumar, L.Patel, R.Sundaresan, N.K.Vaidhiyan, "WaterOpt: A method for checking near-feasibility of continuous water supply," *Proceedings of the 2nd International Workshop on Cyber-Physical Systems for Smart Water Networks*, CPS Week 2016, Vienna, Austria, April 2016.

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N.Rathod, P.Jain, R.Subramanian, S.Yawalkar, M.Sunkenapally, B.Amrutur, and R.Sundaresan, "Performance analysis of wireless devices for a campus-wide IoT network," *Proceedings of the 2015 Wireless Networks: Measurements and Experimentation workshop*, held in conjunction with WiOpt 2015 conference, IIT Bombay, Mumbai, May 2015.

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US Patent # 6,947,475, 20 September 2005.

“Turbo decoder with multiple scale selections”,
co-invented with D.Shiu,
US Patent # 6,885,711, 26 April 2005.

PROFESSIONAL ACTIVITIES

General Co-Chair, 16th International Conference on COMmunication Systems & NETworkS (COM-

SNETS 2024), Bengaluru, 2024

Steering Committee, Asian Engineering Deans Summit, Hong Kong, 2023.

TPC Member, IEEE International Symposium on Information Theory, ISIT 2021

TPC Member, 12th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks, WiOpt 2021

TPC Member, IEEE International Symposium on Information Theory, ISIT 2020

TPC Member, 11th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks, WiOpt 2020

TPC Member, ACM MobiHoc 2019

TPC Member, IEEE International Symposium on Information Theory, ISIT 2019

TPC Member, National Conference on Communications, NCC 2019

TPC Member, 10th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks, WiOpt 2019

Workshop Co-Chair and TPC Member, International Conference on Signal Processing and Communications, SPCOM 2018

TPC Member, IEEE International Symposium on Information Theory, ISIT 2018

TPC Member, 10th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks, WiOpt 2018

TPC Member, National Conference on Communications, NCC 2018

TPC Member, 10th Intl. Conference on Communication Systems & Networks, COMSNETS 2018

TPC Member, 2017 International Conference on Advanced Networks and Telecommunication Systems (ANTS 2017)

Co-chair, Workshop on Research to Impact, November 2017.

General Co-chair, International Symposium on Cyber-Physical Systems, July 2017.

TPC Member, 10th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks, WiOpt 2017

TPC Member, National Conference on Communications, NCC 2017

TPC Member, 9th Intl. Conference on Communication Systems & Networks, COMSNETS 2017

TPC Member, IEEE International Symposium on Information Theory, ISIT 2016

TPC Member, International Conference on Signal Processing and Communications, SPCOM 2018

TPC Member, 10th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks, WiOpt 2016

TPC Member, National Conference on Communications, NCC 2016

Co-chair, Workshop on Game Theory and Mechanism Design, January 2016

Co-chair, Advanced Training in Mathematics, Workshop on Applied Probability, January 2016

Associate Editor for Communications, IEEE Transactions on Information Theory, 2012-2015

Workshop Co-Chair, 13th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks, WiOpt 2015

TPC Member, National Conference on Communications, NCC 2015

Coordinator, Joint Telematics Group of IITs and IISc, 2008 - 2014

Programme Committee, IISc/Microsoft Research Summer School on Wireless Networking, 2014

TPC Member, IEEE International Symposium on Information Theory, ISIT 2014

TPC Member, 12th International Symposium on Modeling and Optimization in Mobile, Ad Hoc,

and Wireless Networks, WiOpt 2014
TPC Member, National Conference on Communications, NCC 2014
Organiser, Workshops on New Avenues for Network Models and Social Networks, January 2014
TPC Co-Chair, 11th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks, WiOpt 2013
TPC Member, National Conference on Communications, NCC 2013
Finance Co-Chair, International Conference on Signal Processing and Communications, SPCOM 2012
TPC Member, National Conference on Communications, NCC 2012
Local Organisation Committee, IISc Mathematics Initiative (IMI) Networks Thematic Programme 2011-2012
TPC Member, 10th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks, WiOpt 2012
Member, Organising Committee, ICTS School and Workshop on Network Science in Electrical Engineering and Computer Science, January 2012
TPC Member, Gamesec 2011
Member, Organising Committee, Workshop on Introduction to Network Science, September 2011
TPC Member, 9th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks, WiOpt 2011
Member, Conference Executive Committee, Finance and Local Organisation, National Conference on Communications 2011
Member, Local Organising Committee, ICM Satellite Conf on Probability and Stochastics 2010
TPC Member, International Conference on Signal Processing and Communications, SPCOM 2010
Organiser, Joint Telematics Group Summer School 2010
TPC Member, National Conference on Communications, NCC 2010
TPC Member, International Conference on Distributed Computing and Networking, ICDCN 2010
Organiser, Joint Telematics Group Summer School 2009
TPC Co-Chair, Wireless Systems: Advanced Research & Development, WISARD 2009
TPC Member, IISc Centenary Conference on Managing Complexity in a Distributed World 2008
TPC Co-Chair, Wireless Systems: Advanced Research & Development, WISARD 2008
TPC Member, IEEE GlobeCom 2008
TPC Member, Wireless Personal Mobile Communications, WPMC 2007
TPC Member, Wireless Systems: Advanced Research & Development, WISARD 2007
Organiser, Workshop on Cognitive Radio 2007