

Curriculum Vitae

Neelesh B. Mehta

FNASc, FNAE, FNA, FIEEE

Contact Information

Professor
Dept. of Electrical Communication Eng. (ECE)
Indian Institute of Science (IISc)
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Education

- PhD California Institute of Technology (Pasadena, USA) 2001
In Electrical Eng.
Advisor: Prof. Andrea Goldsmith (Stanford University)
- MS California Institute of Technology (Pasadena, USA) 1997
In Electrical Eng. (GPA: 3.9/4.0)
- B. Tech. Indian Institute of Technology (IIT), Madras (India) 1996
In Electronics & Communications Eng.
(GPA: 9.73/10, 2nd in the Institute)
(IIT JEE rank: 17)

Research and Development Experience

Professor, ECE Dept., Indian Institute of Science (IISc), Bangalore Since Oct. 2011
(Previously: Assistant Professor (2007-11) and Associate Professor (2012-16), ECE Dept., IISc)

- Extensive research on 4G and 5G cellular communication standards, cooperative communications and relaying, distributed opportunistic selection, multiple access protocols, low complexity multiple antenna techniques, interference modeling, energy harvesting and green wireless sensor networks, and cognitive radio.
 - Published 70+ IEEE Transactions papers, 85+ conference papers, and 3 book chapters, and filed 3 patents
- Introduced new course on Next Generation Wireless System Design on theory and practice of next generation OFDM/OFDMA-based wireless standards such as LTE-Advanced
- Engaged in research projects sponsored by Boeing-HCL-Wipro Aerospace Networking Research Consortium (ANRC), Intel India, Nokia Networks, Broadcom Foundation (USA), Indo-UK Advanced Technology Center (IUATC), Indo-French Centre for the Promotion of Advanced Research (IFCPAR), Ministry of Information Technology, Dept. of Telecommunications (DoT), Defense Research & Development Organization (DRDO)

Principal Member Technical Staff, Mitsubishi Electric Research Labs (MERL), USA 2003-2007

- Project leader for the ‘Beyond 3G’ strategic R&D project. Developed novel technologies and intellectual property for next generation wireless standards and mobile

communication products, with focus on 3GPP technologies. Prepared and presented numerous standards contributions in 3GPP RAN1 meetings on multiple antenna technologies for HSPA and LTE

- Pursued research on low hardware complexity antenna selection and enabling technologies, cooperative communications and cross-layer design in infrastructure-based and ad hoc cooperative communications, spectral efficiency analysis of interference-limited cellular systems with schedulers, and interference modeling methods
- Co-inventor of 25+ issued US patents
- Mentor and collaborator for eight PhD/MS interns from several US universities

Staff Scientist, Broadcom Corp. (Mobile Communications Unit), NJ, USA 2002-2003

- Part of team responsible for developing and integrating the GSM/GPRS/EDGE standards' protocol stack (e.g., PHY, MAC, RLC, SNDCP layers) in commercially successful chipsets for mobile handsets
- Developed a suite of PERL-based tools and tests for automatic internal regression checking of physical layer and protocol stack to enable complex system integration
- Involved in exhaustive testing and debugging of mobile handset products in interoperability testing labs and live EDGE and GPRS wireless networks in Europe and USA

Member Technical Staff, AT&T Research Labs (Wireless Systems), NJ, USA 2001-2002

- Pursued extensive research on performance analysis of WCDMA downlinks and performance determining parameters such as the orthogonality factor. Also part of a team that developed a WCDMA downlink simulator
- Developed a new COST259 system-level MIMO channel model simulation engine

Visiting Graduate Student Researcher, Stanford University, CA, USA 1999-2000

- Pursued research on packet reservation multiple access and link adaptation in 2.5G (EDGE) cellular systems as part of PhD thesis work

Distinctions and Awards

- Fellowships:
 - Indian National Science Academy (INSA) 2020
 - IEEE (for contributions to opportunistic selection in wireless communication systems) 2019
 - Indian National Academy of Engineers (INAE) 2015
 - National Academy of Sciences India (NASI) 2013
- Recipient of the Khosla National Award - 2018 of IIT Roorkee in Engineering 2019
- Recipient of Qualcomm Innovation Fellowship (QInF): With student Vinneth Kumar 2018-19
- Recipient of Qualcomm Innovation Fellowship (QInF): With student Reneeta Isaac 2017-18
- Recipient of the Shanti Swarup Bhatnagar Award in Engineering Sciences 2017
- Recipient of the biennial Hari Om Ashram Prerit Vikram Sarabhai Research Award 2015 in Electronics, Informatics, Telematics, and Automation & System Analysis or Management, awarded by the Physical Research Laboratories, Ahmedabad, India 2016
- Recipient of Swarnajayanti Fellowship, awarded every year by the Dept. of Science and Technology (DST), Govt. of India, to 12 scientists of age 40 years or less 2016-21
- Featured Engineer on EETimes.com May 2016

- Recipient of the NASI-Scopus Young Scientist Award 2014
- Recipient of Indian National Academy of Engineering (INAE) Young Engineer Award 2010
- Co-author of several papers that were among the most accessed papers in IEEE Xplore in IEEE Wireless Communications Letters in Apr. 2015 ([J17]), IEEE Transactions on Wireless Communications in Jan. 2015 ([J22]), Sept./Oct. 2014 ([J24]), Apr. 2011 ([J52]), Sept. 2010 ([J55]), and Apr. 2010 ([J58]), and IEEE Transactions on Communications in Aug. 2013 ([J36])
- Co-author of paper ([C48]) that received the best paper award in Communications Track in National Conf. on Communications (NCC), Chennai, India, Jan. 2010
- Co-author of an IEEE Transactions on Wireless Communications paper ([J65]) that was one among the most accessed papers in all of IEEE Xplore Aug. & Sept. 2008
- Received Certificate of Appreciation for “*Outstanding Contributions to Global Standardization Activities on Mobile Communication Technologies*” given by Corporate R&D, Mitsubishi Electric Corporation 2007
- One of 36 recipients in entire Asia-Pacific region of *AT&T World Leadership Award* 1996
- Awarded the Philips India prize for best undergraduate academic performance in Electronics and Communications Eng., Indian Institute of Technology (IIT), Madras 1996
- Awarded *Institute Merit Prize* for outstanding academic achievements for two consecutive years at the Indian Institute of Technology (IIT), Madras 1995-96
- Secured 17th all India rank (out of 100,000 applicants) in the prestigious joint entrance examination (JEE) for the Indian Institutes of Technology (IIT), 2nd rank (out of 40,000 candidates) in AP state engineering entrance exam (EAMCET), and 1st position in state-level mathematics Olympiad 1991-92
- Recipient of National Talent Search (NTSE) and National Science Talent Scholarships (NSTS) awarded to a select few students within India every year 1992-96

Professional Recognition and Service of Note

- Member of the 4-member Steering Committee that oversees the IEEE Transactions on Wireless Communications 2019-22
- Member of the IEEE ComSoc Awards Committee 2018-20
- Chairman of the Joint Telematics Group (JTG), which consists of several IITs and IISc, and coordinates the National Conference on Communications and summer schools Since 2017
- Co-chair of Membership Development Committee of the Asia-Pacific Board of IEEE ComSoc 2018-19
- Chair of the Executive Editorial Committee of the IEEE Transactions on Wireless Communications 2017-18
- Executive Editor of IEEE Transactions on Wireless Communications 2014-17
- Member-at-Large on the Board of Governors of the IEEE Communications Society 2014-15
- Member of ComSoc’s statutory Education and Training Board 2014-19
- Member of ComSoc’s Marketing and Industry Relations Committee 2014-19
- Director of Conference Publications on the Board of Governors of the IEEE Communications Society (first Indian to serve on the Board in its 60-year history) 2012-13
- Editorships:

- Guest Editor of new Feature topic on “Telecommunication and Network Engineering Education” in IEEE Communications Magazine 2019
- IEEE Transactions on Communications 2013-2019
- IEEE Wireless Communications Letters 2011-16
- IEEE Transactions on Wireless Communications 2008-11
- Sadhana - Academy Proceedings in Engineering Sciences (journal of the Indian Academy of Sciences) 2013-16
- Journal of Communications and Networking (JCN) in the Personal Communications Systems area 2012-13
- Guest editor of Journal of Communication Networks (JCN) special issue on energy harvesting in wireless networks 2011
- Guest editor of Journal of Communications (JCM) special issue on Practical Physical Layer Techniques for 4G Systems & Beyond 2011
- Member of best paper awards committees of:
 - IEEE ICC 2017 (Paris, France)
 - IEEE ICC 2016 (Kuala Lumpur, Malaysia)
 - IEEE Globecom 2014 (Austin, TX, USA)
- Co-chair of program committee for:
 - IEEE Vehicular Technology Conference (Fall) 2019, Honolulu, USA, Sept. 2019 [Signal transmission and reception track]
 - National Conference on Communications (NCC) 2019, Bangalore, Feb. 2019 [General co-chair]
 - IEEE Global Communications Conference (Globecom 2018), Abu Dhabi, Dec. 2018, [Lead co-chair for Communication theory symposium]
 - International Conference on Signal Processing and Communications (SPCOM 2018), IISc, Bangalore, India, Jul. 2018 [TPC co-chair]
 - IEEE Vehicular Technology Conference (VTC) 2014-Fall, Vancouver, Canada, Sept. 2014 [Green communications track]
 - International Conference on Signal Processing and Communications (SPCOM 2014), Bangalore, Jun. 2014 [Treasurer]
 - COMSNETS, Bangalore, Jan. 2014 [TPC co-chair]
 - IEEE Global Communications Conference (Globecom 2013), Atlanta, USA, Dec. 2013 [Green communication systems and networks track]
 - IEEE International Conference on Communications (ICC 2013), Budapest, Hungary, Jun. 2013 [Wireless communications symposium]
 - International Conference on Signal Processing and Communications (SPCOM 2012), Bangalore, India, Jul. 2012 [Publications]
 - Green Telecom and IT workshop, jointly organized by IISc and Bell Labs, Apr. 2012
 - International Center for Theoretical Sciences (ICTS) School and Workshop on Network Science in Electrical Engineering and Computer Science, IISc, Jan. 2012 [Local organizing committee]
 - IISc Mathematics Initiative (IMI) Workshop on Introduction to Network Science, Bangalore, India, Aug. 2011 [Local organizing committee]
 - National Conference on Communications (NCC 2011), Bangalore, India, Jan. 2011 [Communications track co-chair and publications chair]
 - Wireless Systems: Advanced Research and Development (WISARD 2011) workshop of COMSNETS 2011, Bangalore, India, Jan. 2011 [Co-chair]

- International Conference on Signal Processing and Communications (SPCOM 2010), IISc, Bangalore, India, Jul. 2010 [Tutorials]
- Wireless Systems: Advanced Research and Development (WISARD 2010) workshop of COMSNETS 2010, Bangalore, India, Jan. 2010 [Co-chair]
- IEEE Vehicular Technology Conference (VTC 2009, Fall), Anchorage, USA, Sept. 2009 [Transmission technologies track]
- Chinacom 2008, Huangzhou, China, Aug. 2008 [Frontiers of networking and communications symposium]
- Steering committee member of
 - IEEE 5G World Forum, Bangalore, India, Sept. 2020
- Technical program committee member for several conferences:
 - IEEE Globecom 2007 onwards
 - IEEE ICC 2010 onwards
 - IEEE WCNC 2008 onwards
 - IEEE VTC 2017 (Spring), VTC 2013 (Fall & Spring), 2011 (Fall & Spring), 2010 (Fall & Spring), 2009 (Spring), and 2007 (Spring)
 - NCC 2010 onwards
 - WiOpt 2013, WONS 2012, ICC 2012, WISARD 2009
- Executive committee member of IEEE Bangalore Section, India 2010-12
- Executive committee member of IEEE Signal Processing Society, Bangalore Since 2008

Journal Publications

- [J1] Sayan Sen Gupta, Saikiran Pallapothu, Neelesh B. Mehta, “Ordered Transmissions for Energy-Efficient Detection in Energy Harvesting Wireless Sensor Networks,” *To appear in IEEE Transactions on Communications*, 2019.
- [J2] R. Sarvendranath, Neelesh B. Mehta, “Exploiting Power Adaptation with Transmit Antenna Selection for Interference-Outage Constrained Underlay Spectrum Sharing,” *To appear in IEEE Transactions on Communications*, 2019. [Available online on IEEEXplore]
- [J3] Rama Kiran, Neelesh B. Mehta, Jestin Thomas, “Design and Network Topology-Specific Renewal-Theoretic Analysis of a MAC Protocol for Asymmetric Full-Duplex WLANs,” *To appear in IEEE Transactions on Communications*, Vol. 67, No. 12, Dec. 2019, pp. 8532–8544.
- [J4] Bala Venkata Ramulu Gorantla, Neelesh B. Mehta, “Resource and Computationally Efficient Subchannel Allocation for D2D in Multi-Cell Scenarios with Partial and Asymmetric CSI,” *IEEE Transactions on Wireless Communications*, Vol. 18, No. 12, Dec. 2019, pp. 5806–5817.
- [J5] Vineeth Kumar, Neelesh B. Mehta, “Modeling and Analysis of Differential CQI Feedback in 4G/5G OFDM Cellular Systems,” *IEEE Transactions on Wireless Communications*, Vol. 18, No. 4, Apr. 2019, pp. 2361–2373.
- [J6] Sayan Sen Gupta, Neelesh B. Mehta, “Revisiting Effectiveness of Energy Conserving Opportunistic Transmission Schemes in Energy Harvesting Wireless Sensor Networks,” *IEEE Transactions on Communications*, Vol. 67, No. 4, Apr. 2019, pp. 2968–2980.

- [J7] Reneeta Sara Isaac, Neelesh B. Mehta, “Efficient Computation of Multivariate Rayleigh and Exponential Distributions,” *IEEE Wireless Communications Letters*, Vol. 8, No. 2, Apr. 2019, pp. 456–459.
- [J8] R. Sarvendranath, Neelesh B. Mehta, “Impact of Multiple Primaries and Partial CSI on Transmit Antenna Selection for Interference-Outage Constrained Underlay CR,” *IEEE Transactions on Wireless Communications*, Vol. 18, No. 2, Feb. 2019, pp. 942–953.
- [J9] R. Sarvendranath, Neelesh B. Mehta, “Transmit Antenna Selection for Interference-Outage Constrained Underlay CR,” *IEEE Transactions on Communications*, Vol. 66, No. 9, Sep. 2018, pp. 3772–3783.
- [J10] Reneeta Sara Isaac, Neelesh B. Mehta, “A Correlation-aware Splitting Algorithm for Opportunistic Selection,” *IEEE Transactions on Communications*, Vol. 66, No. 3, Mar. 2018, pp. 1250–1261.
- [J11] Sai Kiran Bulusu, Neelesh B. Mehta, Suresh Kalyanasundaram, “Rate Adaptation, Scheduling, and Mode Selection in D2D Systems with Partial Channel Knowledge,” *IEEE Transactions on Wireless Communications*, Vol. 17, No. 2, Feb. 2018, pp. 1053–1065.
- [J12] Priyanka Das, Neelesh B. Mehta, “Rate-Optimal Relay Selection for Average Interference-Constrained Underlay CR,” *IEEE Transactions on Communications*, Vol. 65, No. 12, Dec. 2017, pp. 5137–5148.
- [J13] Vineeth Kumar, Neelesh B. Mehta, “Base Station-Side Rate Estimation for Threshold-Based Feedback, and Design Implications in Multi-User OFDM Systems,” *IEEE Transactions on Wireless Communications*, Vol. 16, No. 11, Nov. 2017, pp. 7634–7645.
- [J14] Vikas Kumar Dewangan, Neelesh B. Mehta, “Revisiting and Optimizing the Design of the Timer-Based Distributed Selection Scheme for Tackling Imperfect Power Control,” *IEEE Transactions on Wireless Communications*, Vol. 16, No. 11, Nov. 2017, pp. 7646–7657.
- [J15] Jobin Francis, Neelesh B. Mehta, “Throughput-Optimal Scheduling and Rate Adaptation for Reduced Feedback Best-M Scheme in OFDM Systems,” *IEEE Transactions on Communications*, Vol. 65, No. 7, Jul. 2017, pp. 3053–3065.
- [J16] Amit K. Dutta, K. V. S. Hari, Chandra R. Murthy, Neelesh B. Mehta, and Lajos Hanzo, “Minimum Error Probability MIMO-Aided Relaying: Multi-Hop, Parallel and Cognitive Designs,” *IEEE Transactions on Vehicular Technology*, Vol. 66, No. 6, Jun. 2017, pp. 5435–5440.
- [J17] Jobin Francis, Neelesh B. Mehta, S. N. Ananya, “Best-M Feedback in OFDM: Base-Station-Side Estimation and System Implications,” *IEEE Transactions on Wireless Communications*, Vol. 15, No. 5, May 2016, pp. 3616–3227.

- [J18] Priyanka Das, Neelesh B. Mehta, "Direct Link-Aware Optimal Relay Selection and a Low Feedback Variant for Underlay CR," *IEEE Transactions on Communications*, Vol. 64, No. 6, Jun. 2015, pp. 2044–2055.
- [J19] Shilpa Rao, Neelesh B. Mehta, "Energy Harvesting WSNs for Accurately Estimating the Maximum Sensor Reading: Trade-offs and Optimal Design," *IEEE Transactions on Wireless Communications*, Vol. 14, No. 8, Aug. 2015, pp. 4562–4573.
- [J20] Priyanka Das, Neelesh B. Mehta, Gagandeep Singh, "Novel Relay Selection Rules for Average Interference-Constrained Cognitive AF Relay Networks," *IEEE Transactions on Wireless Communications*, Vol. 14, No. 8, Aug. 2015, pp. 4304–4315.
- [J21] Salil Kashyap, Neelesh B. Mehta, "Power Gain Estimation and Its Impact on Binary Power Control in Underlay Cognitive Radio," *IEEE Wireless Communications Letters*, Vol. 4, No. 2, Apr. 2015, pp. 193–196.
- [J22] S. N. Ananya, Neelesh B. Mehta, "Performance of OFDM Systems with Best-m Feedback, Scheduling, and Delays for Uniformly Correlated Subchannels," *IEEE Transactions on Wireless Communications*, Vol. 14, No. 4, Apr. 2015, pp. 1983–1993.
- [J23] Arjun Anand, Neelesh B. Mehta, "Quick, Decentralized, Energy-Efficient One-Shot Max Function Computation Using Timer-Based Selection," *IEEE Transactions on Communications*, Vol. 63, No. 3, Mar. 2015, pp. 927–937.
- [J24] Vikas Kumar Dewangan, Neelesh B. Mehta, "Timer-Based Distributed Node Selection Scheme Exploiting Power Control and Capture," *IEEE Transactions on Wireless Communications*, Vol. 14, No. 3, Mar. 2015, pp. 1457–1467.
- [J25] Jobin Francis, Neelesh B. Mehta, "Characterizing the Impact of Feedback Delays on Wideband Rate Adaptation," *IEEE Transactions on Wireless Communications*, Vol. 14, No. 2, Feb. 2015, pp. 960–971.
- [J26] Parag S. Khairnar, Neelesh B. Mehta, "Discrete-Rate Adaptation and Selection in Energy Harvesting Wireless Systems," *IEEE Transactions on Wireless Communications*, Vol. 14, No. 1, Jan. 2015, pp. 219–229.
- [J27] Salil Kashyap, Neelesh B. Mehta, "Optimal Binary Power Control for Underlay CR with Different Interference Constraints and Impact of Channel Estimation Errors," *IEEE Transactions on Communications*, Vol. 62, No. 11, Nov. 2014, pp. 3753–3764.
- [J28] Shilpa Rao, Neelesh B. Mehta, "Hybrid Energy Harvesting Wireless Systems: Performance Evaluation and Benchmarking," *IEEE Transactions on Wireless Communications*, Vol. 13, No. 9, Sept. 2014, pp. 4782–4793.
- [J29] B. Sainath, Neelesh B. Mehta, "Interference-Constrained Optimal Power-Adaptive Amplify-and-Forward Relaying and Selection for Underlay Cognitive Radios," *IEEE Transactions on Communications*, Vol. 62, No. 8, Aug. 2014, pp. 2709–2720.

- [J30] R. Sarvendranath, Neelesh B. Mehta, "Antenna Selection with Power Adaptation in Interference-Constrained Cognitive Radios," *IEEE Transactions on Communications*, Vol. 62, No. 3, Mar. 2014, pp. 786–796.
- [J31] Vikas Kumar Dewangan, Neelesh B. Mehta, "Capture-Induced, Fast, Distributed, Splitting Based Selection with Imperfect Power Control," *IEEE Transactions on Communications*, Vol. 62, No. 1, Jan. 2014, pp. 74–84.
- [J32] Mohd. Shabbir Ali, Neelesh B. Mehta, "Modeling Time-Varying Aggregate Interference in Cognitive Radio Systems, and Application to Primary Exclusive Zone Design," *IEEE Transactions on Wireless Communications*, Vol. 13, No. 1, Jan. 2014, pp. 429–439.
- [J33] Jobin Francis, Neelesh B. Mehta, "EESM-based Link Adaptation in Point-to-point and Multi-cell OFDM Systems: Modeling and Analysis," *IEEE Transactions on Wireless Communications*, Vol. 13, No. 1, Jan. 2014, pp. 407–417.
- [J34] Salil Kashyap, Neelesh B. Mehta, "SEP-Optimal Transmit Power Policy for Peak Power and Interference Outage Probability Constrained Underlay Cognitive Radios," *IEEE Transactions on Wireless Communications*, Vol. 12, No. 12, Dec. 2013, pp. 6371–6381.
- [J35] Rajat Talak, Neelesh B. Mehta, "Optimal Timer-Based Best Node Selection for Wireless Systems with Unknown Number of Nodes," *IEEE Transactions on Communications*, Vol. 61, No. 11, Nov. 2013, pp. 4475–4485.
- [J36] A. Karthik, Neelesh B. Mehta, "En Masse Relay Selection Algorithms for Multi-source, Multi-relay, Decode-and-forward Cooperative Systems," *IEEE Transactions on Communications*, Vol. 61, No. 8, Aug. 2013, pp. 3170–3180.
- [J37] Anup Aprem, Chandra R. Murthy, Neelesh B. Mehta, "Transmit Power Control Policies for Energy Harvesting Sensors with Retransmissions," *IEEE Journal of Selected Topics in Signal Processing*, Vol. 7, No. 5, Oct. 2013, pp. 895–906.
- [J38] Neelesh B. Mehta, Rajat Talak, Ananda T. Suresh, "Interplay Between Optimal Selection Scheme, Selection Criterion, and Discrete Rate Adaptation in Opportunistic Wireless Systems," *IEEE Transactions on Communications*, Vol. 61, No. 7, Jul. 2013, pp. 2735–2745.
- [J39] Salil Kashyap, Neelesh B. Mehta, "Joint Antenna Selection and Frequency-Domain Scheduling in OFDMA Systems with Imperfect Estimates from Dual Pilot Training Scheme," *IEEE Transactions on Wireless Communications*, Vol. 12, No. 7, Jul. 2013, pp. 3473–3483.
- [J40] Vinod Kristem, Neelesh B. Mehta, Andreas F. Molisch, "Training for Antenna Selection in Time-varying Channels: Optimal Selection, Energy Allocation, and Energy Efficiency Evaluation," *IEEE Transactions on Communications*, Vol. 61, No. 6, Jun. 2013, pp. 2295–2305.
- [J41] Sachin Bharadwaj, Neelesh B. Mehta, "Accurate Performance Analysis of Single and Opportunistic AF Relay Cooperation with Imperfect Cascaded Channel Estimates," *IEEE Transactions on Communications*, Vol. 61, No. 5, May 2013, pp. 1764–1775.

- [J42] Arpan Mukhopadhyay, Neelesh B. Mehta, Vikram Srinivasan, “Design and Analysis of an Acknowledgment-Aware Asynchronous MPR MAC Protocol for Distributed WLANs,” *IEEE Transactions on Wireless Communications*, Vol. 12, May 2013, pp. 2068–2079.
- [J43] Subhojit Guharoy, Neelesh B. Mehta, “Joint Evaluation of Channel Feedback Schemes, Rate Adaptation, and Scheduling in OFDMA Downlinks with Feedback Delays,” *IEEE Transactions on Vehicular Technology*, Vol. 62, No. 4, Apr. 2013, pp. 1719–1731.
- [J44] R. Sarvendranath, Neelesh B. Mehta, “Antenna Selection in Interference-Constrained Underlay Cognitive Radios: SEP-Optimal Rule and Performance Benchmarking,” *IEEE Transactions on Communications*, Vol. 61, No. 2, Feb. 2013, pp. 496–506.
- [J45] B. Sainath, Neelesh B. Mehta, “Generalizing the Amplify-and-Forward Relay Gain Model: An Optimal SEP Perspective,” *IEEE Transactions on Wireless Communications*, Vol. 11, No. 11, Nov. 2012, pp. 4118–4127.
- [J46] Rajat Talak, Neelesh B. Mehta, “Feedback Overhead-Aware, Distributed, Fast, and Reliable Selection,” *IEEE Transactions on Communications*, Vol. 11, No. 11, Nov. 2012, pp. 3417–3428.
- [J47] Neelesh B. Mehta, Andreas F. Molisch, Salil Kashyap, “Antenna Selection in LTE: From Motivation to Specification,” *IEEE Communications Magazine*, Vol. 50, No. 10, Oct. 2012, pp. 144–150.
- [J48] Hassan Abou Saleh, Andreas F. Molisch, Thomas Zemen, Steven D. Blostein, Neelesh B. Mehta, “Receive Antenna Selection for Time-Varying Channels Using Discrete Prolate Spheroidal Sequences,” *IEEE Transactions on Wireless Communications*, Vol. 11, No. 7, Jul. 2012, pp. 2616–2627.
- [J49] A. Karthik, Neelesh B. Mehta, “An Opportunistic, Fast, and Distributed Subchannel and User-pairing Algorithm for OFDMA,” *IEEE Transactions on Communications*, Vol. 60, No. 3, Mar. 2012, pp. 767–778.
- [J50] Parag S. Khairnar, Neelesh B. Mehta, “New Insights into Optimal Discrete Rate Adaptation for Average Power Constrained Single and Multi-node Systems,” *IEEE Transactions on Wireless Communications*, Vol. 11, No. 2, Feb. 2012, pp. 537–543.
- [J51] Virag Shah, Neelesh B. Mehta, Dilip Bethanabhotla, “Performance of a Fast, Distributed Multiple Access Based Relay Selection Algorithm Under Imperfect Statistical Knowledge,” *IEEE Transactions on Wireless Communications*, Vol. 10, No. 10, Oct. 2011, pp. 3516–3527.
- [J52] Sushruth N. Donthi, Neelesh B. Mehta, “An Accurate Model for EESM and its Application to Analysis of CQI Feedback Schemes and Scheduling in LTE,” *IEEE Transactions on Wireless Communications*, Vol. 10, No. 10, Oct. 2011, pp. 3436–3448.

- [J53] Sushruth N. Donthi, Neelesh B. Mehta, “Joint Performance Analysis of Channel Quality Indicator Feedback Schemes and Frequency-Domain Scheduling for LTE,” *IEEE Transactions on Vehicular Technology*, Vol. 60, No. 7, Jul. 2011, pp. 3096–3109.
- [J54] Jingxian Wu, Neelesh B. Mehta, Andreas F. Molisch, Jin Zhang, “Unified Spectral Efficiency Analysis of Cellular Systems with Channel-Aware Schedulers,” *IEEE Transactions on Communications*, Vol. 60, No. 12, Dec. 2011, pp. 3463–3474.
- [J55] Vinod Kristem, Neelesh B. Mehta, Andreas F. Molisch, “Training and Voids in Receive Antenna Subset Selection in Time-Varying Channels,” *IEEE Transactions on Wireless Communications*, Vol. 10, No. 6, Jun. 2011, pp. 1992–2003.
- [J56] Neelesh B. Mehta, Vinod Sharma, Gaurav Bansal, “Performance Analysis of a Cooperative System with Rateless Codes and Buffered Relays,” *IEEE Transactions on Wireless Communications*, Vol. 10, No. 4, Apr. 2011, pp. 1069–1081.
- [J57] Bhargav Medepally, Neelesh B. Mehta, “Voluntary Energy Harvesting Relays and Selection in Cooperative Wireless Networks,” *IEEE Transactions on Wireless Communications*, Vol. 9, No. 11, Nov. 2010, pp. 3543–3553.
- [J58] Vinod Kristem, Neelesh B. Mehta, Andreas F. Molisch, “A Novel, Balanced, and Energy-Efficient Training Method for Receive Antenna Selection,” *IEEE Transactions on Wireless Communications*, Vol. 9, No. 9, Sept. 2010, pp. 2742–2753.
- [J59] Virag Shah, Neelesh B. Mehta, Raymond Yim, “The Relay Selection and Transmission Trade-off in Cooperative Communication Systems,” *IEEE Transactions on Wireless Communications*, Vol. 9, No. 8, Aug. 2010, pp. 2505–2515.
- [J60] Vinod Kristem, Neelesh B. Mehta, Andreas F. Molisch, “Optimal Receive Antenna Selection in Time-Varying Fading Channels with Practical Training Constraints,” *IEEE Transactions on Communications*, Vol. 58, No. 7, Jul. 2010, pp. 2023–2034.
- [J61] Virag Shah, Neelesh B. Mehta, Raymond Yim, “Optimal Timer Based Selection Schemes,” *IEEE Transactions on Communications*, Vol. 58, No. 6, Jun. 2010, pp. 1814–1823.
- [J62] Virag Shah, Neelesh B. Mehta, Raymond Yim, “Splitting Algorithms for Fast Relay Selection: Generalizations, Analysis, and a Unified View,” *IEEE Transactions on Wireless Communications*, Vol. 9, No. 4, Apr. 2010, pp. 1525–1535.
- [J63] Sarabjot Singh, Neelesh B. Mehta, Andreas F. Molisch, Abhijit Mukhopadhyay, “Moment-Matched Lognormal Modeling of Uplink Interference with Power Control and Cell Selection,” *IEEE Transactions on Wireless Communications*, Vol. 9, No. 3, Mar. 2010, pp. 932–938.
- [J64] Raymond Yim, Neelesh B. Mehta, Andreas Molisch, Jin Zhang, “Dual Power Multiple Access with Multipacket Reception using Local CSI,” *IEEE Transactions on Wireless Communications*, Vol. 8, No. 8, Aug. 2009, pp. 4078–4088.

- [J65] Raymond Yim, Neelesh B. Mehta, Andreas Molisch, “Fast Multiple Access Selection Through Variable Power Transmissions,” *IEEE Transactions on Wireless Communications*, Vol. 8, No. 4, Apr. 2009, pp. 1962–1973.
- [J66] Ritesh Madan, Neelesh B. Mehta, Andreas F. Molisch, Jin Zhang, “Energy-Efficient Decentralized Cooperative Routing in Wireless Networks,” *IEEE Transactions on Automatic Control*, Vol. 54, No. 3, Mar. 2009, pp. 512–517.
- [J67] Natasha Devroye, Neelesh B. Mehta, Andreas F. Molisch, “Asymmetric Cooperation Among Wireless Relays with Linear Precoding,” *IEEE Transactions on Wireless Communications*, Vol. 7, No. 12, Dec. 2008, pp. 5420–5430.
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- [J69] Ritesh Madan, Neelesh B. Mehta, Andreas F. Molisch, Jin Zhang, “Energy-Efficient Cooperative Relaying over Fading Channels with Simple Relay Selection,” *IEEE Transactions on Wireless Communications*, Vol. 7, No. 8, Aug. 2008, pp. 3013–3025.
- [J70] Hongyuan Zhang, Neelesh B. Mehta, A. F. Molisch, Jin Zhang, Huaiyu Dai, “Asynchronous Interference Mitigation in Cooperative Base Station Systems,” *IEEE Transactions on Wireless Communications*, Vol. 7, No. 1, Jan. 2008, pp. 155–165.
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Patents

Co-inventor of 25+ patents on novel MIMO technologies, low hardware complexity antenna selection and enabling methods, cooperative communication techniques, sensor networks, and interference modeling methods for cellular and ad hoc networks

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- [IP2] *Transmit power scaling method and system to detect occurrences using geographically distributed sensors*, Neelesh B. Mehta, 2009.
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- [P21] *Method and system for antenna selection in wireless networks*, Neelesh B. Mehta, Erdem Bala, Jinyun Zhang, Andreas F. Molisch, US patent number 7,583,939.
- [P22] *Space time transmit diversity with subgroup rate control and subgroup antenna selection in multi-input multi-output communications systems*, Neelesh B. Mehta, Pallav Sudarshan, Andreas F. Molisch, Jinyun Zhang, US patent number 7,542,446.
- [P23] *System and method for transmitting signals in cooperative base station multi-user MIMO networks*, Neelesh B. Mehta, Hongyuan Zhang, Andreas F. Molisch, Jinyun Zhang, US patent number 7,526,036.
- [P24] *Pilot and data signals for MIMO systems using channel statistics*, Neelesh B. Mehta, Fadel F. Digham, Andreas F. Molisch, Jinyun Zhang, US patent number 7,443,925.
- [P25] *RF-based antenna selection in MIMO systems*, Neelesh B. Mehta, Pallav Sudarshan, Andreas F. Molisch, Jin Zhang, US patent number 7,327,983.
- [P26] *Method for representing a combination of signals with a distribution of a single lognormal random variable*, Neelesh B. Mehta, Andreas F. Molisch, Jingxian Wu, Jin Zhang, US patent number 7,280,942.
- [P27] *Multiple antennas at transmitters and receivers to achieving higher diversity and data rates in MIMO systems*, Neelesh B. Mehta, Pallav Sudarshan, Andreas F. Molisch, Jin Zhang, US patent number 7,020,446.

Wireless Standards Experience

- Active participant and contributor to physical layer discussions in RAN working group 1 of third generation partnership project (3GPP) standard. Participated in discussions for HSUPA, LTE, and LTE-Advanced. Developed technology that led to essential IP
- Research and publications on topics in IEEE 802.11n (wireless local area network) and IEEE 802.16m (Advanced WiMAX)

Teaching Experience

- *Next Generation Wireless Systems: Design and Analysis (IISc)* Since 2010
Digital communication over fading channels; Adaptation; Multi-user systems; Long Term Evolution (LTE) standard overview; Comparison with WiMAX; Cooperative communications and relays: Relation to multi-antenna techniques, Cognitive radio
- *Wireless Communications (IISc)* Since 2008
Wireless channel modeling, diversity techniques, multiple access and interference, cellular mobile radio systems, capacity of wireless channels, multi-user diversity, MIMO – channel models, diversity, spatial multiplexing, capacity and architectures, OFDM
- *Digital Communications (IISc)* 2009, 2010, 2017
Representation of signals and systems, digital modulation techniques and performance, optimum receiver structures, signal design for band-limited channels, coding and coded

modulation techniques – capacity approaching schemes, ISI and equalization, digital communication over fading channels

- *Teaching Assistant* at Caltech for undergraduate and graduate courses on 1996-98
 - Linear systems
 - Wireless communications

Tutorials, Lectures, and Invited Talks

Tutorials

- “Rate Adaptation and Scheduling in Wideband Cellular Communication Systems,” at Conference on Information and Communication Technology (CICT), IIIT Gwalior, Gwalior, Nov. 2017
- “Energy Harvesting Wireless Communication Systems,” at National Conf. on Communications, Kanpur, Mar. 2014 (jointly with Chandra R. Murthy)
- “Cooperative Communication Systems: Theory and Practice,” at IIIT Hyderabad organized by IEEE Communications/Signal Processing Chapters, Sep. 2010
- “Cooperative Communications: Theory and Practice,” at SPCOM 2010, Bangalore, Jul. 2010 (jointly with P. Vijay Kumar)
- “Cooperative Communications,” in DRDO-IISc workshop on advances in communications and networking, IISc, Bangalore, Apr. 2008

Keynote/Plenary Talks

- “Rate Adaptation and Scheduling in 4G/5G: How to Make Do with Reduced Feedback?” IEEE ComSoc 5G Summit, Bangalore, Aug. 2019
- “Reduced Feedback Schemes and Base Station-Side Estimation Techniques for 4G/5G Cellular Systems,” HyWIT workshop, IIT Hyderabad, Sep. 2018
- “Energy harvesting wireless networks: Promises and challenges,” Conference on Information and Communication Technology (CICT), IIIT Gwalior, Gwalior, Nov. 2017
- “Max Function Computation in Green Energy Harvesting Wireless Sensor Networks,” International Workshop on Green and Energy Efficient Networks (GREEN), WiOpt, Mumbai, May 2015
- “Opportunism in Current & Next Generation Wireless Communication Systems” at IEEE 8th International Conference on Industrial and Information Systems (ICIIS), Kandy, Sri Lanka, Dec. 2013

Lectures and Invited Talks in India

- “Enabling Rate Adaptation and Scheduling in 4G/5G Cellular Systems with Reduced Feedback,” Inaugural address, Faculty Development Program, MS Ramaiah Institute of Technology, Bangalore, Jan. 2020
- “Understanding 4G/5G Communication Systems,” INAE-VTU Lecture Series, VTU Regional Center, Bangalore, Nov. 2019
- “Energy Efficiency in 5G/Next Generation Communications,” Intel India Research Colloquium, Bangalore, Oct. 2019
- “Energy-Efficient Ordering and Selection in Energy Harvesting Wireless Sensor Networks,” Talk at IIITDM Jabalpur, Oct. 2019
- “Selection in Wireless Communication Systems: Interesting Algorithms and Applications,” Institute Bhatnagar series talk at IIT Ropar, Oct. 2019
- “Revisiting the Design of Wireless Sensor Networks with Energy Harvesting Sensors,” Invited talk at IIT Indore, Jan. 2019
- “Base Station-Side Estimation Algorithms for Cellular Systems with Reduced Feedback,” Invited talk at IEEE CONECCT, Bangalore, Mar. 2018

- “Opportunistic Selection in Next Generation Wireless Communication Systems: A Primer,” Institute seminar at Indraprastha Institute of Information Technology (IIIT) Delhi, Feb. 2017
- Lectures on 4G cellular systems and cognitive radio in TEQIP workshop “Recent Advances in Communications and Signal Processing,” Vasavi College of Engineering, Hyderabad, Telangana, India, Nov. 2015
- “Energy Harvesting-Based Green Wireless Communication Systems,” Intel Bangalore, Aug. 2015
- Lectures on “Wireless communications” in Science Academies’ Lecture Workshop on Wireless Communication and Networking, Amal Jyothi College of Engineering, Kanjirapally, Kerala, India, Jul. 2015
- “Revisiting Amplify-and-Forward Relaying in Cooperative Communications and Underlay Cognitive Radio,” IIT Delhi, Sep. 2014
- “Energy Harvesting-Based Green Wireless Communication Systems,” 2014 Indo-American Frontiers of Engineering Symposium, Mysore, May 2014
- “Green Networks Technologies for Green Communications,” IEEE ANTS workshop, Dec. 2012
- “Opportunistic Selection and Adaptation in LTE: An Overview,” IEEE ComSoc LTE workshop, Bangalore, Sept. 2013
- “Opportunism in Next Generation Wireless Communication Systems,” IEEE Standards Workshop on Last Mile Connectivity, C-DoT, Bangalore, Jul. 2013
- IEEE Industry Day talk on Broadband wireless systems, Mar. 2011
- “Cooperative Communications and How it Affects Our Models for Communication,” IISc-Microsoft Research India Workshop, Feb. 2008

Invited Talks Abroad

- “Transmit Antenna Selection in Underlay Spectrum Sharing: Role of Interference Constraint, Channel State Information, and Power Adaptation,” Center for Cyber-Physical Systems and Internet of Things and Ming Hsieh Institute for Electrical & Computer Engineering Joint Seminar Series, University of Southern California, USA, Dec. 2019.
- “Transmit Antenna Selection in Underlay Cognitive Radio: Understanding the Role of the Interference Constraint,” at KAUST, Saudi Arabia, Dec. 2018
- “Opportunistic Selection in Wireless Systems: Who, How, and What if,” at Qualcomm, San Diego, USA, Dec. 2015
- “Timer-Based Distributed Selection Schemes for Wireless Networks,” at Zhejiang University, Huangzhou, China, Apr. 2013
- “Timer-Based Distributed Selection Schemes for Wireless Networks,” at National University of Singapore, Singapore, Nov. 2012
- “Timer-Based Distributed Selection Schemes for Wireless Networks,” at the Institute for Infocom Research (IIR) workshop, Singapore, Nov. 2012

Sponsored Research Projects

- Baseband algorithms and energy-efficiency in 5G communications Since 2019
 - Funded by Intel India
- Indigenous 5G testbed project Since 2018
 - Funded by Dept. of Telecommunications, Govt. of India
- Data Management for Aerospace Internet of Things Since 2018
 - Funded by Boeing-Wipro-HCL Aerospace Network Research Consortium (ANRC)
- 5G research and building next gen solution for Indian market 2015-19
 - Funded by Ministry of Information Technology, Govt. of India
- Philanthropic research grant from Broadcom Foundation, USA 2013-15
- Unrestricted research grant for research on 4G/5G cellular systems 2014-16

- Funded by Nokia, Bangalore
- Interference-constrained, Spectrally-Efficient Cooperative Relaying for High Band Radios 2015-18
 - Funded by Defense Research and Development Organization (DRDO)-IISc program on mathematical engineering
- Device to device communications for LTE-advanced cellular networks 2014-18
 - Funded by Indo-French Centre for the Promotion of Advanced Research
 - Indian partners: IIT Kanpur, TIFR Mumbai
 - French partners: Alcatel-Lucent Bell Labs, Telecom Paris Tech, INRIA, ALBLF
- Framework for external QoS management for 4G wireless base stations 2014
 - Funded by Bharat Electronics Limited (BEL)
- Intelligent cognitive radio system design in interference-limited environments 2012-15
 - Funded by Boeing-Wipro-HCL Aerospace Network Research Consortium
- Green wireless sensor networks 2012-15
 - Funded by Boeing-Wipro-HCL Aerospace Network Research Consortium
- India-UK advanced technology centre (IU-ATC-PHASE 2) of excellence in next generation networks systems and services 2012-15
 - Funded by Dept. of Science and Technology
- Spectrum sensing, spectrum management & resource allocation for cognitive radio 2011-12
 - Funded by Defence Research and Development Organization (DRDO)
- Selection criteria and distributed selection algorithms in wireless cellular and sensor networks 2010-11
 - Funded by DRDO-IISc Program on Mathematical Engineering
- Providing QoS to real and non-real time applications over WiMAX network 2009-12
 - Funded by Ministry of Information Technology (MITO)
- Energy budget allocation and wireless system design for aeroplane deployment of energy harvesting sensors 2008-11
 - Funded by Boeing-Wipro-HCL Aerospace Network Research Consortium
- Fundamental physical layer aspects of cognitive radio 2008-11
 - Funded by Boeing-Wipro-HCL Aerospace Network Research Consortium
- Interference modeling in spatially distributed shadowed wireless systems 2007-09
 - Funded by DRDO-IISc Program on Mathematical Engineering

Consultancy

- Lekha Wireless Solutions Pvt. Ltd., Bangalore (Expert consultant on communication networks and signal processing) 2018-19
- ARM Embedded Technologies Pvt. Ltd. Bangalore (3GPP LTE technical advice and talk on LTE specific aspects) 2009
- Mitsubishi Electric Research Labs (MERL), Cambridge, MA, USA (3GPP RAN1 LTE standards participation) 2008