

Mohammad Karzand

E-mail : mohammad.karzand@nuim.ie
Dublin, Ireland.



Work and Research Experience

- 04/2014–Now **Researcher, Bell Laboratories, Alcatel-Lucent, Ireland**
The title of the rateless coding in the cloud and is a part of the Science Foundation Ireland Industry Fellowship Programme. We propose to develop new techniques to mask packet loss and latency at the transport layer within modern communication networks. This will offer the potential for significant improvements in user experience and new business opportunities in the delivery of cloud-based software service.
- 2013–Now **Research Fellow, Hamilton Institute, National University of Ireland**
Under supervision of Prof. Leith, I design low delay methods to encode and transmit data over networks. The theoretical part of this work is based on stochastic, queueing and lattice theory. In particular by exploiting the relationship between branching processes, lattice enumeration problems and busy time analysis of general queues, I analyze and compare the delay behavior of various coding schemes. The computer simulations support the analytical results.
- 2007–2013 **Ph.D Assistant, EPFL, Public defense: February 1, 2013**
Under supervision of Prof. Telatar, I designed reliable methods to encode and transmit data over networks. The theoretical part of my work is extensively based on probability, stochastic and information theory, and is supported by computer simulations. More specifically, I developed the first practical algorithm using polar codes to implement the theoretical block Markov coding technique in communication networks.
- 2007 **Research Assistant, EPFL**
I designed opportunistic approaches and algorithms to transmit multimedia over the Internet. My work was an extension of known methods and algorithms both in theory and in practice via simulations to transmit voice, image and video over the Internet.

Education

- 2007–2013 **Ph.D. in Communication and Computer Sciences**
Polar Codes for Communication Networks.
Under supervision of Prof. Emre Telatar
Information Processing Group, EPFL, Switzerland.
- 2005–2007 **M.Sc. in Communication Sciences (Wireless Communications)**
Design of opportunistic approaches to transmit multimedia over the Internet.
Communication Science Department, EPFL, Switzerland.
- 2001–2005 **B.Sc. in Electrical Engineering**
Design of efficient algorithms to route data over wireless networks.
Electrical Engineering Department, University of Tehran, Tehran, Iran.

Publications

Mohammad Karzand, Douglas Leith “A Class of Low Delay Random Linear Codes over Streams,” *Submitted to the 52nd Annual Allerton Conference on Communication, Control, and Computing*, Allerton, 2014.

Mohammad Karzand, Douglas Leith “Low Delay Random Linear Codes over Streams,” *In Preparation, To be submitted to IEEE Transaction on Information Theory*, 2014.

Mohammad Karzand, “Polar Codes for Degraded Relay Channels,” *Proc. Int. Zurich Seminar on Communications*, Zurich, 2012.

Mohammad Karzand, Emre Telatar, “Polar Codes for Q-ary Source Coding,” *Proc. IEEE Int. Symposium on Information Theory*, Austin, 2010.

Mohammad Reza Pourhaghighi, Mohammad Karzand, Hubert Girault, “Orthogonality of two-dimensional separations based on conditional entropy,” *Analytical Chemistry*, pp. 7676–7681, 2011.

M. Karzand, M. Rezaie, V. Mansouri, “Adaptive fault-tolerant data flooding for energy-aware sensor networks,” *Proc. of International Conference on Intelligent Sensing and Information Processing*, 2005.

B. AliPanahi, M. Karzand, “A novel soft handoff algorithm for fair network resources distribution,” *Second IFIP International Conference on Wireless and Optical Communications Networks*, 2005.

Awards, Honors and Fellowships

2014	Won the research Fellowship Grant awarded by the Science Foundation Ireland (Co. Investigators: Dr. Rouzbeh Razavi (Bell Labs) and Prof. Leith (Hamilton Institute)) for the project “Rateless Coding for Clouds”
2005–2007	Recipient of scholarship for graduate students with an outstanding academic record, IC, EPFL.
2005	Top ten in the country in Electrical Engineering graduate entrance exam, Iran.
2004 and 2005	Top ten in the country in Electrical Engineering Olympiad, Iran.
2001	General University Entrance Exam (Mathematics and Physics: Ranked 250th among 1’800’000 candidates).

Teaching Activities

Advanced Mathematics for Engineering, Numerical Computations, Probability and Statistics, Communication Systems I and II, Field and Waves, Electronics III, Information Theory and Coding, Advanced Digital Communications, Signal Processing for Communication Systems, Introduction to Software Defined Radio, Applied Probability and Stochastic Processes, Convex Optimization, Supervision of two students for their Master thesis on polar codes and space-time coding.

Extracurricular Activities

	Reviewer or Committee member <i>IEEE International Symposium on Information Theory.</i> <i>IEEE Transaction on Communications Systems and IEEE Transaction on Information Theory</i> <i>the Second Symposium of ECE Young Researchers, University of Tehran, March 2005.</i>
2009–2011	PhD student representative in Doctoral School (EPFL) - Representative of PhD students in doctoral committee. Leading student / faculty discussion on ways to enhance student / adviser interaction, proposing policies to the doctoral school committee and participating in the meetings with the right to vote.
2009	Board member of Graduate Student Association (IC-EPFL) <i>Financial Officer.</i>