

Nima (A. A.) Moghadam

2984 Woodgate Ct., Unit A
San Jose, CA, 95118

Phone: +1-517-614-1548
nima.moghadam@gmail.com

<http://www.egr.msu.edu/waves/people/nima.htm>

Patents

- Granted: Video representations using a sparsity-based model (US20130235939), Eastman Kodak.
- Granted: Scene boundary detection using a sparsity model (US20130235275), Eastman Kodak.
- Granted: Motion Matrix for video compression (US20130223523), Technicolor.

Work Experience

- **Sony Electronics** San Jose, CA, USA
Sr. Applied research engineer *Aug 2014 - Present*
 - Research & development on Multi-View Stereo for 3D shape reconstruction/modeling including passive and active approaches.
 - Development using different frameworks/libraries including Eigen, OpenCV, Tensorflow, Mex, PCL, etc.
 - Exposed to the whole pipe-line of a Virtual Reality from capture, modeling, compression to texture mapping.
 - Filed two provisional units and are being considered for final patents.
- **Eastman Kodak** Rochester, NY, USA
Intern *May 2011 - Aug. 2011*
 - Formulating the spatio-temporal correlation of a video into a sparse coding format for common video processing tasks such as scene change detection, basic montaging, etc.
 - Two patents were filed and one journal paper published in IEEE transactions on image processing.
- **Technicolor** Princeton, NJ, USA
Intern *May 2010 - Aug. 2010*
 - Proposed an automatically synched video compression method by affine constraint rank minimization and theory of compressed sensing.
 - One patent is filed (which has been cited by Google & Apple research)

Research Experience

- **Michigan State University** 2007 - 2014
Waveslab
 - Studied properties of certain sparse random matrices and showed conditions for exact sparse recovery under ℓ_1 regularized regression could be relaxed for those matrices.
 - Proposing a demosaicing problem through modeling the non-linear behavior of color correlation in the frequency domain.

- Design and implementing (on C++) a distributed protocol in Application Layer Networking for multicasting of data

Awards, achievements and grants

- Won top 3 demo selected by audience at Sony Technology Exchange Fair (STEF) 2016.
- Significantly contributed on NSF award No. 1117709 in 2011 (\$408,536 granted).
- Attained top 10% paper award in IEEE Multi-Media Signal Processing (MMSP) for the paper with the title “Compressive Demosaicing”.
- Served as journal reviewer for journals of IEEE transactions on Image Processing, Springer journal on Circuits, Systems and Signal Processing, ACM Transactions on intelligent systems and technology and also the Conference reviewer for IEEE ICASSP & IEEE ICIP.

Skills

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|------------------------------|-----------------------|---------------------|
| • Compressed sensing | • Data modeling | • Algorithms |
| • Machine learning | • Signal processing | • Image processing |
| • Statistics and Probability | • Numerical methods | • Linear algebra |
| • Optimization | • Embedded systems | • Matlab |
| • C/C++ | • Distributed systems | • Video algorithms |
| • Computer vision | • Multi-View Stereo | • 3D reconstruction |

Selected publications

- A. A. Moghadam, et. al., “*A compressive framework for demosaicing of natural images*”, IEEE transactions on Image Processing, Vol. 22, Issue 6, pp 2356-2371, 2013.
- A. A. Moghadam, et. al., “*Common and Innovative Visuals (CIV): a sparsity modeling framework for video*”, IEEE transactions on Image Processing, Vol.23, issue 9, pp: 4055-4069, 2014.
- A. A. Moghadam, et. al., “*Invariant Support Set in Compressed Sensing*”, IEEE Allerton, 2014.

Education

- **Michigan State University**
Ph.D. Electrical and Computer Engineering 2007 - 2014
 – Thesis title: “Combinatorial Algorithms for Compressed Sensing”
- **Sharif University of Technology**
M.Sc. Computer Engineering 2003-2006
- **Sharif University of Technology**
B.Sc. Computer Engineering 1999-2003