

Sagnik Ghosh

Objective

To obtain a full time Ph.D. level position that utilizes my strengths in communication theory, statistics, and mathematics.

Summary of Skills

Specialties	multiple antenna technologies (MIMO), Turbo codes
Software	MATLAB, Simulink, HSPICE, Modelsim, Synplify Pro, Wireshark, VXWorks, Tornado
Languages	C/C++, Embedded C, Verilog, Visual C++, MIPS Assembly, LISP, Java, Cadence

Education

2006–2012	Ph.D. , <i>University of California, San Diego</i> , 3.90 GPA. M.S. June 2008/Ph.D. Mar. 2012, Electrical Engineering, Communication Systems focus.
2002–2006	B.S. , <i>University of California, Berkeley</i> , 3.72 GPA. B.S. May 2006, Electrical Engineering and Computer Sciences.

Professional Experience

June-September 2009	Systems Engineer , <i>Lockheed Martin Corporation</i> , R & D, San Jose, CA. Developed and researched control algorithms for steering a MEMS mirror to center of optical beam and implemented algorithms on a PIC32 microcontroller and single board computer using a USB interface. Utilized C for microcontroller programming.
June-December 2008	Systems Engineer , <i>Lockheed Martin Corporation</i> , R & D, San Jose, CA. Designed a scalable architecture for a class of turbo codes and developed an efficient architecture for individual turbo decoder blocks. Implemented and tested new architectures in MATLAB, then embedded architecture into Spectrum SDR 3001 platform using C. Guided a small team to implement architecture. Two patents pending for design.
June-September 2007	Graduate Intern Technical , <i>Intel Corporation</i> , Video R & D, Santa Clara, CA. Structured MPEG-2 software encoder for easy translation into hardware, and collaborated with co-workers to formulate and test algorithms for MPEG-2 encoder. Utilized C to restructure encoder.
June-September 2005	Graduate Intern Technical , <i>Intel Corporation</i> , Video R & D, Santa Clara, CA. Developed CABAC decoding engine for new H.264 video standard and collaborated with co-workers to formulate and test algorithms for CABAC engine. Utilized C and Visio for simulations and drawings, and gained experience with decoding block-length codes.

Research Experience

May 2007- Current	Research Assistant , <i>UC San Diego</i> , Professor Bhaskar Rao and Dr. James Zeidler, San Diego, CA. Develop algorithms for statistical channel information in MIMO networks, including: <ul style="list-style-type: none">○ A new framework to optimize use of statistical information to meet Quality of Service constraints of each user.○ Design of codebooks for efficient feedback of statistical information.○ Combining instantaneous channel information with statistical information for scheduling and efficient power control in both centralized and decentralized networks.
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- January-June 2007 **Research Assistant**, *UC San Diego*, Professor Kurt Schurgers, San Diego, CA.
Designed a communications system for a small short-range low-power acoustic modem. Created real-time communications system in air over audio frequencies.
- September 2006 - May 2007 **Research Assistant**, *UC San Diego*, Professors Larry Milstein and Ken Zeger, San Diego, CA.
Investigated sensor network design for Air Force project to track objects/people using low-power devices. Created simulation environment for sensor networks using C, MOSEK, and MATLAB.
- July-August 2006 **Research Assistant**, *Universitaria Politecnica de Madrid (Vodafone Fellowship)*, Video over Wireless Research, Madrid, Spain.
Created and trained channel models from real video data to transfer H.264 and MPEG-2 data across 802.11 networks. Attained data from a real video network with a live stream for purposes of training channel model. Utilized C and MATLAB to create and train models, and Wireshark to attain the data.

Graduate Coursework

MIMO Communications	Digital Communication
Stochastic Wireless Networks	Wavelets and Filter Banks
Parameter Estimation	Channel Coding
Array Processing	Probability and Random Processes
Digital Signal Processing	Convex Optimization
Source Coding	Network Information Theory

Publications

- S. Ghosh, B.D. Rao, and J.R. Zeidler, **Outage-Efficient Strategies for Multiuser MIMO Networks with Channel Distribution Information**, *IEEE Journal on Signal Processing*.
- S. Ghosh, B.D. Rao, and J.R. Zeidler, **Outage-Optimal Transmission in Multiuser-MIMO Kronecker Channels**, *ICCASP 2010*.
- S. Ghosh, B.D. Rao, and J.R. Zeidler, **Techniques for MIMO Channel Covariance Matrix Quantization**, *IEEE Journal on Signal Processing*, submitted.
- S. Ghosh, B.D. Rao, and J.R. Zeidler, **Scheduling and Power Control in Statistical Beamforming Networks Using B Bits of Feedback**, *ICCASP 2012*.
- S. Ghosh, B.D. Rao, and J.R. Zeidler, **Techniques for Scheduling and Power Control in Statistical Beamforming Networks**, *IEEE Journal on Signal Processing*, in preparation.

Patents

- Fast, Efficient Architectures for Inner and Outer Decoders for Serial Concatenated Convolutional Codes**, pending.
- Scalable, Pipelined Decoding Architecture and Methods for Serially Concatenated Convolutional Codes**, pending.

Security Clearance Status

- 2008–2009 Held Secret-level Security Clearance at Lockheed Martin