

Hooman Javaheri

CONTACT INFORMATION	<p>College of Computer and Information Science Northeastern University 360 Huntington Avenue 202 West Village H Boston, MA 02115</p>	<p>Cell: (617) 320-1508 Fax: (617) 373-5121 Email: hooman@ccs.neu.edu Web: www.ccs.neu.edu/~hooman LinkedIn: www.linkedin.me/p/hjavaheri</p>
EXPERTISE AND KEYWORDS	<ul style="list-style-type: none">▶ Wireless networking, Wireless sensor networks▶ RFID systems, Wireless energy transfer, Power delivery▶ Ultra-low power design and pervasive computing▶ Wireless networking in extreme environments▶ Biological interface to RF signals▶ End-to-end system design and prototyping	
EDUCATION	<p>Northeastern University, Boston, MA USA Ph.D. in Computer Science, Dec. 2012 – Thesis title: “Wireless Transfer of Energy alongside Information: From Wireless Sensor Networks to Bio-Enabled Wireless Networks”, Advisor: Prof. Guevara Noubir, GPA: 3.97</p> <p>Sharif University of Technology, Tehran, Iran B.Sc. in Electrical Engineering (Communication Systems), June 2006</p>	
HONORS AND AWARDS	<ul style="list-style-type: none">▶ Northeastern University full scholarship, 2006–2012▶ 36th rank, Iran’s national graduate schools entrance exam for MBA among more than 20,000 participants, 2006▶ Granted dual-degree scholarship by Iranian Petroleum Ministry to study petroleum engineering, Sharif University of Technology, 2003. The program was offered to <i>top 60</i> students from all majors▶ 6th rank, Iran’s national university entrance exam for Engineering and Applied Mathematics among more than 350,000 participants, 2001▶ Semi-finalist in four National Student Olympiads: Mathematics, Informatics, Physics and Chemistry, Iran, 1999–2000	
ACADEMIC EXPERIENCE	<p>Northeastern University, Boston, MA USA</p> <p>Post-Doc Research Associate and Part-time Faculty</p> <p>Application Driven System-on-a-chip Wireless Sensor Networks The ADWaNS project focusses on developing an open-source multi-purpose wireless sensor networking instrument that supports the specific experimental research needs of key applications such as body networks for patients monitoring, and physical infrastructure monitoring. The instrument enables research and education for developing and experimenting with protocols and algorithms for a future generation of wireless sensor networks, cross-cutting research and education in application areas of key interest to implementing ubiquitous computing. The project is funded by MRI-R2 grant from NSF (#0959584)</p> <ul style="list-style-type: none">– Developed hardware and software for customized wireless sensor nodes based on TI CC2530– More information is available at madrid.ccs.neu.edu/app-driven-wsn <p>ANA: AlphaNumeric Avatar (www.neu.edu/ana) ANA is a joint project with Northeastern University College of Arts, Media and Design. We have developed an interactive web application that brings 3D-printing technology to the public. ANA encodes alpha-numeric information (e.g. name, email address) into aesthetically pleasing VRML model ready to be 3D-printed.</p> <ul style="list-style-type: none">– Devised an easy-to-read coding algorithm to map the alpha-numeric value to color and shape of the 3D component– Supervised a team of developers to implement the application (VRML generator, Web Visualizer) using Python, HTML, PHP, MySQL and OpenGL– ANA received great media coverage from www.engineering.com, www.dvice.com and www.3ders.org.– ANA project is being extended to M3DI, a large multi-disciplinary project to develop a micro-scale 3D-printed authentication and tracking system for pharmaceutical products. <p>Teaching Instructing CS1800 Discrete Structures and CS1100 the introductory computer science for non-majors to class of 50~85 undergraduate students in both lecture and computer lab settings.</p>	<p>Jan 2013–present</p>

Graduate Research Assistant

Sept. 2006–Dec. 2012

Conducted theoretical and applied research in computer networks, in particular wireless networks. Research areas: wireless networking in challenging and extreme environments, cross-layer networking, RF energy harvesting. Selected projects include:

iPoint: a passively-powered wireless information tag capable of communicating with commodity smartphones

- Designed the hardware of the system including an RF energy harvester with better performance compared to available commercial circuits, customized PCB antennas and ultralow-power computing core
- Developed software using embedded C for MSP430 microcontroller on the device and Android programming on the smartphone
- Devised two novel communication schemes optimized for severe power deficiency
- Optimized the performance of the system using extensive ADS simulations
- Built a prototype

Bio-Enabled Wireless Networks: a theoretical study on creating a wireless interface for biological system at nanoscale. The goal of this project was to develop a Bio-enabled Sensor Network (BSN) composed of sensing devices that can enter a full sleep mode but still be woken up by a long-range RF signal by transducing a weak Electro-Magnetic signal into biological signals and use a biological device to demodulate the information embedded in the EM signal. The project was funded by NSF under EAGER grant (#958927)

- Developed a theoretical model to quantify the wireless energy transfer performance of magnetically-coupled mechanical nanoresonators
- Designed a bio-mechanical signal interpreter to transduce wireless signal to biological stimulus using energy harvesting
- Our results were presented in two NSF workshops:
 - NSF Workshop on Biologically-Enabled Wireless Networks Design and Modeling, Boston, MA, July 2011
 - BioCom²: NSF Workshop on Biological Computation and Communication, Arlington, VA, Nov. 2012
 - More information may be found at madrid.ccs.neu.edu/bwn/projects

Cooperative Wireless Networks: a cross-layer diversity framework for wireless communication devices with multiple radio interfaces

- Used SIMULINK and MATLAB to simulate the performance of the cooperative communication
- Developed experimental testbed using software defined radio (GNU Radio) on Universal Software Radio Peripheral (USRPs)

Graduate coursework: Advanced Algorithms, Fundamentals of Networking, Data Networks, Digital Signal Processing, Theory of Computation, Principles of Programming Languages, Special Topics in Theoretical Computer Science: Algorithmic Power Tools, Network Algorithms, Intensive Computer Systems.

Teaching Assistant

Sept. 2006–May 2008

- Fundamentals of Networking, Spring 2008
- Computer Organization, Fall 2007
- Computer Science and Applications, Fall 2006–Spring 2007

Sharif University of Technology, Tehran, Iran

Instructor/Teaching Assistant

Jan. 2002–Aug. 2005

- Computer Programming
 - Designed the course's projects and tests
 - Evaluated students' term projects

Iran University of Science and Technology, Tehran, Iran

Undergraduate Researcher

May 2003–Aug. 2005

- Advisor: [Prof. Ali Akbar Jalali](#)
- Worked on several research projects regarding telecommunication infrastructure in Iran
- Investigated Physical layer challenges in rural networks

PROFESSIONAL
EXPERIENCE

Akamai Technologies, Inc.

Cambridge, MA USA

R&D intern: Network Mapping engineer

May 2008–Sept. 2008

- Member of the load balancing group

- Wrote scripts (SQL, Python) that analyzed logs in order to measure the performance of the load balancing system in Akamai production network
- Calculated appropriate capacity coefficients for upgraded servers in Akamai network
- Developed a statistical analysis tool in MATLAB to evaluate the performance of FLIT, the scale used in the load balancing mechanism, by analyzing the correlation between the reported FLIT and actual load on the servers

Electronic Research Center, Tehran, Iran

Technical committee member

June 2003–July 2005

- Contributed to Iran’s National ICT Master Plan by conducting a comprehensive study to evaluate the status of telecommunication infrastructure
- Analyzed the telecommunication infrastructure in Iran’s rural regions
- Developed a comprehensive technical plan to address the telecommunication issues of rural and remote areas

PATENTS

- ▷ Janos Stone, **Hooman Javaheri**, Ahmed Busnaina, Nathan Felde, Graham B. Jones, Guevara Noubir, “M3DI: Micro, high-security, data storage and tracking system for product authentication and counterfeit prevention.” *provisional file submitted, Dec. 2013.*

PUBLICATIONS

- [9] H. Javaheri, B. Barbiellini, G. Noubir “Energy transfer performance of mechanical nanoresonators coupled with electromagnetic fields”, *Nanoscale Research Letters* 2012, 7:572
- [8] H. Javaheri, B. Barbiellini, G. Noubir, “On the Energy Transfer Performance of Mechanical Nanoresonators Coupled with Electromagnetic Fields: Applications with magnetic nanoparticles”, *in proceedings of APS March Meeting* 2012.
- [7] H. Javaheri, B. Barbiellini, G. Noubir, “Efficient Magnetic Torque Transduction using Tunable Nanomechanical Resonators”, *in proceedings of IEEE EMBC* 2011.
- [6] H. Javaheri, G. Noubir, “iPoint: A Platform-independent Passive Information Kiosk for Cell Phones”, *in proceedings of IEEE SECON* 2010.
- [5] H. Javaheri, Y. Wang, G. Noubir, “Distributed Cooperation and Diversity for Hybrid Wireless Networks”, *in proceedings of WWIC* 2010.
- [4] H. Javaheri, G. Noubir, S. Noubir, “RF Control of Biological Systems: Applications to Wireless Sensor Networks”, *in proceedings of Nano-Net* 2009.
- [3] H. Javaheri, Y. Wang, G. Noubir, “Cross-Layer Distributed Diversity for Heterogeneous Wireless Networks”, *in proceedings of WWIC* 2007.
- [2] M. Tabesh, M. A. Arbabian, H. Javaheri, A. Jalali, “Rural Telecommunications in Iran: A Hybrid Solution”, *in proceedings of the IEE International conference on Internet Technologies and Applications, ITA* 2005.
- [1] H. Javaheri, M. A. Arbabian, M. Tabesh, A. Jalali, “The Analysis of Rural Telecommunication Infrastructure in Iran and Internet Connectivity”, *in proceedings of the first Information and Communication Management Conference, ICTM* 2005, Iran.

PRESENTATIONS AND TALKS

- “Energy Transfer Performance of Magnetically-Coupled Mechanical Nanoresonators”, *NSF Workshop on Biological Computations and Communications, Boston, MA, Nov. 2012.*
- “Applications with magnetic nanoparticles: Energy transfer in Mechanical Nanoresonators coupled with Electromagnetic Fields”, *MaterialsToday Virtual Conference: Nanotechnology, Dec. 2012*
- “iPoint: A Platform-independent Passive Information Kiosk for Cell Phones”, at:
 - Research, Innovation and Scholarship Expo (RISE 2013), Northeastern University, April 2013.
 - The 7th Annual IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON’10), Boston, MA, June 2010.
 - [Research and Scholarship Expo 2010](#), Northeastern University, March 2010.
- “The Analysis of Rural Telecommunication Infrastructure in Iran and Internet Connectivity”, *The first Information and Communication Technology Management conference (ICTM), Tehran, Iran, June 2005.*

SERVICE

Reviewed papers for *Sensor Letters*, *ACM MobiCom*, *ACM MobiHoc*, *IEEE INFOCOM*, and *IEEE SECON*

TECHNICAL
SKILLS

Programmig skills: MATLAB scripting, C/C++, Python, Unix shell scripting, SQL, T_EX, Assembly, Lisp (Scheme), and HTML/CSS. Familiar with Perl and Tcl/Tk

Tools: COMSOL Multiphysics packages, SIMULINK, Agilent ADS, GNU Radio, ns-2, Maple, OrCAD, PSpice

Embedded systems: Software and hardware development with several MCU platforms (e.g., Texas Instruments MCU's), PCB Design (DipTrace, EXpressPCB)

Instrumental analysis Hands-on experience with variety of communication and networking instruments: Oscilloscopes, Signal Analyzers, Network Analyzers

Operating systems: GNU/Linux, Mac OS X, Microsoft Windows family

ACTIVITIES

- ▷ Webmaster, [Iranian Student Association at Northeastern \(ISAN\)](#), 2009
- ▷ Social Chair, [Iranian Student Association at Northeastern \(ISAN\)](#), 2008
- ▷ Ph.D. Seminar Organizer, College of Computer and Information Science, Northeastern University, 2007–2008