

ANURAG KUMAR(homepage: <http://ece.iisc.ac.in/anurag>)

23 U.A.S. Layout R.M.V. Extension Stage II Bangalore 560 094, India Phone: (+91) 80-2341-5032 Mobile: (+91) 98-4500-6755	Dept. of Electrical Communication Engineering, Indian Institute of Science, Bangalore 560 012, India Phone: (+91) 80-2293-2281 e-mail: anurag@iisc.ac.in
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RESEARCH INTERESTS:

- **Communication Networks, Distributed Systems, Cyber Physical Systems:** Stochastic modeling, analysis, optimisation, optimal resource allocation, and control problems arising in communication networks (wireline and wireless) and in distributed systems; experimental research in traffic engineering, and quality of service techniques in communication networks; with application to technologies such as cellular wireless networks (5G and beyond), wireless local area networks (WLANS, WiFi), the internet of things (IoT), and cyber physical systems (CPS); inference and control over wireless networks.

EDUCATION:

- *Doctor of Philosophy* in Electrical Engineering, January 1982, Cornell University, Ithaca, New York, U.S.A. Major area: Information and Decision Sciences; Minor area: Operations Research and Mathematics; (GPA 4.1).
- *Bachelor of Technology* in Electrical Engineering, (first division with distinction, and first rank, with cumulative performance index (CPI) = 10.0 out of 10; President's Gold Medal), May 1977, Indian Institute of Technology (IIT), Kanpur, U.P., India.

PROFESSIONAL EXPERIENCE:

Position Held	Organisation/Institution	Period
Indian National Science Academy (INSA) Distinguished Professor	Indian Institute of Science, Bangalore	1 January 2024 – 31 December 2026
Honorary Professor	Indian Institute of Science, Bangalore	1 August 2020 – 31 July 2025
Director	Indian Institute of Science, Bangalore	1 August 2014 – 31 July 2020
Chair, Division of Electrical Sciences	Indian Institute of Science, Bangalore	July 2007 – July 2014
Chair, Department of Electrical Communication Engineering	Indian Institute of Science, Bangalore	January 2004 – July 2007
Associate Chair, Department of Electrical Communication Engineering	Indian Institute of Science, Bangalore	October 2000 – December 2003
Professor – HAG, Department of Electrical Communication Engineering	Indian Institute of Science, Bangalore	August 2008 – July 2014
Professor – Department of Electrical Communication Engineering	Indian Institute of Science, Bangalore	October 1997 – July 2008
Visiting Research Scholar, Wireless Information Lab (WINLAB) (On sabbatical)	Rutgers University, Piscataway, N.J., U.S.A.	May 1996 – November 1996

Associate Professor, Department of Electrical Communication Engineering	Indian Institute of Science, Bangalore	October 1991 – September 1997
Assistant Professor, Department of Electrical Communication Engineering	Indian Institute of Science, Bangalore	June 1988 – September 1991
Member Technical Staff, Performance Analysis Department, <i>Job Responsibility:</i> Performance engineering of telecommunication systems, research in stochastic modelling as applied to communication and computer systems.	AT&T Bell Laboratories, Holmdel, New Jersey, U.S.A.	December 1981 – May 1988
Visiting Research Student, Information Systems Laboratory, Department of Electrical Engineering	Stanford University	July 1979 – June 1980
Teaching Assistant and Graduate Research Assistant, School of Electrical Engineering	Cornell University	September 1977 – December 1981

RESEARCH GUIDANCE:

- Ph.D.: 19 awarded, and 1 under supervision. Six of the Ph.D. theses have won best thesis medals at IISc: Alumni Medal (1996), Seshagiri Kaikini Medals (1996, 1997, 2000, 2005, 2012).
- Over 55 M.E. or M.Tech. projects supervised

PUBLICATIONS: Books and Papers:

- 84 journal papers, 125 refereed conference proceedings papers
- 2 published books, another book manuscript on my website, 2 invited book chapters, 3 conference proceedings edited
- **Complete list of publications is attached at the end**
- Citations (Google Scholar): 6317; h-index (Google Scholar): 38; i10-index (Google Scholar) 113

FELLOWSHIPS:

- J.C. Bose National Fellowship (2011-2021)
- Fellow of The World Academy of Sciences (TWAS) (since 2013)
- Fellow of the Indian Academy of Science (FASc) (since 2010)
- Fellow of the Indian National Science Academy (FNA) (since 2005)
- Fellow of the IEEE (Institute of Electrical and Electronics Engineers) (FIEEE) (since 2005)
- Fellow of the Indian National Academy of Engineering (FNAE) (since 1999)

- Fellow of the Institute of Electronics and Telecommunication Engineers (IETE), India (FIETE) (since 1992)

AWARDS and HONORS:

- **Professional:**
 - INSA Distinguished Professor, 2024-2026
 - A.C. Banerji Memorial Lecture, National Academy of Sciences (India), 2019
 - Gujar Mal Modi Award for Innovative Science and Technology 2018
 - IEI-IEEE Award for Engineering Excellence, 2017
 - Distinguished Alumnus Award, IIT Kanpur, 2016
 - VASVIK Award for Information Technology, 2015
 - Lifetime Achievement Award, Systems Society of India, 2016
 - CDAC-ACCS (Advanced Computer & Communications Society) Foundation Award, 2009
 - Indian Institute of Science Alumni Award for Excellence in Engineering Research, 2008
 - S.V.C. Aiyar Memorial Award for Excellence in Telecom Education, awarded by the Institution of Electronics and Telecommunications Engineers (IETE), Pune Centre, 2001
- **Member of Boards/Councils, Journal Editorial Boards:**
 - Member of the Council of the Indian National Academy of Engineering (2021-2023)
 - Member of the Council of the Indian National Academy of Science (2021-2023)
 - Member (Independent) of the Board of Directors Tata Elxsi (from Nov. 2020)
 - Member Steering Committee, IEEE/ACM Transactions on Networking (2010-2014)
 - Area Editor, IEEE/ACM Transactions on Networking (wireless networks area) (2005-2009)
 - Member Editorial Board, IEEE Communications Surveys and Tutorials (2002 - 2007)
- **Best Paper Awards:**
 - Best paper award in the COMSNETS 2013 conference (Abhijit Bhattacharya, Akhila Rao, Deeksha G. Rao Sahub, Aniruddha Mallia, Rachit Srivastava, Sanjay M. Ladwa, S.V.R. Anand, and Anurag Kumar "Smart Connect: A System for Design and Deployment of Wireless Sensor Networks," The 5th International Conference on Communication Systems and Networks (COMSNETS), Bangalore, January 2013)
 - Best student paper award in WiOpt 2012 (K.P. Naveen and Anurag Kumar, "Relay Selection with Channel Probing for Geographical Forwarding in Wireless Sensor Networks," WiOpt'12: 10th Symposium on Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks, Paderborn, Germany, May 2012.)
 - Best paper award in COMSNETS 2010 conference (Pranav Agrawal, Anurag Kumar, Joy Kuri, Manoj Panda, Ramchandra Ramjee, Vishnu Navda, and Venkat Padmanabhan, "Analytical Models for Energy Consumption in Infrastructure WLAN STAs Carrying TCP Traffic," The 2nd International Conference on Communication Systems and Networks (COMSNETS), Bangalore, January 2010)
 - Best demo/paper award in the WISARD 2010 workshop ("SmartDetect: An Efficient Wireless Sensor Network Implementation for Intrusion Detection," WISARD, a workshop of COMSNETS, Bangalore, January 2010)
 - Best paper award in the WISARD 2009 workshop (Malati Hegde, Pavan Kumar, K. Vasudev, S. V. R. Anand, Anurag Kumar, Joy Kuri, "Experiences with WM: A centralised scheduling approach for performance management of IEEE 802.11 wireless LANs," Proceedings of WISARD, a workshop of COMSNETS, Bangalore, January 2009)

- Best student paper award in COMSNETS 2009 conference (Onkar Bharadwaj, G. V. V. Sharma, Manoj Panda, Anurag Kumar, "Modeling Finite Buffer Effects on TCP Traffic over an IEEE 802.11 Infrastructure WLAN," The 1st International Conference on Communication Systems and Networks (COMSNETS), Bangalore, January 2009)
- Best paper award in the conference COMSWARE 2008 (Samuel David and Anurag Kumar, "Network Coding for TCP Throughput Enhancement over a Multi-Hop Wireless Network," Proceedings of COMSWARE'08, Bangalore, January 2008)
- Best paper award: Institute of Electronics and Telecommunication Engineers (IETE) CDIL award (1993) (Anurag Kumar, B. Hareesh Kumar, and B. Madhavi, "Modelling and Performance Analysis of a Digital Switching System - Case Study of the C-DoT DSS", Special Issue on Telematics of the Journal of the Institution of Electronics and Telecommunications Engineers, India, Vol. 39, No. 2, pp 77-97, March - April 1993)
- **Academic Awards:**
 - President's Gold Medal, L.N. Das Memorial Gold Medal, and Proficiency Prize, respectively for the best outgoing undergraduate student, the best undergraduate student in Electrical Engineering (Cumulative Performance Index (CPI) 10.0 out 10), and best project work in Electrical Engineering, 1977, IIT Kanpur, India
 - Merit scholarship at I.I.T. Kanpur for securing the rank of 33 in the IIT Joint Entrance Exam (JEE) 1972
 - Silver Medal for securing the First Rank in the Panjab University Pre-Engineering Exam 1972

PATENTS GRANTED or FILED:

- Shivam V. Vatsa, Anusha G. P., Vishal Sevani, Purushothaman Saravanan, Rishabh Roy, S. V. R. Anand, Joy Kuri, Anurag Kumar, "Method and System for Providing Multiaccess Point Coordination in a Wireless Network," **Indian Patent No. 570851, granted 18 September 2025.**
- Shivam Vinayak Vatsa, Anusha G. P., Jaya Goel, Tanisha Kosti, S.V.R. Anand, Joy Kuri, and Anurag Kumar, "System and Method for Handling Real-Time Uplink Dataflow in a Wireless Fidelity (Wi-Fi) Network," Indian Patent Application No. 202541000794, 03 January 2025.
- Anurag Kumar, Rajesh Sundaresan, Chandra R. Murthy, Venkatareddy Akumalla, S. V. R. Anand, Sudhakar Balijepalli, "Method and Device for Scheduling Transport Blocks in Presence of Transmission Losses and Rate Guarantees," Indian Patent Application No. 202441060771, 12 August 2024.
- Krishna Chaythanya, Anurag Kumar, and Rajesh Sundaresan, "A System and Method for Detecting Fault in a Bearing," **Indian Patent No. 572500, granted 23 October 2025.**
- Malati Hegde, Pavan Kumar, K. R. Vasudev, S. V. R. Anand, Anurag Kumar, and Joy Kuri, "System and Method for Management of Throughput Between Internet and Heterogeneous Network and Qos Management," **Indian Patent No. 330594, granted 28 January 2020.**
- Abu Sajana, P. Vijay Kumar, Syam Krishnan, Bharadwaj Amrutur, Jeena Sebastian, Malati Hegde, S.V.R. Anand, Anurag Kumar, Ramnathan Subramanian, "An Intrusion Detection System and a Method Thereof," **Indian Patent No. 329897, granted 22 January 2020.**

- Malati Hegde, Pavan Kumar, K. R. Vasudev, S. V. R. Anand, Anurag Kumar, and Joy Kuri, "A Centralized Wireless Manager (WiM) for Performance Management of IEEE 802.11 and a Method thereof," **Indian Patent No. 301414, granted 26 September 2018.**
- Anurag Kumar, Santosh P. Abraham, Greg M. Bernstein, Jeffrey T. Gullicksen, Gurpreet S. Chhabra, "Apparatus and Method for Providing Max-Min Fair Rate Control of ABR Sessions," **U.S.A. Patent No. 6,597,662, granted July 2003.**

SYSTEM DEVELOPMENT:

- **ADWISER:** (ADvanced Wifi Service EnhancerR) Conceptualised and guided the development of this system for managing the quality of service in an IEEE 802.11 wireless local area network (WLAN). The system is based on the novel idea of an overlaid external centralised controller that can manage the network performance without any change in the wireless Access Points or end-devices. This work was begun under a Department of Electronics and Information Technology funded project. Currently, we are pursuing this line of research to develop an overlay system for managing connection-level quality of service in high throughput WiFi systems (IEEE 11ac and beyond). A paper based on the work in this project has won a best paper award (see awards list earlier).
- **SmartConnect:** Conceptualised and guided the development of this system for the design an analysis of multihop wireless networks for industrial sensor network applications. The system was based on the idea of iteratively building a multihop wireless network on the field by a combination of statistical models and field measurements. This work was done under a Department of Electronics and Information Technology funded project, with CDAC Trivandrum as collaborators, and with power distribution yards as the application scenario.
- **NETMASTER:** Conceptualised and guided the development of this system for network monitoring, network quality-of-service management, and network design. Developed initially under the ERNET project at IISc, it was later acquired by NextEra Technologies. It was developed into a commercial product, underwent field trials in June and August 2004, and was branded as NETERA-BM.

SPONSORED RESEARCH PROJECTS (Government and Industry) (total research funding obtained: approx. Rs. 12 crores (Rs. 120 million)):

- Principal Investigator of COCOWinets (Control Of and Control Over Wireless Networks) a research project supported by the Karnataka Centre for Excellence in Wireline and Wireless Networking, IISc. Rs. 52 lakhs for 2024-2026, plus Rs. 32 lakhs for 2026-2027.
- Coinvestigator of a project titled "Topics in Scheduling for QoS in 5G-NR Cellular Networks," funded by the Centre for Networked Intelligence, Indian Institute of Science, 2024-2026.
- Coinvestigator of an Arista Networks funded project (under CSR) for the development of ADWISER, a system for overlay time-slicing or WiFi networks for their online performance optimisation, 2021-present.
- Coinvestigator of a Defence Research and Development Organisation (DRDO) funded project on deployment of wireless sensor networks for intrusion detection, 2013-2017.

- Coinvestigator of a Dept. of Electronics and Information Technology (DeitY, formerly DIT) funded project (Indo-US collaborative project) on Wireless Sensor Networks for Forest and Wildlife Monitoring, Rs. 185 lakhs, 2012-2014. This project led to the SmartConnect network deployment system, which was delivered to our collaborator Centre for Development of Advanced Computing (CDAC), Trivandrum, who then used it for deploying sensor networks.
- Coinvestigator of a Dept. of Science and Technology (DST) funded project (Indo-Brazil collaborative project) on Wireless Sensor Networks for Social Applications, 2010-2013.
- Coinvestigator of a Dept. of Information Technology (DIT) funded project for the development of a centralised quality-of-service manager for IEEE 802.11 wireless local area networks, Rs. 60 lakhs for the period 2010-2012. This project led to the development of WM (WLAN Manager), a centralised controller for quality of service management of wireless LANs.
- Joint principal investigator of a research project on Emerging Strategies for Wireless Communication Networks, funded by IFCPAR (Indo-French Centre for the Promotion of Advanced Research); the other principal investigator is Dr. Eitan Altman, INRIA, France; Rs. 59 lakhs for the period 2009-2010. **The project obtained an excellent grading; the two successive “excellent” grades were noted by the IFCPAR Council, who then gave the two PIs one travel to each other’s country in order to continue our interaction.**
- Principal investigator of a Dept. of Information Technology funded project (jointly with C-DAC, Trivandrum) for design and development of sensor networking technology for certain industrial applications. IISc’s part of the funding is Rs. 1 crore for 2009-2012.
- Principal investigator of a Microsoft funded research project on the energy consumption modeling of wireless LAN access devices. Rs. 8 lakhs for 2008-9.
- Principal investigator of a DRDO funded research project on Wireless Sensor Networks, a multi-faculty project with 10 other coinvestigators in the areas of communication and net-working, operating systems, compilers, electronics and sensors; Rs. 2.7 crores, for the period 2006-2010.
- Coinvestigator of a project on Network Coding for Wireless Networks: Motorola India: Rs. 6.5 lakhs for 2006-2007
- Principal investigator of a Honeywell funded research project on the performance analysis of IEEE 802.15.4 wireless sensor networks for industrial monitoring applications; Rs. 10.5 lakhs for 2005.
- Joint principal investigator of a research project on New Strategies for Wireless Communication Networks, funded by IFCPAR (Indo-French Centre for the Promotion of Advanced Research); the other principal investigator is Dr. Eitan Altman, INRIA, France; Rs. 59 lakhs for the period 2003-2006. **The project obtained an excellent grading.**
- Joint Investigator of an Intel funded project for research on Quality of Service in Wireless Local Area Networks; Rs. 11.5 lakhs for the period 2003-2004; Rs. 12.5 lakhs for 2005-2006.
- Joint Investigator in the Himachal Futuristic Communications Limited (HFCL) - IISc Research Program (HIRP) for research in, and development and productisation of Internet communication technologies: specifically in the areas of Internet edge devices (with emphasis on quality of

service and voice over IP), network management and network design; Rs. 71 lakhs for the period 2000-2003.

- Principal investigator of Nortel Networks (USA) funded research projects in the areas: "Assured Service for TCP Controlled Elastic Flows using the Differentiated Services Approach; Techniques for Quality of Service for Guaranteed Delay Services in Packet Networks; Network Based Congestion Control in the Internet; Performance of TCP over the ABR Service in an ATM Network; Traffic Control in ATM Networks," Rs. 80 lakhs for the period 1996-2001.
- Principal investigator of an Intel Asia funded project on "Internet Service Provider Architecture," Rs. 15 lakhs (equipment and funds) for the period 1999-2000.
- Coordinator of the Ministry of Information Technology's ERNET (Education and Research NETwork) project site at IISc (June 1989 - December 2002). The project group at IISc had equipment worth Rs. 100 lakhs, received annual grants averaging to about Rs. 20 lakhs, and employed 7 full-time project engineers.

INDUSTRIAL CONSULTANCY:

- TETCOS, Bangalore, April 2004 – March 2006: Advice on the development of a network simulation software package, called NetSim. I have provided technical advice on simulation software architecture, explained the functioning of the various networking protocols, and used analytical models to help verify the simulation outputs. From being a small educational software package in the early years, today NetSim is being used to answer professional networking questions, is competitive at the world level, and has over 400 customers worldwide.
- Bell Laboratories, January 2006 - December 2006: Design and analysis of rural wireless broadband networks.
- Airtight Networks, Pune, 2005-2006: Advice on monitoring and performance aspects of wireless local area networks.
- Satyam Computers, February 2004 - January 2006: Modeling and performance analysis of communication network subsystems.
- Philips Telekom, Germany (1994 - 1996): Traffic engineering of a cell in the GSM system for mobile telephony, with full rate and half rate coded mobile stations. (Joint work with Dr. Kumar N. Sivarajan.)
- ITI, Bangalore (1994 - 1996): Performance analysis and performance optimisation of the call processing subsystem of the ITI Digital Switching System.
- SONATA (software division of IOCL), Bangalore (1993): Advice in the development of a Local Area Network simulation package.
- WIPRO Information Technologies, Bangalore (1991): Performance analysis of WIPRO's multiprocessor system architecture.
- C-DOT (Centre for Development of Telematics) (1989 - 1990): Performance analysis, performance optimisation, and development of overload controls for the call processing subsystem of the C-DOT Digital Switching System.

COURSES TAUGHT:

- Probability Theory, Information Theory, Communication Networks, Stochastic Processes and Queuing Theory, Advanced Topics in Communication Networks, Statistical Theory of Communication, Switching and Statistical Multiplexing in Telecommunication Networks, Wireless Networks, Random Processes.

OTHER PROFESSIONAL ACTIVITIES:

- Member IEEE Communications Society Fellows Evaluation Committee
- Member IEEE Koji Kobayashi Award Committee
- Member IEEE/ACM Transactions on Networking (TON) Steering Committee 2010-2014
- Co-General Chair, COMSNETS 2011, Bangalore, January 2011.
- Co-General Chair, International Conference on Distributed Computing and Networking (ICDCN), Kolkata, January 2010.
- President, COMSNETS Association, since 2009; COMSNETS Association organises the annual series of COMSNETS conferences on communication systems and networks.
- General Chair, Conference on Managing Complexity in a Distributed World (MCDES), the IISc Centenary Conference of the Division of Electrical Sciences, IISc, May 2008.
- Member (by invitation) of the IFIP (International Federation of Information Processing) WG 7.3 on Computer Performance Modeling and Analysis
- Co-General Chair, IEEE Workshop on Information Theory, Bangalore, October 2002.
- Co-Chairman, Program Committee, International Conference on Communications, Control and Signal Processing (CCSP2000), Bangalore, India, July 2000
- Chairman, Program Committee, Conference on Signal Processing, Communications, and Networking (SPCOM), Bangalore, India, July 1997
- Chairman, Organizing Committee, International Teletraffic Congress (ITC) sponsored seminar on Teletraffic Analysis Methods, Bangalore, India, November 1993
- Member of program committees of several workshops and conferences
- Reviewer for various journals and magazines of IEEE, ACM, IETE, and the Computer Society of India

SOME PROFESSIONAL VISITS OUTSIDE INDIA:

- National Institute of Standards and Technology, Gaithersburg, June 2017
- University of Avignon, France, May-June 2014 (research interaction under Indo-French project)
- Ohio State University, Columbus, Ohio, July 2013: for collaboration under an Indo-US (Deity-NSF) collaborative project on Wireless Sensor Networks for Protecting Wildlife and Humans.

- Hamilton Institute, National University of Ireland, Maynooth, under invitation to speak at a workshop on Network Science, December 2011.
- University of Avignon, France, May 2011 (research interaction under Indo-French project)
- University of Avignon, France, June 2008 (research interaction under Indo-French project)
- Seoul National University, South Korea, May 2007 (invited lectures)
- University of Cyprus, Nicosia, April 2007 (invited lecture, and promotion committee)
- University of Avignon, France, June 2006 (research interaction under Indo-French project)
- INRIA (National Institute for Research in Information and Automation), Sophia-Antipolis, France, October-November, 2003 (research interaction under Indo-French project)
- Coordinated Sciences Lab, University of Illinois, Urbana-Champaign, USA, May-July 2003 (sabbatical)
- AT&T Shannon Labs, University of Pennsylvania, IBM Research Labs, and University of Illinois, Urbana-Champaign, all in USA, during June 2002 (to give talks)
- Nortel Networks, USA and Canada; several visits during 1996 to 2000 (in connection with research projects)
- INRIA (National Institute for Research in Information and Automation), Sophia-Antipolis, France (September 2000) (invited talks)
- Wireless Information Networks Lab (WINLAB), Rutgers University, New Jersey, U.S.A (June 1996 to December 1996) (sabbatical)
- Ecole Polytechnic, University of Montreal, Montreal, Canada (June 1997) (research discussions)
- AT&T Bell Laboratories, Holmdel, N.J., USA (June 1994) (for talks)
- Institute of System Sciences, National University of Singapore, Singapore (June 1993) (invited lectures)

SOME RECENT LECTURES AND KEYNOTE TALKS OUTSIDE IISc:

Academic Administration Related

- *Towards World Class Institutions of Higher Education in Science and Engineering*, National Assessment and Accreditation Council (NAAC), Silver Jubilee Lecture Series, 10 February, 2020.
- *Towards World Class Institutions of Higher Education in Science and Engineering: Some Good Practices*, Indian Institute of Science Education and Research, Bhopal, 10th Foundation Day, 3 November, 2017.
- *Towards World Class Institutions of Higher Education in Science and Engineering*, Indian National Academy of Engineering, Engineers Conclave 2016, 2 September 2016.
- *Towards World Class Universities*, MHRD Regional Workshop on “Leadership for Academic Excellence in Higher Education,” Bengaluru, 15 April 2016

Technical Talks:

- *WiFi Analysis Revisited: Systems with Short-Term Unfairness*, National Institute of Standards and Technology, Gaithersburg, USA, 29 August 2018
- *Cyber Physical Systems over the Internet of Things*, keynotes and invited talks at several venues.
- *The Internet of Things: Technology and Prospects*, The Bangalore Science Forum, 23 July 2016
- *Design and Deployment of IEEE 802.15.4 (Zigbee) Wireless Networks for Internet of Things Applications*, Keynote at UbiComp, organised by Centre for Development of Telematics, Bangalore, 27 May 2016.
- *Internet of Things: Technology and Prospects*, Texas Instruments Developers Conference, 25 February 2016
- *Design and Deployment of IEEE 802.15.4 (Zigbee) Wireless Networks for Internet of Things Applications*, University of Melbourne, 28 January 2016.
- *Internet of Things: Technology and Prospects*, CSIR Foundation Day Lecture, National Aerospace Laboratories, 28 September 2015.
- *Internet of Things: Technology and Prospects*, Defence Science Forum, DRDO, New Delhi, 28 January 2015.
- *Design and Deployment of IEEE 802.15.4 (Zigbee) Wireless Networks for Internet of Things Applications*, Xerox Research Centre in India, Bangalore, 22 January 2015.
- *Internet of Things: Technology and Prospects*, International Conference on Emerging Electronics, Bangalore, 4 December 2014.
- *Internet of Things: Technology and Prospects*, Keynote at ACCS ADCOM Conference, Bangalore, 20 September 2014.
- *Design and Deployment of IEEE 802.15.4 (Zigbee) Wireless Networks for Internet of Things Applications*, Corporate Research, Robert Bosch Engineering Centre, Bangalore, 16 June 2014.
- *The Internet of Things*, The Second Annual Workshop of the National Knowledge Networks, IISc, Bangalore, 18 October 2013.
- *SmartConnect: A System for the Design and Deployment of Multihop Wireless Networks for Sensor Interconnection*, Cyber Physical Systems Workshop, IIT Hyderabad, 22 March 2013
- *Co-evolution of Content Popularity and Delivery in Mobile Opportunistic Networks*, keynote talk in the RAWNET Workshop, WiOpt Conference, Tsukuba Science City, Japan, May 2013.
- *Co-evolution of Content Popularity and Delivery in Mobile Opportunistic Networks*, Texas A&M University, USA, 25 October 2012.
- *Optimal Forwarding in Networks with Intermittent Links*, Workshop on Network Science, Hamilton Institute, National University of Ireland, 22-23 August, 2011.

- *Wireless Sensor Networks: Pervasive Systems for Measurement and Inference*, Invited Plenary Talk, International Conference on Methods and Models in Computer Science (ICM2CS-09), December 14-15, 2009 Jawaharlal Nehru University, New Delhi, India
- *Wireless Sensor Networks for Intrusion Detection*, keynote talk, COMSWARE 2008, Bangalore
- *Wireless Local Area Networks, and Wireless Sensor Networks*, Seoul National University, South Korea, May 2007
- *Wireless Sensor Networks*, University of Cyprus, Nicosia, April 2007
- *Wireless Sensor Networks: Pervasive Systems for Monitoring and Inference*, keynote talk, Willopan 2007 (in COMSWARE 2007), Bangalore
- *Modeling and Optimisation of Wireless Sensor Networks for Monitoring and Detection*, invited plenary talk, Wireless Networking Summit, Goa, April 8-9, 2006.
- *Optimising Network Delay in Sequential Detection on Ad Hoc Wireless Sensor Networks*, Workshop on Wireless Communications and Sensor Networks, TIFR, Mumbai, March 3, 2006.
- *Wireless Networking: The New Frontier*, Invited Talk, DST-GOF Indo-UK Workshop, IIT Madras, Jan 29 { Feb 2, 2006.
- *IEEE 802.11 Wireless Networks: New Insights from Stochastic Models*, Keynote Lecture, National Conference on Communications, January 27-29, 2006.
- *Wireless Networking: The New Frontier* Keynote address, Workshop on Wireless Networks and Network Security, IETE Bangalore Centre, October 22, 2005.
- *Analysis and Optimisation of IEEE 802.11 WLANs*, Keynote Lecture, WiOpt 2005 Symposium, Riva Del Garda, Italy, April 2005.
- *Wireless Networking: The New Frontier*, Centre for Development of Advanced Computing, Pune Campus, May 5, 2004, and ITI Bangalore, May 17, 2004, on the occasion of World Telecom Day.
- *Optimal Buffer Scheduling over a Fading Wireless Link*, National Institute of Standards and Technology (NIST), Gaithersburg, Maryland, USA, July 2003.
- *Long Range Dependence in Network Traffic and the Closed Loop Analysis of Buffers under Adaptive Window Control*, Institute for Systems Research, University of Maryland, College Park, MD, USA, July 2003.
- *Long Range Dependence in Network Traffic and the Closed Loop Analysis of Buffers under Adaptive Window Control*, Coordinated Sciences Lab, University of Illinois, Urbana-Champaign, USA, June 2003.
- *Telecommunication Networks: A Canvas for Analytical Research*, Keynote Lecture, National Conference on Communications, 2003, IIT Madras, January 2003.
- *Internet Performance and Traffic Engineering: Insights from Stochastic Models*, Cisco Systems, Bangalore, March 2002; University of Pennsylvania, Philadelphia, June 13, 2002; AT&T Labs Research, Florham Park, New Jersey, June 14, 2002; Lucent Bell Laboratories, New Jersey, June

14, 2002; University of Illinois at Urbana-Champaign, June 17, 2002; IBM T.J. Watson Research Centre, New York, June 20, 2002.

- *Intelligent Internet Traffic Engineering: A Model Based Approach*, Invited Talk, High Performance Computing Conference, December 2001
- *Wireless Ad Hoc Internet and Sensor Networks: Progress and Challenges*, Keynote Talk, Workshop on Ad Hoc Networking, Bhubaneswar, December 2001
- *Innovations for Intelligent Internet Engineering*, S.V.C. Aiya Award Conferral Talk, Institute of Electronics and Telecom Engineers, Pune, September 2001

Publications of Prof. ANURAG KUMAR

1. Books

1. Anurag Kumar, D. Manjunath, and Joy Kuri, *Communication Networking: An Analytical Approach*, published by Morgan Kaufman Publishers (a division of Elsevier Science) in the Morgan Kaufman Networking Series (edited by David Clark), May 2004, 929 pages.
 - In addition to its use in graduate programs in India (including the Visvesvaraiya Technological University, Karnataka), this book has been used as a text book in California Institute of Technology, Drexel University, University of Maryland (College Park), Rensselaer Polytechnic Institute, University of California (Riverside), Rice University, University of Toronto, and University of Waterloo.
2. Anurag Kumar, D Manjunath, and Joy Kuri, *Wireless Networking*, published by Morgan Kaufman Publishers (a division of Elsevier Science) in the Morgan Kaufman Networking Series (edited by David Clark), March 2008, 450 pages.
 - This book has been used as a text book in Wayne State University, University of South Florida, North Carolina State University, Minnesota State University, Johns Hopkins University, and Auburn University. In May 2012, the Korea Advanced Institute of Science and Technology (KAIST) ran a course based (chapter-by-chapter) on this book; this course was instructed by and attended by professors from several academic institutions in Korea.
3. Anurag Kumar, *Discrete Event Stochastic Processes: Lecture Notes for an Engineering Curriculum*, 2012; manuscript available on the author's homepage.

2. Invited Book Chapters and Survey/Tutorial Papers

1. Anurag Kumar and D. Manjunath, "A Tutorial Survey of Topics in Wireless Networking," *Sadhana*, Indian Academy of Sciences Proceedings in Engineering Sciences, Vol. 32, No. 6, December 2007.
2. Anurag Kumar and Aditya Karnik, "Performance Analysis of Wireless Ad Hoc Networks," *The Handbook of Ad Hoc Networks*, CRC Press, December 2002.

3. Conference Proceedings Edited

1. Anurag Kumar and V.U. Reddy, *International Conference on Communications Control and Signal Processing*, Bangalore, July 2000.
2. Anurag Kumar and V.U. Reddy, *Signal Processing, Communications and Networking*, Bangalore, July 1997.
3. Sanjay K. Bose and Anurag Kumar, *ITC Seminar on Teletraffic Analysis Methods for Current and Future Telecom Networks*, Bangalore, November 1993.

4. Journal papers submitted or in preparation

- Anusha G.P., Shivam V. Vatsa, Soumyodipta De, Meghana Devanand, Shreyas Gogdani, Sriniketh Desikan, SVR Anand, Joy Kuri, Pavankumar Tallapragada, Anurag Kumar, “Can Multi-AP Wi-Fi Networks Simultaneously Support Low-Latency and Best-Effort Traffic at Scale?,” submitted to the 22nd International Conference on emerging Networking EXperiments and Technologies (CoNEXT'26),
- Anurag Kumar, Chandra R. Murthy, Rajesh Sundaresan, VenkataReddy Akumalla, “Fair Scheduling with Rate Guarantees in Cellular Networks: A Two-Time-Scale Stochastic Approximation Algorithm,” in preparation for submission to IEEE/ACM Transactions on Networking. Based on the manuscript: Anurag Kumar and Rajesh Sundaresan, “Utility Optimal Scheduling with a Slow Time-Scale Index-Bias for Achieving Rate Guarantees in Cellular Networks,” 2024. arXiv: 2408.09182[cs.NI]. url: <https://arxiv.org/abs/2408.09182>.
- Krishna Chaythanya, Saqib Abbas, Anurag Kumar, Arpan Chattopadhyaya, Rajesh Sundaresan, “Quickest Change Point Detection with Measurements over a Lossy Link,” to be resubmitted IEEE Transactions on Signal and Information Processing over Networks.

5. Journal papers published (or accepted)

1. Saqib Abbas, Anurag Kumar, Arpan Chattopadhyay, “Quickest change detection for UAV-based sensing,” accepted, *IEEE Transactions on Signal Processing*, accepted, online preprint, 2026.
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18. K.P. Naveen and Anurag Kumar, "Relay Selection with Channel Probing for Geographical Forwarding in Wireless Sensor Networks," *WiOpt'12: 10th Symposium on Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks*, Paderborn, Germany, May 2012. **Best Student Paper Award**
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