

Curriculum Vitae of Mohammad H. Mahoor, Ph.D.

Associate Professor
Department of Electrical & Computer Engineering
University of Denver

Address: 2390 S. York Street, CMK #308, Denver, CO 80208
Office Phone/Fax: (303)-871-3745/4450

Email: mmahoor@du.edu, **Website:** www.mohammadmahoor.com

Immigration Status: U.S. Citizen

EDUCATION

Ph.D. in Electrical & Computer Engineering, 2007

University of Miami, Coral Gables, FL
Dissertation: "A multi-modal approach for face modeling and recognition"
Advisor: Professor M. Abdel-Mottaleb; Fellow IEEE

M.S. in Biomedical Engineering, 1998

Research area: Biological System Modeling and Medical Image Processing
Sharif University of Technology, Tehran, Iran

B.S. in Electronics Engineering (with first-class honors), 1996

University of Petroleum Technology (Former AIT), Iran

APPOINTMENTS

Associate Professor with tenure, September 2014-present

Department of Electrical and Computer Engineering, University of Denver

Visiting Professor, June-August 2014

Machine Perception Lab., University of California, San Diego

Adjoint Professor, March 2011-present

Department of Computer Science, University of Denver

Assistant Professor, August 2008-August 2014

Department of Electrical and Computer Engineering, University of Denver

Post-Doctoral Fellow Oct. 2007- July 2008

University of Miami, Department of Psychology, Coral Gables, FL

- Worked on facial expression analysis and modeling with application in studying emotions of children with autism

Summer Internship, 2005

Beckman-Coulter Inc. Miami FL, US

- Worked as a C# programmer at department of Algorithm Development, Hematology Division
- Developed and implemented unit test routines for the signal processing algorithms utilized in the software under development

- Reduced the computational complexity of the software under development for the blood analyzer instrument

Research Assistant, 2003-2007

University of Miami, Department of Electrical and Computer Engineering Coral Gables, FL

- Prepared research proposals for NSF and NIJ, 2004-2007
- Worked on 2-D and 3-D pattern recognition with application in face recognition
- Worked on 3-D object recognition and matching with application in face recognition
- Worked on data fusion based on Belief theory
- Worked on image stitching using Graph-Cut optimization
- Worked on image quality assessment with application in face recognition

Director of Training and Supporting Section, 2000-2003

Bamdad Computer Company, Tehran, Iran

- Managed a team of 35 people for database and network administration activities

Hardware Design Engineer, 1999-2000

Bamdad Computer Company, Tehran, Iran

- Designed DSP systems using TMS C25 series with application in radar signal processing
- Developed analog and digital microcontroller based system for general applications

Research Assistant, 1996-1997

Sharif University, Tehran, Iran

- Developed a system for object detection with application in breast cancer detection (based on ultrasonic tissue characterization and motion detection using optical flow)

RESEARCH INTERESTS

Theory

- Computer vision & Pattern recognition
- Machine learning & Deep learning
- Image processing
- Compressive sensing theory
- Optimization
- Algorithm development
- Data fusion
- Embedded systems

Application

- Affective computing (Facial expressions recognition and analysis)
- Social assistive robotics
- Social behavior analysis
- Biomedical signal processing
- Body sensor network
- Brain and human computer interfacing

TEACHING EXPERIENCES

Courses Taught at University of Denver

- Modern/Advanced Digital System Design & Lab, Falls 2008, 2009, 2010, 2011, 2012, 2013

- Computer Vision, Winters 2009, 2011, 2013, 2015
- HDL Modeling & Synthesis, Springs 2009, 2010, 2011, 2013, 2014, 2015
- (Advanced) Pattern Recognition, Winters 2010, 2012, 2014

Teaching Assistant, January 2004-May 2007

University of Miami, Coral Gables, FL

- Assistant Lecturer: digital image processing, digital signal processing, digital control system, pattern recognition and multimedia systems

Lecturer, 1999- 2000

University of Shahid Sattari, Tehran, Iran

- Courses taught: Digital design and Lab., Electronics I and Lab

Lecturer, 2001- 2003

Bamdad Computer Company, Tehran, Iran

- Lectured Network and Unix/Solaris 2.5 (User & Administration Level)

Teaching Assistant, Jan 1998- September 1998

Sharif University of Technology, Tehran, Iran

- Courses: Mathematical Engineering, Electronics I

Teaching Assistant, September 1994- September 1996

University of Petroleum, Ahwaz, Iran

- Courses: Electromagnetic, Circuit Theory, Electrical Machines

HONORS & AWARDS

- Teacher of the year Award; School of Engineering and Computer Science, University of Denver, June 2013
- Marino Autism Research Institute (MARI) Award for research on” Study Facial Expressions of Children with Autism”, 2008. Amount: \$14,000
- Eliahu I. and Joyce Jury Graduate Scholar Award, University of Miami, 2007
- University of Petroleum engineering, Valedictorian, 1996

CURRENT PHD STUDENTS

1. Mohammad Reza Mohammadi (co-advised with Dr. Fatemizadeh from Sharif University), research topic: Facial Action Measurement via Sparse Representation (Aug 2012-)
2. Tanarat Dityam (co-advised with Dr. Rutherford), research topic: Embedded vision systems for robotics applications (Sep 2012-)
3. Hadi Rezaeilouyeh (co-advised with Dr. Zhang), research topic: Medical image processing; cancer detection (Jan 2013-)
4. Ali Mollahosseini, research topic: Social assistive robots for dialog on depression (Jan 2013-)
5. Michelle Salvador, research topic: Social assistive robotics for children with autism spectrum disorder (Sep 2013-)

CURRENT MS STUDENTS

1. Amir Kargar, research topic: Social robots for dialog on depression (Aug 2013-)
2. Soroush Niketeghad, research topic: Brain signal processing for Human Computer Intervention (Aug 2013-)

GRADUATE STUDENTS ADVISING

Advised Ph.D. Students

3. Xiao Zhang; Graduated Feb. 2015; Current position: Fidelity Investment Inc.
Thesis: “Facial Expression Analysis via Transfer Learning”
2. Seyed Mohammad Mavadati; Graduated Jan. 2015; Current position: Affectiva Inc.
Thesis: “Spontaneous Facial Behavior Computing Human Machine Interaction with Applications in Autism Treatment”
1. Salah Althloothi; Graduated August 2013
Thesis: “Human Action Recognition Via Fused Kinematic Structure and Surface Representation”
Primary advisor: Dr. Mahoor, Co-advisor: Dr. Voyles

Advised MS students

4. Howard Feng; June 2014; Current position: St. Vrain Innovation Center; Thesis: Studying Eye-Gaze Attention of Children with Autism Spectrum Disorders Using Socially Assistive Robotics
3. Saba Bakhshi, June 2011; current position: Internship at Solutelia Inc.; Thesis: Development of Wearable Sensors for Body joint Angle Measurement
2. Kevin Veon, Aug 2011; Current position: Dynetics Co.; Thesis: Video Stabilization Using SIFT Features, Fuzzy Clustering, and Kalman Filtering
1. Guosheng Wu, MS, 2009; Current position: Xilinx, Inc; Thesis: SIFT-ME: A New Feature for Human Activity Recognition Primary advisor: Dr. Voyles, Co-advisor: Dr. Mahoor

Served on MS Defense Committee

1. Frank Agyei-Ntim (ECE department), 2009
2. Kang Li (ECE department), 2010
3. Kav Shrestha (CS department), 2010
4. Guosheng Wu (ECE department), 2009
5. Xiaoting Yang (ECE department), 2010
6. James Balasalle (CS department), 2010
7. Xiaoxiao Dai (ECE department), 2013
8. Meng Wu (ECE department), 2013
9. Guangying Jiang (ECE department), 2013
10. Craig Simons (MME department), 2013
11. Florence Mbithi (ECE department), 2014

Served on PhD Defense Committee

1. Bahaa Al-Sheikh (ECE department); 2010
2. Xin Jiang (Physics Department); 2012
3. Douglas Miller (ECE department); 2013
4. Arezoo Hanifi (ECE department); 2012
5. Hamdan Alzahrani (CS department of University of Colorado at Colorado Springs); 2014

UNDERGRADUATE STUDENTS ADVISING (Advised Senior Design Project)

1. Nolan Tallman, Ryan McDonald, 2009
2. Benjamin Natala, Lisette McGlynn, Alan Zukerman, 2010
3. Chris Brune, Tyler Grubb, Alexa Jansey, Donn Sederstrom, 2011
4. John De Witt, Jeff Evans, Peter Neilson, Jordan Rath, 2012
This project was the finalist for the ASME Rehabilitation and Assistive Devices Undergraduate Design competition and the second runner up for the NIBIB DEBUT Challenge for “Eye Tracking Project”.
5. Josh Lane, Boe Watters, Tony Che, Allison Hendrix, 2013

RESEARCH EXPERIENCE FOR UNDERGRADUAGE (REU) STUDENTS

1. Kevin Bartlett, 2010, 2011 (NSF REU, \$4000)
2. Phil Trinh, 2011 (NSF REU, \$4000)
3. Khoa Nguyen (NSF REU, \$4000)
4. Mohammed Agha, 2012 (DU Pins, \$3500)
5. Mary Kastner, 2012 (Start-up Fund, \$2000)
6. Steven Conyers, 2012 (NSF REU, \$8000)
7. Evan Boucher, 2013 (NSF REU, \$8000)
8. Sophia Silver, 2013 (Start-up Fund, \$3000)
9. Gabriel Graitzer, 2013 (NSF REU, \$8000)
10. Peter Schichtel, 2013 (DU Pins, \$3500)
11. Joshua Lane, 2013 (NSF REU, \$8000)
12. Andy Cromer, 2013 (NSF REU, \$4000)
13. William Platista, 2013 (NSF REU, \$4000)
14. Ashton Webberley, 2013 (DU Pins, \$3500)
15. Niteesh Prasad, 2014 (NSF REU, \$8000)
16. Luke Skelly, 2014 (DU Pins, \$3500)
17. Quinn Martindale-George, 2014 (DU Pins, \$3500)
18. Kristin Douglass, 2014 (DU Pins, \$3500)
19. Amanda Pennington, 2014 (NSF REU, \$4000)
20. Peyton Sanger, 2014 (NSF REU, \$3000)
21. Kendall Weistroffer 2015 (NSF REU, \$2000)
22. Benjamin Toofer, 2015 (NSF REU, \$3000)
23. David Chan, 2015 (NSF REU, \$3000)

COMPETITIVE RESEARCH GRANTS AND FUNDING

Current

1. I-CORPS Team: Commercialization feasibility research of light-projected ExpressionBot
Agency: NSF
Role: PI
Total Amount: \$50,000
Period: 7/1/2014-12/31/2014
2. MRI Development: Human Avatars: Enabling Research in Natural Communication with Virtual Tutors, Therapists, and Robotic Companions
Agency: National Science Foundation
Role: PI; Co-PIs: Ron Cole & Wayne Ward (BLT Inc.) and Juan Wachs (Purdue University)
Total Amount: \$1.3M
Period: 09/01/2014-08/30/2017
3. EAGER: Studying Emotional Responses of Children with Autism in Interaction with Facially Expressive Social Robots
Agency: NSF
Role: PI
Total Amount: \$80,000
Period: 09/1/2014/-9/30/2016
4. SHB: Large: Collaborative Research: Companionbots for Proactive Therapeutic Dialog on Depression
Agency: NSF

Role: PI; Senior personnel: Richard Voyles
Total Amount: \$468,122
Period: 9/1/2009/-8/31/2016

5. Collaborative Research: Communication, Perturbation, and Early Development

Agency: NSF

Role: PI

Total Amount: \$104,029

Period: 06/15/2011/-06/15/2015

6. I/UCRC: Collaborative Research: Detecting cancer using advanced computer vision techniques

Agency: NSF

Role: Co-PI; PI: Dr. Andrews

Total Amount: \$107,977; my share: 85%

Period: 7/01/2012-05/30/2015

Note: Dr. Andrews is the PI of this grant because she is the director of the NSF-I/UCRC center. Although, I am Co-PI, I manage the grant (I wrote the proposal, do the research, advise students, and report to the NSF).

7. MRI Collaborative: Development of an Intelligent, Autonomous, Unmanned, Mobile Sensor

Agency: NSF

Role: Co-PI; PI: Dr. Valavanis

Total Amount: \$1,645,350; my share: ~ 10%

Period: 9/01/2012-05/30/2015

Completed

1. Home Telemonitoring for Congestive Heart Failure Risk Management

Agency: Caring for Colorado & Colorado Health Foundation

Role: PI; Co-PIs: Drs. Long and Newman

Total Amount: \$217,247; my share: ~60%

Period: 11/1/2008-9/31/2011

2. EAGER¹: RI: Developing a Framework for Automated Measurement of the Intensity of Spontaneous Facial Expressions

Agency: NSF

Role: PI

Total Amount: \$87,886; my share: 100%

Period: 11/15/2009-11/14/2011

3. Integrating Ethics in New Undergraduate Engineering Curriculum for the 21st Century Interdisciplinary Program

Agency: DU Center for Teaching and Learning Center (Internal Grant)

Role: Co-PI; PI: Dr. M. Matin

Total Amount: \$19,500; my share: 20%

Period: 5/1/2010-4/30/2012

4. I/UCRC: Collaborative Research: A New Miniature Ground/Water Robot

Agency: NSF

Role: PI

Total Amount: \$91,984; my share: 100%

¹ See List of Acronyms.

Period: 07/15/2010 - 07/14/2013

1. MRI Development: Heterogeneous, Autonomic Wireless Control Networks for Scalable Cyber-Physical Systems,

Agency: NSF

Role: Senior Personnel; PI: Drs. Andrews/Voyles

Total Amount: \$1,580,219; my share: ~ 10%

Period: 8/1/09-7/31/14

3. RAPID: CRAWLER Robot with Dual-Use Limbed Locomotion and Manipulation for Void Inspection

Agency: NSF

Role: Co-PI; PI: Dr. Andrews

Total Amount: \$64,351; my share: 100%

Period: 7/01/11 – 6/30/14

Note: Dr. Andrews is the PI of this grant because she is the director of the NSF-I/UCRC center. Although, I am a Co-PI, I manage the grant (I wrote the proposal, do the research, advise students, and report to the NSF).

9. Bed-exit Detection Using Image Processing Techniques

Agency: TKO Enterprises, Inc. Via NSF I/UCRC Center

Role: Co-PI; PI: Dr. Zhang

Total Amount: \$35,000; my share: ~ 30%

Period: 01/01/2013-12/31/2013

8. Decoding Behavior From Brain Electrical Signals to Optimize Deep Brain Stimulation in Patients With Parkinson's Disease

Agency: Knobel Institute for Longevity and Health

Role: PI; Co-PI: Dr. Hebb

Total Amount: \$30,000

Period: 01/15/2013-12/31/2014

9. Collaborative Research: I/UCRC for Safety, Security, and Rescue Research

Agency: NSF

Role: Co-PI; PI: Drs. Andrews/Voyles

Total Amount: \$306,998; my share: ~15%

Period: 9/1/2009/-8/31/2014

Pending

1. Gaze Perception and Intervention in Autism Spectrum Disorders

Agency: DU PROF

Role: PI with Tim Sweeny (Psychology Department)

Total Amount: \$30,000;

Period: 9/1/2015/-8/31/2017

2. CRCNS: Collaborative Research: Adaptive Learning of Brain Behavior in Parkinson's Disease for Closed-loop Deep Brain Stimulation

Agency: NSF

Role: Co-PI; PI: Dr. Jun Zhang

Total Amount: \$340,389; my share: ~15%

Period: 9/1/2009/-8/31/2018

PUBLICATIONS, PRODUCTS, MULTIMEDIA (H-Index according to Google scholar: 15)

Provisional Patent Applications and Invention Disclosures

- [1] M.H. Mahoor, H. Rezaeilouyeh, P. Werahera, F. LaRosa, S. Chang, “Detection of Prostate Carcinoma on Multi-Parametric MR Images Using Shearlet Transform”, DU and UCD Invention Disclosures filed, April 2015.
- [2] M.H. Mahoor, A. Mollahosseini, Q. Martindale-George and L. Skelly, “Rear-Projected LifeLike Robotic Head”, Provisional Patent Application filed Feb 2015, #62115023.

Book Chapters

- [1] D. Messinger, L. L. Duvivier, Z. Warren, M.H. Mahoor, J. Baker, A. Warlaumont, and P. Ruvolo, “Affective Computing, Emotional Development, and Autism”, R. Calvo and A. Bachfischer (Eds); Affective Computing Handbook, NY: Oxford University Press, in press.
- [2] S. Cadavid², M.H. Mahoor, and M. Abdel-Mottaleb, “Multi-modal Ear and Face Modeling and Recognition”, B. Bhanu & V. Govindaraju (Eds.); Multibiometrics for Human Identification, Cambridge University Press, 2011.
- [3] D. S. Messinger, M.H. Mahoor, S.-M. Chow, J. D. Haltigan, S. Cadavid, and J. F. Cohn, “Early emotional communication: Novel approaches to interaction”, J. Gratch & S. Marsella (Eds.), social emotions in nature and artifact: Emotions in human and human-computer interaction. NY: Oxford, Vol. 14. 2010.
- [4] A. Ansari, M.H. Mahoor, and M. Abdel-Mottaleb, “3D Face Mesh Modeling for 3D Face Recognition”, Pone J. and Karahoca (Eds), in State of the Art in Face Recognition, A. Publisher: IN-TECH, ISBN: 978-3-902613-42-4, pp. 131- 2009.
- [5] M. Abdel-Mottaleb and M.H. Mahoor, “Assessment of Blurring and Facial Expression Effects on Facial Image Recognition,” Lecture notes in computer science, ISSN 0302-9743, pp 12-18, Springer 2006.

Refereed Journal Papers

Pending

- [1] S.M. Mohammadi, M. Salvador, S. Silver, A. Gutierrez, and M.H. Mahoor, “Pilot Study: Robot-based Behavioral Intervention for Individuals with Autism Spectrum Disorder, under review, Journal of Autism and Development Disorders.
- [2] S.M. Mohammadi, H. Feng, A. Gutierrez, and M.H. Mahoor, “How Children with Autism Regulate Their Eye Gaze in Interaction with a Robot”, under review, Research in Autism Spectrum Disorders.
- [3] M.R.Mohammadi, E. Fatemizadeh, and M.H. Mahoor, “A Bayesian Source Separation Method for Intensity Estimation of Action Units”, under review, IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI).
- [4] H. Rezaeilouyeh, M.H. Mahoor, J. Zhang, “Automatic Gleason Grading in H&E Images using Multiple Kernel learning”, under review, Computerized Medical Imaging and Graphics journal.
- [5] Yongqiang Li, S.M. Mavadati, Qiang Ji, and Mohammad H. Mahoor, “Measuring the Intensity of Spontaneous Facial Action Units with Dynamic Bayesian Network”, Revised and resubmitted, Journal of Pattern Recognition.

Published

² Name of students are underlined in the citations.

- [1] M.R. Mohammadi, E. Fatemizadeh, M.H. Mahoor, “: Intensity Estimation of Spontaneous Facial Action Units Based on Their Sparsity Properties”, IEEE Transactions on Cybernetics, in press (**Impact Factor 2.18**).
- [2] X. Zhang, M.H. Mahoor, and S.M. Mavadati, “A Lp-norm Multiclass-SVM Framework for Facial Expression Recognition”, Machine Vision and Applications, in press (**Impact Factor: 1.103**).
- [3] M.R. Mohammadi, E. Fatemizadeh, M.H. Mahoor, “PCA-Based Dictionary Building for Accurate Facial Expression Recognition via Sparse Representation”, Journal of Visual Communication and Image Representation, in press (**Impact Factor 1.195**).
- [4] J. M. Girard, J. F. Cohn, M.H. Mahoor, S. M. Mavadati, Z. Hammal, and D.P. Rosenwald, “Nonverbal social withdrawal in depression: Evidence from manual and automatic analyses”, Journal of Image and Vision Computing, in press (**Impact Factor:1.959**) (**editor selection of high quality F&G’13 conference papers**)
- [5] M.R. Mohammadi, E. Fatemizadeh, M.H. Mahoor, “Non-Negative Sparse Decomposition Based on Constrained Smoothed L0 Norm”, Journal of Signal Processing, Volume 100, Pages 42–50, July 2014. (**Impact Factor:1.745**).
- [6] S. Althloothi, M.H. Mahoor, X. Zhang, R. M. Voyles, “Human Activity Recognition Using Multi-Features and Multiple Kernel Learning”, Journal of Pattern Recognition, Volume 47, Issue 5, Pages 1800–1812, May 2014 (**Impact Factor: 2.632**).
- [7] A. O. Hebb, J. J. Zhang, M. H. Mahoor, C. Tsiokos, C. Matlack, H. J. Chizeck, and N. Pouratian, “Creating the feedback loop: Signals for Closed Loop Neurostimulation”, in press, Journal of Neurosurgery Clinics of North America (**Impact Factor: 1.904**).
- [8] W. I. Mattson, J. F. Cohn, M.H. Mahoor, D.N. Gangi, and D.S. Messinger, “Darwin's Duchenne: Eye constriction during infant joy and distress”, PLoS ONE, Vol 8, no. 11, e80161. ISSN 1932-6203, 2013 (**Impact Factor: 3.730**).
- [9] S. M. Mavadati, M.H. Mahoor, K. Bartlett, J.F. Cohn, “DISFA: A Spontaneous Facial Expressions Dataset”, IEEE Transactions on Affective Computing, April-June, vol. 4 no. 2, pp. 151-160, 2013 (**Impact Factor: 1.97**).
- [10] S. Althloothi, M.H. Mahoor, and R.M. Voyles, “A Robust Method for Rotation Estimation Using Spherical Harmonics Representation”, IEEE Transactions on Image Processing. pp. 2306-2316, Vol. 22, No.6 June 2013 (**Impact Factor: 3.199**).
- [11] S. Althloothi, M.H. Mahoor, and R.M. Voyles, “Fitting Distal Limb Segments for Accurate Skeletonization in Human Action Recognition”, Journal of Ambient Intelligence and Smart Environments, Volume 4 (2) IOS Press – Jan 1, 2012 (**Impact Factor: 1.298**).
- [12] D.S. Messinger, W.I. Mattson, M.H. Mahoor, and J.F. Cohn, “The eyes have it: Making positive expressions more positive and negative expressions more negative”, Emotion, 2012 June, 12(3):430-6. Epub 2011 Dec (**Impact Factor: 3.269**).
- [13] M.H. Mahoor, R. Godzdzanker, K. Dalamagkidis, K. P. Valavanis, “Vision-Based Landing of Light Weight Unmanned Helicopters on a Smart landing Platform”, Journal of Intelligent and Robotic Systems, Vol. 61, Issue 1-4, January, 2011 (**Impact Factor: 0.827**).
- [14] D.S. Messinger, M.H. Mahoor, S. Chow, and J.F. Cohn, “Automated Measurement of Facial Expression in Infant-Mother Interaction: A Pilot Study”, infancy Journal, Vo. 14, 2009 (**Impact Factor: 1.969**).
- [15] M.H. Mahoor and M. Abdel-Mottaleb, “Face Recognition Based on 3D Ridge Images Obtained from Range Data”, Journal of Pattern Recognition, Vol., 42, No. 3: pp. 445-451, 2009 (**Impact Factor: 2.632**).
- [16] A-Nasser Ansari, M. Abdel-Mottaleb and M.H. Mahoor, “A Multimodal Approach for 3D Face Modeling and Recognition using 3D Deformable Facial Mask”, Machine Vision and Applications Journal, Volume 20 Issue 3, February 2009 (**Impact Factor: 1.103**).
- [17] N. Gracias, M.H. Mahoor, S. Negahdaripour, A. Gleason, “Fast Image Blending using Watersheds and Graph Cuts,” Journal of Image and Vision Computing, Volume 27, Issue 5, 2 April 2009, Pages 597-607 (**Impact Factor: 1.959**). (**editor selection of high quality BMVC’06 conference papers**).
- [18] M.H. Mahoor and M. Abdel-Mottaleb, “A Multi-modal Approach for Face Recognition Based on Ridge Images and Attributed Relational Graph”, IEEE Transactions on Information Forensics and Security, vol 3, no. 3, 2008 (**Impact Factor: 1.895**).

- [19] M. Abdel-Mottaleb and M.H. Mahoor, "Algorithm for Assessing the Quality of Facial Images," IEEE Computational Intelligence Magazine (CIM), Vol. 2, No. 2, pp. 10-17, May 2007 (**Impact Factor: 2.329**). (**editor selection of high quality IBC'06 conference papers**).
- [20] M.H. Mahoor, M. Abdel-Mottaleb, and A. Ansari, "Improved Active Shape Model for Facial Feature Extraction in Color Images", Journal of Multimedia, Vol. 1, No. 4, pp. 21-28, July 2006 (**Impact Factor: .42**).
- [21] M.H. Mahoor and M. Abdel-Mottaleb, "Classification and Numbering of Teeth in Bitewing Dental Images", Journal of Pattern Recognition, Vol. 38, No. 4, pp. 577-586, April 2005 (**Impact Factor: 2.632**).

Peer-Reviewed Conference Papers:

Pending

- [1] A. Mollahosseini, D. Chan, and M.H. Mahoor, "DeepExpression: Going Deeper in Facial Expression Recognition", IEEE International Conference on Computer Vision (ICCV) 2015.
- [2] M. R. Mohammadi, E. Fatemizadeh, M.H. Mahoor, "Supervised Dictionary Learning for Intensity Estimation of Facial Action Units", IEEE International Conference on Computer Vision (ICCV) 2015.
- [3] S. Niketeghad, A. Hebb, S. Hanrahan, J. Nedrud, and M.H. Mahoor, "Towards Behavioral-level Closed-Lopp DBS: Motor Task Detection from Human STN", IEEE Conference on Engineering in Medicine and Biological Systems (EMBS) 2015.

Published

- [1] Michelle Salvador, Sophia Silver, Mohammad Mahoor, "An Emotion Recognition Comparative Study of Autistic and Typically-Developing Children using the Zeno Robot", 2015 IEEE International Conference on Robotics and Automation (ICRA), Seattle, Washington.
- [2] A. Mollahosseini, G. Graitzer, E. Borts, S. Conyers, R. M. Voyles, R. Cole, M.H. Mahoor, "An Emotive Lifelike Robotic Face for Natural Face-to-Face Communication", 2014 IEEE-RAS International Conference on Humanoid Robots.
- [3] S. Mohammad Mavadati, Howard Feng, Anibal Gutierrez, and Mohammad H. Mahoor, "Comparing the Gaze Responses of Children with Autism and Typically Developed Individuals in Human-Robot Interaction", 2014 IEEE-RAS International Conference on Humanoid Robots.
- [4] Xiao Zhang, Ali Mollahosseini, Amir H. Kargar B., Evan Boucher, Richard Voyles, Rodney Nielsen, Mohammad Mahoor, "eBear: An Expressive Bear-Like Robot", in the 23rd IEEE International Symposium on Robot and Human Interactive Communication (Ro-MAN), Edinburgh, Scotland, UK, Aug 2014.
- [5] Yanzhe Cui, Richard Voyles, Joshua Lane, Mohammad Mahoor, "ReFrESH: A Self-Adaptation Framework to Support Fault Tolerance in Field Mobile Robot", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Chicago, 2014.
- [6] Zaker, N., Mahoor, M.H., Messinger, D.S., Cohn, "Jointly Detecting Infants Multiple Facial Action Units Expressed During Spontaneous Face-to-Face Communication", in the IEEE International Conference on Imaging Processing (ICIP). La Defense, Paris, France. October 2014.
- [7] Hadi Rezaeilouyeh, Mohammad H. Mahoor, Jun Zhang, Francisco G. La Rosa, Samuel Chang, Priya N. Werahera, "Diagnosis of Prostatic Carcinoma on Multiparametric Magnetic Resonance Imaging Using Shearlet Transform", the 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'14), Chicago, Illinois, August 2014.
- [8] Soroush Niketeghad, Adam O. Hebb, Joshua Nedrud, Sara Hanrahan, Mohammad H. Mahoor, "Single Trial Behavioral Task Classification Using Subthalamic Nucleus Local Field Potential Signals", 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'14), Chicago, Illinois, August 2014.
- [9] Amir H. Kargar B., Ali Mollahosseini, Taylor Struempfler, Wilson Pace, Rodney D. Nielsen, Mohammad H. Mahoor, "Automatic Measurement of Physical Mobility in Get-Up-and-Go Test Using Kinect Sensor",

- the 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'14), Chicago, Illinois, August 2014.
- [10] S.M. Mavadati and M.H. Mahoor, "Temporal Facial Expression Modeling for Automated Action Unit Intensity Measurement", in the 22nd International Conference on Pattern Recognition (ICPR), Stockholm, Sweden, August 2014.
 - [11] X. Zhang and M.H. Mahoor, "Simultaneous Detection of Multiple Facial Action Units via Hierarchical Task Structure Learning", in the 22nd International Conference on Pattern Recognition (ICPR), Stockholm, Sweden, August 2014.
 - [12] M.R. Mohammadi, E. Fatemizadeh, and M.H. Mahoor, "Simultaneous Recognition of Facial Expression and Identity via Sparse Representation", in the IEEE Winter conference on Applications of Computer Vision (WACV14).
 - [13] S.M. Mavadati, M. H. Mahoor, and X. Zhang, "Manifold Alignment Using Curvature Information", in the 2013 Image and Vision Computing New Zealand Conference (IVCNZ), Nov. 2013.
 - [14] X. Zhang and M. H. Mahoor, and R. Nielsen, "On Multi-task Learning for Facial Action Unit Detection", in the 2013 Image and Vision Computing New Zealand Conference (IVCNZ), Nov. 2013.
 - [15] X. Zhang, M.H. Mahoor, S.M. Mavadati, and J.F. Cohn, "A l_1 -norm MTMKL Framework for Simultaneous Detection of Multiple Facial Action Units", in the IEEE Winter conference on Applications of Computer Vision (WACV'14), Steamboat Springs, Co, March 2014.
 - [16] H. Jiang, J.J. Zhang, A. O. Hebb, and M.H. Mahoor, "Time-frequency Analysis of Brain Electrical Signals for Behavior Recognition in Patients with Parkinson's Disease", 47th Asilomar Conference on Signals, Systems and Computers, Nov.2013.
 - [17] H. Rezaeilouyeh, M.H. Mahoor, F. La Rosa, and J.J. Zhang, "Prostate Cancer Detection and Gleason Grading of Histological Images using Shearlet Transform", 47th Asilomar Conference on Signals, Systems and Computers, Nov. 2013.
 - [18] X. Dai, M. Wu, B. Davidson, M.H. Mahoor and J.J. Zhang, "Image-based Fall Detection with Human Posture Sequence Modeling", in the IEEE International Conference on Healthcare Informatics (ICHI), Philadelphia, USA, September 2013.
 - [19] M. Ayad, J.J. Zhang, R.M. Voyles, and M.H. Mahoor, "Mobile Robot Connectivity Maintenance Based Electromagnetic Field Recognition", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Osaka University, Japan, Nov. 2013.
 - [20] Z. Hammal, J.F. Cohn, D.S. Messinger, W.I. Mattson and M.H. Mahoor, "Head movement dynamics during normal and perturbed parent-infant interaction", in the Proceedings of the Affective Computing and Intelligent Interaction, Geneva, Switzerland. September 2013.
 - [21] H. Rezaeilouyeh, M.H. Mahoor, S.M. Mavadati and J. Zhang, "A Microscopic Image Classification Method using Shearlet Transform", IEEE International Conference on Healthcare Informatics (ICHI 2013), Philadelphia, USA, September 2013.
 - [22] Y. Cui, R.M. Voyles, and M.H. Mahoor, "ReFrESH, Part I: A Self-Adaptive Architecture for Embedded Systems", in the 9th IEEE International Conference on Automation Science and Engineering. Madison, Wisconsin, August 2013.
 - [23] A. Mollahosseini and M.H. Mahoor, "Bidirectional Warping of Active Appearance Model", in the IEEE CVPR workshop on Analysis and Modeling of Faces and Gestures, Portland, OR, June 2013.
 - [24] X. Zhang, M.H. Mahoor, and R.M. Voyles, "Facial Expression Recognition using HessianMKL based Multiclass-SVM", in EmoSpace Workshop with the IEEE International Conference on Automatic Face and Gesture Recognition (F&G'13), Shanghai, China, April 2013.
 - [25] J. M. Girard, J.F. Cohn, M.H. Mahoor, S.M. Mavadati, D. Rosenwald, "Manual and automatic analysis of facial affective reactivity in major depressive disorder". In the 10th IEEE International Conference on Automatic Face and Gesture Recognition (F&G'13), Shanghai, China, April 2013.
 - [26] N. Zaker, M.H. Mahoor, W.I. Mattson, D.S. Messinger, J.F. Cohn, "A study on different classification methods for automatic measurement of spontaneous facial expression, in the 10th IEEE Conference on Automatic Face and Gesture Recognition (F&G'13), Shanghai, China, April 2013.

- [27] Y. Li, S.M. Mavadati, M.H. Mahoor, Qiang Ji, “A Unified Probabilistic Framework For Measuring The Intensity of Spontaneous Facial Action Units”, in the 10th IEEE Conference on Automatic Face and Gesture Recognition (F&G’13), Shanghai, China, April 2013.
- [28] S.M. Mavadati and M.H. Mahoor, “Curvature Estimation of High-dimensional Data: Implication for Behavioral Data Analysis”, in the Proceedings of the IEEE International Conference on Development and Learning and Epigenetic Robotics, November 2012.
- [29] N. Zaker, M.H. Mahoor, W.I. Mattson, D.S. Messinger, J.F. Cohn, “Intensity Measurement of Spontaneous Facial Actions: Evaluation of Different Image Representations”, in the Proceedings of the IEEE International Conference on Development and Learning and Epigenetic Robotics, November 2012.
- [30] A. Mollahosseini, M.H. Mahoor, and H. Shahbazkia, “Bidirectional Warping of Active Appearance Model”, in the Proceedings of the IEEE International Conference on Development and Learning and Epigenetic Robotics, November 2012.
- [31] Y. Cui, R.M. Voyles, M. He, G. Jiang, M.H. Mahoor, “A Self-Adaptation Framework for Heterogeneous Miniature Search and Rescue Robots”, in the 10th IEEE International Symposium on Safety, Security, and Rescue Robotics, College Station, Texas, Nov. 2012.
- [32] M. Ayad, J.J. Zhang, R.M. Voyles, and M.H. Mahoor, “Electromagnetic Field Recognition for Proactive Robot Communication Connectivity Maintenance”, Asilomar Conference on Signals, Systems, and Computers, Nov. 2012.
- [33] S.M. Mavadati, M.H. Mahoor, K. Bartlett, P. Trinh, “Automatic Detection Of Non-Posed Facial Action Units”, in the proceedings of the IEEE International Conference on Image Processing (ICIP’12), Orlando, FL 2012.
- [34] Y. Cui, M. He, R.M. Voyles, M.H. Mahoor, “Morphing Crossbar: A Partial Dynamic Reconfiguration Architecture for Module Interconnect”, in the proceedings of the 7th International Workshop on Reconfigurable Communication-centric Systems-on-Chip, York, UK, July 2012.
- [35] J. Evans, P. Neilson, J. Rath, J. De Witt, P. Laz, and M.H. Mahoor, “Design Of An Eye Tracking System Enabling Communication For Tbi And Sci Patients” in the proceedings of the ASME 2012 Summer Bioengineering Conference, Puerto Rico, USA, June 2012 (**this paper was the finalist in the ASME 2012 summer bioengineering conference for undergraduate design project competition in rehabilitation and assistive devices and the second runner up for 2012 NIBIB DEBUT challenge**).
- [36] S. Bakhshi, Mohammad H. Mahoor, and B.S. Davidson, “Development Of A Body Joint Angle Measurement System Using IMU Sensors”, in the proceeding of the 33rd Annual International IEEE Conference of Engineering in Medicine and Biology Society (EMBC ’11), Boston, Aug. 30th-Sep. 3rd, 2011.
- [37] S. Bakhshi, X. Li, N. Semenov, J. Apodaca-Madrid, M.H. Mahoor, K.E. Newman, C.S. Long, and C. Neuman, “Congestive Heart Failure Home Monitoring Pilot Study in Urban Denver”, in the proceedings of the 33rd Annual International IEEE Conference of Engineering in Medicine and Biology Society (EMBC ’11), Boston, Aug. 30th-Sep. 3rd, 2011.
- [38] S. Althloothi, M.H. Mahoor, and R.M. Voyles, “Human Action Recognition For Intelligent Robot Systems”, in the 3rd International Joint Topical Meeting on Emergency Preparedness & Response and Robotics & Remote Systems (EPRRS), Knoxville, TN, August 2011.
- [39] K.L. Veon, M.H. Mahoor, R.M. Voyles, “Video Stabilization Using SIFT-ME Features and Fuzzy Clustering”, in the proceedings of the 2011 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2011), San Francisco, CA, Sep. 2011.
- [40] S. Bakhshi and M.H. Mahoor, “Development of a Wearable Sensor System for Measuring Body Joint Flexion”, in the proceedings of the Body Sensor Networks (BSN) Conference, Dallas, May 23-25, 2011.
- [41] M.H. Mahoor, M. Zhou, K.L. Veon, S.M. Mavadati, and J. Cohn, “Facial Action Unit Recognition with Sparse Representation”, in the proceedings of the 9th IEEE International Conference on Automatic Face and Gesture Recognition (F&G011), Santa Barbra CA, March 2011.
- [42] A. Ansari, M.H. Mahoor, and M. Abdel-Mottaleb, “Normalized 3d to 2d Model-Based Facial Image Synthesis for 2d Model-Based Face Recognition”, in the proceedings of the IEEE GCC conference and Exhibition, Dubai, Feb. 2011.

- [43] D. Alie, M.H. Mahoor, W.I. Mattson, D. Anderson, and D.S. Messinger, "Analysis of Eye Gaze Pattern of Infants at Risk of Autism Spectrum Disorder using Markov Models" in the proceedings of the IEEE Workshop on Applications of Computer Vision (WACV2011), Hawaii, January 2011.
- [44] K.L. Veon and M.H. Mahoor, "Localized Support Vector Machines Using Parzen Window for Incomplete Sets of Categories", in the proceedings of the IEEE Workshop on Applications of Computer Vision (WACV2011), Hawaii, January 2011.
- [45] R.D. Nielsen, R.M. Voyles, D. Bolanos, M.H. Mahoor, W. Pace, K. Siek, and W. Ward, "A Platform for Human-Robot dialog Systems Research", in the Proceedings of the Association for the Advancement of Artificial Intelligence (AAAI) Fall Symposium, November 2010.
- [46] M.H. Mahoor, R. Godzdanker, K. Dalamagkidis, K.P. Valavanis, "Vision-Based Landing of Light Weight Unmanned Helicopters on a Smart landing Platform", in the Proceeding of the International Conference & Exhibition on Unmanned Aerial Vehicles (UAV'10), Dubai, June 2010.
- [47] G. Wu, M.H. Mahoor, S. Althloothi, R.M. Voyles, "SIFT-Motion Estimation (SIFT-ME): A New Feature for Human Activity Recognition", in the 2010 International Conference on Image Processing, Computer Vision, and Pattern Recognition, Los Vegas, July 2010.
- [48] S. Althloothi, R.M. Voyles, M.H. Mahoor, and G. Wu, "2D Human Skeleton Model from Monocular Video for Human Activity Recognition", in the 2010 International Conference on Image Processing, Computer Vision, and Pattern Recognition, Los Vegas, July 2010.
- [49] S. Cadavid, M.H. Mahoor, and M. Abdel-Mottaleb, "Multi-modal Biometric Modeling and Recognition of the Human Face and Ear", international Workshop on Safety, Security, and Rescue Robotics, Denver, November 2009.
- [50] M.H. Mahoor, S. Cadavid, M. Abdel-Mottaleb, "Multimodal Ear and Face Modeling and Recognition", in IEEE International Conference on Image Processing (ICIP), Cairo, Egypt, 2009.
- [51] S. Cadavid, M. Abdel-Mottaleb, D. S. Messinger, M.H. Mahoor, and L. E. Bahrack, "Detecting local audio-visual synchrony in monologues utilizing vocal pitch and facial landmark trajectories", in British Machine Vision Conference (BMVC), 2009.
- [52] S. Cadavid, M.H. Mahoor, D. S. Messinger, J. F. Cohn, "Automated Classification of Gaze Direction Using Spectral Regression and Support Vector Machine", in International Conference on Affective Computing & Intelligent Interaction. Netherland, 2009.
- [53] D. S. Messinger, M.H. Mahoor, S. Cadavid, M. Kimijima, JD Haltigan, and J. F. Cohn, "The Role of Eye Constriction in Positive and Negative Infant Emotional Expressions", hot Topic papers presented to the International Society for Research in Emotions. Leuven, Belgium, 2009.
- [54] M.H. Mahoor, S. Cadavid, D.S. Messinger, and J.F. Cohn, "A Framework for Automated Measurement of the Intensity of Non-Posed Facial Action Units", in the 2nd IEEE Workshop on CVPR for Human communicative Behavior analysis (CVPR4HB), Miami Beach, June 25, 2009.
- [55] M.H. Mahoor, A. Ansari, and M. Abdel-Mottaleb, "Multi-modal (2-D and 3-D) Face Modeling and Recognition Using Attributed Relational Graph", in IEEE International Conference on Image Processing, ICIP08, San Diego, CA, Oct. 2008.
- [56] D.S. Messinger, M.H. Mahoor, S. Cadavid, S. Chow, J.F. Cohn, "Early Interactive Emotional Development", IEEE 7th International Conference on Development and Learning. Monterey, CA. 2008.
- [57] M.H. Mahoor and M. Abdel-Mottaleb, "3D Face Recognition based on: Ridge Image and Hausdorff Distance", in the IEEE International Conference on Image, ICIP07, San Antonio, TX, Sept. 2007.
- [58] A. Ansari, M. Abdel-Mottaleb, and M.H. Mahoor, "3D Face Mesh Modeling From Range Images for 3D Face Recognition", in the Processing of IEEE International Conference on Image, ICIP-2007.
- [59] N. Gracias, S. Negahdaripour, A. Gleason and M.H. Mahoor, "Fast Image Blending using Watersheds and Graph Cuts," in the proceedings of British Machine Vision Conference 2006 (BMVC06), Edinburgh, September 2006.
- [60] A. Ansari, M. Abdel-Mottaleb and M.H. Mahoor, "Disparity-Based 3D Face Modeling Using 3D Deformable Facial Mask for 3D Face Recognition," in the Proceeding of International Conference on Multimedia and Expo 2006 (ICME06), Toronto, Canada, July 2006, pp 981-984.
- [61] A. Ansari, M. Abdel-Mottaleb and M.H. Mahoor, " Disparity-Based 3D Face Modeling For 3D Face Recognition," IEEE International Conference on Image Processing (ICIP06), Atlanta, October 2006.

- [62] A. Ansari, M. Abdel-Mottaleb and M.H. Mahoor, "A Multimodal Approach for 3D Face Modeling and Recognition Using Deformable Mesh Model," Biometrics Symposium 2006, Baltimore, Maryland, September 2006.
- [63] M.H. Mahoor and M. Abdel-Mottaleb, "Facial Features Extraction in Color Images Using Enhanced Active Shape Model," in the proceedings of the 7th IEEE international conference of AFGR, Southampton, UK 2006.
- [64] M.H. Mahoor and M. Abdel-Mottaleb, "Automatic Classification of Teeth in Bitewing Dental Images," IEEE International Conference on Image Processing, ICIP04, Oct 24-27, Singapore, 2004.
- [65] M. Mokhtari-Dizaji, E. Zahedi, M. Gity, N. Ahmadinejad, A. Sharafi, M.H. Mahoor, "Evaluation Of Optical Flow Technique On Detection Of Internal Displacement Of Tissue In Ultrasound Images", in the proceedings of the 2nd Conference on Machine Vision, Image Processing & Applications (MVIP'03), Tehran, Feb. 2003.
- [66] M.H. Mahoor and Bijan Vosoughi, "Mathematical Modeling of Neurons," 4th Conference of Computer Association in Iran, January 1999.

Abstracts

- [1] S.M. Mavadati, H. Feng, S. Silver, A. Gutierrez, M. H. Mahoor, Children-Robot Interaction: Eye Gaze Analysis of Children with Autism during Social Interactions, Poster presented in International Meeting for Autism Research (IMFAR 2014).
- [2] M.H. Mahoor, A.O. Hebb, J. Nedrud, and S. Niketeghad "Human Behavior Coding from Brain LFP Signal", poster to be presented at Neuroscience 2013, San Diego, Nov. 2013.
- [3] H. Feng, A. Gutierrez, and M.H. Mahoor, "Using NAO to Improve Directed Eye Gaze of Children with Autism Spectrum Disorders," oral presentation at the Texas Autism Research Conference, San Marcos, Texas, 2013.
- [4] H. Feng, A. Gutierrez, J.J. Zhang, and M.H. Mahoor, "Can NAO Robot Improve Eye-Gaze Attention of Children with High Functioning Autism", poster presented at the IEEE International Conference on Healthcare Informatics (ICHI 2013), Philadelphia, USA, September 2013.
- [5] H. Feng, M. Kastner, J.J. Zhang, A. Gutierrez, S. Hepburn, and M.H. Mahoor "Using Social Robots to Improve Directed Eye Gaze of Children with Autism Spectrum Disorders", poster presented at the 2013 International Meeting for Autism Research (IMFAR), Spain, 2-4 May, 2013.
- [6] W.I. Mattson, J.F. Cohn, M.H. Mahoor, D.S. Messinger, "Duchenne Smiling in the Face-to-Face/Still Face", poster presented at the 2012 International Conference on Infant Studies, Minneapolis, MN, 2012.
- [7] W.I. Mattson, J.F. Cohn, M.H. Mahoor, and D.S. Messinger, "Beyond Smiles: Duchenne Distress in Infants", poster presented at the Association for Psychological Science (APS) Annual Convention, Chicago, IL, USA, 2012.
- [8] S. Bakhshi, M. Matin, and M.H. Mahoor, "Human Joint Angle Measurement Using Fiber Bragg Grating Sensor", poster presented at the Covidien 2011 R&D Summit.
- [9] W.I. Mattson, M.H. Mahoor, S. Cadavid, O.L. Martinez, D.S. Messinger, and J.F. Cohn, "Eye Constriction in Positive and Negative Emotional Expressions", poster session presented at the International Conference for Infant Studies, Baltimore, MD, 2010.
- [10] D.S. Messinger, L. Ibanez, J.F. Cohn, M.H. Mahoor, JD. Haltigan, K. Kelley, and J. Baker, "University of Miami Sibling Study Measuring Infant Learning and Emotion", oral presentation to the annual meeting of the NIH/Autism Speaks Baby Sibs Research Consortium, Miami Beach, FL., 2009.
- [11] M.H. Mahoor, D.S. Messinger, L.V. Ibanez, S. Cadavid, J.F. Cohn, "Automated Measurement of Gaze Direction in Infants", poster presented at the meeting of the Society for Research in Child Development, Denver, CO., 2009.
- [12] M.H. Mahoor, D. S. Messinger, L. Ibanez, M. Kimijima, Y. Wang, S. Cadavid, and J.F. Cohn, "Studying Facial Expressions Using Manifold Learning and Support Vector Machines", poster presented at the IEEE 7th International Conference on Development and Learning, Monterey, California, Aug. 2008.

- [13] M.H. Mahoor, D.S. Messinger, M. Kimijima, R. Brewster K.M. Kelley, J.F. Cohn, “Automatic Measurement of Smile Intensity”, poster presented at Marino Autism Research Institute Scientific Symposium, Vanderbilt University, Nashville, TN. April 2008.

Multimedia

- [1] Interview with Colorado Public Radio (CPR) on Robot May Help Kids With Autism Become More Sociable, Aug 23, 2013

URL: http://www.cpr.org/category/colorado_matters#load_article|Robot_May_Help_Kids_With_Autism_Become_More_Sociable

- [2] Interview with University of Denver Advancement office on DU Professor Uses New Techniques to Treat Autism; Feb. 2013

URL: <http://www.du.edu/ascend/news-mohammad-mahoor.html>

- [3] Interview with DU Magazine on Using Robots to Help Kids with Autism Disorders, July 2013

URL: <http://blogs.du.edu/magazine/academics-research/engineering-school-uses-robot-to-help-kids-with-autism-disorders>

Database

- [1] Denver Intensity of Spontaneous Facial Action (DISFA) Database

Acquisition/development date: January 2010-September 2012

Release date: November 2012

Description: DISFA is a non-posed facial expression database for those who are interested in developing computer algorithms for automatic action unit detection and their intensities described by FACS. This database was created at the University of Denver by Dr. Mahoor. It contains stereo videos of 27 adult subjects (12 females and 15 males) with different ethnicities. The images were acquired using PtGrey stereo imaging system at high resolution (1024×768). The intensity of AU's (0-5 scale) for all the video frames were manually scored by two human FACS experts. The database also includes 66 facial landmark points of each image in the database. The database is available for distribution for research purposes.

Ref: <http://mohammadmahoor.com/databases/denver-intensity-of-spontaneous-facial-action/>

LABARATORY ESTABLISHMENT

- Computer Vision and Image processing Lab at DU, 2008

UNIVERSITY SERVICES AND OUTREACH

University

- Strategic research plan committee appointed by associate provost for research, 2010-2011

Division/School

- Dean search committee, 2013, 2014

ECE department

- Member of ECE faculty hiring search committee, 2009, 2010, 2011, 2012
- Member of undergraduate curriculum development committee (Computer Eng. Program), 2009-2010
- Graduate seminar organizer/coordinator, 2009-2011
- Graduate program curriculum committee, 2009-2011
- PhD qualifying exam, 2009-present
- Chair of CpE undergraduate assessment committee, 2011-present

External Grant Reviewer

- National Science Foundation, Panelist
 - 2010, (x2) 2012, 2013, 2015 (All CISE Division)
- Reviewed research proposal for the American University of Sharjah, UAE, 2011
- Reviewed proposals for undergraduate research for Qatar National Research Foundation, 2011, 2012
- Canada Research Chairs, 2015

PROFESSIONAL ACTIVITIES and SERVICES

Editorial Board member

- Associate Editor Journal of Intelligent and Robotic Systems, Springer, 2011-present

Society membership

- Senior Member of Institute of Electrical and Electronics Engineers (IEEE) 2013-present
- Member of the Society for Imaging Science and Technology, 2010

Paper reviewer

Journals

- IEEE Transactions on Automation Science and Engineering
- IEEE Transactions on Pattern Analysis and Machine Intelligence
- IEEE Transactions on Information Technology in BioMedicine
- IEEE Transactions on Affective Computing
- IEEE Transactions on Information Forensics and Security
- IEEE Transactions on Image Processing
- IEEE Transactions on Knowledge and Data Engineering
- Journal of Pattern Recognition
- Pattern Recognition Letters
- Journal of Computer Vision and Image Understanding
- Journal of Intelligent and Robotic Systems
- IEEE Sensors Journal
- ASME Journal of Medical Devices

Conferences

- IEEE International Conference on Computer Vision (ICCV) 2015
- IEEE International Conference on Image Processing (ICIP), 2005-present
- International Conference on Biometrics, 2006
- IEEE International Conference on Robotics and Automation (ICRA), 2009, 2013
- Fifth International Conference on Body Area Networks, 2010
- First ACM International Health Informatics Symposium, 2010
- The IEEE International Conference on Automatic Face and Gesture Recognition (2011, 2013, 2015)

Chair and Co-chair for Conference Sessions

- Session Chair: UAV'10 Conference, Dubai, June 2010
- Session Chair: International Workshop on Safety, Security, and Rescue Robotics, Denver, Nov. 2009
- Session Co-Chair; IROS'11 conference, Vision from features to applications San Francisco, Sep. 2011

Conference Program Committee Member/Chair

- Technical Program Committee of the IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN 2014, 2015)
- Program Committee: IEEE International Health Informatics Conference, 2013

- Program Committee Member: IEEE International Symposium on Safety, Security, and Rescue Robotics, 2013
- Program Committee Member: IEEE Conference on Face and Gesture Recognition, 2013
- International Program Committee: International Conference on Informatics, Electronics & Vision 2012 (ICIEV12)
- Program Committee Member: IEEE Face and Gesture Special Session on 3D Facial Expression, 2011
- Program Committee Member: First ACM International Health Informatics Symposium (IHI), 2010, 2012
- Local Arrangement Chair: 2011 International Conference on Unmanned Aircraft Systems (former UAV conference)
- Program Committee: Body Nets conference, 2011.
- Program Committee: 3D facial expressions recognition workshop, 2011
- Associate Editor of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2011)

Invited Talks/Seminars

- Keynote Speaker, Technology for Behavioral Change (TECH B) Conference, Miami, FL, March 2015
- Seminar, DU Physics Department, presentation title: Facial Modeling and Analysis: Applications in Social Robotics, March 2014
- Computational Optical Sensing and Imaging (COSI) Seminar series, University of Colorado, Boulder, presentation title: Facial Expression Recognition Using Computer Vision Techniques, Oct. 2013
- 13th Annual Coleman Institute National Conference on the State-of-the-science on Social Assistive Robotics, University of Colorado, School of Medicine, presentation title: Social Assistive Robotics, Sep. 2013
- ECE Seminar, Colorado School of Mines, presentation title: Facial Modeling and Analysis: Applications in Social Robotics, October 2012
- ECE Seminar, University of Colorado, Denver, presentation title: Facial Modeling and Analysis for Biometrics and Biomedical Applications, Feb. 2012
- Dads & Granddads Weekend, University of Denver, presentation title: Social Assistive Robotics for Autism Therapy, Feb. 2012
- All-campus lecture presentation, University of Denver, presentation title: Facial Modeling and Analysis for Biometrics and Biomedical Applications, Sep. 2010
- Identix Inc. New Jersey, presentation title: Multimodal Face Recognition, May 2007

Invitation to conferences:

Dr. Mahoor was invited to the 8th **Annual National Academies Keck Futures Initiative (NAKFI)** conference, Seeing the Future with Imaging Science, which was held Nov. 16-19, 2010 in Irvine, CA. NAKFI is a 15-year effort of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine to catalyze interdisciplinary inquiry and to enhance communication among researchers, funding organizations, universities, and the general public. The objective is to support the climate for conducting interdisciplinary research, and to break down related institutional and systemic barriers. NAKFI works towards these objectives by harnessing the intellectual horsepower of approximately 150 individuals from diverse backgrounds who apply to attend its annual “think-tank” style conference; and by awarding \$1 million in seed grants – on a competitive basis – to conference participants to enable further pursuit of bold, new ideas and connections stimulated by the conference.

Collaborators

- Purdue University; Professor Richard M. Voyles
- University of Miami, FL; Professor Daniel Messinger
- Florida International University; Professor Anibal Gutierrez
- Rensselaer Polytechnic Institute; Professor Qiang Ji
- University of Colorado, Denver; School of Medicine; Professor Susan Hepburn
- University of Pittsburgh/Carnegie Mellon University; Professor Jeffrey Cohn

- University of Minnesota; Professor Nikolaos Papanikolopoulos
- Colorado School of Mines; Professor Mike Wakin
- University of North Texas; Professor Rodney Nielsen
- Denver Health Medical Center, Professor of Medicine Carlin Long
- University of Colorado School of Medicine; Drs. Wilson Pace and Priya Werahera
- Colorado Neurological Institute; Dr. Adam Hebb
- Sharif University of Technology; Professor Emad Fatemizadeh
- Qatar University, Drs. Loay Ismail and Hasan Krad

List of Acronyms

RI:	Robust Intelligence
I/UCRC:	Industry University Research Center
EAGER:	Early-concept Grants for Exploratory Research
MRI:	Major Research Instrumentation
CRI:	Computational Research Infrastructure
RAPD:	Research to Aid Persons with Disabilities Program
SHB:	Smart Health and Well-Being
SCH:	Smart Connected Health
MRI-R2:	Major Research Instrumentation-Recovery 2
R01:	NIH Research Project Grant
R21:	Research Projects, Exploratory/Developmental Grants
RAPID:	Rapid Response Research Grants
EUREKA:	Exceptional, Unconventional Research Enabling Knowledge Acceleration
NRI:	National Robotics Initiative
II:	Institutional Infrastructure
CAREER:	Faculty Early Career Development
NIBIB	National Institute of Biomedical Imaging and Bioengineering
DEBUT	DEsign by Biomedical Undergraduate Teams