RESUME'

Dr. Rajarshi Roy

PhD in Electrical Engineering, Polytechnic University, Brooklyn, New York, USA (Now after Merger with New York University known as "NYU Tandon School of Engineering, New York, U.S.A")

Associate Professor, Department of E & ECE, IIT, Kharagpur

Mailing Address: Qtr. No. B-96, Indian Institute of Technology, Kharagpur Campus,
Indian Institute of Technology, Kharagpur-721302, West Midnapur, West Bengal, India**.**
E-mail: royr@ece.iitkgp.ernet.in
Phone: 9163310306

Date of Birth: 31st October, 1969.
Nationality and Citizenship: Indian..
Gender: Male. **Marital Status:** Married.
Languages Known: (1) English (2) Hindi and (3) Bengali (native)

Interests

Application of optimization, control, algorithmic and AI techniques in optimal resource allocation problems, Performance Analysis and Modeling of communication networks, Sensor and ad hoc Networks, Optical Networks, Data networks, Wireless networks and diversity systems, Cyber physical systems, Network Coding, MIMO systems, Cooperative communication, cognitive communication systems, Energy efficiency, fundamental trade-offs between performance and complexity, energy and delay etc., Directional antenna, Adaptive beam forming, Stochastic geometry for wireless networks, Peer-to-peer systems, Delay Tolerant Networks, Network pricing, Performance evaluation of computer and manufacturing systems, Distributed computing, Complex Networks: in particular spatial and temporal properties of social networks like citation networks, co-authorship networks and internet communities, systems biology, transportation and financial systems, trust and reputation based systems in e-commerce and m-commerce, social networking, Bandwidth on demand mechanism, Rural connectivity, Understanding demand patterns, Telecommunication Regulation and Policy.

Stochastic Processes, Optimization, Markov decision theory, Queuing theory, Scheduling, Stochastic geometry, Service curve models, Game theory models, Application of control theory, algorithmic techniques and detection/estimation techniques in communication, network dynamics, network optimization and stability, distributed algorithms and online algorithms, Biologically inspired algorithms for optimization of large scale networked structures, Interaction of communication, control, computing in networked control, communication or computing systems and related micro-macro issues, Emergent global patterns due to localized, distributed action of multiple agents based on local information and corresponding learning and optimization models for optimal control of complex networked systems.

Work Experience

1. **Served as acting Head of School for G. S. Sanyal School of Telecommunication for two weeks (approx.) in Autumn, 2014.**

2. (a) Present Occupation (From 19th April, 2010 to Date) Associate Professor, Dept. of E & ECE, Indian Institute of Technology, Kharagpur, India. (Confirmed already after successful completion of probation period on 19th April, 2011) We offer 10 hours of teaching duties per week. Although in Spring, 2014 I offered 14 hours / week.

3.From 22nd July, 2002 to 19th April, 2010: **22-07-2002 18-04-2010 7 Years 9 Months 2Days Assistant Professor,** Department of Electronics and Electrical Communication Engineering, **Indian Institute of Technology, Kharagpur, India (IIT, Kharagpur)**.

Teaching responsibility in Indian Institute of Technology, Kharagpur (IIT, Kharagpur): Taught Courses: (1) Basic Electronics Laboratory (Freshman), (2) Basic Electronics Theory (Sophomore), (3) Digital Communication Laboratory (Junior), (4) Selected Topics in Networking (Graduate), (5) Digital signal processing Laboratory (Junior), (6) Optical transmission and networking (simulation) lab (junior), (7) Digital Signal Processing theory (Junior), (8) Computer Communication and Networking theory (Senior / Graduate), (9) Lightwave Networks theory (graduate), (10) Electronic Circuits lab (Junior), (11) Microprocessor Lab (Graduate), (12) Design and simulation of optical systems lab (Graduate) (13) Modern Digital Communication Systems theory (Graduate) (14) Teletraffic Engineering (graduate) (Diploma Course) (15) Network Management (graduate) (Diploma Course) (16) Internet Technology (Graduate) (Diploma Course) (17) Linear algebra and Error Control Coding Theory (Graduate) (18) Telecommunication Switching and Networks Theory (Graduate) (19) Digital Signal Processing and Applications (Graduate) (20) Telecommunication System Modeling, simulation and software (20) Communication systems (Junior) **(At Polytechnic Brooklyn) (**21) Communication networks (on-line video course), (22) Wireless Communication (on-line video course) (23) Arranged Seminar courses for graduate students.

Few Books Used as Text Books for the theory courses:

1. Error Control Coding, Shu Lin and Daniel J. Costello, Jr., 2nd Edition, Pearson, 2011.
2. Data Networks, Bertsekas and Gallagher, 2nd Edition, Prentice Hall.
3. Communication Networking: An analytical approach: Anurag Kumar, D. Manjunath and Joy Kuri, Morgan Kaufmann, 2004.
4. Computer Networking: A top down approach featuring the Internet, J.F. Kurose and K.W. Ross, 4th Edition, Addison Wesley, 2004.
5. Computer Networks-A systems approach, L.J. Paterson and B. S. Davie, Fourth Edition, Morgan Kaufmann, 2004.
6. Data Communications and Networking: A bottom up approach, Behrouz A. Forouzan, McGrawhill Higher Education, 4th Edition, 2006.
7. Communication Networks: Fundamental Concepts and Key Architectures, Alberto Leon Garcia and Indra Widjaja, McGraw Hill, 2nd Edition, 2005.

8. Optical Networks: A Practical Perspective: R. Ramaswamy and K. Sivarajan, 2nd Edition, Morgan Kaufmann, 2001.
9. Multi-Wavelength Optical Networks, A layered approach: T. E. Stern and K. Bala, Prentice Hall, 1st Edition, 1999.
10. Digital Communications: John G. Proakis, 4th Edition, McGraw Hill Higher Education.
11. Fundamentals of Wireless Communication: D. Tse and P.Viswanath, Cambridge University Press (2005)
12. Digital Signal Processing: R.W. Schafer and A.V. Oppenheim (2002)
13. Discrete Time Signal Processing: A.V.Oppenheim, R.W.Schafer and J.R.Buck, 2nd Edition, Prentice Hall.
14. Digital Signal Processing, Principles, Algorithms and Applications: Proakis and Manolakis, 4th Edition, Prentice Hall. (2006)
15. Probability and Statistics with Reliability, Queuing and Computer science applications: K.S. Trivedi, John Wiley and Sons, New York, 2nd edition, 2001.
16. Queuing Systems, Volume I: Theory, L. Kleinrock, New York, Wiley Interscience, 1975.
17. Probability, Random variables and Stochastic Processes: A. Papoulis and S. U. Pillai, McGraw Hill, 4th edition, 2002.
18. Probability and Computing: Randomized Algorithms and Probabilistic Analysis: M. Mitzenmacher and E. Upfal, Cambridge University Press, 2005.
19. Algebraic Switching Theory and Broadband Applications: Shuo-Yen Robert Li, Academic Press, Elsevier, 2001.
20. Switching and Traffic Theory for Integrated Broadband Networks: J.Y.Hui, Boston, Kluwer Academic Publishers, 1990.
21. Integrated Electronics: Analog and Digital Circuits and Systems: J. Millman, C. Halkias and C. Parikh, 2nd edition, McGrawHill, 2010.
22. Electronic Devices and Circuits: J. Millmann, C. Halkias, and S. Jit, 3rd Edition, McGraw Hill, 2010.
23. Electronic Circuits, Analysis and Design, D. A. Neamen, 3rd Edition, McGraw Hill, 2010.
24. Solid State Electronic Devices, Ben G. Streetman, Sanjay Banerjee, 6th Edition, Prentice Hall, August, 2005.

Additional Teaching Responsibility (Special Courses, Diploma Courses, Distant Learning Course):

1. I was one of the organizers of NCC 2005, NCC 2012 (National Communication Conference) and also an international conference on optical networks (2005) in IIT KGP. The number of attendees was 200, 300 and 100, respectively. A workshop on social networks was also organized in 2013 with 50 participants in IIT KGP where I did work as session chair and took part in panel discussion.

2. Offered Lectures on **Teletraffic Theory (No. of students: 30), Routing in Communication Networks (Number of students: 40), Wireless Sensor Networks (Number of students: 40), RWA problems in optical networks (Number of students:30) and Buffer Management in Communication Networks (Number of students: 100)** for Dept. of E & ECE and G. S. Sanyal School for Telecommunication, Indian Institute of Technology, Kharagpur organized **Special Summer Courses** on Networking, Optical Networks and Wireless Networks.

3. Offered courses in **Teletraffic Theory** and **Network Management** in **Post Graduate Diploma in Telecommunication Network Management** course of **G. S. Sanyal School of Telecommunication. (Number of students: 20)**

4. Served as contact teacher, invigilator and evaluator / grader for various courses of **Post Graduate Diploma in Information Technology program of School of Information Technology, Indian Institute of Technology, Kharagpur** in IIT center at Bhubaneshwar, Orissa, India, Kolkata, West Bengal, India and Kharagpur, West Bengal, India.. (No. of students: 30)

5. Offered Lectures on **Network Performance Evaluation** for **Special Condensed Course** on networking. The course was offered by IIT, Kharagpur to the executives of Oil and Natural Gas Corporation (ONGC), India.(No of people: 30)

6. Offered Lectures on **Optimization** for **Special Condensed Course** . The course was offered by IIT, Kharagpur to the executives of Indian Space Research Organization (ISRO), India.(No of people: 30)

7. Offered Lectures on **Medical Applications of Markov Decision Theory** in **School of Medical Science and Technology, Indian Institute of Technology, Kharagpur organized special course on Statistics and Pattern Recognition for Medical Diagnostics** (2009) (No. of students: 30).

8. Offered **Communication Network, Wireless Communication course** for the M.tech students of **Electronics and Communication Engineering course which is being offered by distance learning method. (On line Video transmission) (No. of students: 30)**

9. **Served as (1) Internal examiner of two MS thesis submitted in IIT KGP (2) external examiner for three M. tech projects done in Jadavpur University, (3) External Examiner for a PhD thesis done in Dept. of EE, Indian Institute of Science, Bangalore and (4) External Examiner for a PhD thesis done in Dept. of Computer Science and Technology, Indian Institute of Engineering Science and Technology (IIEST), Shibpur, Howrah, India (Formerly known as Bengal Engineering and Science University and even before that as Bengal Engineering College (B. E. College, Shibpur)**

(b) Research Supervision:

PhD Thesis:

Sole Supervisor

(1) **"Some new Approaches for Lifetime Maximization in wireless sensor networks".** Student: Dr. Kumar Padmanabh. in E & ECE Dept. IIT, Kharagpur 2007.. (Status: **Completed.) (Category: General, Institute Scholar)**

(2) **“Performance analysis of Cooperative Decode-Forward relaying Scheme under correlated and uncorrelated Nakagami-m fading chanels”** Student: Swminathan Ramabadran. (**Status**: Completed, 2016. **Category**: General, Institute Scholar)

(3) **“Deployment strategies in large sensor networks” Student:** Mrtyunjay Rout. (Status: Continuing)

Co-Supervisor

(4) **“Study of Energy aware routing protocols for wireless adhoc networks”.** Student: Tamaghna Acharya. Student is an assistant professor in **Bengal Engg. And Science University, Shibpur, West Bengal, India** PhD registration is done with **Jadavpur University, Kolkata, India**. (Status: **Completed**.) **(Category: General)**

(5) “A Metaheuristics Based Approach for Ideal and Impairment-Aware Dynamic Routing and Wavelength Assignment in Lightwave Networks”, Student: Mrs. Urmila Bhanja. Student was enrolled under **QIP (Quality Improvement Program of Govt. of India)** program in IIT, KGP. (Status: **Completed.) (Category: QI P)**

(6) “Transmission Characteristics and Advanced Signal Processing in an Optical Link Using Differential Phase-Shift Keying Signaling” Student: Sumanta Gupta, **Dept. of E & ECE, IIT, Kharagpur.** Status: **Completed**.) **(Category: General, Institute Scholar)**

(7) “Comprehensive Analysis of Cooperative Diversity Relaying in Wireless Communication Systems” Student: Soumendra Nath Datta, **GSSST, IIT, Kharagpur.** (Status: **Completed)** (Category: **General, Institute Scholar**).

(8) "Green Cellular Communication", Student: Purnendu Karmakar GSSST, IIT, KGP. (Status:Continuing)

Master's level thesis:

MS Thesis (Degree by research):

Co-Supervisor: 1.

M. Tech Thesis:

Sole Supervisor: 37, Co-Supervisor: 6

Bachelor's level thesis:

Sole Supervisor: 14.

4. System Engineer, Lucent technologies, India development center, Bangalore, India, Worked on ATM, Frame Relay and IP switching product line, From March, 2002 to early July, 2002. **From 25-03-2002 To 16-07-2002 3 Months 23 Days**

5. Visiting scientist in **Indian Statistical Institute, Kolkata, India**. Worked on problems in broadcast scheduling, co-supervised at Master's level thesis on algorithms for broadcast scheduling, From December, 2001 to Feb, 2002**.(From 03-12-2001 To 28-02-2002 2 Months 27 Days)**

6.Performance Analysis Software Engineer (R & D) in Performance evaluation department of the advanced development division of **COMVERSE Network Systems,** a leading multimedia messaging company in **Wakefield, MA, USA. From 3rd September, 2000 to 13th May, 2001 (8 Months 12 Days).**

7.Summer Intern, **Bell Laboratories, Lucent Technologies, Holmdel, New Jersy, U.S.A.** June, 1997 to August, 1997 (**02-06-1997 29-08-1997). (2 Months 28 Days)**

8.Academic Visitor, Helsinki University of Technology, Espoo, Helsinki, Finland. Fall, 16-09-2004 11-11-2004. **(1 Month 26 Days)**

9. Adjunct Teacher, Electrical Engineering Dept. of Polytechnic University, Brooklyn, NY, USA. June 2000 to August, 2000**. (3 Months)**

Note: After completion of my PhD at various stages I was offered jobs by few other reputed organizations. I did not take these offers as I had alternative offers. Those unexplored opportunities are the following:

1. Tenure Track Assistant Professor Position in **Dept. of Electrical Engineering, University of Mississippi, Oxford, Mississippi, USA**.

2. I was offered assistant professor position in **Indian Statistical Institute (ISI)**. I was offered that I may join either **ACMU, ECSU, MIU** or **CVPRU** unit of **Computer and Communication Sciences Division** of **ISI, Kolkata head quarter** or new **CS program of ISI, Bangalore Center** or **ISI, New Delhi center.** As I opted for **ISI, Bangalore center** I was given the position in **CS program of ISI, Bangalore** with **Document Research and Training Center (DRTC) unit of Library, Documentation and Information Sciences Division** as initial host unit.

3. Post-doctoral position in **University of Melbourne, Australia.**

4. Post doctoral position in **Free University, Amsterdam, Netherlands.**

5. Post doctoral position **University of California, Riverside, CA, USA**.

6. Short term visitor position in **INRIA, France**.

7. I got interview call from **Dept. of Systems and Computer Engineering, Carleton University, Ottawa, Canada** for an Assistant Professor position, but due to certain VISA rules I could not take the interview.

Education

1. Ph.D. in Electrical Engineering From 01/95 to 07/00 **Polytechnic University, Brooklyn, New York, USA**. Course Work G.P.A. in Graduate career: 3.74/4.00. (Thesis submitted and approved in Aug., 2000, Degree awarded in 2001, **Minor:** Computer Science) (Thesis Supervisor: **Prof. Shivendra Singh Panwar**) (Head of Dept.: **Prof. E. Cassidy**)

Polytechnic University was founded in 1854 and was known as **Polytechnic Institute of Brooklyn** or **"Brooklyn Poly"**. After the merger with **New York University**'s Science and Technology Program it was renamed **Polytechnic Institute of New York**. Later it was again renamed **Polytechnic University**. **Polytechnic University** was made affiliated to **New York University** to become **Polytechnic Institute of New York University**. Now after the completion of merger process in 2014 it is called **New York University Polytechnic School of Engineering**. In 2015 it is renamed NYU Tandon School of Engineering (Polytechnic School)

2. Master of Science (Engineering) in Electrical Communication Engineering From 08/92 to 01/95 **Indian Institute of Science, Bangalore, India**. Course Work G.P.A. 6.67/8.00. (Thesis Supervisor: **Prof. Utpal Mukherji,** Head of Dept.: **Prof. Selvarajan**) (External Examiner: **Prof. Narahari**, Dept. of CSA, IISc, Bangalore. He is the current chairperson of Dept. of CSA, IISc, Bangalore.) (External Examiner for qualifier examination: **Prof. Vinod Sharma**, Dept. of EE, IISc, Bangalore. He served as Chairperson, Dept. of E & ECE, IISc, Bangalore)

Indian Institute of Science was established in 1909. Father of India's Industry J.N.Tata established it based on a discussion aboard a ship with fellow traveler **Swami Vivekananda,** an Indian spiritual leader, philosopher, social reformer and nation builder. In 2011 , IISc was the only Indian university ranked in the top 500 by the Academic Ranking of World Universities, at 301-400 th place overall. IISc managed to maintain its overall ranking through the 2012 and 2013 rankings. In 2013, it ranked 43rd in Chemistry and 51-75 in Computer Science. Also, according Times Higher Education World Reputation Rankings

2011, IISc stood somewhere around 91-100. According to The India Reputation Rankings, Indian Institute of Science (IISc), Bangalore, is in the first position. In 2012, IISc was ranked 35 in the Global Employability Survey and it was the only Indian institution in that list and in 2013 in the same Global Employability Survey it was ranked 23. IISc was ranked 39 in Materials Science, 59 in Chemistry, 50–100 in Engineering/Technology and Computer Science in the QS World University Rankings 2012-2013. it was also ranked 137 in Natural Sciences and 167 in Life Sciences, with no overall ranking.

3. Bachelor of Engineering in Electronics and Telecomm. From 08/88 to 08/92 **Jadavpur University, Kolkata, West Bengal, India. Marks Obtained: 83.68%.** G.P.A.9.60/10.00 (G.P.A. Calculated based on formula provided by Jadavpur University at the bottom of grade cards). (1 st Class, Hons.). (Project Supervisor: **Late Prof. Achintya Mukherjee**) (Head of Dept.: **Late Prof. M. N. Roy**)

J**adavpur University** was initially known as **Bengal Technical Institute** and was established in **1906** by **Society for Promotion of Technical Education in Bengal.** In **1910** this society was amalgamated with **National Council of Education.** After the **independence of India (1947), The Jadavpur University Act, 1955** converted the Institute into **Jadavpur University** and the same was granted full autonomy.

4. Secured 84.6% marks in Higher Secondary Examination, West Bengal, India (1st Division) (12th Standard) (1988) (Awarded a **gold medal** for scoring highest marks in first language Bengali among all candidates taking this examination under West Bengal Higher Secondary Education Council, Overall rank 23rd (approx.) in entire board).(School attended: **Hindu School, Kolkata**, (1986-1988) (Head Master: **Late Dr. Paresh Chandra Chakraborty**)

5. Secured 83.6% marks in Secondary Examination, West Bengal, India (1st Division) (10th Standard) (1986) .(School attended: **Hindu School, Kolkata**, (1976-1986) (Head Master: **Late Dr. Paresh Chandra Chakraborty,**)

Hindu School, Kolkata, was formerly the high school section (*Pathsala*) of **Hindu College, Kolkata (Established in 1817)** whose college section (*Mahapathsala*) was separated and renamed as **Presidency College, Kolkata.**

6. Always class topper in kindergarten school. (School Attended: **Rani Park Kindergarten and Primary School, Near Texmaco Company, Belgharia, West Bengal, India.** (1974-1976) (Head of School: **Mrs. Ivy Dasgupta**)

Academic Honors and performance in competitive situations

1. **Member of Editorial Board**, IETE Technical Review.
2. Awarded **Research Fellowship at Polytechnic University** 2/95-7/00.(During Doctoral studies)
3. Awarded Research Scholarship at **Indian Institute of Science, India** 1992-1994.(During masters studies)
4. Obtained **J.B.N.S.T.S. scholarship from Government of West Bengal**, India, 1988-1992.(During Bachelor's studies)
5. Awarded **N.T.S. scholarship from Government of India**, 1986-1988. (During High School studies)

6. Ranked 2nd and 16th respectively in entire province of West Bengal in high school level (9th and 10th standard) **Science Talent Search** examination organized by **Science Teacher's Association of West Bengal**.
7. Awarded a **gold medal** from **Council of Higher Secondary Education, Govt. of West Bengal, India for securing highest marks in Bengali (First Language)** among all candidates in the entire board in Higher Secondary Examination (12th standard final examination) (marks obtained: 160 / 200)
8. Overall rank **23rd (approx.) in Higher Secondary Examination** in the entire board.
9. Won 1st prize (group) in Quiz Contest program organized by **Calcutta Cine Center** in 8th standard.
10. Qualified for quarter final level in quiz contest program organized by **Calcutta Doordarshan (the regional branch of national television)** in weekly program Harekarakamba (6th and 7th standard).
11. Won 4th rank (group) in Quiz Contest program organized by **Calcutta Cine center** in 7th standard in Calcutta section of National contest.
12. Participated in provincial level quiz contest in 9th standard. (Quiz master: **Neil O'brien**)
13. Won first prize in debate competitions organized by **Calcutta Cine** Center while in 6th standard.
14. Won first prize again in debate competition organized by **Calcutta Doordarshan** (while in 9th standard).
15. Participated in University level debate competition while in Jadavpur University. (Judge: **Asoke Viswanathan and Suhel Seth**).
16. Entered **Hindu School, Kolkata** in 1976 by competitive entrance examination in 1st standard.
17. Also got admission by competitive entrance examination in **Ramakrishna Mission Institution, Narendrapur** in 5th and 7th standard. Although I did not join.
18. Qualified for entrance in B.Sc. (Physics Major) program of Prestigious **Presidency College, Kolkata, India.**
19. Ranked in provincial level Medical school entrance examination and was qualified for entrance in M.B.B.S. Program of Prestigious historical **Medical College, Kolkata which is affiliated to Calcutta (Kolkata) University, India.**
20. Ranked in provincial level engineering school entrance examination and was qualified for entrance in **Bachelor of Engineering Program of Computer Science Department of Jadavpur University and Electronics and Telecommunication Engineering Program of Jadavpur University**. I have joined the later one.
21. Ranked in national level (**IIT-JEE**) engineering / science school entrance examination and was qualified for entrance in Bachelor of Science (Physics Major) program of **Indian Institute of Technology, Kharagpur, India.**
22. Qualified for entrance in prestigious Bachelor of Statistics Program of **Indian Statistical Institute, Kolkata, India.**
23. I got interview call based on my GATE score from prestigious **Master's program in Nuclear Engineering from Indian Institute of Technology, Kanpur.** However, due to conflicting interview schedule I could not take the interview.
24. I was admitted through national level competitive examination in **Joint Astronomy Program** (Known as **JAP** this program offers direct enrolment as Ph.D. student for students with Bachelor of Engineering or equivalent degree) of **Indian Institute of Science, Bangalore, India.**

Doctoral Thesis Summary

1. Dissertation work involves developing a queuing theoretic analytical model for TCP-Reno based on delay differential equations. Our intention was to match the window, throughput and queue evolution curves offered by the model to the same offered by the NS- simulator output. We find that this analytical model provides the basis for a simulator that can be a substitute for the packet based simulators. Some results that relate throughput to buffer and capacity allocation are presented. We have also developed our own prototype of TCP source and router using SIMULINK package of MATLAB based on our own analytical model. The numerical output from this prototype accurately matches the widow and queue evolution data obtained from NS simulator.

2. Early dissertation work also involves designing optimal buffer management policies for a shared memory fast packet switch using sample path methods in control of queues with the objective of minimizing total weighted packet loss. Our work reveals the usefulness of expelling policies over push out class of policies in maintaining the QOS for cells of different priority classes.

Master's Thesis Summary

Designed optimal scheduling policies in a dual bus network to achieve queue length fairness among contending nodes using dynamic programming and sample path methods for discounted cost problem. We have considered zero and non-zero delay case between contending nodes. We have also extended our work for general class of cost functions, for average cost criteria and for general slot wise independent arrival process.

Selected Graduate Course Work

Credit

1. Networks I - Modeling and Analysis. (Queuing Models) (Instructor: **Prof. Robert Boorstyn**, Polytechnic University, Brooklyn, NY, USA) (Grade: 4/4)
2. Broadband packet Switching. (SONET/ ATM/ Switch structures/ Buffer Management/ Bandwidth scheduling/ Admission control.) (Instructor: **Prof. H.J.Chao**, Polytechnic University, Brooklyn, NY, USA) (Grade: 4/4)
3. Computer Architecture (Instructor: **Prof. Haldun Hadimioglu**, Polytechnic University, Brooklyn, NY, USA) (Grade: 2/4)
4. Introduction to Local Area Networks. (TCP, IP, OSPF, BGP, RIP, SNMP, FTP etc.) (Instructor: **Prof. Shivendra S. Panwar**, Polytechnic University, Brooklyn, NY, USA) (Grade: 4/4)
5. Design and Analysis of Algorithms I. (Instructor: **Prof. Jeneat Schimdt**, Polytechnic University, Brooklyn, NY, USA) (Grade: 3/4)
6. Design and Analysis of Algorithms II (Instructor: **Prof. Boris Aronov**, Polytechnic University, Brooklyn, NY, USA) (Grade 4/4)
7. Learning Automata and Neural Networks (Instructor: **Prof. M.A.L.Thatachar**, Indian Institute of Science, Bangalore, India) (Grade 7/8)
8. Networks II - Design Techniques.(Capacity allocation, Flow allocation, Network optimization) (Instructor: **Prof. Robert Boorstyn**, Polytechnic University, Brooklyn, NY, USA) (Grade: 3/4)
9. Stochastic Process and Queuing Theory **(**Instructor: **Prof. Anurag Kumar**, Indian Institute of Science, Bangalore, India) (Grade: 6/8)
10. Advanced Mathematical Methods in Networks (Markov Decision Process) (Instructor: **Prof. Leandros Tassiulas**, Polytechnic University, Brooklyn, NY, USA) (Grade: 4/4)

11. Random Processes (Instructor: **Prof. G.V.Anand**, Indian Institute of Science, Bangalore, India.) (Grade: 7/8)
12. Principles of Feedback Control Systems (Instructor: **Prof. Farshad Khorrami**, Polytechnic University, Brooklyn, NY, USA) (Grade: 3/4)
13. Linear and Non-linear Optimization (Instructor: **Professor Vivek Borkar**, Indian Institute of Science, Bangalore, India) (Grade: 6/8)
14. System Optimization Methods (Instructor: **Professor Philip Sarachik**, Polytechnic University, Brooklyn, NY, USA) (Grade: 4/4)
15. Real Analysis (Instructor: **Professor Renuka Ravindran**, Indian Institute of Science, Bangalore, India) (Grade: 7/8)
16. Signal, system and transform (Instructor: **Professor S. P. Kim**, Polytechnic University, Brooklyn, NY, USA) (Grade: 4/4)
17. Probability Theory (Instructor: **Professor Shalom Bergstein**, Polytechnic University, Brooklyn, NY, USA) (Grade: 4/4)
18. Linear systems theory (Instructor: **Professor X.K.Chen**, Polytechnic University, Brooklyn, NY, USA) (Grade: 4/4)
19. Communication Networks (Instructor: **Professor Vinod Sharma** and **Prof. Anurag Kumar**, Indian Institute of Science, Bangalore, India.) (Grade: 7/8)
20. Selected Topics in Communication Networks (Instructor: **Professor Robert Boorstyn**, Polytechnic University, Brooklyn, NY, USA) (Grade: 4/4)

Audit / Studied Material

21. Switching (Instructor: **Prof. Utpal Mukherji**, Indian Institute of Science, Bangalore, India.)
22. Performance Evaluation of Computer Systems (Instructor: **Prof. N.Vishwanadham** and **Prof. Mathew Jacob,** Indian Institute of Science, Bangalore, India.)
23. Non-Linear Optimization (Instructor: **Prof. S. Sathiya Keerthi,** Indian Institute of Science, Bangalore, India.)
24. Applied Stochastic Process (Instructor: **Prof. S.U. Pillai**, Polytechnic University)

Corporate Training

1. Introductory level training in **Opnet.com, Washington, D.C., USA** about Opnet modeling software which is capable of modeling and collecting statistics of any phenomena of interest in communication networks. (2000). Selected and funded by employer Comverse Network Systems.

2. Basic level training about hammer call generator in **Empirix.com, Wilmington, MA, USA.** (2001). Selected and funded by employer Comverse Network Systems.

Academic Training

1. Summer training in **Microprocessor Application Lab,** IISc, Bangalore, India. (1991) under a program of **Center for Theoretical Studies, Indian Institute of Science, Bangalore,** India. (Supervisor: **Dr. J. Mohan Kumar.** Head of Host Lab: **Prof. L. M. Patnaik,** Head of Program: **Prof. Pasupathy**) Project: Studies on Kohonen Self-organizing feature map.

2. Summer School on Astronomy and Astrophysics offered by **Inter University Center for Astronomy and Astrophysics and National Center for Radio Astronomy, Pune**

Maharashtra, India. (1992) Project: Walsh Functions. Head of Program: **Prof. Sanjeev Dhurandhar**.

3. **JTG Summer School in IIT, Bombay. Mumbai, Maharashtra, India**. Attended Lectures by **Prof. Bruce Hajek of UIUC** and **Prof. Radhakrishnan of TIFR, Bombay.**

4. **Attended NMI workshops on Game theory and optimization in ISI Delhi and IIT, Ropar**

Other teaching, Project writing and other professional Experience

1. **Adjunct Teacher** in **Polytechnic University, Brooklyn, NY, USA** for the undergraduate course in ``Principles of Communication systems'', summer 2000.

2. **Grader and Teaching Assistant, Polytechnic University, Brooklyn, NY.** Graded graduate level courses on Networking. 8/98 to 7/99 (Worked for **Prof. Tushar Bhattacharjee.** Professor Bhattacharjee was an adjunct professor and he worked for AT&T, Middletown, New Jersy, USA)

3. Prepared a research proposal with my research supervisor on TCP modeling while working for my doctoral thesis in **Polytechnic University, Brooklyn, NY, U.S.A**. The proposal was submitted to **National Science Foundation, U.S.A** and was funded.

4. Initially served as **Co-PI** and then as **Principal investigator** for a project on **Optical packet switching.** Funding Agency**: Ministry of human resource development, Government of India**. Amount: 13, 00, 000 Indian Rupees. Status: **Completed**.

5. **Principal investigator** for a project on **Control and algorithmic techniques in communication networks**. Funding agency**: IIT, Kharagpur.** Amount: 1,50,000 Indian Rupees.Status: **Completed**.

6. A sponsored project on "**Green Radio"** from **Vodafone, India** is procured. Total fund money is: 3, 10, 00, 000 INR. Served as co-PI. Status**: Completed**..

7. PI for a project on **"Energy Efficient Routing" (1 lakh) funded by KCSTC / ISRO**. Status**: Completed**.

8. In the process of negotiation with a leading publishing house about a graduate level text book on Probability, Random Processes. Status: **Work in Progress**.

9. **Professional service in technical Journals and Conference**s

   (a) Member, Editorial Board, **IETE Technical Review**.
   (b) TPC member **ATNAC INFOCOM NCC ICDCN, AIMOC ICDCN 2014 (session chair), IEEE ANTS, ISWPC, ISWPC, ICTC 2014, Comsnet, Globecom.**

(c) Organized an international workshop in IIT, Kharagpur about optical transmission and networking systems.

(d) **Reviewed papers** for Advances in Multimedia, **IEEE** Transactions on Automation Science and Engineering, **IEEE** Transactions on Information theory, **IEEE** Communications Letters, **IEEE/ACM** Transactions on Networking, **IEEE** Transactions on parallel and distributed systems, **IEEE** Transactions on Computers, **IEEE** Transactions on Software Engineering, **IEEE** Transactions on Wireless Communication, Performance Evaluation Journal (**Elsevier**), Indian Institute of Science Journal, **Elsevier's** Computer Communication Journal, **Actapress** International Journal of Computers and Applications, Pervasive and Mobile Computing Journal (**Elsevier**), **IEEE** Wireless Communication Magazine, GLOBECOM, INFOCOM, ICC, WCNC, Comsware, National Communication Conference of India and National Systems Conference of India, IMSAA, 2007 and ICDCN, 2008, Infocom 2010, Infocom –work-in-progress 2010.

9. Administrative Work for Dept of E & ECE and GSSST, IIT, Kharagpur:

(a) **Served as acting Head of GSSST for two weeks (approx.).**

(b) **Faculty advisor and course planner** for freshman, sophomore, junior, senior, and dual degree (M.Tech.) students.

(c) **Member of implementation committee** for Govt. of India funded networking laboratory for undergraduate and post-graduate students.

(d) **Member of technical advisory committee** (at the incubation stage) for SAV Networks a start-up company incubated by IIT, Kharagpur which was housed at Dept. of E & ECE.

(e) **Member of training and placement program** for undergraduate students.

(f) **Tabulator for MS program** students personal data file.

(g) **Member of Departmental committee for mathematics education for undergraduate students in engineering**.

(h) Member **of ragging prevention committee** in the IIT, Kharagpur campus.

(i) **Served as Govt. representative and invigilator** for major competitive nation wide academic examinations **like IIT-JEE and GATE**.

(j) **Member of museum committee**, IIT, KGP.

(k) **Member of departmental library committee**.

(l) Mentor of eight Undergraduate students of IIT, Kharagpur as a participant of student mentoring program of IIT, Kharagpur.

(m) Member of **Post Graduate Education Committee**, Dept. of E & ECE, IIT, KGP.

(n) Member of **Executive core committee** of Vodafone-Essar funded telecomm center of excellence in IIT, Kharagpur.
(o) **Member of a committee for short listing of assistant professors applicants**.
(p) **Co-ordinator of TSE M.tech and PhD** program.
(q) Member, Departmental administrative Committee.
(r) **Professor-in-charge Communication systems lab and Digital Communication lab.**

10. Employer approved Academic Visits Abroad while serving IIT, Kharagpur:

(a) Attended and presented paper in ICPP workshops, 2004 in Montreal, Canada.
(b) Attended and presented paper in ATNAC, 2007 Conference in Christchurch, New Zealand in December, 2007.
(c) Attended and presented three papers in 4th Nordic Workshop on system and network optimization for Wireless SNOW, 2013 in Yllas, Finland.
(d) I was funded to attend ICC, 2013, Budapest Hungary also but due to flood like situation in Budapest could not go there.

Talks

1. Short presentation on "Evolution of trust and emergence of preference clusters in distributed networked structure" **JTG summer school, Indian Institute of Technology, Bombay, India. June 2012. (No. of people: 150)**

2. **Invited Seminar on "Current research trends in wireless networking and our contribution" Bengal Engineering and Science University, 2013. (VC: Prof. A. K. Roy) (No. of people: 50)**

3. Talk on "Computer Communication Networks: Teaching, Research Methodology and modern Lab and Curriculum Development" **Birbhum Institute of Engineering and Technology, Suri, Birbhum, West Bengal., West Bengal University of Technology, India**. (Chairman: **Late Prof. Ramaranjan Mukherji**.) (Spring, 2010) (No. of people: 300)

4. Talk on "Buffer Management and other control issues in Networks" **National Institute of Technology, Durgapur, West Bengal, India.** (Director of Institute: **Prof. Swapan Bhattacharya**) (Spring, 2008) (Number of people: 150)

5. Talk on "Some new approaches in lifetime maximization of wireless sensor networks" in **Indian Institute of Technology, Kanpur, Uttar Pradesh, India.** (Autumn, 2007) (Host: **Professor Manindra Agrawal**, Dept. of Computer Science and Engineering, IIT, Kanpur, Uttar Pradesh, India.) (No. of people: 60)

6. Talk on "Applications of MDP in Communication Network Problems" in Dept. of E & ECE, **Indian Institute of Technology, Kharagpur, West Bengal, India.** (Autumn, 2005) (Host: **Professor Jaideva Goswami,** Former Professor, Dept. of E & ECE, IIT, Kharagpur) (No. of people: 50)

7. Talk on "Buffer Management in Communication Networks" in **Indian Statistical Institute, Kolkata, West Bengal, India.** (Spring, 2002) (No. of people: 20)

8. Talk on "Analytical Fluid Model for TCP" in **Qualcomm Inc., San Diago, California, USA**. (Spring, 2001) (No. of people: 20)

9. Talk on "Analytical Fluid Model for TCP" in **NEC Laboratories, Princeton, New Jersy, USA** (Spring, 2001) (Head of host Division: **Dr. Stephen Weinstein**) (No. of people: 20)

10. Talk on "Quality of Service Models in IP and ATM Networks" **University of Missisippi., Mississippi, USA** (Summer, 2000) (Host: **Professor John Daigle**) (No. of attendees: 30)

11. Talk on "Expelling and Pushout policies for buffer management in shared memory switch with multiple priority traffic" in **Alcatel Development center, San Francisco, California, USA.** (Spring, 2000) (No. of attendees: 40)

12. Talk on "Quality of Service Models in IP and ATM Networks" **Tellabs Inc., Mishwaka, Indiana, USA** (Spring, 2000) (**Host: John Kenny**) (No. of persons attended: 30)

Publications

Papers (Documented by research area) (Already Accepted / Published)

Journal

A. **Sensor Networks**

1. Kumar Padmanabh and **Rajarshi Roy,** "Transmission Range and Density Gradient management for Lifetime Maximization in Wireless Sensor Network", Vol. 4, No. 1, pp. 70-89, 2010. ***International Journal of Communication Networks and Distributed Systems,*** Inderscience Publisher, DOI: 10.1504/IJCNDS.2010.029738) **(Impact factor: 0.15)**

B. Wireless Networks

2. Kataria P, **Roy R**. "Parallel Glauber Dynamics based scheduling in static wireless grid networks with polynomially fading interference". ***IET Electronic Letters*** 2015;51(23):1948-1950

3. Rigil Salim and **Rajarshi Roy**, "Network Coding-aware Lifetime Maximal routing in Multi-hop Static Wireless Ad-hoc Networks" ***JOURNAL OF COMMUNICATIONS SOFTWARE AND SYSTEMS***, VOL. 10, NO. 1, pp. 1-13, MARCH 2014. (Impact factor: 0.15)

4. Anindya Nag and **Rajarshi Roy, "**A REVIEW OF ENERGY OPTIMAL TOPOLOGY CONTROL FOR LARGE WIRELESS NETWORK USING YAO-GRAPH AND ITS VARIANTS", ***INTERNATIONAL JOURNAL ON SMART SENSING AND INTELLIGENT SYSTEMS*** VOL. 7, NO. 2, pp. 740-761, June 2014

5. Tamaghna Acharya and **Rajarshi Roy, "**Efficient Routing in Ad Hoc Network using Multiple Disjoint Energy Aware Minimum Connected Dominating Sets" Published in Journal *Foundations of Computing and Decision Science***s**, vol. 35, no. 3, pp. 145-170**,** 2010. **Publisher: Poznan University of Technology, Poland. (Impact factor: 0.514)**

6. Tamaghna Acharya, Samiran Chattopadhyay and **Rajarshi Roy** "Maximum lifetime broadcasting in cooperative multi-hop wireless ad hoc networks", ***International Journal of Ad Hoc and Ubiquitous computing*, IJAHUC Journal,** Vol. 6, No. 1, pp. 10-23, 2010. **Inderscience Publisher**. **(Impact factor: 0.511 (2012), 0.848 (2011), 0.435 (2010), 0.865 (2009) DOI:** 10.1504/IJAHUC.2010.033822

7. Tamaghna Acharya, Samiran Chattopadhyay and **Rajarshi Roy**, "Constructing Path Efficient And Energy Aware Virtual Multicast Backbones in Static Ad Hoc Wireless Networks" *International Journal of Wireless & Mobile Networks (IJWMN) (AIRCC SERIES)* [ISSN: 0975-3834 (Online); 0975-4679 (Print)], Vol. 2, No. 2, pp. 134-150, May, 2010.

8. **Rajarshi Roy**, Mukesh Kumar, Navin K. Sharma and Shamik Sural, "Bottom-up Construction of Bluetooth Topology under a Traffic-aware Scheduling Scheme" In *IEEE transactions of Mobile Computing*: Vol. 6, Issue 1, pp. 72-86, 2007. **(Impact factor:** 3.352 (2008), 1.716 (2007); 2.395 (2013), Eigen factor: 0.01424 (2013), Article Influence Score: 1.406 (2013))**; Top 10 journals in Information systems and Telecommunications, 3rd most cited journal among all IEEE computer society journals)**

9. Shamik Sural, Mukesh Kumar, Navin K. Sharma and **Rajarshi Roy**, "A Power aware master and bridge scheduling scheme for Bluetooth scatternets", In *International Journal of Ad Hoc and Ubiquitous computing*, Inderscience Publishers, Vol. 2, Number 1-2, 2007, pp. 119-132**. (Impact factor: 0.511 (2012), 0.848 (2011), 0.435 (2010), 0.865 (2009))**

10. **Rajarshi Roy**, Mukesh Kumar, Navin K. Sharma and Shamik Sural, "A self-organizing protocol for bluetooth scatternet formation", Published in *European Transaction of Telecommunication*: Special issue on Self-organization in Mobile Networking, ETT Vol: 16, No: 5, pp. 483-493, September-October, 2005. **(0.415, 2002 0.448 (2013)impact factor; article influence index: 0.87283 at 2007), Wiley.**

C. Bio-inspired Algorithm in Optimization of large networks and optical networks with or without physical impairment

11. Urmila Bhanja, **Rajarshi Roy** and Sudipta Mahapatra, "An Evolutionary Programming Algorithm for finding constrained optimal disjoint paths for Multihop Communication Networks," Published in **International journal of Metaheuristics, Vol. 1, No. 2, pp. 132-155, 2010. Inderscience Publisher. ISSN (Online): 1755-2184 ISSN (Print): 1755-2176,** DOI: 10.1504/IJMHEUR.2010.034203

12. Urmila Bhanja, Sudipta Mahapatra and **Rajarshi Roy**, "A novel solution to the dynamic routing and wavelength assignment problem in transparent optical network," **International journal of computer networks and communication, IJCNC, Vol. 2, No. 2, March, 2010, pp. 119-130. DOI: 10.5121/ijcnc.2010.2209, AIRCC Series. (ERA level C journal)**

13. Urmila Bhanja, Sudipta Mahapatra and **Rajarshi Roy,** "FWM-aware Evolutionary Programming Algorithm for Transparent Optical Networks"

Photonic Network Communication, Springer, Vol. 23, pp. 285-299, 2012.. DOI: **10.1007/s11107-011-0359-2 (2010 Impact factor: 0.448)**

14. Urmila Bhanja, Sudipta Mahapatra and **Rajarshi Roy**, "An Evolutionary Programming Algorithm For Survivable Routing And Wavelength Assignment In Transparent Optical Networks," it will appear **Vol. 222, Feb., 2013, pp. 634-647. in Information Sciences**, **Elsevier. (Impact factor 3.646) http://dx.doi.org/10.1016/j.ins.2012.08.021**

15. Urmila Bhanja, Sudipta Mahapatra and **Rajarshi Roy, "**QoT aware evolutionary programming algorithm for transparent optical networks" ***in Optik - International Journal for Light and Electron Optics***, vol. 124, issu 23, pp. 6391-6399, Dec., 2013, Elsevier. DOI: 10.1016/j.ijleo.2013.05.060 (Impact factor: 0.524, 5 year impact factor: 0.519) ISSN: 0030-4026

D. Buffer Management

16. **Rajarshi Roy** and S. S. Panwar "Buffer Sharing in Shared Memory ATM Systems With Space Priority traffic", in *IEEE Communications Letters*, Vol. 6, No. 4, April, 2002, pp. 162-164**. (Impact factor: 1.16 (2012), Eigen factor: 0.01709, Article influence score: 0.549)**

17. Kumar Padmanabh and **Rajarshi Roy** "Expelling Policy Based Buffer Control during congestion in Differentiated Service Routers" in *International Journal of Information Technology*, **Vol. 4, pp.76-85** (2007) The publisher later discontinued that journal and re-archived this paper on their own in "World Academy of Science, Engineering and Technology", Issue 48, December 2008, pp. 615-624.

E. Physical Layer and link layer Issues in Wireless Communication

18. S.S.Chakraborty, **R.Roy** and S.De, "ARQ-based switched antenna diversity in Markov channels," *IET Electronics Letters*, vol. 44, no. 25, pp. 1475--1476, Dec. 2008. **(Impact factor: 1.14 (2008) 0.97(2009) 0.965 (2011) 1.038(2012)**

19. Soumendra Nath Datta, Saswat Chakrabarti and **Rajarshi Roy**, ``A comprehensive error performance analysis of distributed selection combining with multi- antenna amplify-and-forward relay over Nakagami-m fading channels", *IET Electronics Letters*, vol. 46, no. 22, pp. 1523 – 1525, 28th October, 2010. **(Impact factor: 1.14 (2008) 0.97(2009) 0.965 (2011) 1.038(2012)**

20. Soumendra Nath Datta, Saswat Chakrabarti and **Rajarshi Roy, "**Comprehensive Error Analysis of Multi-antenna Decode-and-Forward Relay in Fading Channels", ***IEEE Communication Letters***.Vol. 16, No. 1, January, 2012, pp. 47-49. (**Impact factor**: 1.16)

21. S.N.Datta, R. Gangopadhyay, Saswat Chakraborti and **Rajarshi Roy**," Performance Analysis of Relay-Assisted Cooperative Systems in Correlated Fading Channels**"** ***Wireless Personal Communication, (*****78 (2), 1441-1454*****) Impact Factor: 0.979 (2013).**

22. Swaminathan R., M. D. Selvaraj, and **Rajarshi Roy**, "Exact Error Analysis of MPAM Signaling for a Cooperative Diversity System with Correlated Links Using Paired Error Approach". Vol. 18, Issue 2, pp. 273-276, 2014***. IEEE Communication letters***. (Impact factor: 1.16 (2012), Eigen factor: 0.01709, Article influence score: 0.549)

23. Swaminathan R., M.D. Selvaraj, and **Rajarshi Roy**, "On the Error and Outage Performance of Decode and Forward Cooperative Selection Diversity System with Correlated Links", ***IEEE transactions on Vehicular Technology***, 64(8): 3578-3593 (2015) DOI: 10.1109/TVT.2014.2356479 **2.642** Impact Factor **0.03382 Eigenfactor 0.941 Article Influence Score**

24. Swaminathan, R, Karagiannidis, G., and Rajarshi Roy, "Joint Antenna and Relay Selection Strategies for Decode-and-Forward Relay Networks" IEEE TRANSACTIONS ON VEHICULAR TECHNOLOGY, Issue 99, (IEEE explore early access) **2.642** Impact Factor **0.03382 Eigenfactor 0.941 Article Influence Score DOI:** 10.1109/TVT.2016.2515265

25. Swaminathan, R., Rajarshi Roy, and M.D. Selvaraj, "Performance Comparison of Selection Combining with Full CSI and Switch-and-Examine Combining with and without Post-Selection" IEEE TRANSACTIONS ON VEHICULAR TECHNOLOGY, Issue 99, (IEEE explore early access) **2.642** Impact Factor **0.03382 Eigenfactor 0.941 Article Influence Score DOI:** 10.1109/TVT.2015.2434836

F. Traffic Engineering

26.C. S. Krishnadas and **Rajarshi Roy**, "Quality of Experience (QoE) assurance by a Multi-path balanced traffic-splitting algorithm in MPLS networks" *Annales UMCS, Sectio AI (Informatica)*, , vol. 9, no. 1, pp. 165-177, 2009, Online date: Monday, January 24, 2011. DOI: 10.2478/v10065-009-0013-0 Owner: Maria Curie-Sklodowska University, Lublin, Poland. Publisher: Versita , Warsaw, Poland. ISSN: 1732-1360 (Print Version)

27. Chinmay Chakraborty, S.S. Pathak, **Rajarshi Roy** and Saswat Chakrabarti, "An Optimal Probabilistic Traffic Engineering Scheme for Heterogeneous Networks" DOI: FS022011003, Issue: February 2011. ***CiiT International Journal of Fuzzy Systems*****.** Print: ISSN 0974 – 9721 & Online: ISSN 0974 – 9608.

G. Cyber psychology, virtual communities, Blogging Behavior

28. Purnendu Karmakar and **Rajarshi Roy,** "Evolution of Trust and Formation of Preference Clusters in Distributed Networked Structure" ***International Journal of Virtual Communities and Social Networks, IGI-GLOBAL Publication.*** Vol. 3, No. 2, April-June, 2011, pp. 17-50.

Conference

A. Sensor Networks

1. Kumar Padmanabh, Puneet Gupta and **Rajarshi Roy,** "Transmission Range Management for Lifetime Maximization in Wireless Sensor Network" Appeared in *the proceedings of 2008 International Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS-2008),* Edinburgh, UK, June 16-18, 2008.

2. Tamaghna Acharya, Samiran Chatterjee and **Rajarshi Roy**, "Energy-Aware Virtual Backbone Tree for Efficient Routing in Wireless Sensor Networks", Accepted for publication in *ICNS*, June 19-25, 2007, Athens, Greece (Acceptance rate: 32%)

3. Kumar Padmanabh and **Rajarshi Roy**, "Maximum Lifetime Routing in Wireless Sensor networks minimizing various chemical limitations of the sensor battery" Appeared in the proceedings of *IEEE CCNC*, Jan., 2007, Las Vegas, NV, USA, pp. 525-529. (Acceptance rate: 30%)

4. Kumar Padmanabh and **Rajarshi Roy**, "Maximum Lifetime Routing in Wireless Sensor Network by minimizing Rate Capacity Effect" In *International Workshop on Wireless and Sensor Networks*, August 14th, 2006, pp. 165-174. To be held in Conjunction with *The 2006 35th International Conference on Parallel Processing, ICPP 2006*, August 14th-18th, Columbus, Ohio, USA.

5. Kumar Padmanabh and **Rajarshi Roy**, "Bottleneck around base station in wireless sensor network and its solution" Accepted for publication in *First International Workshop on Advances in Sensor Networks*, July 17th, 2006, San Jose, California, USA. (To be held in Conjunction With *3rd International conference on Mobile and Ubiquitous Systems: Networks and Services (Mobiquitous 2006)*, July 17th-21st, 2006 San Jose, California, USA pp. 1-5. ln Cooperation with ACM SIGMOBILE Co-Sponsored by IEEE Computer Society and the EU (IST-FET).

6. Kumar Padmanabh and **Rajarshi Roy**, "Multi-commodity flow based maximum lifetime routing in wireless sensor networks" In the proceedings of the *twelfth international conference on parallel and distributed systems* to be held on July 12-15, 2006, Minneapolis, Minnesota, USA (*ICPADS 2006*, Vol.1, pp. 187-194). (Acceptance rate: 38%)

7. Kumar Padmanabh and **Rajarshi Roy**, "Doughnut Effect in Wireless sensor Networks and its solution" Accepted for publication in *First International workshop on Wireless Adhoc and Sensor Networks (IWWAN 2006)*, New York City, USA, June 28-30, 2006. (Sponsored by IEEE Comsoc, Bell Labs Lucent, France Telecom.) (It also appears in the proceedings of *IEEE SECON, 2006, (3rd Annual IEEE Communications Society conference on Sensor and Ad hoc communications and Networks)* Vol. 3, pp. 957-963) (Acceptance rate: 26%)

8. Kumar Padmanabh and **Rajarshi Roy**, "Maximum Lifetime Routing in wireless sensor network using realistic battery model" In *IEEE International workshop on high performance switching and routing, HPSR 2006*, June 7-9, 2006, pp. 155-160, Poznan, Poland. (Acceptance rate: 53.5%)

9. Kumar Padmanabh and **Rajarshi Roy**, "Multicommodity flow based routing in wireless sensor networks with lifetime latency trade off" Appeared in *IEEE/ACM First Comsware*, 8-12 Jan, 2006, pp. 1-10, New Delhi, India. (Acceptance rate: 32.8%)

10. Kumar Padmanabh and **Rajarshi Roy**: "A Max-Min Algorithm for Energy Efficient Routing in Wireless Sensor Networks using charge recovery effect of realistic battery model" Appeared in the proceedings of *IEEE international*

conference on next generation wireless systems, Dhaka, Bangladesh, pp. 62-66, Jan 2-4, 2006.

B. Wireless Ad hoc networks

11. Tamaghna Acharya, **Rajarshi Roy** and Samiran Chattopadhyay, "Energy Efficient Broadcasting in Wireless ad-hoc Networks using directional antennas" Appeared in *the proceedings of IEEE VTC Spring 2008*, Marina Bay, Singapore, 11-14th May, 2008.

12. Tamaghna Acharya, Samiran Chattopadhyay and **Rajarshi Roy**, "Multiple Disjoint Power aware minimum connected dominating sets for efficient routing in wireless ad hoc networks", *International Conference on Information and Communication Technology*, 7 - 9 th March, 2007 *(ICICT, 2007)*, Dhaka, Bangladesh, pp. 336-340.

13. Tamaghna Acharya and **Rajarshi Roy**: "Distributed Algorithm for power aware minimum connected dominating set for routing in wireless ad hoc networks" Appeared in *ICPP 2005 workshop on wireless and sensor networks*, Oslo, Norway, pp. 387-394.

14. V. Bhatia, S. Chakrabarti and **Rajarshi Roy**, "Performance of Max Min zPmin Online Routing Algorithm Under Different Deployment Scenarios", Proc. of All India Seminar on Emerging Trends in Wireless Communications, Institute of Engineers, Kolkata, 11- 12, Mar 2006

15. **Rajarshi Roy**, Mukesh Kumar, Navin K. Sharma, Shamik Sural: Dynamic Topology Construction in Bluetooth Scatternets. *HiPC 2004*: 30-39, Bangalore, India. Also appeared in *Springer Verlag Lecture Notes in Computer Science (LNCS 3296) (acceptance rate: 22.4%)*

16 **Rajarshi Roy**, Mukesh Kumar, Navin K. Sharma, Shamik Sural: P3 - A Power-Aware Polling Scheme with Priority for Bluetooth. *ICPP Workshop, 2004*, pp. 480-487, Montreal, Canada.

17.Navin. Sharma, Shamik. Sural and **Rajarshi Roy**, "A Buffer occupancy optimizing scheduling algorithm for Bluetooth Ad-hoc networks" Accepted for publication in *International conference on communication, devices and intelligent systems, (CODIS)*, Calcutta, January, 2004.

18.Rajarshi Roy, Navin Sharma and Shamik Sural, "A Flow based Scheduling algorithm for bluetooth adhoc networks", Accepted for publication in *Sixth International Conference On Information Technology (CIT-2003)* Bhubaneswar, India December 22-25, 2003

C. Radio Over Fiber

19.Ashish Ramkrishna Sontakke and **Rajarshi Roy**, "Optimization issues in design of Radio over fiber Networks for vast rural area: initial results" Appeared in the proceedings of in *Australian Telecommunication Networks and Applications Conference*, held in Christchurch, New Zealand on 2nd-5th December, 2007. (*ATNAC, 2007*), pp. 104-108.

D. Bio-inspired algorithms for large network optimization and design

20.Urmila Bhanja, Sudipta Mahapatra and **Rajarshi Roy,** "An Evolutionary Programming Algorithm for the RWA problem in survivable optical networks," In the proceedings of CERA, 2009, 19th Feb., 2010 to 21st Feb., 2010, IIT Roorkee, Roorkee, Uttarakhand, India.

21.Urmila Bhanja and **Rajarshi Roy**, "'Impairment Aware Evolutionary Programming Algorithm for Transparent Optical Networks'" In proceedings of 2011 International Conference on Business, Engineering and Industrial Applications (ICBEIA2011), Kualalampur, Malayasia, June, 2011.

E. Buffer Management

22. Kumar Padmanabh and **Rajarshi Roy**, "Cost sensitive Pushout and expelling policies for differentiated service router driven by versatile traffic" In the proceedings of *5th International Conference on Networking ICN*, April, 23-26, 2006, pp. 56-61, Mauritius. (Acceptance rate: 40%)

23. Kumar Padmanabh and **Rajarshi Roy**, "Cost Sensitive pushout policy for the buffer management in versatile traffic switch", *IEEE Indicon*, 2005, 11-13 Dec., 2005, Chennai, India, pp. 404-407.

24. Kumar Padmanabh and **Rajarshi Roy**: Expelling Policies for shared memory fast packet switches with variable length packets of multiple space priorities. Appeared in *2005 IEEE workshop on high performance switching and routing*, Hong Kong, P.R. China, May 12-14, 2005, pp. 332-335. (Acceptance rate: 49.5%)

25. **Rajarshi Roy** and S. S.Panwar, ``Efficient Buffer Sharing in Shared Memory ATM Systems with Space Priority Traffic", *In proceedings of the 33rd Annual Conference on Information Sciences and Systems*, March, 1999, Johns Hopkins University, Baltimore, Maryland, USA.

26. **Rajarshi Roy** and S. S. Panwar, ``Optimal Space Priority Policies for Shared Memory ATM Systems," *In proceedings of the 35th Annual Allerton Conference on Communication, Control and Computing*,September-October, 1997, University of Illinois at Urbana-Champaign, Illinois, USA.

F. TCP Analysis

27. **Rajarshi Roy**, M.C.Raghuraman and S. S. Panwar ``Analysis of TCP Congestion Control Using a Fluid Model", Appeared in *International Communications Conference of IEEE, 2001, (ICC, 2001*, pp. 2396- 2403), Helsinki, Finland. (Acceptance rate: 54.8%)

28. **Rajarshi Roy** and S. S. Panwar, ``An analytical Fluid model for TCP" Appeared in *Networld/Interop Conference*, May, 2000, Las Vegas, Nevada, USA.

G. Scheduling

29. Avijit Chakroborty, **Rajarshi Roy**, R. R. Pillai and U. Mukherji, "Optimal Scheduling for balancing queue lengths", *International conference on stochastic optimization and*

adaptation, December 19-22, 2000, organized by *IEEE and Department of Mathematics, Cochin University of Science and Technology,* Cochin, Kerala, India.

30. Avijit. Chakraborty, **Rajarshi Roy** and Utpal Mukherji, "Delay Differentiation by optimal-balancing-of-queue-lengths scheduling", Appeared in *IEEE Region 10 Conference on Convergent Technologies for the Asia-Pacific (IEEE TENCON)*, October, 2003, pp. 1219-1223, Bangalore, India.

H. Physical layer issues in wireless communication

31. Soumendra Nath Datta, Saswat Chakrabarti and **Rajarshi Roy**, "Closed-form error analysis of noncoherent FSK for dual hop relay network in Nakagami-m fading channel," in *Proc. NCC*, IIT Chennai, pp. 1-5, Jan 2010.

32. Soumendra Nath Datta, Saswat Chakrabarti and **Rajarshi Roy**, "Error analysis of noncoherent FSK with variable gain relaying in dual-hop Nakagami-m relay fading channel," in *Proc. SPCOM*, IISc Bangalore, 18-21 July, 2010, pp. 1-5, DOI: 10.1109/SPCOM.2010.5560477.

33. Soumendra Nath Datta, Saswat Chakrabarti and **Rajarshi Roy**, "Performance analysis of square M-QAM with dual-hop relay link in Nakagami-m fading channel," in *Proc. SPCOM*, IISc, Bangalore, 18-21 July, 2010, pp. 1-5, DOI: 10.1109/SPCOM.2010.5560493

.

34. Soumendra Nath Datta, Saswat Chakrabarti and **Rajarshi Roy,** "Performance Analysis of Distributed Selection Combining with Dual-Hop Relay Link in Rayleigh Fading Channel," in *IEEE ICCS 2010*, Singapore. pp. 361-365, **Digital Object Identifier:** 10.1109/ICCS.2010.5686477

35. Swaminathan R., M.D.Selvaraj and Rajarshi Roy, "Error Analysis of NC-BFSK for Cooperative Diversity with Correlated Links" in proceedings of 4th Nordic Workshop on system and network optimization for wireless, April 2-6, 2013, Hotel Akashoteli, Yllas, Lapland, Finland. (Poster)

36. Swaminathan R., M.D.Selvaraj and Rajarshi Roy, "Performance analysis of triple correlated selection combining for cooperative diversity systems". IEEE Comsoc ICC 2013: 5483-5488, Budapest, Hungary. (Acceptance rate: 39.1%, 948 out of 2422 papers)

37. Swaminathan Ramabadran, M.D.Selvaraj, and Rajarshi Roy, "Performance Analysis of Double Correlated Selection Combining for Cooperative Diversity Systems" in Proceedings of 19th National Communication Conference of India, 2013 (NCC-2013) held in IIT, New Delhi, 15-17 Feb, 2013.

I. Cognitive Radio

38. Soumya Maulik, **Rajarshi Roy**, Arijit De, Amitabha Bhattacharya, "Online dynamic Resource allocation in interference temperature constrained cognitive radio network using reinforcement learning" SPCOM, July-2012, Bangalore, India.

39. Soumya Maulik, Arijit De, Amitabha Bhattacharya , and Rajarshi Roy, "Dynamic Resource Allocation in SINR Constrained Cognitive Radio Network with Imperfect Channel States" In proceedings of 4th Nordic Workshop on system and network optimization for wireless, April 2-6, 2013, Hotel Akashoteli, Yllas, Lapland, Finland.

J. **Green Systems**

40. Purnendu Karmakar, Ratnam Varada Rajakumar, and Rajarshi Roy, "Energy Efficient Cell Planning Using Centroidal Voronoi Diagram" In proceedings of 4th Nordic Workshop on system and network optimization for wireless, April 2-6, 2013, Hotel Akashoteli, Yllas, Lapland, Finland. (poster)
41. Chittaranjan Debata, Rajarshi Roy, "Efficacy of Power of Two Choices technique for Data Evacuation process in sensor networks for post-disaster relief operations" in Proceedings of IEEE ISPCC, Juit, Wakhnaghat, Solan, HP, India, 26-28 Sept., 2013 Sept.
42. M.V. Kumar, Swaminathan R., Rajarshi Roy, "Green cooperative communication techniques for intelligent transportation systems" in Proceedings of IEEE ISPCC, Juit, Wakhnaghat, Solan, HP, India, 26-28 Sept., 2013 Sept.

Thesis

(1) **Rajarshi Roy**, ``Optimal Control for Queue Length Fairness in Dual Bus Network", M.Sc. (Engg.) thesis, Indian Institute of Science, Bangalore, India, Jan., 1995.

(2) **Rajarshi Roy**, "Quality of Service issues in IP and ATM networks", Ph.D. thesis, Polytechnic University, Brooklyn, NY, USA Submitted, Aug, 2000. (Degree awarded in 2001)