Seyedmohammad Mavadati (Ph.D.)

CONTACT INFORMATION

FirstName: Seyedmohammad Lastname: Mavadati
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SUMMARY OF QUALIFICATIONS

Professional Background:

Automatic Facial Expression and Emotion Recognition, Facial Action Classification
Machine Learning and Statistical Pattern Recognition
Image and Video processing, Emotive Human-Machine Interaction
Computer Vision and Image Processing, Facial Action Coding System (FACS) Annotation

Computer Skills:

C++, C#, Python, MATLAB and Simulink, OpenCV, Object Oriented Programming

EDUCATION

Ph.D. in Electrical and Computer Engineering January 2015

University of Denver, School of Engineering and Computer Science

- Major in Machine Learning and Computer Vision
- Dissertation Title: "Automatic Measurement of Spontaneous Facial Behaviors for Human Machine Interaction"
- GPA: 3.78 out of 4.00

Master of Science in Electrical and Telecommunication Engineering 2010

Yazd University, Electrical Engineering Department

- Major in Digital Signal Analysis and Computer Vision Applications
- Thesis Title: "Fusing Visible and Infrared Visual Data for Automatic Face Authentication"
- GPA: 18.23 out of 20 (Outstanding Student with Second Highest GPA)

Bachelor of Science in Electronics Engineering 2007

Shahrood University of Technology, Electrical Engineering Department

- Thesis Topic: "Computer Vision-based Citrus Defects Detection by K-Means Clustering"
- GPA: 17.38 out of 20 (Outstanding Student with Second Highest GPA)

INDUSTRY AND RESEARCH EXPERIENCES

Computer Vision Scientist February 2015 - Present
Affectiva, Inc., Waltham, MA

- Research, develop and implement state of the art machine learning and computer vision algorithms for automated facial expression and emotion recognition.
- Employing object-oriented programming (C++ and Python) for large scale data analysis and emotion sensing
- Develope and design algroithms for classifying facial acations and expressions autoamtically for diverse applications (e.g. medical, marketting, etc.)

Computer Vision Algorithm Developer Intern June - September 2014
TKO Enterprises, Inc., Longmont, CO

- Designing a software in C++/OpenCV to detect specific events or objects of interest in real-time (with motion detection capability and using HOG, LBP, HAAR AdaBoost cascade classifier).

Machine Learning and Computer Vision Graduate Researcher 2010 - January 2015
Electrical and Computer Engineering Dept., University of Denver, CO

- Developed automatic spontaneous facial action analyzer which utilizes geometric and appearance features (e.g. LBPH, HOG, Gabor) to analyze and recognize facial expression in single image or sequence of video frames (using C++ and MATLAB).
- Designed, annotated and publicly released a new facial expression database (DISFA) in 2012.
- Designed a video capturing system and have been conducting robot-based game sessions to analyze and model social and facial behaviors of children with autism (using Kinect, multiple-HD cameras, and skin conductance sensor) since January 2013.
- Mentored four Electrical and Psychology undergraduate students for summer projects.

Computer Vision and Image Processing Graduate Research Assistant 2007 - 2010
Electrical Engineering Dept. Yazd University,Iran

- Developed a new illumination invariant face authentication system by fusing visible and infrared images (with 96% accuracy).
- Designed Optical Character Recognition (OCR) system for categorizing handwritten digits using SVM and geometric features.
- Integrated Fuzzy system and pattern classification analysis for modeling time series and weather forecasting.

Teaching Experience

Teaching Assistantship

University of Denver, Denver, CO 2011 - 2012
Microprocessors I and II, Digital Signal Processing, Electrical Concepts, Technology 21, MATLAB Programming

Yazd University, Yazd, Iran 2008 - 2009
Image Processing, Control Systems, Digital Signal and Systems, Electrical Circuits, MATLAB Programming (Image Processing Toolbox)

Volunteer Tutoring

Engineering Mathematics, Digital Signal Processing, Electrical Concepts, Image Processing Algorithm, Linear Control Systems, C++ and MATLAB Programming,

Honors and Awards

- Nominated as a member of *'Doctoral Consortium at CVPR'2013* and presented a poster related to my PhD research. 2013
- Arranged, annotate and released a novel spontaneous facial action coded database, known as Denver Intensity of Spontaneous Facial Action (DISFA). 2012
- Outstanding student with second highest overall GPA (18.23 out of 20.00) among M.Sc. students in Electrical and Electronics Engineering Department. 2010
- Outstanding student with second highest overall GPA (17.38 out of 20.00) among 145 B.Sc. students in Electrical and Electronics Engineering Department. 2007
- Top 1% among 400,000 participants in Iran's nationwide B.Sc. Entrance Exam. 2003

Publications

Journal Papers:

1. **S.M. Mavadati**, M.H. Mahoor, K. Bartlett, P. Trinh, J. Cohn, *"DISFA: A Spontaneous Facial Action Intensity Database"*, Transaction on Affective Computing IEEE, vol.4, no.2, pp.151,160, April-June 2013 (TAC'13)
2. **S.M. Mavadati**, H. Feng, A. Gutierrez, M.H. Mahoor, *"How Children with Autism Regulate Their Eye Gaze in Interaction with a Robot?"*, Journal of Plos One (2015)– Under Review.
3. **S.M. Mavadati**, M. Salvador, H. Feng, S. Silver, A. Gutierrez, M.H. Mahoor, *"Pilot Study: Robot-based Behavioral Intervention for Individuals with Autism Spectrum Disorder "*, Journal

of Autism and Developmental Disorders (JADD, 2015)– Under Review.

4. J.M. Girard, J.F. Cohn, M.M Mahoor, **S.M. Mavadati**, Z. Harnmal, D. P. Rosenwald, *"Non-verbal social withdrawal in depression: Evidence from manual and automatic analyses"*, Image and Vision Computing Journal (IVCJ2014).
5. X. Zhang, M. H. Mahoor, **S.M. Mavadati**, *"Facial Expression Recognition using lp-norm MKL Multiclass-SVM"*, Machine Vision and Applications Journal (MVA'15).
6. Y. Li, **S.M. Mavadati**, M. H. Mahoor, Y. Zhao, Q. Ji, *"Measuring the Intensity of Spontaneous Facial Action Units with Dynamic Bayesian Network"*, Pattern Recognition - Journal (PR'15).

Refereed Conference Papers:

5. **S.M. Mavadati**, H. Feng, P. B. Sanger, S. Silver, A. Gutierrez, M. H. Mahoor, *"Using Robots As Therapeutic Agents to Teach Children with Autism Recognize Facial Expression"*, International Meeting for Autism Research (IMFAR 2015).
6. **S.M. Mavadati**, H. Feng , A. Gutierrez, M. H. Mahoor , *" Comparing the Gaze Responses of Children with Autism and Typically Developed Individuals in Human-Robot Interaction"*, International Conference on Humanoid Robots (ICHR'14).
7. **S.M. Mavadati**, M. H. Mahoor , *"Temporal Facial Expression Modeling for Automated Action Unit Intensity Measurement"*, International Conference on Pattern Recognition (ICPR 2014).
8. **S.M. Mavadati**, H. Feng, S. Silver, A. Gutierrez, M. H. Mahoor, *"Children-Robot Interaction: Eye Gaze Analysis of Children with Autism during Social Interaction"*, International Meeting for Autism Research (IMFAR 2014).
9. X. Zhang, M. H. Mahoor, **S.M. Mavadati**, J. F. Cohn, *"A Lp-norm MKMTL Framework for Simultaneous Detection of Multiple Facial Action Units"*, Winter Conf. on Application of Computer Vision(WACV 2014).
10. **S.M. Mavadati**, M. H. Mahoor, X. Zhang, *"Manifold Alignment Using Curvature Information"*, International Conference on Image and Vision Computing New Zealand (IVCNZ 2013).
11. H. Rezaeilouyeh, M. H. Mahoor, **S.M. Mavadati**, J. J. Zhang, *"A Microscopic Image Classification Method using Shearlet Transform"*, IEEE International Conference on Healthcare Informatics (ICHI 2013)
12. **S.M. Mavadati**, M.H. Mahoor, K. Bartlett, P. Trinh, *"Automatic Detection of Non-posed Facial Action Units"*, International Conference in Image Processing (ICIP 2012)
13. Y. Li,**S.M. Mavadati**, M.H. Mahoor, Q. Ji, *"A Unified Probabilistic Framework For Measuring The Intensity of Spontaneous Facial Action Units"*, IEEE International Conference on Automatic Face and Gesture Recognition (FG 2013), Shanghai, China. April 2013
14. J.M. Girard, J.F. Cohn, M.H. Mahoor, **S.M. Mavadati**, D. Rosenwald. *"Social Risk and Depression: Evidence from Manual and Automatic Facial Expression Analysis"*. IEEE International Conference on Automatic Face and Gesture Recognition (FG 2013), Shanghai, China. April 2013 (FG'13)
15. **S.M. Mavadati**, M.H. Mahoor, *"A New Approach for Curvature Estimation of Sampled Data"*, International Conference on Development and Learning, San Diego, CA, November 2012 (ICDL 2012)
16. M. H. Mahoor, M. Zhou, K. L. Veon, **S.M. Mavadati**, J. F. Cohn, *"Facial Action Unit Recognition with Sparse Representation"*, Automatic Face and Gesture Recognition, Santa Barbara, March 21-25, 2011 (FG 2011)
17. **S.M. Mavadati**, M.T. Sadeghi, J. Kittler, *"Fusion of Visible and Synthesised Near Infrared Information for Face Authentication"*, Proceeding of the IEEE International Conference on Image Processing, Hong Kong, September 2010 (ICIP'10)

18. **S.M. Mavadati** ,M.T.Sadeghi, M. Dashtnavard, *"Lip Segmentation by Fuzzy Algorithm and Decision Level Fusion"*, 9th Iranian Fuzzy Systems, Proceeding of the 10th Conference in Intelligent Systems, Yazd University, Yazd, Iran, 15-17, July 2009
19. M. Dashtnavard, M.T. Almodares, M.T.Sadeghi, **S.M. Mavadati**, *"Automatic Counting Liver Cells of Mouse by FCM Algorithm"*, Iranian Conference on Electrical Engineering, Elmo-Sanat University, Tehran, Iran , May 2009 (ICEE 2009)
20. S. Hejazi, **S.M. Mavadati**, A. Darabi, *"Introduction the Structure of Induced Claw Pole Machine"*, Proceeding of the10th Student Electrical Engineering Conference, Isfahan, Iran, August 2007

Computer Skills

- **Programming Languages:** C++, C#, MATLAB/Simulink, Object Oriented Programming.
- **Libraries:** OpenCV, OpenGL.
- **Scripting Languages:** Python, HTML.
- **Operating Systems:** Windows, Linux.
- **Applications:** MS Visual Studio, Netbeans, LaTex, LabView, Protel, Orcad, AutoCAD.

Last updated: December 13, 2015