Curriculum Vitae

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Mohsen Hejazi

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Work Experience

Fall 2016 - Present **Assistant Professor** of Electrical Engineering (Communications Systems), *University of Kashan, Kashan, Iran*.

Education

Fall 2010 - Fall 2016 **Ph.D. in Electrical Engineering, Communication Systems**, *Sharif University of Technology*, Tehran, Iran.
GPA: 19.40/20 (*ranked 2rd*)
Thesis Title: Harnessing Interference in Cooperative Communication Networks
Advisor: Prof. Masoumeh Nasiri-Kenari

Nov. 2015 - Feb. 2016 **Ph.D. Visit**, *Chalmers University of Technology*, Gothenburg, Sweden.
Project Title: Green Communications in Multi-Relay Wireless Networks
Host: Prof. Tommy Svensson and Dr. Behrooz Makki

Fall 2007 - Spring 2010 **M. Sc. in Electrical Engineering, Communication Systems**, *Iran University of Science and Technology (IUST)* , Tehran, Iran.
GPA: 19.29/20 (**ranked 1st**)
Thesis Title: A New Method for Cooperative Spectrum Sensing in Cognitive Radio Networks over Correlated Channels
Advisor: Dr. Bahman Abolhassani

Fall 2003 - Spring 2007 **B. Sc. in Electrical Engineering, Communications**, *Iran University of Science and Technology (IUST)* , Tehran, Iran.
GPA: 17.49/20 (**ranked 1st**)
Thesis Title: Performance analysis and simulation of a Polynomial-Cancellation-Coded OFDM system
Advisor: Dr. Bahman Abolhassani

Research Interests

Various areas of Wireless Communications including:, *Cooperative Communications and Relaying Strategies, 5G Wireless Systems, MIMO Systems, Green Communications, Cognitive Radio (Spectrum Sensing), Communications Theory, OFDM, SDR.*

Honors and Awards

2019 Selected as a **distinguished lecturer**, *Electrical and Computer Engineering Department, University of Kashan*.

2007 **Ranked 1st** *in Class of 2003, B.Sc., Electrical Engineering Department, Iran University of Science and Technology (IUST)*, among more than 110 students.

2010 **Ranked 1st** *in Class of 2007, M.Sc., Field of Communications, Electrical Engineering Department, Iran University of Science and Technology (IUST)*, among about 30 students.

2016 **Ranked 2rd** *in Class of 2010, Ph.D., Electrical Engineering Department, Sharif University of Technology*, among about 50 students.

2002 **Bronze medal** (Ranked 3rd) *in National Physics Olympiad*.

2007 Ranked 8th *in National Electrical Engineering Olympiad*.

2004-2010 Identified as an Exceptional Talent *in Iran University of Science and Technology (IUST)*.

Since 2009 Member of *the National Elite Foundation*.

2010-2011 2 Year Fellowship Award of *the National Elite Foundation*.

2003 Graduated with high honors from *one of the National Organization for the Development of Exceptional Talents (NODET) high schools*.

Research Experiences

Ph.D. Thesis

Title **Harnessing Interference in Cooperative Communication Networks**

Advisor Prof. Masoumeh Nasiri-Kenari

Description In many wireless communications scenarios, it is actually possible to harness interference to enable more efficient communication over the network. In this thesis, we examine a set of novel strategies geared at exploiting wireless interference for reliable communication. We consider a recently-proposed relaying strategy, compute-and-forward, that enables relays in a Gaussian network to efficiently recover (and forward) linear functions of codewords. This strategy is neither limited by interference nor limited by noise. Classic strategies such as decode-and-forward are fundamentally interference limited as the relays must decode a subset of the codewords and end up facing multiple-access type constraints. Other strategies including amplify-and-forward or compress-and-forward send both signal and noise to the destination. Compute-and-forward uses lattice codes so that relays can decode linear functions of transmitted codewords according to the channel coefficients. Using compute-and-forward strategy, interference can in fact be harnessed for reliable communication over the network.

Research Lab.

Fall 2010 - Spring 2016 **Member of WRL** (Wireless Research Lab.), Sharif University of Technology, Tehran, Iran.

Jan. 2015 - Present **Green Communications in Multi-Relay Wireless Networks**, I am involved in this joint project between WRL and communication systems research group, department of signals and systems, Chalmers University of Technology, Gothenburg, Sweden.

Fall 2010 - Spring 2017 **Member of MCL-TD** (Mobile Communications Lab.-Test and Development), Sharif University of Technology, Tehran, Iran.

2010 - Spring 2017 **Design and implementation of conformance tests for 2G and 3G mobile base stations** (according to related 3GPP standards), MCL-TD, Sharif University of Technology, Tehran, Iran.

Fall 2007 - Spring 2010 **Member of WCL** (Wireless Communications Lab.), Iran University of Science and Technology (IUST), Tehran, Iran.

2009 **Iran Tele-Communication Research Center (ITRC)**, Tehran, Iran

My M.Sc. thesis has been supported by ITRC.

Selected Projects

Spring 2011 **Interference management in CDMA networks using power control and cooperative relays**, *Course: Spread Spectrum Communications*, Advisor: Prof. M. R. Aref.

Spring 2011 **Joint detection for multi-antenna channels**, *Course: Multi-user Detection*, Advisor: Dr. S. Mashhadi.

Fall 2010 **DMT (Diversity-Multiplexing Trade off)-optimal codes in MIMO systems**, *Course: Space-Time Coding*, Advisor: Dr. H. Behroozi.

Fall 2010 **Power control in two-tier femtocell networks**, *Course: Wireless Communication Networks*, Advisor: Prof. J. Golestani.

Fall 2008 **DPC (Dirty Paper Coding) using Concatenated Lattices**, *Course: Coding Theory*, Advisor: Dr. F. Lahouti.

Spring 2008 **ICI-self-cancellation in OFDM systems**, *Course: Advanced Communication Systems*, Advisor: Prof. V. Tabataba-Vakili.

Spring 2008 **Blind source separation using generalized eigendecomposition**, *Course: Spectral Estimation*, Advisor: Dr. M. H. Kahaie.

Spring 2008 **Effect of cooperation on the capacity of a two-transmitter and two-receiver network**, *Course: Information Theory*, Advisor: Prof. M. R. Aref.

Fall 2007 **Simulation of flat-fading channel using sum-of-sinusoids method**, *Course: Stochastic Processes*, Advisor: Prof. V. Tabataba-Vakili.

Fall 2007 **Exact peak frequency detection of AM narrowband signal using DFT**, *Course: Digital Signal Processing*, Advisor: Dr. M. H. Kahaie.

Graduate Courses

Passed Courses

Wireless Communications, Advanced Communication Systems, Spread Spectrum Communications, Space-Time Coding, Wireless Communication Networks, Coding Theory, Information Theory, Detection Theory, Stochastic Processes, Spectral Estimation, Digital Signal Processing, Multi-user Detection, Convex Optimization.

Audited Courses

Adaptive Filters, Simulation of Communication Systems, Estimation Theory, Data Networks, Advanced Data Networks, Numerical Optimization, Cryptography, Network Information Theory, Quantum Information Theory, Approximation Algorithms, Radar Systems.

Teaching Experiences

Spring 2017-Present — **Lecturer**, *M.Sc.: Advanced Communication Systems*, University of Kashan, Kashan, Iran.

Fall 2017-Present — **Lecturer**, *M.Sc.: Wireless Communication Systems*, University of Kashan, Kashan, Iran.

Fall 2016-Present — **Lecturer**, *B.Sc.: Communication Systems*, University of Kashan, Kashan, Iran.

Spring 2018-Present — **Lecturer**, *B.Sc.:Wireless Communications*, University of Kashan, Kashan, Iran.

Spring 2018-Present — **Lecturer**, *B.Sc.:Digital Communications Lab.*, University of Kashan, Kashan, Iran.

Spring 2017 and Fall 2016 — **Lecturer**, *B.Sc.: Fundamentals of Electrical Engineering (1)*, University of Kashan, Kashan, Iran.

Fall 2011 — **Teaching Assistan**, *Space-Time Coding*, Sharif University of Technology, Tehran, Iran.

Spring 2013 and Fall 2013 — **Laboratory Assistant**, *Digital communication Systems Lab.*, Sharif University of Technology, Tehran, Iran.

Fall 2008 — **Teaching Assistant**, *Wireless Communications*, Iran University of Science and Technology (IUST), Tehran, Iran.

Fall 2009 — **Teaching Assistant**, *Communication Systems*, Iran University of Science and Technology (IUST), Tehran, Iran.

Spring 2008 and Spring 2009 — **Teaching Assistant**, *Signals and Systems*, Iran University of Science and Technology (IUST), Tehran, Iran.

Relevant Skills

Language Skills — Persian: Native
English: Reading, Speaking, Writing

Computer Skills — Programming: MATLAB, Simulink, Maple
General: Windows O.S., MS Office, LaTeX

Publications

[1] Azimi-Abarghouyi, S. M.; **Hejazi, M.**; Makki, B.; Nasiri-Kenari, M.; Svensson, T., "Integer-Forcing Message Recovering in Interference Channels," *IEEE Transactions on Vehicular Technology* ,vol. 67, no. 5, pp. 4124-4135, May 2018. (url: `https://ieeexplore.ieee.org/document/8247247/`)

[2] **Hejazi, M.**; Azimi-Abarghouyi, S. M.; Makki, B.; Nasiri-Kenari, M.; Svensson, T., "Robust Successive Compute-and-Forward over Multi-User Multi-Relay Networks," *IEEE Transactions on Vehicular Technology*,vol. 65, no. 10, pp. 8112-8129, Oct. 2016. (url: `http://ieeexplore.ieee.org/document/7349245/`)

[3] **Hejazi, M.**; Nasiri-Kenari, M., "Simplified compute-and-forward and its performance analysis," *Communications, IET*, vol. 7, no. 18, pp. 2054-2063, Dec. 2013. (url: `http://ieeexplore.ieee.org/document/6678941/`)

[4] **Hejazi, M.**; Makki, B.; Nasiri-Kenari, M.; Svensson, T., "On the Ice-Wine Problem: Optimal CMF-Based Schemes," *under preparation*, 2019.

[5] Azimi-Abarghouyi, S. M.; **Hejazi, M.**; Nasiri-Kenari, M., "Compute-and-Forward Two-Way Relaying," *Communications, IET*, vol. 9, no. 4, pp. 451-459, Mar. 2015. (url: `http://ieeexplore.ieee.org/document/7055380/`)

[6] Azimi-Abarghouyi, S. M.; Nasiri-Kenari, M.; Maham, B.; **Hejazi, M.**, "Integer Forcing-and-Forward Transceiver Design for MIMO Multi-Pair Two-Way Relaying," *IEEE Transactions on Vehicular Technology*, vol. 65, no. 11, pp. 8865-8877, Nov. 2016. (url: `http://ieeexplore.ieee.org/document/7384521/`)

[7] Azimi-Abarghouyi, S. M.; **Hejazi, M.**; Makki, B.; Nasiri-Kenari, M.; Svensson, T., "Decentralized Compute-and-Forward for Ad Hoc Networks," *IEEE Wireless Communications Letters*, vol. 5, no. 6, pp. 652-655, Dec. 2016. (url: `http://ieeexplore.ieee.org/document/7572875/`)

[8] Karbalay-Ghareh, A; Nasiri-Kenari, M.; **Hejazi, M.**, "Convolutional Network-Coded Cooperation in Multi-Source Networks with a Multi-Antenna Relay," *IEEE Transactions on Wireless Communications*, vol. 13, no. 8, pp. 4323-4333, Aug. 2014. (url: `http://ieeexplore.ieee.org/document/6784385/`)

[9] **Hejazi, M.**; Abolhassani, B., "Cyclostationarity-Based Multi-Antenna Cooperative Spectrum Sensing in Cognitive Radio Networks over Correlated Fading Channels," in Proc. of *Iranian Conference on Electrical Engineering (ICEE)*, Mashhad, Iran, pp. 627-632, 2018. (url: `https://ieeexplore.ieee.org/document/8472493`)

[10] **Hejazi, M.**; Abolhassani, B., "Energy detection based spectrum sensing in cognitive radio networks over spatially-correlated channels," *IEEE Symposium on Industrial Electronics and Applications (ISIEA)*, Penang, Malaysia, pp.738-743, 2010. (url: `http://ieeexplore.ieee.org/document/5679368/`)

[11] **Hejazi, M.**; Abolhassani, B., "Adaptive Cooperative Spectrum Sensing in Cognitive Radio Networks," in proc. of *19th Iranian Conference of Electrical Engineering (ICEE)*, 2011, in Persian.

References

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Dr. Bahman Abolhassani, *Associate Professor, Electrical Engineering Department, Iran University of Science and Technology, Tehran, Iran.*
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Prof. Mohammad R. Aref, *Professor, Electrical Engineering Department, Sharif University of Technology, Tehran, Iran.*
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