

# Ali Mousavi

Rice University  
Department of Electrical and Computer Engineering  
Houston, TX, 77005  
Email: ali.mousavi@rice.edu, Web: alim.blogs.rice.edu, Tel: 832-475-7602  
November 15, 2017

## RESEARCH INTERESTS

Statistical Machine Learning, Deep Learning, Sensor Data Science, Computational Sensing

## EDUCATION

**Rice University** Houston, TX  
Ph.D. in Electrical and Computer Engineering Sept. 2011–Current  
Advisor: Richard G. Baraniuk  
Thesis: From Physics-Driven to Data-Driven Approaches in Computational Sensing

**Sharif University of Technology** Tehran, Iran  
B.Sc. in Electrical Engineering Sept. 2007–June 2011

## PROFESSIONAL EXPERIENCE

**Research Assistant, Rice DSP Group** Houston, TX  
*Machine Learning and Statistical Signal Processing* Sept. 2011–Current

- Deep learning frameworks for inverse problems
- Data-driven parameterless algorithms for solving the LASSO problem
- Asymptotic analysis of the LASSO from the regularization parameter perspective
- Association detection in high-dimensional settings and large datasets

**Data Science Intern, NativeX LLC** San Francisco, CA  
*Focusing on Big Data related problems in mobile advertisement platform* May 2014–July 2014

- Designing new features for the decision tree classifier based on life time value
- Big data programming using the Apache Hadoop platform
- SQL programming to extract engagement data of users
- Classifier performance evaluation by exploiting hypothesis testing techniques
- Executing A/B testing on live traffic to measure the impact of new models

**Research Intern, École Polytechnique Fédérale de Lausanne (EPFL)** Lausanne, Switzerland  
*Approximation for a Problem in Multi-User Information Theory* May 2010–Sept. 2010

- Capacity characterization of communication over a wireless diamond network with an adversarial jammer

**Researcher, Advanced Communications Research Institute** Tehran, Iran  
*Overloaded CDMA Systems* Aug. 2009–Aug. 2011

- Joint active user identification and multi-user detection for binary input CDMA systems

## Teacher/Teaching Assistant

Statistics and electrical engineering courses

Rice Univ. & Sharif Univ.  
2007–2016

- Interactive R for Applied Statistics
- Probability and Statistics
- Linear Regression Applications
- Signals and Systems
- Communications Systems
- Principles of Electrical Engineering
- Principles of Logic Circuits and Digital System

## AWARDS and HONORS

Schlumberger Graduate Fellowship	2016
Society of Iranian-American Women for Education (SIAWE) Fellowship	2013, 2014
Travel Grant, Matheon Conference on Compressed Sensing and its Applications, Berlin, Germany	2013
George R. Brown School of Engineering Fellowship, Rice University	2011
Iran's National Elites Foundation Fellowship	2007–2011
President's Honorary Rank Award, Sharif University of Technology	2008
Ranked 12th in the Centralized University Entrance Exam among 300,000 students (Iran)	2007
Member of the National Organization for Development of Exceptional Talents (Iran)	2000–2007

## PUBLICATIONS (Google Scholar)

### Journal Publications

1. Ali Mousavi, Arian Maleki, Richard G. Baraniuk, “Consistent Parameter Estimation for LASSO and Approximate Message Passing”, *Annals of Statistics*, 2017
2. Pedram Pad, Ali Mousavi, Ali Goli, Farokh Marvasti, “Simplified MAP-MUD for Active User CDMA”, *IEEE Communications Letters*, 2011
3. Ali Mousavi, Richard G. Baraniuk, “Where the Sieve Sifts: Detecting Associations Among Variables in Large Datasets”, *Submitted to IEEE Transactions on Signal Processing*, 2017
4. Debarshi Sen, Amirali Aghazadeh, Ali Mousavi, Satish Nagarajaiah, Richard G. Baraniuk, Ananad Dabak, “Data-driven Approaches to Structural Health Monitoring of Steel Pipes”, *Submitted to Elsevier Mechanical Systems and Signal Processing*, 2017
5. Debarshi Sen, Amirali Aghazadeh, Ali Mousavi, Satish Nagarajaiah, Richard G. Baraniuk, “Sparsity-based Data-driven Approaches for Damage Detection in Plates”, *Submitted to Elsevier Mechanical Systems and Signal Processing*, 2016
6. Ali Mousavi, Richard G. Baraniuk, “Deep Learning Approaches for Computational Sensing”, *In preparation*

### Conference Publications

1. Chris Metzler, Ali Mousavi, Richard G. Baraniuk, “Learned D-AMP: A Principled CNN-based Compressive Image Recovery Algorithm”, *Neural Information Processing Systems—NIPS*, Long Beach, CA, December 2017
2. Ali Mousavi, Gautam Dasarathy, Richard G. Baraniuk, “Deepcodec: Adaptive Sensing and Recovery via Deep Convolutional Neural Networks”, *Allerton Conference on Communication, Control, and Computing*, Monticello, IL, October 2017.

3. Ali Mousavi, Richard G. Baraniuk, “Beyond l1: Data Driven Sparse Signal Recovery using DeepIn-verse”, *Signal Processing with Adaptive Sparse Structured Representations—SPARS*, Lisbon, Portugal, June 2017.
4. Ali Mousavi, Richard G. Baraniuk, “Learning to Invert: Signal Recovery via Deep Convolutional Networks”, *IEEE International Conference on Acoustics, Speech and Signal Processing—ICASSP*, New Orleans, March 2017
5. Ali Mousavi, Ankit Patel, Richard G. Baraniuk, “A Deep Learning Approach to Structured Signal Recovery”, *Allerton Conference on Communication, Control, and Computing*, Monticello, IL, October 2015.
6. Ali Mousavi, Richard G. Baraniuk, “An Information-Theoretic Measure of Dependency among Variables in Large Datasets”, *Allerton Conference on Communication, Control, and Computing*, Monticello, IL, October 2015.
7. Ali Mousavi, Arian Maleki, Richard G. Baraniuk, “Optimal Tuning of Approximate Message Passing”, *Allerton Conference on Communication, Control, and Computing*, Monticello, IL, October 2014.
8. Ali Mousavi, Arian Maleki, Richard G. Baraniuk, “Asymptotic Analysis of LASSOs Solution Path” , *IEEE International Symposium on Information Theory—ISIT*, Honolulu, HI, June 2014
9. Ali Mousavi, Pedram Pad, Payam Delgosha, Farokh Marvasti, “A New Decoding Scheme for Errorless Codes for Overloaded CDMA with Active User Detection” , *International Conference on Telecommunications—ICT*, Ayia Napa, Cyprus, May 2011

## PATENTS

Ali Mousavi, Richard G. Baraniuk, *Signal Recovery Via Deep Convolutional Networks*, U.S. Provisional Patent Application No. 62/432230, filed Dec 2016

## INVITED TALKS/POSTERS

Allerton Conference on Communication, Control, and Computing, Monticello, IL	2017
Tehran University, Department of Electrical and Computer Engineering, Tehran, Iran	2017
Structural Health Monitoring Group, Rice University Dept. of Civil Engineering, Houston, TX	2017
Oil & Gas High Performance Computing Conference, Houston, TX	2017
Geo-Mathematical Imaging Group, Rice University CAAM Department, Houston, TX	2017
Sharif University of Technology, Winter Seminar Series, Tehran, Iran	2016
Sharif University of Technology, Department of Electrical Engineering, Tehran, Iran	2016
UCSD Workshop on Information Theory and its Applications (ITA), San Diego, CA	2014
Matheon Workshop on Compressed Sensing and its Applications, Berlin, Germany	2013
Texas Instruments Leadership University Seminar, Houston, TX	2013

## ACADEMIC SERVICE

### *Session Chair*

Machine Learning Session at the 53rd Annual Allerton Conference

### *Journal/Conference Reviewer*

- IEEE Transactions on Signal Processing
- Elsevier Signal Processing
- IEEE Signal Processing Letters
- NIPS, Neural Information Processing Systems

- AISTATS, International Conference on Artificial Intelligence and Statistics
- ECCV, European Conference on Computer Vision
- ISIT, IEEE International Symposium on Information Theory

## **COMPUTER SKILLS**

Python, TensorFlow, Theano, JAVA, C, SQL, MATLAB, R, Apache Hadoop