

ADITYA CHOPRA

Voice – (512) 775 4506

Email – achopra@utexas.edu

Web – <http://signal.ece.utexas.edu/~chopra>

OBJECTIVE

Seeking a challenging full-time position in the design and implementation of high-speed wireless communication systems.

EDUCATION

Doctor of Philosophy, Electrical Engineering, Dec 2011 (expected)

Dissertation Title: *Modeling and Mitigation of Interference in Receivers with Multiple Co-located or Distributed Antennae*

The University of Texas at Austin

Advisor: Prof. Brian L. Evans

Master of Science, Electrical Engineering, May 2008

The University of Texas at Austin

CGPA – 3.92/4.00

Advisor: Prof. Brian L. Evans

Bachelor of Technology, Electrical Engineering, May 2006

Indian Institute of Technology, Delhi

CGPA – 8.97/10 **GRE** – 1600/1600

Advisor: Prof. Surendra Prasad

COURSEWORK

Wireless Communications – Modulation and Multiple Access, Space Time Communications, Space Time Coding for MIMO systems, Wireless Systems Laboratory, Information Theory

Signal Processing – VLSI Communication Systems, Time Frequency Analysis, Advanced Signal Processing, Detection & Estimation Theory, Signal Theory, Digital Communications, Digital Signal Processing

Networking – Analysis and Design of Communication Networks, Advanced Wireless Networks

Computer Science – Algorithms, Engineering Programming Languages, Advanced Programming Tools

Optimization – Stochastic Optimization, Optimization in Engr. Systems

Mathematics – Probability and Stochastic Processes, Mathematical Statistics, Numerical Analysis: Linear Algebra, Linear Algebra, Real Analysis, Complex Analysis

Physics – Electromagnetic fields and waves, Modern Physics, Engineering Electromagnetics

Embedded Systems – Digital System Design Using VHDL, Embedded Systems Laboratory, Digital Signal Processing

PUBLICATIONS

Aditya Chopra and Brian L. Evans, "**Joint Statistics of Interference across Distributed Antennae in a Poisson Field of Interferers**", *IEEE Transactions on Wireless Communications*, in preparation.

Aditya Chopra and Brian L. Evans, "**Outage Performance of Diversity Combining in Interference Limited Channels**", *IEEE Transactions on Wireless Communications*, to be submitted Sep. 2011.

Aditya Chopra and Brian L. Evans, "**Joint Statistics of Radio Frequency Interference in Multi-Antenna Receivers**", *IEEE Transactions on Signal Processing*, submitted Apr. 2011.

Aditya Chopra and Brian L. Evans, "**Design of Sparse Filters for Channel Shortening**", *Journal of Signal Processing Systems*, May 2011.

Aditya Chopra and Brian L. Evans, "**Design of Sparse Filters for Channel Shortening**", *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Proc.*, Mar. 2010, Texas, USA.

Kapil Gulati, Aditya Chopra, Brian L. Evans, and Keith R. Tinsley, "**Statistical Modeling of Co-Channel Interference**", *Proc. IEEE Global Communications Conference*, Dec. 2009, HI, USA.

Aditya Chopra, Kapil Gulati, Brian L. Evans, Keith R. Tinsley, and C. Sreerama, "**Performance Bounds of MIMO Receivers in the Presence of Radio Frequency Interference**", *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Proc.*, Apr. 19-24, 2009, Taipei, Taiwan.

Kapil Gulati, Aditya Chopra, Robert W. Heath Jr., Brian L. Evans, K. R. Tinsley, and X. E. Lin, "**MIMO Receiver Design in the Presence of Radio Frequency Interference**", *Proc. IEEE Int. Global Communications Conf.*, Nov. 30-Dec. 4th, 2008, New Orleans, LA USA.

Alex Olson, Aditya Chopra, Yousof Mortazavi, Ian Wong and Brian L. Evans, "**Real-Time MIMO Discrete Multitone Transceiver Testbed**", *Proc. Asilomar Conference on Signals, Systems and Computers*, 2007. **(Selected as finalist entry for best paper award contest)**

Bjørn O. Hogstad, Matthias Pätzold, Aditya Chopra, Dongwoo Kim and Kwang Baek Yeom, "**A Wideband MIMO Channel Simulation Model Based on the Geometrical Elliptical Scattering Model**", *Proc. 15th Wireless World Research Forum*, Paris, France, December 08-09, 2005.

Bjørn O. Hogstad, Matthias Pätzold and Aditya Chopra, "**A Study on the Capacity of Narrow- and Wideband MIMO Channel Models**", *Proc. 15th IST Mobile & Wireless Communication Summit*, Mykonos, Greece, June 2006.

TECHNICAL REPORTS

Yousof Mortazavi, Aditya Chopra and Brian L. Evans, "**LabVIEW Multicore Real-Time Multi-Input Multi-Output Discrete Multitone Transceiver Testbed**", National Instruments Week, August 4-7, 2008, Austin, Texas USA.

Alex Olson, Aditya Chopra, Yousof Mortazavi and Brian L. Evans, "**2x2 MIMO DMT Testbed**", National Instruments Week, August 7-9, 2007, Austin, Texas USA. **(Second place - 2007 NI Week Virtual Instrumentation Applications Paper Finalist, Prototyping and Testing Category)**

RESEARCH EXPERIENCE

Radio Frequency Interference Modeling and Mitigation

Developed statistical models of platform noise, co-channel interference and adjacent channel interference for single and multi-antenna systems. Studied communication performance of multi-antenna receivers in the presence of impulsive interference. Designed receiver algorithms to mitigate impact of impulsive interference on communication performance.

Radio Frequency Interference Modeling and Mitigation Toolbox in MATLAB provides a simulation environment for generating RFI and quantifying the performance of algorithms for parameter estimation and interference mitigation. Release includes 51 files with 9,632 lines of MATLAB code.

More details - <http://users.ece.utexas.edu/~bevans/projects/rfi/index.html>

Modeling and Mitigation of Synchronous Spurs

Modeled additive and mixing spurs in test and measurement equipment, and designed fixed- and floating-point algorithms to mitigate the impact of synchronous spurs on measurement and communication test performance.

Multi-channel Discrete Multi-Tone Testbed

Designed and developed a bi-directional high speed multi-channel multi-carrier testbed using National Instruments' PXI hardware and LabVIEW Real-Time software. Studied communication performance vs. implementation complexity trade-offs and designed novel channel shortening equalizers using sparse filters.

More details - <http://users.ece.utexas.edu/~bevans/projects/adsl/index.html>

Channel Estimation in MIMO-OFDM

Developed novel channel estimation techniques for OFDM systems in my senior design project. Awarded the **Rajiv Bambawale award for the best senior design project in Electrical Engineering.**

Statistical-geometric modeling of MIMO channels

Studied statistical circular and elliptical channel models in different scattering environments.

Speech coding

Implemented the ITU-T standard G.729AB and G.723 speech-coding algorithm on a TI C6211 and C6711 DSP. **(Awarded the Summer Undergraduate Research Award 2004)**

Reviewer for IEEE conferences and journals

- IEEE International Global Communications Conference
- IEEE International Conference on Communications
- Asilomar Conference on Signals, Systems and Computers
- IEEE International Conference on Acoustics, Speech, and Signal Processing
- IEEE Transactions on Communications
- IEEE Transactions on Signal Processing
- IEEE Transactions on Aerospace and Electronic Systems
- IEEE Transactions on Circuits and Systems
- IEEE Transactions on Mobile Computing
- European Transactions on Telecommunication

INDUSTRY EXPERIENCE

Summer Internship – National Instruments (R&D – Advanced Communications Research) – 2011

Implemented a LTE – based OFDM communication system on National Instruments' PXI test/measurement hardware.

Summer Internship – National Instruments (R&D – RF Modular Instruments) - 2010

Designed and implemented signal-processing algorithms to suppress low-level synchronous noise (spurs) in RF test and measurement equipment.

Summer Internship – Qualcomm Inc. (Corporate R&D - Systems) - 2009

Designed advanced CDMA receiver algorithms such as linear and decision feedback based interference cancellation for enhanced HSPA uplink.

Summer Internship – Qualcomm Inc. (Corporate R&D - Systems) - 2008

Designed and implemented algorithms to perform efficient resource allocation in macro- and pico- cell based wireless network environments.

Summer Internship – Qualcomm Inc. (Corporate R&D - Systems) - 2007

Designed and implemented interference cancellation algorithms for wireless receivers based on broadcast OFDM technology (MediaFLO).

AWARDS

Finalist - Best Student Paper Contest at the **Asilomar Conference on Signals, Systems and Computers, 2007** for “Real-time MIMO Discrete Multitone Transceiver Testbed”.

Finalist - Prototype/Test category at the **National Instruments' NIWeek Virtual Instrumentation Applications Paper Contest Awards 2007** for “2x2 MIMO DMT testbed”.

Rajiv Bambawale Award for Best Senior Design Project in Electrical Engineering, 2006 for “Design and Simulation of Channel Estimation Techniques for MIMO-OFDM systems”.

Certificate of Merit in the Indian National Mathematical Olympiad (2001) and invitation to the International Mathematics Olympiad Training Camp. (www.nbhm.dae.gov.in/olympiad.html)

TECHNICAL SKILLS

Test and measurement: Signal generators, oscilloscopes, spectrum analyzers, LabVIEW

Analog circuit simulation: Spice

Hardware description languages: Verilog, VHDL

Assembly languages: TI TMS320C5000 DSP, TI TMS320C6000 VLIW DSP

High-level languages: C, C++, Java

Integrated development environments: Code Composer Studio, Visual Studio, IntelliJ, Eclipse

Software development: Perforce, Subversion, Sourcesafe

Scripting languages: csh, ksh, sed, sh, awk, Perl

Algorithm development environments: MATLAB, LabVIEW, Android

Electronic design automation tools: LabVIEW RT, SIMULINK

Optimization software: GAMS