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Mina A. Makar

Education

Ph.D. in Electrical Engineering *Sept. 2007 – Expected June 2013*
Stanford University, CA

GPA 4.10

M.Sc. in Electrical Engineering / Communications and Signal Processing *Sept. 2004 – Dec. 2006*
Faculty of Engineering, Alexandria University, Egypt

GPA 4.00

B.Sc. in Electrical Engineering / Communications and Electronics *Sept. 1999 – June 2004*
Faculty of Engineering, Alexandria University, Egypt

Rank 1 / 421

Research Interests

- Image and Video Coding
- Video Quality Monitoring
- Computer Vision
- Networked Multimedia Systems

Experience

- **Research Assistant** *June 2008 – Present*

Image, Video and Multimedia Systems (IVMS) Group, EE Dept., Stanford University

- **Teaching Assistant** *Jan. 2012 – March 2012*
Jan. 2011 – March 2011
Jan. 2010 – March 2010

EE 398A – Image and Video Compression, EE Dept., Stanford University

Helped students to achieve better understanding of the course material. Mentored class projects on different image and video coding topics. Designed the class final project on “Compression of Stereo Image Pairs (Winter – 2012)”

- **Research Associate** *June 2011 – Sept. 2011*

Hewlett-Packard Labs

Palo Alto, CA

Worked on developing new methods to provide rate-efficient decoder hints to drive decoder error concealment behavior in high-definition video conferencing. The developed method relies on transmitting additional hints to support selective freezing of heavily damaged pictures only. Published the proposed method in ICASSP 2012 conference. Implemented a real-time demonstration of the selective frame freezing idea.

- **Video Software Engineer** *June 2010 – Sept. 2010*

Droplet Technology

Palo Alto, CA

Implemented a low-complexity saliency map generation algorithm to detect the objects that attract users’ attention in a video scene in real-time. This saliency map is further used to control a standard H.264 video encoder to reduce encoding complexity and/or bit-rate and allocate more bits to more salient parts in the scene.

- **Video Software Engineer** *June 2009 – Sept. 2009*

AMPEX Data Systems

Redwood City, CA

Implemented a real-time video streaming system with interactive region-of-interest functionality. The implementation platform is DM6467 DSP. The system allows a remote client to arbitrarily pan/tilt/zoom to a certain part in an HD video scene. The server should send only the relevant part in the scene along with a thumbnail video serving as an overview of the whole field of view.

- **Teaching Assistant** *Sept. 2004 – Aug. 2007*

EE Dept., Faculty of Engineering, Alexandria University, Egypt

Assisted in teaching the following undergraduate courses

- Signal Processing
- Circuit Analysis
- Communication Systems

Publications

- **Journal Papers**

(1) C.-L. Chang, **M. Makar**, S. Tsai, and B. Girod, "Direction-Adaptive Partitioned Block Transform for Color Image Coding," *IEEE Transactions on Image Processing*, Vol. 19, No. 7, July 2010.

- **Conference Proceedings**

(1) **M. Makar**, H. Lakshman, V. Chandrasekhar and B. Girod, "Gradient Preserving Quantization," *IEEE International Conference on Image Processing (ICIP 2012)*, Orlando, Florida, USA, September 2012 (submitted)

(2) **M. Makar** and W.-T. Tan, "Selective Freezing of Impaired Video Frames Using Low-Rate Shift-Invariant Hint," *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2012)*, Kyoto, Japan, March 2012 (accepted)

(3) **M. Makar**, Y.-C. Lin, A. F. de Araujo and B. Girod, "Compression of VQM Features for Low Bit-Rate Video Quality Monitoring," *Proc. IEEE International Workshop on Multimedia Signal Processing (MMSP 2011)*, Hangzhou, China, October 2011 [**Top 10% Paper Award**]

(4) **M. Makar**, Y.-C. Lin, N.-M. Cheung, D. Pang and B. Girod, "Quality-Controlled View Interpolation for Multiview Video," *Proc. IEEE International Conference on Image Processing (ICIP 2011)*, Brussels, Belgium, September 2011 [**Invited Paper**]

(5) **M. Makar**, D. Pang, Y.-C. Lin and B. Girod, "Quality-Controlled Motion-Compensated Interpolation," *Proc. 44th Annual Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, USA, November 2010 [**Invited Paper**]

(6) **M. Makar**, A. Mavlankar, P. Agrawal and B. Girod, "Real-Time Video Streaming with Interactive Region-of-Interest," *Proc. IEEE International Conference on Image Processing (ICIP 2010)*, Hong Kong, September 2010

(7) V. Chandrasekhar, **M. Makar**, G. Takacs, D. Chen, S. Tsai, N.-M. Cheung, R. Grzeszczuk, Y. Reznik, and B. Girod, "Survey of SIFT Compression Schemes," *Proc. Second International Workshop on Mobile Multimedia Processing (WMMP 2010)* in conjunction with *20th International Conference on Pattern Recognition (ICPR 2010)*, Istanbul, Turkey, August, 2010

(8) **M. Makar**, A. Mavlankar and B. Girod, "Compression-Aware Digital Pan/Tilt/Zoom," *Proc. 43rd Annual Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, USA, November 2009 [**Invited Paper, Best Student Paper Finalist**]

(9) J. Noh, **M. Makar** and B. Girod, "Streaming to Mobile Users in a Peer-to-Peer Network," *Proc. 5th International Mobile Multimedia Communications Conference (MobiMedia 2009)*, London, UK, September 2009 [**Best Student Paper Award**]

(10) **M. Makar**, C.-L. Chang, D. Chen, S. Tsai, and B. Girod, "Compression of Image Patches for Local Feature Extraction," *Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2009)*, Taipei, Taiwan, April 2009. [**Best Student Paper Finalist**]

- **Patents**

(1) J. Noh, **M. Makar**, B. Girod, F. Hartung and J. P. Singh, "Distributed Video Transcoding for Peer-to-Peer Systems," *US Patent pending*.

- **MPEG Contributions**

(1) **M. Makar**, V. Chandrasekhar, H. Lakshman, S. Tsai, G. Takacs, D. Chen and B. Girod, "Canonical patch encoding for CDVS," February 2012 (99th, San Jose, USA). ISO/IEC JTC1/SC29/WG11/m23577

(2) D. Chen, V. Chandrasekhar, G. Takacs, S. Tsai, **M. Makar**, R. Vedantham, R. Grzeszczuk and B. Girod, "Improvements to the test model under consideration with a global descriptor," February 2012 (99th, San Jose, USA). ISO/IEC JTC1/SC29/WG11/m23578

(3) S. Tsai, D. Chen, V. Chandrasekhar, G. Takacs, **M. Makar**, R. Grzeszczuk and B. Girod, "Improvements to the location coder in the TMuC," February 2012 (99th, San Jose, USA). ISO/IEC JTC1/SC29/WG11/m23579

(4) V. Chandrasekhar, D. Chen, G. Takacs, S. Tsai, **M. Makar**, R. Vedantham, R. Grzeszczuk and Bernd Girod, "Improvements to the test model under consideration with low memory descriptors," February 2012 (99th, San Jose, USA). ISO/IEC JTC1/SC29/WG11/m23580

Academic Honors

- 'Top 10% Paper Award' (MMSP – 2011)
- Co-recipient of 'Best Student Paper Award' from the 5th International Mobile Multimedia Communications Conference (MobiMedia – 2009)
- 'Best Student Paper Finalist' (Asilomar conference – 2009)
- 'Best Student Paper Finalist' (ICASSP – 2009)
- Recipient of the Departmental Fellowship for graduate studies from EE Dept., Stanford University, academic year 2007 – 2008
- Awarded the 'Science Day' prize for obtaining the highest cumulative score over Alexandria University students in the academic year 2003-2004 presented from the Academy of Scientific Research and Technology and awarded by the Egyptian President, Egypt
- Ranked 1st on the EE Dept., Alexandria University students during the academic years 2000-2001 to 2003-2004

Core Ph.D. Courses

- Image and Video Compression
- Information Theory
- Convex Optimization
- Digital Image Processing
- Statistical Signal Processing
- Machine Learning

Core M.Sc. Courses

- Fast Algorithms for Signal Processing
- Adaptive Signal Processing
- M.Sc. Thesis Cellular Radio Network Design Using Particle Swarm Optimization
- Neural Networks
- DSP Architecture and Circuits

Computer Skills

- Software Packages: MATLAB, Mathcad, Microsoft Office
- Programming Languages: C , C++, Python

Language Skills

- **Arabic** Native
- **English** Fluent

Professional Activities

- Member of the US delegation to MPEG
- Student member of IEEE
- Helped in the preparation of “**Lecture Notes on Z-Transform**” by Refaat El-Attar
Published in 2005, Lulu Press Inc., USA