

## **Qualifications**

4+ years of experience in high-tech industries and more than 8+ years of experience in research labs as researcher/developer/system designer with extensive knowledge and specialty in sparse coding (compressed sensing), digital signal processing, video processing, image processing, modeling, machine learning, algorithm development, optimization, mathematics (combinatorics and designs, algebra, linear algebra, tensors, graph theory and algebraic graph theory), statistics (including probability theory, deviation analysis), information theory, channel coding, frame theory, computer vision and designing embedded systems.

## **Honors, Awards, Achievements and Grants**

- Achieved quantitative and qualitative records in "demosaiicing" problem (image processing).
- Achieved state of the art results in certain video processing problems (e.g. scene change detection, object localization and removal).
- Had significant contribution on NSF award #1117709 in 2011 (\$ 408,536 granted).
- DCF fellowship, department of Electrical and Computer Engineering, MSU, 2012.
- Top 10% paper award in IEEE Multi-Media Signal Processing (MMSP) for the paper with the title "Compressive Demosaicing".
- Ranked 31st among more than 350,000 applicants in the Iranian Nationwide University Entrance Exams (Konkour), 1999.

## **Employments and Professional Experiences**

***Eastman Kodak, Rochester, NY*** [summer intern] May. 2011 – Aug 2011

- Designing a sparsity based model for video contents.
- Utilizing such model to perform advanced video processing tasks such as scene change detection, object removal, video montaging, inpainting and object tracking without relying on local motion estimation/ detection and/or image segmentation.

***Technicolor (Thomson), Princeton, NJ*** [summer intern] May. 2010– Aug. 2010

- Utilizing state of the art researches on Affine Constraint Rank Minimization and theory of compressed sensing to achieve video compression.

***Michigan State University-Waves Lab*** [research assistant] Summer. 2007– Present

- Designing an optimal (in terms of sample requirement and complexity) and robust (in the presence of noise) combinatorial algorithm for the compressed sensing framework.
- Utilizing theory of compressed sensing to solve algorithm intensive image processing and video processing problems, such as color image demosaicing, video modeling and video montaging.

***Tehran Municipality, Tehran, Iran*** [team lead, system designer] Spring 2004–Winter 2007

- Leading "Kiosk project": Designing a low cost (embedded) kiosk system to be installed in some bus stops, allowing people to browse news while waiting for the bus.
- Customizing a Linux based OS for a low cost set-top-box

***Semiconductor industries of Iran*** [team lead, consultant] Summer. 2003 – Winter. 2004

- Workshops on Linux device driver programming, real-time systems and operating systems.
- Designing a generic low cost, embedded system and developing firmwares for some peripherals (e.g. touch screen) to be connected to that system.

***Sharif University of Technology, Tehran, Iran*** [research assistant] 2003–2007

- Designing a scalable overlay (peer-to-peer) network architecture.
- Implementing a video streaming server on Intel IXP 1200 network processor.

## **Patents**

- Video representations using a sparsity-based model (K000877US01/KES), Eastman Kodak.
- Scene boundary detection using a sparsity model (K000878US01/KES), Eastman Kodak.
- Motion Matrix for video compression (PU 100198/IU 100197), Technicolor.

## Selected Publications

- [1] **Abdolreza Abdolhosseini Moghadam**, Mrityunjay Kumar and Hayder Radha, "*Common and Innovative Visuals (CIV): a sparsity modeling framework for video*", under review in IEEE transactions on Image Processing, 2012.
- [2] **Abdolreza Abdolhosseini Moghadam**, Mohamad Aghagolzadeh, Mrityunjay Kumar and Hayder Radha, "*A compressive framework for demosaicing of natural images*", accepted in IEEE transactions on Image Processing.
- [3] **Abdolreza Abdolhosseini Moghadam** and Hayder Radha, "*Sparse Expander-like Real-valued Projection (SERP) matrices for compressed sensing*", under review in IEEE transactions on Signal Processing, 2012.
- [4] Mohamad Aghagolzadeh, **Abdolreza Abdolhosseini Moghadam**, Mrityunjay Kumar and Hayder Radha, "*Compressive demosaicing for periodic color filter arrays*", IEEE International Conference on Image Processing (ICIP'11), September 2011.
- [5] Mohamad Aghagolzadeh, **Abdolreza Abdolhosseini Moghadam**, Mrityunjay Kumar and Hayder Radha, "*Bayer and panchromatic color filter array demosaicing by sparse recovery*", SPIE, Digital Photography, 2011.
- [6] **Abdolreza Abdolhosseini Moghadam**, Mohamad Aghagolzadeh, Mrityunjay Kumar and Hayder Radha, "*Incoherent Color Frames for Compressive Demosaicing*", IEEE ICASSP 2011.
- [7] **Abdolreza Abdolhosseini Moghadam**, Mohamad Aghagolzadeh, Mrityunjay Kumar and Hayder Radha, "*Compressive Demosaicing*", IEEE MMSP 2010 (top 10 paper award).
- [8] **Abdolreza Abdolhosseini Moghadam** and Haydar Radha, "*Hybrid Compressed Sensing*", IEEE MMSP 2010.
- [9] **Abdolreza Abdolhosseini Moghadam** and Haydar Radha, "*Complex Sparse Projections for Compressed Sensing*", IEEE Conference on Information Sciences and Systems (CISS10), Johns Hopkins, University, Baltimore, MD, USA.
- [10] **Abdolreza Abdolhosseini Moghadam** and Haydar Radha, "*Complex Randomness-in-Structured Projections for Compressed Sensing*", in Proceedings of IEEE International Conference on Image Processing (ICIP09), Egypt.
- [11] **Abdolreza Abdolhosseini Moghadam** and Haydar Radha, "*Practical Compressed Sensing with Log-of-Prime Projections*", CISS 2009, Johns Hopkins University, Baltimore, MD, USA.
- [12] **Abdolreza Abdolhosseini Moghadam**, S. Barghi, H. R. Rabiee, M. Ghanbari, "*A new scheme on recovery from failure in NICE overlay protocol*", IEEE P2P Information Management 2006.

## Skills

- Solid understanding of advanced digital signal processing techniques and theories, most notably compressed sensing and affine constraint rank minimization.
- Solid understanding of advanced image and video processing techniques such as color image demosaicing, video representation/modeling and MPEG standard.
- Solid knowledge in simulations, system modeling and algorithm development of complex systems with MATLAB and Mathematica (6+ years).
- Proficient in C/C++ (4+ years) coding, debugging and simulation for both embedded as well as desktop platforms.
- Knowledge of OS (Windows, UNIX), shell programming and developing device drivers.
- Experience with Verilog/VHDL (2+ years) code development, debugging, verification flows and methodologies for both ASICs, as well as FPGA targets.
- Solid knowledge of digital hardware design and embedded systems (3+ years).

## Education

<b>Michigan State University</b> Ph.D Electrical and Computer Engineering	Lansing, MI-USA	2007-present
<b>Sharif University of Technology</b> M.Sc. Computer Engineering	Tehran-IRAN	2003-2006
<b>Sharif University of Technology</b> B.Sc. Computer Engineering	Tehran-IRAN	1999-2003