Mahdi Hajiaghayi

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EDUCATION

University of Toronto, Ontario, Canada
Ph.D in Electrical and Computer Engineering/ Communication systems (Sep. 2007-present)
Supervisor: Prof. Ben Liang

University of Alberta, Alberta, Canada
M.Sc. in Electrical and Computer Engineering/ Communication systems (Sep. 2005-Sep. 2007)
Supervisor: Prof. Chintha Tellambura

Sharif University of Technology (SUT), Tehran, Iran
B.Sc. in Electrical Engineering/ Communication systems(Sep. 2000-July 2005)
GPA: 17.8 out of 20

SUT, Tehran, Iran
B.Sc. in Petroleum Engineering (Feb. 2003-July 2005)

RESEARCH INTERESTS

Wireless Networks: Resource allocation in Cooperative and sensor networks, Sensor Networks networks

Wireless Communication: MIMO systems, Space-Time codes, Limited feedback precoding.

Robotic and Controlling Systems

Intelligent Signal Processing: Personal wearable computers,

RESEARCH EXPERIENCES

- Member and Research Assistant of ICORE Wireless Communication Lab (IWCL) headed by Dr. Norman Beauleiu, Dept of ECE, Univ. of Alberta, Sept. 2005 - Present, Working on different topics of MIMO such as DUST code, Limited Feedback precoding system, Antennas Selection and Sphere decoding as an efficient way to decode MIMO signals.

- Member of Autonomous Robotic Vehicle Project (ARVP),Jan. 2007 -Present. The aim of this project is to develop, apply and promote robotic technology. Designing PCB, digital and analog circuits analyzing with Orcad/Pspice, Micro-controller programming and collaborating with Computer engineering team to develop and implement some specific applications such as voice recognition and path planner on the robot. For more information about this group refer to http://arvp.org

- Attended a 10-day tutorial workshop on doing signal integrity for high frequency circuits using Cadence design software. Dec. 2006-Jan 2007. Signal integrity analysis is essential for any nonometer board or IC with high frequency and limited size because it alerts us on unintended electrical effects such as cross talk and voltage drop that impacts design timing and functionality.

- Cooperated with Advanced Information and communication Technology center (AICTC) to customize Set Top Box (STB), a platform that could receive digital signals and display on TV, for iranian home users. Worked on programming some applications in Linux environment to be installed in the Embedded boards. July 2002- Jan. 2003

- Cooperated with GATA Co. on researching and evaluating different communication system options to provide Interactive TV (ITV) services to individual home users. A complete report of possible options was submitted to the 'Ministry of Industries and Mines', Iran July 2003 - Dec. 2003.

- Member of CEDRA Rescue Robot Team, which got International achievements during years 2004-2005, worked in Section of PCB design and PIC (one type of micro-controllers) programming. (see http://sina.sharif.edu/ cedra/rescue/en/ for more information about this project). Feb 2004- Dec 2004

HONORS AND AWARDS

-Ted Rogers Fellowship Award, ECE department of the Univ. of Toronto, Sept. 2007
-International Tuition Award, Univ. of Toronto, Sept 2007
-Provost Doctoral Award, University of Alberta, July 2007, (Received but Declined)
-Ph.D Fellowship Award, Univ. of Minnesota, 2005, (received but declined).
-Recognized as the outstanding graduate student with having the highest number of publications among all graduated students at the Univ. of Alberta from Sept. 2005 to August 2007
-Included in top 8 % in Electrical engineering students at Sharif Univ. of Technology (The most prominent science and engineering school in Iran).
-Being admitted for *Dual Degree program* jointly offered by Sharif Univ. of Technology and Iranian Petroleum ministry. This program was meant for highly qualified students to take two engineering programs at the same time. Remark: Although it is nearly impossible to get two engineering degrees in the country, only top 60 students from all majors at Sharif University could enter this particular program and take the Petroleum Engineering as their minor program.
-Ranked 8th among 300000 applicants in National University Entrance Exam in Iran, Sep 2000 (konkoor).
-Among first 100 top students in National Physics Olympiad.
-Educated in National Organization for Development of Exceptional Talents (NODET), Qazvin, Iran, 1996- 2000.

PUBLICATIONS

- **M. Hajiaghayi**, A. Ghaderipoor and C. Tellambura, 'A Novel Structure for 2×2 Full-Rate Full-Diversity Space-Time Block Codes', accepted to be published in GLOBECOM 2007, Washington, USA
- **M. Hajiaghayi**, C. Tellambura 'Antenna selection for Unitary Space Time Modulation over Transmit Correlated Channels', Submitted to ICC 2008, Beijing, China.
- **M. Hajiaghayi**, C. Tellambura 'Antenna selection for Unitary Space Time Modulation over over Correlated and Ricean Channels', (34 pages manuscript) Submitted to IEEE Trans. Inform. Theory, Aug. 2007.
- **M. Hajiaghayi** and Chintha Tellambura, 'Unitary Signal Constellation for Differential Space-Time Modulation', Communications Letters, IEEE Volume 11, Issue 1, Jan. 2007 Page(s):25 - 27
- **M. Hajiaghayi** and Chintha Tellambura, 'Optimum Design of Differential Unitary Space Time Modulation for Transmit Correlation', Submitted to IEEE Communication journal letters,
- A. Ghaderipour, **M. Hajiaghayi** and Chintha Tellambura, 'Unitary Matrix Design via Genetic Search for Differential Space-Time Modulation and Limited Feedback Precoding',PIMRC'06, 2006 IEEE 17th International Symposium on Sept. 2006 Page(s):1 - 5, Helsinki, Finland (Presented)
- **M. Hajiaghayi** and Chintha Tellambura, 'Optimum Design of Differential Unitary Space-Time Modulation', Vehicular Technology Conference, 2006. VTC-2006 Fall. 2006 IEEE 64th Sept. 2006 Page(s):1 - 4 Montreal, Canada (presented)
- **M. Hajiaghayi** and M.T. Hajiaghayi, 'On the Bounded Fragmentation Property and its Applications', European Journal of Combinatorics, Vol 24, No. 7, pp. 891-896, 2003.
- **M. Hajiaghayi** and M.T. Hajiaghayi, 'On the Bounded Fragmentation Property and its Applications', Proc. Euro conference on Combinatorics, Graph Theory and Applications, EuroCOMB'03, Sep. 2003. (A preliminary version of the journal paper)
- **M. Hajiaghayi**, M. Moeeni, S. Bagheri, Y. Khatami and the other members of rescue robot team, 'Sharif CEDRA Rescue Robot' team paper www.robocup2004.pt, Lisbon, Portugal, June27-July5, 2004.
- **M. Hajiaghayi**, M.Hashempour, R. Dehestani, 'ITV Network and its future', Ministry of Industries Mines-Department for High-Tech Industries (In Persian). http://www.ecs.org.ir

TEACHING EXPERIENCE

Sept 2008 -present Lab instructor, ECE Dept., Univ. of Toronto, *Digital systems*, This course mainly focuses on hardware programming using Verilog language.
Jan 2008 -April 2008 Lab instructor, ECE Dept., Univ. of Toronto, *Communication systems*, which talks basic principles of wireless communication and different modulation schemes used for transmitting data.
Jan 2007 -April 2007 Teaching Assistant, Dept. of ECE, Univ. of Alberta, Edmonton, Canada, *RF Communication Circuits*, I was assigned to mark the assignments and mid-term exam. Office hours and designing some questions for assignments was my other duties.

Sep. 2006- Jan 2007 Teaching Assistant, Dept. of ECE, Univ. of Alberta, Edmonton, Canada, *Introduction to Communication Systems*, in which I solved and explained the problems of mid term exam in the class, Other duties included office hours, homework grading, Midterm and final exam grading, and course website maintenance

Jan 2006 - April 2006 Teaching Assistant, Dept of ECE, Univ. of Alberta, Edmonton, Canada, *Communication 1 Laboratory*, in which students got familiar with basic concepts of analog and digital communication such as modulation, sampling, PCM, TDM, by working with different equipment.

PROGRAMMING & COMPUTER SKILLS

General Programming

- ◇ Programming Languages: C, C++, Assembly (Intel, Z80), Pascal
- ◇ Operating Systems: Linux, Dos, Windows(98/2000/XP)
- ◇ Network Programming: Ns (Network Simulator), Opnet
- ◇ Typesetting: TEX, LATEX, FarsiTEX, Microsoft Office
- ◇ Web Development: HTML, XML
- ◇ Environments: Visual C++, Microsoft .NET Framework,

Technical Programming

- ◇ MATLAB & Simulink: Familiar with Signal Processing, Communications, Filter Design, Wavelet, and Control Systems Toolboxes. Familiar with MATLAB Compiler and using MATLAB's features in C++.
- ◇ Maple, OrCAD, Protel,
- ◇ Assembly programming, PIC programming, Code Composer Studio.