RAMYA KORLAKAI VINAYAK

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Objective Graduate studies (PhD) in Communication Theory

Interests Information Theory, Coding Theory, Wireless Networks, Applied Mathematics and Physics

Education

Indian Institute of Technology Madras
B.Tech in Electrical Engineering; Minor in Physics
CGPA 9.6 (Major) and 9.5/10.0 overall (Ranked 2/95)

Relevant Courses

Communication & Signal Processing: Information Theory & Coding, Error Control Coding, Digital Communication, Analog Communication, Communication Systems, Computer Networks, Analog & Digital Signal Processing, Networks & Systems.

Mathematics: Graph Theory, Probability & Random Processes, Linear Algebra, Operations Research, Vectors Matrices and Differential Equations, Elements of Calculus.

Physics: Classical Physics (Classical Dynamics, Statistical Physics & Introduction to Special Theory of Relativity), Quantum Mechanics, Quantum Information and Quantum Computation[1].

Awards and Scholarships

Certificate of Academic Distinction
- Awarded by the Indian Institute of Technology Madras for the academic year Aug 2009 - May 2010 for excellent academic performance.

Summer Research Fellowship (2010)
- Awarded by Indian Academy of Sciences for pursuing research during summer 2010.

OPJEMS Scholar (2008)
- OP Jindal Engineering and Management Scholarship is one of the prestigious scholarships awarded by the OP Jindal Group for outstanding performance in academics and leadership skills.

KVPY Fellowship (2005)
- Kishore Vaigyanik Protsahan Yojana (Young Researcher Fellowship) awarded by Indian Institute of Science, Bangalore and Department of Science and Technology, Govt. of India.

NTSE Scholarship (2005)
- National Talent Search Examination is conducted by the National Council of Education, Research and Teaching (NCERT), Delhi.

Projects

Mean Field Limit Based Approximations for Wireless Networks May - Jul 2010
Guide: Prof. Anurag Kumar, Department of ECE, Indian Institute of Science, Bangalore
- Analyzed the behavior of Scaled Node Attempt Model of a wireless network.
- Simulated the system and compared the results with the approximate ODE solutions.
- Analyzed the local stability of the equilibrium point and proved the existence of a zero eigenvalue for a general scaled node attempt model.

Analysis of IEEE 802.11n Infrastructure Wireless Local Area Networks with Channel Errors May - July 2010
Guide: Prof. Anurag Kumar, Department of ECE, Indian Institute of Science, Bangalore
- Analyzed the 802.11 WLAN with channel errors and showed that the sufficient condition for the existence of unique fixed point for an errorless system holds good for the system with channel errors also.
- Modeled a Single Cell IEEE 802.11n Infrastructure WLAN with two class of nodes (one with good channel conditions and the other with channel errors) as a 2D Markov Chain.

[1] To be done during Spring 2011.

Application of Generalized DFT in OFDM Systems Aug 2010 - present

Guide: Prof. David Koilpillai, Department of Electrical Engineering, IIT Madras

- Studied the timing and frequency synchronization problems in OFDM systems and existing algorithms to estimate the timing and frequency errors.
- Exploring the effects of using GDFT in the place of traditional DFT in OFDM systems and analyzing the robustness and advantages with respect to traditional design.

Space-Time Coding Oct - Dec 2010

Guide: Prof. Hema. A. Murthy, Department of Computer Science & Engineering, IIT Madras

- Literature Survey on Space-Time Codes.
- Simulated and compared the performance of various space-time block codes.

Establishing Multicast Wireless Personal Area Network May - July 2009

Summer Internship at Allgo Embedded Systems Pvt. Ltd., Bangalore

- Studied the IEEE 802.15.4 Standard.
- Developed an application to establish multicast network of Zigbee sensors in a WPAN.
- Ported the application to i.MX embedded board (with ARM processor) and successfully tested the application.

Scholastic Achievements

- Rank 1 in Junior Year in a class of 95 students, 2009-2010
- Among the Top 5 undergraduate (B.Tech Final Year) students in the Institute, 2007-2010
- Rank 1 in the State in Karnataka State Pre-University Board Exam, 2007
- Rank 3 in Karnataka State Common Entrance Test Engineering, 2007
- Rank 6 in the National Mathematics Talent Competition conducted by Association of Mathematics Teachers of India, 2006
- Among the Top 1% (250 students) selected for the National Chemistry Olympiad (INChO), 2007
- Among the Top 1% in the state at the National Standard Exam in Physics conducted by Indian Association of Physics Teachers, 2006

Summer School & Conferences

- Joint Telemetrics Group (IITs and IISc) Summer School held at Indian Institute of Science, Bangalore. (May 2010)
- International Conference on Communication and Signal Processing (SPCOM) 2010, held at IISc, Bangalore. (July 2010)

Co-Curricular Achievements

- Represented the State of Karnataka twice in National Science Seminar (2004 and 2002) conducted by National Council of Science Museum, Kolkata and was Placed 2^{nd} and 3^{rd} respectively at the National Level
- Placed 1^{st} in Ericsson-sponsored Industry Relevant Problems in Telecom at Shaastra 2010[2] for designing a highly scalable and parallelizable *'Behavior based Subscriber Ranking Algorithm'* for large cellular operators
- One of the 5 Finalists in Simulation Championship at Shaastra 2009 for simulating the Viral Marketing scenario
- Finalist in the quizzing event 'How Things Work' as a fresher at Shaastra 2007
- Placed 2^{nd} in State Level Science & Mathematics Quiz conducted by Directorate of State Education, Research and Training, Karnataka in 2005

Extra-Curricular Activities

- Active member of Boltzmann[3], an open Physics Discussion Group at IIT Madras
- Active member of Astronomy Club, IIT Madras
- Coordinator of Astronomy Workshop in Shaastra, 2008
- Hobbies : Reading, Painting, Classical Dance (Bharathanatyam) and Classical Music.

[2] Shaastra - ISO 9000:2008 certified annual technical festival of IIT Madras

[3] http://boltzmann.wikidot.com/