

Personal Information

Adrish Banerjee
Department of Electrical Engineering,
Indian Institute of Technology, Kanpur
Kanpur, U.P., INDIA 208016
Ph: +91-512-2597991
Fax: +91-512-2590063
E-mail: adrish@iitk.ac.in

Education:

- Indian Institute of Technology, Kharagpur, INDIA: B.Tech (Hons.) in Electronics & Electrical Communications Engineering, 1996.
- University of Notre Dame, U.S.A.: M.S. in Electrical Engineering, 1998.
- University of Notre Dame, U.S.A.: Ph.D. in Electrical Engineering, 2003.

Professional Experience:

- Applied Research Labs, Motorola, Arlington Heights, Chicago, U.S.A.: Aug. 1998-Jan 1999.
- Postdoctoral Research Associate; University of Notre Dame, U.S.A.: June 2003-May 2004.
- Assistant Professor; Department of Electrical Engineering, I.I.T. Kanpur: July 2004-Nov 2010.
- Associate Professor; Department of Electrical Engineering, I.I.T. Kanpur; Nov 2010-Nov 2018.
- Professor; Department of Electrical Engineering, I.I.T. Kanpur; Since Nov 2018.
- Visiting Assistant Professor, Department of Electrical Engineering, National Yunlin University of Science and Technology, Douliou City, Taiwan, July-August 2007.
- Visiting Associate Professor, Department of Electrical Engineering, National Yunlin University of Science and Technology, Douliou City, Taiwan, July-August 2008.
- Distinguished Visiting Professor, Department of Electrical and Electronics Engineering, Chung-Ang University, Sept-Dec. 2008.
- Visiting Professor under ERASMUS-MUNDUS MERIT Visiting Professor and Researcher Scholarship, Department of Electronics Engineering, Politecnico di Torino, May-June 2009.
- Visiting Professor, Telecommunication Program at Asian Institute of Technology, Bangkok, Thailand. Indian Seconded faculty by MHRD, Jan-Apr. 2019.

Teaching

A. Undergraduate Course (Instructor)

1. Esc201A: Introduction to Electronics
2. EE320A: Principles of Communications
3. EE321A: Communication Systems.
4. EE381A: Electronics Circuits Laboratory
5. EE390A: Electrical Engineering Communication Skills

B. Undergraduate Course (Tutor)

1. Esc201A: Introduction to Electronics
2. EE250A: Control Systems
3. EE320A: Principles of Communications

C. Undergraduate Course (Laboratory)

1. EE380A & EE381A: Electronics
2. EE381A: Microprocessors & Microcontrollers
3. EE380A: Control Systems

D. Graduate Courses (Instructor)

1. EE622A: Communication Theory
2. EE621A: Representation and Analysis of Random Signals
3. EE669A: Simulation of Communication Systems.
4. EE624A: Information & Coding Theory.
5. EE667A: Information Theory
6. EE668A: Coding Theory
7. EE698T: Advanced Topics in Multiuser Communications.
8. EE698C: Advanced Topics in Information & Coding Theory.
9. EE606A: Architecture & Applications of Digital Signal Processors. (Setup a DSP laboratory based on TI C6711/C6713 processors.)
10. EE670A: Wireless Communications
11. EE628A: Topics in Cryptography & Coding

E. New Course Introduced:

1. EE667A: Information Theory
2. EE668A: Coding Theory
3. EE669A: Simulation of Communication Systems

Postdoctoral Supervision

1. Dr. Shivanshu Shrivastava, PhD IIT Guwahati, "Resource allocation issues in Hybrid RF/VLC communication systems". (Aug 2017-Oct 2018)

PhD Supervision (completed)

1. Kedar Prakash Kulkarni, "Resource Allocation and Stable Throughput

- Tradeoffs in Cognitive Radio Networks”, October 2016. Now postdoctoral fellow at Technical University Dresden under Prof. Gerhard Fettweis.
2. Sanket Kalamkar, “On Cooperation, Energy Harvesting, and Security in Cognitive Radio Networks”, January 2017. Now Postdoctoral fellow at INRIA under Prof. Francois Baccelli.
 3. Kalpant Pathak, “On Optimal Transmission Policies in Energy Harvesting Wireless Networks”. December 2018. Now senior engineer, corporate R & D, Qualcomm India Private Limited, Bangalore.

PhD Supervision (ongoing)

1. Tamoghno Nath, “On molecular communications”

Supervision of Master thesis

1. 2005: Arya Mazumdar, “Interleavers in Turbo codes: Some new results”. (with A. K. Chaturvedi)
2. 2006: Satyabrata Rout, “Turbo code design for half-duplex relay channel”.
3. 2006: N. S. L. Phani Kumar, “On peak-to-average power ratio reduction of orthogonal frequency division multiplexing modems”. (with P. Sircar)
4. 2006: Atul Sharma, “Study on energy efficient modulation techniques for wireless sensor networks”. (with P. Sircar)
5. 2006: A. Srinivas, “Prefiltering in autocorrelation domain and its application in noisy speech analysis”. (with P. Sircar)
6. 2006: Amrit Kaur, “Interpolation of lost frames”. (with P. Sircar)
7. 2008: Arnab Kanti Dey, “On sensing and interference mitigation of multiuser cognitive radio”.
8. 2009: Abha Tiwari, “Peak to Average Power Reduction of MIMO-OFDM Systems”.
9. 2009: K. Soujanya, “On Turbo Code Performance in AWGN Channel”.
10. 2009: Shishir Kumar Srivastava, “Cooperative spectrum sensing using double threshold energy detection for cognitive radio”.
11. 2009: Shakti Malik “On Power Loading Algorithms for OFDM Based Cognitive Radio”.
12. 2009: Vikas Bhatia, “VHDL Implementation of two-state Multiple Turbo Codes”.
13. 2009: Nikhil Joshi, “Design of turbo coded PPM modulation for deep space optical channels”.
14. 2010: Abhishek Kumar Gupta, “Adaptive Scheduling and Capacity of Multiuser MIMO MAC System with Transmit Antenna Correlation” (with A. K. Chaturvedi)
15. 2010: Mayank Sirotiya, “Detection and Estimation of Frequency Hopping Signal using Wavelet Transform” (with P. Sircar)
16. 2010: Abhishek Mishra, “Robust spectrum sensing under noise uncertainty and data correlation” (with P. Sircar)
17. 2011: Ayush Kumar, “Adaptive Power, Bit and Subcarrier Allocation

- Schemes for OFDM based Cognitive Radio with Primary User Queue-Awareness”.
18. 2011: Nitish Kumar Gupta, “Capacity Analysis of Femto-cell Based Cognitive Radio in a two-tier network”.
 19. 2011: Gaurav Agarwal, “Throughput Maximization for secondary user in different cognitive radio paradigm employing ARQ protocol”.
 20. 2012: Abhishek Srivastava, “Nonuniform sampling based detection of frequency hopped signals”.
 21. 2012: Onkar Pandit, “Effect of Cyclic Frequency Estimation Error and Timing Mismatch on Cyclostationary Detector of frequency hopped signals”.
 22. 2012: Vivek G, “Compressed sensing based cooperative spectrum sensing for wideband cognitive radio”.
 23. 2012: Praveen Kumar Singh, “Malicious user detection using multiple outlier tests for cooperative spectrum sensing in cognitive radio networks”.
 24. 2012: G. Chandrashekar Goud, “On performance improvement of cognitive radio communications using cooperative relay networks”.
 25. 2013: Jeya Pradha: “Channel-Adaptive Sensing and Access Strategies for Energy Harvesting Cognitive Radio”.
 26. 2013: Ravikiran Bhonagiri, “OFDM based out-of-band dedicated common control channel design for cognitive radio networks”. (with
 27. P. Sircar)
 28. 2013: Anirudh Palle, “Optimum Resource Allocation for Relays with Perfect and Outdated CSI under Fairness Constraint”.
 29. 2013: Partha Sarathi Swain, “Optimal Power Allocation for Ergodic and Outage Capacity Maximization in OFDM based CR Network with Perfect and Imperfect CSI”.
 30. 2014: Hrushikesh Pradhan, “Sensing Throughput Tradeoff in Cognitive Radio with Random Arrival and Departure of Multiple Primary Users”.
 31. 2014: Shailendra Kumar, “A study on rate compatible Turbo product codes”.
 32. 2014: Manoj Gowda, “On the performance of Quantum error correcting codes in the presence of Qubit Loss and Amplitude Damping” (with Pradeep Kumar).
 33. 2015: Gourab Ghatak, “Preamble Based Channel Estimation in GFDM” (with Prof. G. Fettweis).
 34. 2015: Sudhakar Reddy Sirigireddy, “Energy Harvesting Cognitive Radio: Save-Sensing-Transmit Trade-offs under Primary User Traffic”.
 35. 2015: Ayush Agrawal, “On Low Complexity Approach to Joint Resource and Transmission Mode Selection in D2D Communications”.
 36. 2015: Swarup Suman Patra, “On Techniques to Detect Malicious Users in Cooperative Spectrum Sensing”.
 37. 2015: Yogesh Dharmwal, “On History Assisted Spectrum Sensing for Cognitive Radio”.

38. 2016: Rahul Joon, "On Convergence Analysis of Braided Convolutional Codes".
39. 2016: Prachi Bansal, "Optimal time sharing in energy harvesting cognitive radio network with channel and energy uncertainty".
40. 2016: Kusum Kalyani, "On packet throughput in cognitive radio networks under primary delay constraints".
41. 2018: Lohith V, "On Cooperative Spectrum Sensing for Frequency Hopping Cognitive Radio".
42. 2019 (expected): Suraj Dhar. "On energy harvesting in cooperative MIMO Non-Orthogonal Multiple Access (NOMA) communications" (with P. Sircar)
43. 2019 (expected): Deepak Singh Kalhan, "On distributed online learning with stochastic conditional gradient algorithms" (with A. Gupta)
44. 2019 (expected): Ujjwal Dhusia, "On implementing a Full-Duplex radio on USRP using active cancellation techniques for self interference cancellation" (with P. Sircar)

M.S.(Research) Supervision (ongoing)

1. 2019 (expected) Nitin Jain, "Coding for Visible Light Communications"

BTech Project Supervision

1. 2005: Ankit Godha and Gaurav Bansal, "Concatenated codes for low bit error rate applications".
2. 2007: Pranav Krishna Sakulkar, "Improved cooperative spectrum sensing using belief propagation".
3. 2008: Vaibhav Katewa and Shweta Tomar, "Reduction of peak-to-average power ratio in OFDM based communication system".
4. 2008: Vikas Choudhary, "Blind spectrum sensing based on goodness of fit test for cognitive radios under noise uncertainty".
5. 2009: Jyoti Wadhvani, "Robust cooperative spectrum sensing in cognitive radio with malicious user suppression".
6. 2013: Astik Gupta, "Connecting voice call using openBTS".
7. 2017: R. Shyam Sundhar, "On performance of polar codes".
8. 2017: Vishal Rana, "Cache-enabled opportunistic cooperative MIMO for video streaming in wireless systems".
9. 2018: Sagnik Bhattacharya, "A Fourier analytic proof of the q-ary LP bound".

Knowledge Dissemination

Massive Open Online Course (MOOC)

1. Error control coding: An introduction to linear block code, March

- 2016 (1445 participants).
2. Error control coding: An introduction to convolutional codes, March 2016 (1242 participants).
 3. An introduction to information theory, July 2016 (1522 participants), July 2017 (1731 participants). July 2018 (2779 participants)
 4. An introduction to coding theory, January 2017 (3643 participants), January 2018 (6194 participants), January 2019 (3696 participants)

Course under GIAN proposal

1. Advanced topics in coding theory, Oct 2016. (with Profs. Daniel J. Costello, Jr., Emre Teletar)
2. Codes for distributed storage, July 2017. (with Profs. Udaya Paramalli, Aaron Harwood)
3. Network Information Theory, March 2018 (with Prof. Gerhard Kramer)

Short courses (co-organized)

1. Lectures on digital transmission, error detection and correction in a short course on “Audio & Video: Processing, Transmission, Coding and Display”, Nov.-Dec. 2007, I.I.T. Kanpur.
2. Lectures on OFDM and LTE in a short course on “Cellular Technologies: 3G and Beyond” at I.I.T. Kanpur, 26th-28th December 2009.
3. Lectures on OFDM and LTE at a workshop on “Wireless Circuits and Systems” jointly organized by I.I.T. Kanpur and USM Malaysia at Penang, Malaysia, December 2009.
4. Lectures on OFDM, Channel Coding and LTE short course on “OFDM based Next Generation Wireless Standards” at I.I.T. Kanpur, May 17th- 19th 2010.
5. Lectures on various aspects of cognitive radio in a short course on “Cognitive Radio: Next Frontier in Wireless Communications” at I.I.T. Kanpur, Nov. 23rd – 25th 2010.
6. Lectures on LTE in a short course on “OFDM based 4G cellular standards: LTE and WiMAX”, at I.I.T. Kanpur, May 09-11, 2011.
7. Lectures on various aspects of cognitive radio in a short course on “Cognitive Radio: Next Frontier in Wireless Communications” at I.I.T. Kanpur, Oct. 20th-22nd 2011.
8. Lectures on various aspects of wireless sensor networks in a short course on “Wireless Sensor Networks: From Theory to Practice”, May 24th-26th 2012.

9. Lectures on MIMO, OFDM and channel coding in a short course on “MIMO/OFDM based Advanced 4G Cellular Networks”, January 11th-13th 2013.
10. Lectures on various aspects of wireless sensor networks in a short course on “Wireless Sensor Networks: Theory and Challenges”, July 22nd -24th 2013.
11. Lectures on various aspects of cognitive radio in a short course on “Cognitive Radio: A New Paradigm in Wireless” at I.I.T. Kanpur, Oct. 20th – 22nd 2013.
12. Lectures on convex functions, duality and decomposition in a short course on “Convex Optimization for Wireless Communications”, at I.I.T. Kanpur, Sept. 15th -17th 2014.
13. Lectures on adaptive filtering in a short course on “Estimation Theory for Communications and Signal Processing”, at I.I.T. Kanpur, Jan 21st – 23rd 2015.
14. Lectures on basis of detection theory in a short course on “Detection Theory for Communications and Signal Processing”, at I.I.T. Kanpur, Apr. 27th-29th 2015.
15. Lectures on convex functions, duality and application of convex optimization in a short course on “Convex Optimization for Wireless Communications”, at I.I.T. Kanpur, Nov. 16th -18th 2015.
16. Lectures on 5G Physical layer technologies in a short course on “Technologies for 5G” at I.I.T. Kanpur, Jul. 25th-27th 2016.
17. Lectures on convex functions, duality and application of convex optimization in a short course on “Optimization for Communications & Machine Learning”, at I.I.T. Kanpur, Mar. 28th-30th 2018.
18. Lectures on MIMO, OFDM, 5G-NR radio and full duplex radios in a short course on “A Hands-on-Introduction to Modern Wireless Systems: Theory & Simulation”, to be held at IIT Kanpur, 3rd-6th Dec. 2018.

Short courses (given lectures)

1. Lectures on communication and anti-collision techniques for RFID in a short course on “Principles and Practices in Radio Frequency Identification (RFID)”, Nov. 2007, I.I.T. Kanpur.
2. Lecture on “Specifics of LTE-A Air Interface with emphasis on unique aspects: SC-FDMA and Multiple Antenna Techniques in 3GPP Long Term Evolution” in A Unified Perspective of 4G: IEEE 802.16m and LTE- Advanced Workshop at IIT Madras, Jan 30th 2010.
3. Lectures on “Introduction to LTE” at a workshop organized by C-DOT Bangalore, 12th-13th Aug 2010.
4. Lecture on “Spectrum Sensing: How to Cooperate for Better Detection” TV White Spaces and Cognitive Radio Workshop at IIT

- Bombay, December 2012.
5. Lectures on “An introduction to cognitive radio” at a short course on 3G & 4G Technologies at NIT Surat, Oct 2013.
 6. Lecture on “An introduction to 3GPP Long Term Evolution (LTE) Physical Layer” at a workshop on LTE in IMPACT 2013 at Aligarh Muslim University, Nov. 2013.
 7. Lectures on “Introduction to Spectrum Sensing” and “Control Channels in Cognitive Radio” at a short course on Dynamic Spectrum Management at IIT Bombay, January 2014.
 8. Lectures on convolutional codes, turbo codes and LDPC codes in a workshop on “Coding and Cryptography: Fundamentals and Applications” at IIT (ISM) Dhanbad, December 13th-17th 2017.

Invited talks

1. “Bandwidth efficient hybrid ARQ schemes using Turbo-TCM”, *Motorola's Science Advisory Board Associates (SABA) meeting*, San Marco Islands, FL, October 1999.
2. “Some reflections on the design of bandwidth efficient turbo codes”, *Motorola Labs*, Schaumburg, IL, June 2001.
3. “Bandwidth efficient coding using turbo codes”, Vodafone Chair Mobile Communications Systems, Technische Universität Dresden, Dresden, January 2003.
4. “Bandwidth efficient coding using turbo codes”, Lehrstuhl für Informationsübertragung, Universität Erlangen-Nürnberg, Erlangen, January 2003.
5. “Bandwidth efficient coding using turbo codes”, Dipartimento di Automatica e Informatica, Politecnico di Torino, Torino, Italy, February 2003.
6. “Nonsystematic turbo codes”, Department of Electronics Engineering, Cheng-Shiu University, Kaohsiang, Taiwan, July 2007.
7. “PAPR reduction for OFDM signals”, *National Conference on Wireless and Optical Communication (WOC-2007)*, Chandigarh, December 2007.
8. “Cognitive radio: A physical layer communication perspective”, National Workshop on Signal Processing and its Application to Software Defined Radio, Kolkata, January 2008.
9. “Communication over Relay Channels”, Tutorial talk in *Fourteenth National Conference on Communications*, Mumbai, February 2008.
10. “Smart House”, Keynote talk at 40th World Telecommunication and Information Society Day, May 2008 at IIT Kanpur organized by IETE Kanpur Chapter.
11. “Turbo Code Design for Half-Duplex Relay Channels”, Department of Electronic Engineering, Far East University of Science and Technology, Tainan, August 2008.
12. “Cognitive Radio”, Department of Electronics & Communication Engineering, Thiagarajar College of Engineering, Madurai, April 2009.

13. "Cognitive Radio", Department of Electronics & Communication Engineering, PSNA College of Engineering and Technology, Dindigul, April 2009.
14. "Cognitive Radio", Microsoft Research Labs India, Bangalore, May 2009
15. "Turbo Codes and Its Application to Optical and Relay Channels", Dipartimento di Elettronica, Politecnico di Torino, Italy, June 2009.
16. "Spectrum sensing for cognitive radio", Defense Electronics Application Laboratory, Dehradun, October 2009.
17. "Turbo Principle in Communications", Defense Electronics Application Laboratory, Dehradun, October 2009.
18. "Cognitive Radio" organized by IEEE Kolkata Section at Jadavpur University, January 2010.
19. "Spectrum sensing for cognitive radio", Institute of Engineering & Management, Kolkata, January 2010.
20. "Malicious User Detection and Suppression for Cooperative Spectrum Sensing in Cognitive Radio Networks Using Outlier Detection Techniques", CORD 2012, Indian Institute of Technology Hyderabad, Hyderabad, February 2012.
21. "An Introduction to 4G Wireless Standards", 44th World Telecommunications & Information Society Day, May 2012, IIT Kanpur
22. "Cognitive Radio (Poster Presentation)", 4th Indo-German Frontiers of Engineering Symposium, Merseburg, June 13-16, 2012
23. "Resource Allocation in Wireless Powered Cooperative Cognitive Radio Networks", University of Notre Dame, Indiana, 4th December 2015.
24. "Secure Communication via a Wireless Energy Harvesting Untrusted Relay", Indian Institute of Engineering Science and Technology, Shibpur, 27th January 2016.
25. "Cognitive Radio: An Enabler for Smart Cities", 29th GISFI Standardization Series Meeting and IEEE 5G Summit, SoA University, Bhubaneswar, August 17th-18th 2018.
26. "What is 5G?", National Institute of Technology Silchar, 13th March 2018
27. "Cognitive Radio for Tactical Communications: Opportunities and Challenges", Central Research Laboratory, Bharat Electronics Limited (CRL-BEL), Bangalore, June 14th 2018.
28. "Collusion Resistant Regret Minimization in Second-Price Auction", IIT Bombay, 26th July 2018.

Publications

Book Chapter

1. Abhishek K. Gupta and **Adrish Banerjee**, "Spectrum landscape above radio bands", to appear in the book titled "Spectrum Sharing: The Next

Frontier in Wireless Networks”, Editor’s: Constantinos B. Papadias, Tharmalingam Ratnarajah, and Dirk T. M. Slock, Wiley, 2019.

Journals (published)

1. **Adrish Banerjee**, Daniel J. Costello Jr., “Low rate code designs for multilevel signaling”, *IEEE Communications Letters*, vol. 9, no. 2, Feb. 2005, pp. 166-168.
2. **Adrish Banerjee**, Francesca Vatta, Bartolo Scanavino, and Daniel J. Costello Jr., “Nonsystematic turbo codes”, *IEEE Transactions on Communications*, vol. 53, no. 11, November 2005, pp. 1841-1849.
3. Arya Mazumdar, Ajit K. Chaturvedi, and **Adrish Banerjee**, “Construction of Turbo Code Interleavers from 3-regular Hamiltonian Graphs”, *IEEE Communications Letters*, vol. 10, no. 4, April. 2006, pp. 284-286.
4. Sangmok Oh, Inho Hwang, **Adrish Banerjee**, and Jeong Woo Lee, “A Novel Turbo Coded Pulse Position Modulation Scheme for Deep Space Optical Communications”, *IEICE Transactions on Communications*, vol. E93-B, no. 5, pp. 1260-1263, May 2010.
5. Nikhil Joshi, **Adrish Banerjee**, Jeong W. Lee, “Convergence Analysis of TAPPM Decoders for Deep Space Optical Channels”, *IEICE Transactions on Fundamentals of Electronics, Communications and Computer Sciences*, Vol.E95-A, No.8, pp.1435-1438, Aug. 2012.
6. Sanket S. Kalamkar, **Adrish Banerjee**, “Improved Double Threshold Energy Detection for Cooperative Spectrum Sensing in Cognitive Radio”, Special issue on communication systems and image processing technologies, *Defense Science Journal*, vol. 63, no. 1 pp. 34-40, January 2013.
7. J. Jeya Pradha, Sanket S. Kalamkar, **Adrish Banerjee**, “Energy Harvesting Cognitive Radio with Channel-Aware Sensing Strategy”, *IEEE Communications Letters*, vol. 18, no. 7, pp. 1171-1174, July 2014.
8. Hrushikesh Pradhan, Sanket Kalamkar and **Adrish Banerjee**, “Sensing Throughput Tradeoff in Cognitive Radio with Random Arrivals and Departures of Multiple Primary Users”, *IEEE Communications Letters*, vol. 19, no. 3, pp. 415-418, March 2015.
9. Sanket S. Kalamkar, Abhishek K Gupta, and **Adrish Banerjee**, “Impact of Antenna Correlation on Optimum Improved Energy Detector in Cognitive Radio”, in *IEICE Transactions on Communications*, Vol.E98-B, No.08, pp. 1690-1699, Aug. 2015.
10. Sanket S. Kalamkar, J. Pradha J, **Adrish Banerjee**, and K. Rajawat, “Resource allocation and fairness in wireless powered cooperative cognitive radio networks”, in *IEEE Transactions on Communications*, vol. 64, no. 8, pp. 3246-3261, August 2016.
11. Kedar Kulkarni and **Adrish Banerjee**, “On Stable Throughput of Cognitive Radio Networks with Cooperating Secondary Users”, in *IEEE Transactions on Communications*, vol. 64, no. 10, pp. 4097-4110, Oct. 2016.
12. Sanket S. Kalamkar and **Adrish Banerjee**, “Secure communication via a wireless energy harvesting untrusted relay”, in *IEEE Transactions on Vehicular Technology*, vol. 66, no. 3, pp. 2199-2213, March 2017.

13. Kedar Kulkarni and **Adrish Banerjee**, “Multi-channel sensing and resource allocation in energy constrained cognitive radio networks”, in *Physical Communication*, vol. 23, pp. 12-19, June 2017.
14. Kedar Kulkarni and **Adrish Banerjee**, “On optimal spectrum access of cognitive relay with finite packet buffer”, in *IEEE Transactions on Vehicular Technology*, vol. 66, no. 8, pp. 7584-7588, Aug. 2017.
15. Sanket S. Kalamkar and **Adrish Banerjee**, “Interference-Aided Energy Harvesting: Cognitive Relaying with Multiple Primary Transceivers”, *IEEE Transactions on Cognitive Communications and Networking*, vol. 3, no. 3, pp. 313-327, Sept. 2017.
16. Kalpant Pathak, Sanket S. Kalamkar and **Adrish Banerjee**, “Optimal User Scheduling in Energy Harvesting Wireless Networks”, *IEEE Transactions on Communications*, vol. 66, no. 10, pp. 4622-4636, Oct. 2018.
17. Gourab Ghatak, M. Matthe, **Adrish Banerjee**, and G. Fettweis, “Preambles With Low Out of Band Radiation for Channel Estimation”, *Physical Communications*, vol. 32, pp. 252-260, Feb. 2019.

Journals (in review)

1. Kalpant Pathak, and **Adrish Banerjee**, “Harvest or Transmit Policy for Cognitive Radio Network: A Learning Theoretic Approach” in *IEEE Transactions on Green Communications and Networking*.

Journals (in preparation)

1. Abhishek K. Gupta, **Adrish Banerjee**, and Ajit K. Chaturvedi, “Transmit Antenna Correlation based Adaptive Scheduling in Multiuser MIMO MAC”, to be submitted to *Physical Communication*.
2. Aprit Chitransh, Ketan Rajawat and **Adrish Banerjee**, “Collusion Resistant Regret Minimization in Second Price Auction” to be submitted to *IEEE Transactions on Signal Processing*.

Conference (published)

1. **Adrish Banerjee**, Daniel J. Costello Jr. and Thomas E. Fuja, “Bandwidth Efficient Hybrid ARQ Schemes Using Turbo Codes”, *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, pp. 188, Sorrento, Italy, June 2000.
2. **Adrish Banerjee**, Daniel J. Costello Jr. and Thomas E. Fuja, “Performance of Hybrid ARQ Schemes Using Turbo Coded Modulation for Wireless Channels”, *Proceedings of the IEEE Wireless Communications and Networking Conference*, pp. 1025-1029, Chicago, U.S.A., September 2000.
3. **Adrish Banerjee**, Daniel J. Costello Jr. and Thomas E. Fuja, “Comparison of Different Retransmission Strategies for Bandwidth Efficient Hybrid ARQ Schemes Using Turbo Codes”, *Proceedings of the 2000 IEEE International Conference on Personal Wireless Communications*, pp. 548-552, Hyderabad,

India, December 2000.

4. **Adrish Banerjee**, Daniel J. Costello Jr. and Thomas E. Fuja, "Diversity Combining Techniques for Bandwidth-Efficient Turbo ARQ Systems", *Proceedings of the 2001 IEEE International Symposium on Information Theory*, p. 213, Washington D.C., U.S.A. June 2001.
5. **Adrish Banerjee**, Daniel J. Costello Jr., Thomas E. Fuja and P. C. Massey, "Asymmetric Turbo-like Codes for Bit-Interleaved Coded Modulation", *Proceedings of the 39th Annual Allerton Conference on Communication, Control, and Computing, Monticello, IL, U.S.A., Oct 2001*.
6. Daniel J. Costello Jr., **Adrish Banerjee**, Thomas E. Fuja and P. C. Massey, "Some Reflections on the Design of Bandwidth Efficient Turbo Codes", *Proceedings of the 4th International ITG Conference on Source and Channel Coding, Berlin, pp. 357-364, Germany, Jan. 2002*.
7. **Adrish Banerjee**, Daniel J. Costello Jr., Thomas E. Fuja and P. C. Massey, "Bit Interleaved Coded Modulation Using Multiple Turbo Codes", *Proceedings of the IEEE International Symposium on Information Theory*, p. 443, Lausanne, Switzerland, June 2002.
8. Daniel J. Costello Jr., **Adrish Banerjee**, Francesca Vatta and Bartolo Scanavino, "On the Convergence of Nonsystematic Turbo Codes", *Proceedings of the Fifteenth International Symposium on Mathematical Theory of Networks and Systems, Notre Dame, U.S.A., Aug. 2002*.
9. Ching He, **Adrish Banerjee**, Daniel J. Costello Jr. and Peter C. Massey, "On the Performance of Low Complexity Multiple Turbo Codes", *Proceedings of the 40th Annual Allerton Conference on Communication, Control, and Computing, Monticello, IL, U.S.A., Oct 2002*.
10. Daniel J. Costello, Jr., **Adrish Banerjee**, Ching He, and Peter C. Massey "A comparison of low complexity turbo-like codes", *Proceedings of the 36th Asilomar Conference on Signals, Systems, and Computers*, pp. 16-20, Pacific Grove, California, U.S.A., Nov. 2002.
11. Francesca Vatta, Bartolo Scanavino, **Adrish Banerjee**, and Daniel J. Costello, Jr., "On the design of nonsystematic turbo codes", *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, p. 320, Yokohama, Japan, July. 2003.
12. Daniel J. Costello, Jr., and **Adrish Banerjee**, "Combining low rates codes with multilevel signaling", *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, p. 236, Yokohama, Japan, July. 2003.
13. Wei Zhang, Xiaowei Jin, Hongzhi Chen, **Adrish Banerjee**, Daniel J. Costello, Jr., and Thomas E. Fuja, "On the application of low complexity iterative decoding schemes to fading channels", *Proceedings of the Military Conference on Communications (MILCOM)*, pp. 428-433, Boston, MA, U.S.A., Oct. 2003.
14. Francesca Vatta, Bartolo Scanavino, **Adrish Banerjee**, and Daniel J. Costello, Jr., "Design of turbo codes using high rate nonsystematic convolutional encoders", *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, p. 406, Chicago, U.S.A., July. 2004.
15. Francesca Vatta, Bartolo Scanavino, **Adrish Banerjee**, and Daniel J. Costello, Jr., "On the design of serially concatenated nonsystematic feedback convolutional encoders", *Proceedings of the IEEE International*

Symposium on Information Theory and Applications (ISITA), Parma, Italy, Oct. 2004.

16. Arya Mazumdar, **Adrish Banerjee**, and Ajit K. Chaturvedi, "On the spread of random interleavers", *Proceedings of the IEEE International Symposium on Information Theory (ISIT), Adelaide, Australia, Sept. 439-445, 2005.*
17. N. S. L. Phani Kumar, **Adrish Banerjee**, and Pradip Sircar, "Modified exponential companding for PAPR reduction of OFDM signals", *Proceedings of the IEEE Wireless Communications and Networking Conference (WCNC), pp. 1344-1349, Hong Kong, March 2007.*
18. A. Srinivas, Pradip Sircar and **Adrish Banerjee**, "Extraction of noise robust feature vector and speech denoising", *Proceedings of the XII International Conference on Speech and Computer (SPECOM'2007), Moscow, Russia, October 15th-18th, 2007*
19. K. Rajawat and **Adrish Banerjee**, "Selection Relaying at Low Signal to Noise Ratios", *Proceedings of the 10th International Symposium on Wireless Personal Multimedia Communications, Jaipur, India, December 3rd-6th, 2007.*
20. Francesca Vatta, Alexandre Graell i Amat, **Adrish Banerjee**, Daniel J. Costello Jr., "Nonsystematic Turbo Codes: Design and Bounds on Effective Free Distance", *Proceedings of the 2008 International Symposium on Information Theory and its Applications (ISITA2008) Auckland, New Zealand, December 7th-10th 2008.*
21. Atul Sharma, **Adrish Banerjee**, Pradip Sircar, "Performance Analysis of Energy-Efficient Modulation Techniques for Wireless Sensor Networks", *Proceedings of the IEEE INDICON 2008, pp. 327-332, December 11th-13th 2008.*
22. Amrit Kaur, Pradip Sircar, **Adrish Banerjee**, "Interpolation of Lost Frames of a Video Stream using Object based Motion Estimation and Compensation", *Proceedings of the IEEE INDICON 2008, pp. 40-45, December 11th-13th 2008.*
23. Arnab Kanti Dey, **Adrish Banerjee**, "On Primary User Detection Using Energy Detection Technique for Cognitive Radio", *Proceedings of the National Conference on Communications, IIT Guwahati, pp. 99-102, January 16th- 18th 2009.*
24. Satyabrata Rout, **Adrish Banerjee**, "Convergence analysis of turbo codes over half-duplex relay channel", *Proceedings of Wireless VITAE, pp. 762-766, Aalborg, Denmark, May 17-20, 2009.*
25. Shishir Kumar Srivastava, **Adrish Banerjee**, "'n-ratio' logic based cooperative spectrum sensing using double threshold energy detection", *Proceedings of the Cognitive Radio Oriented Wireless Networks and Communications (CROWNCOM), June 22-24, 2009.*
26. Shakti Malik, **Adrish Banerjee**, "On Power Loading Algorithms For OFDM Based Cognitive Radio", *Proceedings of the First UK-India International Workshop on Cognitive Wireless Systems (UKIWCWS 2009), 11th December 2009, New Delhi 2009.*
27. Vikas Bhatia, **Adrish Banerjee**, "VHDL Implementation of Two-State

- Multiple Turbo Codes”, *Proceedings of the 16th National Conference on Communications (NCC 2010)*, pp. 21-25, 29th-31st Jan. 2010, IIT Madras, India.
28. Abhishek Mishra, Ankesh Garg, **Adrish Banerjee**, “Selection based detection method for spectrum sensing for cognitive radio”, *International Conference on Signal Processing and Communications (SPCOM 2010)*, 18th - 21st July 2010, pp. 1-5, Bangalore, India.
 29. Pranav Sakulkar and **Adrish Banerjee**, “Improved Cooperative Spectrum Sensing Using Belief Propagation Algorithm and Energy Detection”, *Proceedings of the Eight IEEE International Symposium on Wireless Communication Systems (ISWCS 2011)*, pp. 472-476, Aachen, Germany, Nov. 2011.
 30. Nitish Kumar Gupta and **Adrish Banerjee**, “Power and subcarrier allocation for OFDMA Femto-cell based underlay cognitive radio in a two-tier network”, *Proceedings of International Workshop on Cognitive Radio and Smart Antennas (CORSA 2011)*, pp. 1-6, Bangalore, India, Dec. 2011.
 31. Sanket S. Kalamkar, **Adrish Banerjee**, and Ananya Roychowdhury, “Malicious User Suppression for Cooperative Spectrum Sensing in Cognitive Radio Networks using Dixon’s Outlier Detection Method”, *Proceedings of the Eighteenth National Conference on Communications, NCC 2012*, Kharagpur, India, pp. 1-5, Feb 2012.
 32. Sanket S. Kalamkar, **Adrish Banerjee**, “On the Performance of Generalized Energy Detector under Noise Uncertainty in Cognitive Radio”, *Proceedings of the Nineteenth National Conference on Communications, NCC 2013*, New Delhi, pp. 1-5, Feb 2013.
 33. Kedar P. Kulkarni, **Adrish Banerjee**, “Power Allocation for OFDM-based Cognitive Radio Systems under Average Interference Constraint”, *Proceedings Of the Nineteenth National Conference on Communications, NCC 2013*, pp. 1-5, New Delhi, Feb 2013.
 34. Gaurav Agarwal, **Adrish Banerjee**, “Stable Throughput of an Interweave Cognitive Radio System Employing SR-ARQ Protocol”, *Proceedings European Wireless, EW 2013*, pp. 1-5, April 2013.
 35. Sanket S. Kalamkar, **Adrish Banerjee**, and Abhishek Kumar Gupta, “SNR Wall for Generalized Energy Detection Under Noise Uncertainty in Cognitive Radio”, *Proceedings of the 19th Asia-Pacific Conference on Communications*, pp. 375-380, Bali, Indonesia, August 2013
 36. Kedar P. Kulkarni, **Adrish Banerjee**, “Maximizing sum-outage capacity of OFDM-based cognitive radio under primary user queue stability constraint”, *Proceedings of IEEE Wireless Communications and Networking Conference, WCNC 2014*, pp. 1-6, Istanbul, Turkey, April 2014.
 37. Praveen Kumar Singh, Sanket Kalamkar, and **Adrish Banerjee**, “Block Outlier Methods for Malicious User Detection in Cooperative Spectrum Sensing”, *Proceedings of IEEE Vehicular Technology Conference (VTC- Spring 2014)*, Seoul, South Korea, pp. 1-5, May 2014.
 38. Kedar P. Kulkarni, **Adrish Banerjee**, “Adaptive Transmission Strategies to Maximize Packet Throughput of Cognitive Radio under Primary User Queue Stability Constraint”, *Proceedings of International Conference on Signal*

- Processing and Communications (SPCOM 2014), 22nd – 25th July 2014, pp. 1-6, Bangalore, India.
39. Sanket S. Kalamkar, **Adrish Banerjee**, “On the Effect of Primary User Traffic on Secondary Throughput and Outage Probability under Rayleigh Flat Fading Channel”, Proceedings of International Conference on Signal Processing and Communications (SPCOM 2014), 22nd – 25th July 2014, pp. 1-6, Bangalore, India.
 40. Subhajit Majhi and **Adrish Banerjee**, “Asymptotic Outage Analysis of Incremental Decode and Forward Cognitive Radio Relay Network”, Proceedings of the 7th International Conference on Communications Systems & Networks, COMSNETS 2015, pp. 1-8, Bangalore, Jan 2015.
 41. Subhajit Majhi, Sanket S. Kalamkar and **Adrish Banerjee**, “Secondary Outage Analysis of Amplify-and-Forward Cognitive Relays with Direct Link and Primary Interference”, Proceedings of the 21st National Conference on Communications, NCC 2015, pp. 1-6, Mumbai, Feb 2015
 42. Kedar Kulkarni and **Adrish Banerjee**, “Stable Throughput Tradeoffs in Cognitive Radio Networks With Cooperating Rechargeable Nodes”, Proceedings IEEE Wireless Communications and Networking Conference, WCNC 2015, pp. 1742-1747, New Orleans, USA, April 2015.
 43. Jeya Pradha J, Sanket S. Kalamkar, and **Adrish Banerjee**, “On Information and Energy Cooperation in Energy Harvesting Cognitive Radio”, Proceedings of IEEE 26th Annual International Symposium on Personal, Indoor, and Mobile Radio Communications (PIMRC) 2015, pp. 943-948, Hong Kong, China, Aug 30th- Sept. 2nd 2015
 44. Sanket S. Kalamkar, and **Adrish Banerjee**, “Interference-Assisted Wireless Energy Harvesting in Cognitive Relay Network with Multiple Primary Transceivers”, Proceedings of IEEE Global Communications Conference (GLOBECOM) 2015, San Diego, December 2015.
 45. Sanket S. Kalamkar, Subhojit Majhi and **Adrish Banerjee**, “Outage Analysis of Spectrum Sharing Energy Harvesting Cognitive Relays in Nakagami-m Channels”, Proceedings of Global Communications Conference (GLOBECOM) 2015, San Diego, December 2015.
 46. Kalpant Pathak, and **Adrish Banerjee**, “On Energy Cooperation in Energy Harvesting Underlay Cognitive Radio Network”, in Proceedings of the 22nd National Conference on Communications, (NCC 2016), IIT Guwahati, India, 4th-6th March 2016.
 47. Kalpant Pathak, and **Adrish Banerjee**, “On Optimal Offline Time Sharing Policy for Energy Harvesting Underlay Cognitive Radio”, in Proceedings of the Signal Processing and Communications (SPCOM 2016) Conference, Bangalore, India.
 48. Kalpant Pathak, Prachi Bansal, and **Adrish Banerjee**, “Online Time Sharing Policy in Energy Harvesting Cognitive Radio Network with Channel Uncertainty”, in Proceedings of Global Communications Conference (GLOBECOM) 2017, Singapore, December 2017.
 49. Vipul Gupta, Sanket S. Kalamkar, and **Adrish Banerjee**, “On Secure

Communication using RF Energy Harvesting Two-Way Untrusted Relay”, in Proceedings of Global Communications Conference (GLOBECOM) 2017, Singapore, December 2017.

50. Kalpant Pathak, and **Adrish Banerjee**, “Optimal Harvest-or-Transmit Strategy for Energy Harvesting Underlay Cognitive Radio Network”, in Proceedings of the Signal Processing and Communications (SPCOM 2018) Conference, Bangalore, India, July 2018
51. Abhishek Kumar Gupta, and **Adrish Banerjee**, “On the Spatial Performance of Users in Indoor VLC Networks with Multiple Reflections”, in Proceedings of the Signal Processing and Communications (SPCOM 2018) Conference, Bangalore, India, July 2018
52. Abhishek Kumar Gupta, **Adrish Banerjee**, Kalpant Pathak and Shivanshu Shrivastava, “On Association and Bandwidth Allocation for Hybrid RF/VLC Systems”, in proceedings of the IEEE International Conference on Advanced Networks and Telecommunication Systems (ANTS) 2018, Indore, India, December 2018.
53. Sagnik Bhattacharya and **Adrish Banerjee**, “A method to find the volume of a sphere in the Lee metric, and its applications” in IEEE International Symposium on Information Theory, June 2019.

Development

Demonstration of dynamic spectrum access for cognitive radio transmission using OFDM and MIMO technology. The demonstration video can be viewed at https://www.youtube.com/channel/UCCxlOJXBbcua74_GDGMXHRw

Funding

Projects (ongoing):

1. Indigenous 5G Test Bed design, (PI): Rohit Budhiraja, Co-PI: Adrish Banerjee, Supported by Ministry of Communications, Department of Telecommunications, Networks & Technologies (NT) Cell (425.49 lakhs).
2. Green Communications for 5G (PI): Adrish Banerjee, Supported by Qualcomm, USA, Aug. 2017-July 2019 (USD: 5000)

Projects (completed):

1. Design of Robust Error Control Coding Techniques. Project Investigator (PI): Adrish Banerjee. Supported by IIT Kanpur Initiation Grant.

- May 2005-June 2006, (8.65 lakhs).
2. Some Research Issues in Cognitive Radio. Project Investigator (PI): Adrish Banerjee, Co-Project Investigator (Co-PI): Ajit K. Chaturvedi. Supported by BSNL IIT Kanpur Telecom Center of Excellence. Dec 2008-June 2010, (18.375 lakhs).
 3. Collaborative Research in Dynamic Spectrum Management (Co-PI). Workplan Theme-8. Co-PIs, Barry Evans (University of Surrey), David Koilpillai (IIT Madras), S. Merchant (IIT Bombay), Mohammad Zafar Ali (IIT Hyderabad). Project supported under Indo-UK Advanced Technologies Centre of Excellence in Next Generation Networks, Systems and Services. Oct 2009-June 2012, (50 lakhs: shared with K. Vasudevan and A. K. Chaturvedi)
 4. Indian Coordinator of Cognitive Radio, Work Package 3 of IUATC Phase-2 Group 3: Heterogeneous Wireless Access Networks. UK Coordinator: Barry Evans (University of Surrey). Other Co-PIs: Frank Guo (Queen Mary University of London), David Koilpillai (IIT Madras), Mohammad Zafar Ali Khan (IIT Hyderabad), Animesh Kumar (IIT Bombay), Project supported under Indo-UK Advanced Technologies Centre of Excellence in Next Generation Networks, Systems and Services. Nov. 2012-Sept. 2015, (57.69 lakhs).
 5. GIAN course on Advanced Topics in Coding Theory (PI): Adrish Banerjee, Co-PI: K. Muralidhar, June 2016-Nov. 2016 (8.16 lakhs)
 6. GIAN course on Coding for Distributive Storage (PI): Adrish Banerjee, Co-PI: K. Muralidhar, Jan 2017-Sept. 2017 (8.16 lakhs)
 7. GIAN course on Network Information Theory (PI): Adrish Banerjee, Co-PI: K. Muralidhar, Aug 2017-Apr. 2018 (8.16 lakhs)
 8. Designing Energy Efficient Hybrid RF/VLC for 5G Communications (PI): Adrish Banerjee, Co-PI: Shivanshu Srivastava. Supported by SERB, Aug 2017-Oct 2018, (19.2 lakhs)

Grants received for organizing conferences

1. Grant from SERB for National Conference on Communications 2014 (1 lakh) (PI: Adrish Banerjee, Co-PI: Ketan Rajawat)
2. Grant from Samsung, India for National Conference on Communications 2014 (1 lakh)
3. Grant from DeitY for National Conference on Communications 2014 (2 lakh) (PI: Adrish Banerjee, Co-PI: Ketan Rajawat)
4. Grant from Qualcomm, USA for National Conference on Communications 2014 (2.5 lakh)
5. Grant from Naval Research Board for National Conference on Communications 2014 (3 lakh) (PI: Adrish Banerjee, Co-PI: Ketan

Rajawat)

6. Grant from Qualcomm, India for Shannon Day 2016 (1 lakh)
7. Grant from Information Theory Society for Shannon Day 2016 (USD 2300)
8. Grant from TEQIP, IIT Kanpur for Shannon Day 2016 (1 lakh)

Consultancy

Projects (ongoing):

1. Development of Cooperative Spectrum Sensing Algorithms and Channel Detection Methods for Cognitive Radio (PI): Adrish Banerjee, Co-PI: Ketan Rajawat. Supported by Central Research Laboratory, Bharat Electronics Limited, Bangalore, Aug 2017-June 2019, (19.6175 lakhs)

Projects (completed):

1. Cooperative Spectrum Sensing for Military Radio Applications (PI): Adrish Banerjee. Supported by Defense Electronics Application Laboratory, Dehradun under Collaborative Academic Research Scheme (CARS). Aug. 2010-June 2012, (9.8 lakhs).

Peer Recognition

1. National Talent Search Examination (NTSE) Scholar, 1990.
2. Merit Certificate from CBSE for being among top 0.1% of the successful candidates in Mathematics in All India Senior Secondary Examination, 1990
3. Research Grant Writing Fellowship, University of Notre Dame, 1999.
4. MERIT, Erasmus-Mundus Visiting Professor Scholarship, 2008.
5. Visiting Professor, Faculty Invitation program of Institute for Information Technology Advancement (IITA), *South Korea. 2008*
6. Microsoft Research India Outstanding Young Faculty Award, 2009.
7. Young Engineer Award, Institute of Engineers (IEI), India in area of Electronics & Communications, 2009.
8. P. K. Kelkar Research Fellowship, IIT Kanpur, 2013-2016.
9. Editor, IETE Technical Review, 2014-. (48 papers handled so far)
10. Editor, IETE Journal of Education, 2018- (2 papers handled so far)
11. Next Generation Broadcasting Faculty Chair, IIT Kanpur, 2019-2022.
12. Technical Program Committee Chair, 20th National Conference on Communications at IIT Kanpur, Feb. 2014.
13. IETE Prof. K Sreenivasan Memorial Award 2016.
14. Commendation Letter from Director IITK for the course EE624: Information and Coding Theory for getting good feedback from students in

the academic semester 2016-17/I.

15. According to Google Scholar, h-index of 16.
16. Following papers of mine appeared in the list of IEEE most popular articles
 - The paper "Resource Allocation and Fairness in Wireless Powered Cooperative Cognitive Radio Networks" ranked 15th, and 10th in the most popular downloads for IEEE Transactions on Communications in September 2016, and August 2016, respectively, in IEEE Xplore
 - The paper "Secure Communication via a Wireless Energy Harvesting Untrusted Relay" ranked 5th and 17th in the most popular downloads for IEEE Transactions on Vehicular Technology in March 2017 and April 2017, respectively, in IEEE Xplore
 - The paper "Energy Harvesting Cognitive Radio With Channel-Aware Sensing Strategy" ranked 7th, 2nd, 7th, 12th, and 17th in the most popular downloads for IEEE Communications Letters in May 2014, June 2014, July 2014, August 2014, and September 2014, respectively, in IEEE Xplore
 - The paper "Sensing-Throughput Tradeoff in Cognitive Radio With Random Arrivals and Departures of Multiple Primary Users" ranked 27th, 20th, and 21st in the most popular downloads in IEEE Communications Letters for March 2015, April 2015, and May 2015, respectively, in IEEE Xplore.
 - The paper "Interference-Aided Energy Harvesting: Cognitive Relaying with Multiple Primary Transceivers", ranked 43rd , 12th , 22nd , 11th , 11th , 31st , 21st , 33th in the most popular downloads in IEEE Transactions on Cognitive Communications and Networking for July 2017, August 2017, September 2017, October 2017, November 2017, December 2017, January 2017, February 2017 respectively, in IEEE Xplore.

Contributions to the institute

1. Department Seminar Coordinator 2004-2005.
 - Responsible for organizing and sending seminar notices, including IEEE UP Section seminars at IIT Kanpur.
2. Department Coordinator for Summer Undergraduate Research and Graduate Excellence (SURGE) program 2009-2012.
 - Responsible for shortlisting of candidates from EE department for SURGE.
3. Department Web Page Committee Convenor, 2009-2012
 - Responsible for developing webcontent for EE departmental webpage. Majority of the content that one finds in EE website now were developed during my tenure.
 - Electronic display board at the entrance of EE department was programmed and put up during my tenure.
4. Department TA Committee Convenor, 2012-2014

- Responsible for assigning TA duty to more than 300 postgraduate students. Streamlined the process of collecting student preferences using Google forms.
- 5. Department Library Committee Convenor, 2014-2018
 - Responsible for physical upgradation of library facility. Also, responsible for entry of undocumented books/manuals/journals in departmental library. Also, representative of EE department in Senate Library committee.
- 6. Institute Coordinator for SURGE program 2013.
 - Responsible for supervising all the three programs under summer internships (IITK students to foreign universities, foreign students to IITK, and Non-IITK students to IITK.) at IITK. Introduced for the first time, lab visits for Non-IITK SURGE students.
- 7. Coordinator for EE Research Scholar Day, 2014.
 - Responsible for organizing first EE Research scholar day. Also, brought out a book of abstracts for all the poster presentations.
- 8. Member Senate Scholarships and Prize Committee 2016-2017
 - Responsible for promotion of excellence in academics and extra- curricular activities through student scholarships, prizes and medals.
- 9. Member Institute Research and Development Committee 2017-2018
 - Responsible for providing impetus to the Institute research and development activities.

Contributions outside the institute

Professional Activities:

1. Participated in IMT-A evaluation as a member of Telecom Center of Excellence, India, 2010.
2. IEEE UP Section Treasurer, 2008.
3. IEEE UP Section Student Convener, 2006-2007.
4. Member of the National Committee for preparing a roadmap for development of an Indian Software Defined Radio (SDR) ecosystem, Dec. 2018.
5. Technical program committee (TPC) member, National Conference on Communications (*NCC 2007*), 26th-28th January 2007, I.I.T. Kanpur, India.
6. TPC member, IEEE Sarnoff Symposium, 30th April-2nd May 2007, Princeton, U.S.A.
7. TPC member, 2007 IEEE 66th Vehicular Technology Conference, Transmission Technology Track (*VTC-Fall 2007*), 1st-3rd October, Fall 2007, Baltimore, U.S.A.
8. TPC member, The 10th International Symposium on Wireless

- Personal Multimedia Communications (*WPMC 2007*), 3rd-6th December 2007, Jaipur, India.
9. TPC member, The 11th International Symposium on Wireless Personal Multimedia Communications (*WPMC 2008*), 8th-11th Sept. 2008, Lapland, Finland.
 10. TPC member, 2008 IEEE 68th Vehicular Technology Conference, Transmission Technology Track (*VTC-Fall 2008*), 21st-24th Sept., Fall 2008, Calgary, Canada.
 11. TPC member, Wireless Communications Symposium of IEEE Global Communications Conference (*GLOBECOM 2008*), 30th Nov-4th Dec. 2008, New Orleans, U.S.A.
 12. TPC member, INDICON 2008, 11th-13th Dec. 2008, I.I.T. Kanpur, India.
 13. TPC member, 2008 IEEE Vehicular Technology Conference, Transmission Technology Track (*VTC-Fall 2009*), 20th-23rd Sept, Fall 2009, Anchorage, U.S.A.
 14. TPC Member, International Conference on Multimedia, Signal Processing and *Communication Technologies (IMPACT 2009)*, 14th- 16th March 2009, Aligarh, India.
 15. TPC member, The 12th International Symposium on Wireless Personal Multimedia Communications (*WPMC 2009*), 7th-10th Sept. 2009, Sendai, Japan
 16. TPC member, The 16th National Conference on Communications (*NCC 2010*), 29th-31st January 2010, I.I.T. Madras, India.
 17. TPC member, Wireless Communications Symposium of IEEE International Conference on Communications (*ICC 2010*), 23rd-27th May 2010, Cape Town, South Africa.
 18. TPC member, International Conference on Signal Processing and Communications (*SPCOM 2010*), 18th -21st July 2010, Bangalore, India.
 19. TPC member, 2010 IEEE Vehicular Technology Conference, Transmission Technology Track (*VTC-Fall 2010*), 6th-9th Sept, Fall 2010, Ottawa, Canada.
 20. TPC member, 2010 Military Communication Conference, (*MILCOM 2010*) Oct 31st-Nov 3rd 2010, San Jose, U.S.A.
 21. TPC member, First International Workshop on Cognitive Radio co-located with 4th International Conference on Internet Multimedia Systems Architecture and Application, (*IMSAA 2010*), 15th Dec. 2010, Bangalore, India
 22. TPC member, The 17th National Conference on Communications (*NCC 2011*), 28th-30th January 2011, I.I.Sc. Bangalore, India.
 23. TPC member, 2011 IEEE 73rd Vehicular Technology Conference, Transmission Technology Track (*VTC-Spring 2011*), 15th-18th May, Spring 2011, Budapest, Hungary.
 24. TPC member, Wireless Communications Symposium of IEEE International Conference on Communications (*ICC 2011*), 5th-9th June 2011, Kyoto, Japan.
 25. TPC member, The 14th International Symposium on Wireless

- Personal Multimedia Communications (*WPMC 2011*), 11th-15th Sept. 2011, Brest, France.
26. TPC Member, International Workshop on Cognitive Radio and Smart Antennas, 12th Dec. 2011, Bangalore.
 27. TPC member, The 18th National Conference on Communications (*NCC 2012*), 3rd-5th Feb. 2012, I.I.T. Kharagpur, India.
 28. TPC Member, Wireless Communications Symposium of IEEE International Conference on Communications (*ICC 2012*), 10th-15th June 2012.
 29. TPC Member, The 7th FTRA International Conference on Future Information Technology, 26-28 June 2012, Vancouver, Canada.
 30. TPC member, International Conference on Signal Processing and Communications (*SPCOM 2012*), 22nd-25th July 2012, Bangalore, India.
 31. TPC Member, The First International Conference on Communications in China (*ICCC 2012*), 15th-18th Aug. 2012, Beijing, China
 32. TPC member, The 15th International Symposium on Wireless Personal Multimedia Communications (*WPMC 2012*), 24th-27th Sept. 2012, Taipei, Taiwan
 33. TPC Member, Waveform and Signal Processing Track, 2012 *Military Communication Conference (MILCOM 2012)*, Oct 29th-Nov 1st 2012, Orlando, U.S.A.
 34. TPC Member, Cognitive Radio and Network Symposium of IEEE Global Communications Conference (*GLOBECOM 2012*), 3rd-7th Dec. 2012.
 35. TPC Member, The Fifth International Conference on Communication Systems and Networks (*COMSNETS 2013*), 7th-10th Jan. Bangalore, India
 36. TPC member, The 19th National Conference on Communications (*NCC 2013*), 15th-17th Feb. 2013, I.I.T. Delhi, India.
 37. TPC Member, PHY Track, IEEE Wireless Communications and Networking Conference (*WCNC 2013*) 7th- 10th Apr. 2013, Shanghai, China.
 38. TPC Member, 19th European Wireless Conference (EW 2013), 16th-18th April, 2013, Guildford, UK.
 39. TPC member, 77th Vehicular Technology Conference (VTC 2013-Spring), 2nd -5th June, 2013, Dresden, Germany.
 40. TPC member, 2013 *Military Communication Conference (MILCOM 2013)* Nov. 18th-Nov 20th 2013, San Diego, U.S.A.
 41. TPC Chair, 20th National Conference on Communications (*NCC 2014*), 28th Feb.-2nd Mar 2014, I.I.T. Kanpur, India.
 42. TPC member, SAB Track, IEEE Wireless Communications and Networking Conference (*WCNC 2014*), 6th -9th April, 2014, Istanbul, Turkey.
 43. TPC member, 20th European Wireless Conference (EW 2014), 14th-16th May 2014, Barcelona, Spain.
 44. TPC member, 10th International Conference on Signal Processing and

- Communications (SPCOM 2014), 22nd-25th July 2014, Bangalore, India.
45. TPC member, The 17th International Symposium on Wireless Personal Multimedia Communications (WPMC 2014), 14th – 18th Sept., Sydney, Australia.
 46. TPC member, IEEE International Conference on Advanced Networks and Telecommunication Systems, (ANTS 2014), 14th – 17th Dec., New Delhi, India
 47. PhD Student Forum TPC Chair, IEEE International Conference on Advanced Networks and Telecommunication Systems, (ANTS 2014), 14th-17th Dec., New Delhi, India.
 48. TPC member, 21st National Conference on Communications (*NCC 2015*), 27th Feb.-1st Mar 2015, I.I.T. Kanpur, India.
 49. TPC member, SAB Track, IEEE Wireless Communications and *Networking Conference (WCNC 2015)*, 9th -12th March, 2015, New Orleans, U.S.A.
 50. TPC member, 13th International Symposium on Modeling and Optimization in Mobile Ad Hoc, and Wireless Networks (*WiOpt 2015*), 25th-29th May 2015, IIT Bombay, Mumbai, India.
 51. TPC member, Wireless Communications Symposium of IEEE International Conference on Communications (*ICC 2015*), 8th-12th June 2015, London, United Kingdom.
 52. TPC member, 26th Annual International Symposium on Personal, Indoor and Mobile Radio Communications (*PIMRC 2015*), 30th Aug-2nd Sept. 2015, Hong Kong.
 53. TPC member, IEEE International Conference on Advanced Networks and Telecommunication Systems, (ANTS 2015), 15th–18th Dec., Kolkata, India
 54. Tutorial Co-Chair, IEEE International Conference on Advanced Networks and Telecommunication Systems, (ANTS 2015), 15th-18th Dec., Kolkata, India.
 55. TPC member, 22nd National Conference on Communications (*NCC 2016*), 4th-6th Mar 2016, I.I.T. Guwahati, India.
 56. TPC member, 83rd Vehicular Technology Conference (*VTC 2016-Spring*), 15th – 18th May, 2016, Nanjing, China.
 57. TPC member, 11th International Conference on Signal Processing and Communications (SPCOM 2016), 12th-15th June 2016, Bangalore, India.
 58. TPC member, 27th Annual International Symposium on Personal, Indoor and Mobile Radio Communications (*PIMRC 2016*), 4th -7th Sept. 2016, Valencia, Spain.
 59. Tutorial Co-Chair, IEEE International Conference on Advanced Networks and Telecommunication Systems, (ANTS 2016), 6th-9th Nov. 2016, Bangalore, India.
 60. TPC member, 19th International Symposium on Wireless Personal *Multimedia Communications (WPMC 2016)*, 13th -16th Nov. 2016, Shenzhen, China.

61. TPC member, 85th Vehicular Technology Conference (VTC 2017-Spring), 4th – 7th June, 2017, Sydney, Australia.
62. TPC member, 23rd National Conference on Communications (*NCC 2017*), 2nd -4th Marc 2017, I.I.T. Madras, India.
63. TPC member, The 20th International Symposium on Wireless Personal Multimedia Communications (WPMC 2017), 17th – 20th Nov., Bali, Indonesia.
64. TPC member, 28th Annual International Symposium on Personal, Indoor and Mobile Radio Communications (*PIMRC 2017*), 8th Aug-13th Oct. 2017, Montreal, CA.
65. TPC member, IEEE International Conference on Advanced Networks and Telecommunication Systems, (*ANTS 2017*), 17th–20th Dec., Bhubaneswar, India
66. TPC member, Mobile and Wireless Networks Symposium of IEEE Global Communications Conference (*GLOBECOM 2017*), 4th-8th Dec. 2017, Singapore.
67. TPC member, 24th National Conference on Communications (*NCC 2018*), 25th -28th Feb. 2018, I.I.T. Hyderabad, India.
68. TPC member, Wireless Communications Symposium of IEEE International Conference on Communications (*ICC 2018*), 20th-24th May 2018, Kansas City, MO, USA.
69. TPC Member, Radio Access Technology and Heterogeneous Networks track of the 87th Vehicular Technology Conference (VTC 2018-Spring), 3rd -6th June, 2018, Porto, USA.
70. TPC Member, IEEE 5G World Forum 2018, 9th-11th July 2018, Santa Clara, California, USA.
71. TPC member, 12th International Conference on Signal Processing and Communications (*SPCOM 2018*), 16th-19th July 2018, Bangalore, India.
72. TPC Member, Green Communications and Networks track of the 88th Vehicular Technology Conference (VTC 2018-Fall), 27th-30th August, 2018, Chicago, USA.
73. TPC Member, Radio Access Technology and Heterogeneous Networks track of the 88th Vehicular Technology Conference (VTC 2018-Fall), 27th-30th August, 2018, Chicago, USA.
74. TPC member, 29th Annual International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC), 9th Sept-12th Sept. 2018, Bologna, Italy.
75. TPC member, 2018 International Conference on Advanced Technologies for Communication (*ATC 2018*), 18th -20th October 2018, Ho Chi Minh city, Vietnam
76. TPC member, Mobile and Wireless Networks Symposium of IEEE Global Communications Conference (*GLOBECOM 2018*), 9th-13th Dec. 2018, Abu Dhabi, UAE.
77. TPC member, Wireless Communications Symposium of IEEE International Conference on Communications (*ICC 2019*), 20th-24th

May 2019, Shanghai, China.

78. TPC member, 25th National Conference on Communications (NCC 2019), 20th -23rd Feb. 2019, I.I.Sc. Bangalore, India.
79. TPC member, Phy & Fundamentals Track, IEEE Wireless Communications and Networking Conference (WCNC 2019), 15th - 18th April, 2019, Marrakesh, Morocco.
80. TPC member, 30th Annual International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC), 8th Sept-11th Sept. 2019, Istanbul, Turkey.
81. TPC member, 2019 IEEE 5G World Forum (WF-5G), 30th Sept-2nd Oct. 2019, Dresden, Germany
82. TPC member, 2019 International Conference on Advanced Technologies for Communication (ATC 2019), 17th -19th October 2018, Hanoi, Vietnam.
83. Reviewer:
 - a. IEEE Transactions on Communications,
 - b. IEEE Transactions on Vehicular Technology,
 - c. IEEE Transactions on Wireless Communications,
 - d. IEEE Journal on Selected Areas in Communications,
 - e. IEEE Transactions on Cognitive Communications and Networking,
 - f. IEEE Communications Letters,
 - g. IEEE Signal Processing Letters,
 - h. IEEE Wireless Communication Letters,
 - i. IET Transactions on Communications,
 - j. EURASIP Journal on Wireless Communications and Networking,
 - k. ETRI Journal
 - l. Journal of Communications Software and Systems

Others

Membership of Professional Societies:

- Senior Member, Institute of Electrical & Electronics Engineers (IEEE)
- Member, Eta Kappa Nu.

Travel Grants:

- Travel grant from Department of Science and Technology (DST), India for attending International Symposium on Information Theory (ISIT) 2005 at Adelaide Australia.
- Travel grant from Indian National Science Academy (INSA), India for attending International Symposium on Information Theory (ISIT)

2005 at Adelaide Australia.

- Microsoft India travel grant for attending Cognitive Radio Oriented Wireless Networks and Communication (CROWNCOM) Conference 2009 at Hannover, Germany.

References:

Available upon request