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**DEGREES**

PhD (1983) and MS (1981) in Clinical Psychology, University of Massachusetts at Amherst  
BA in Sociology, University of Wisconsin at Madison

**LICENSE AND CERTIFICATION**

Clinical Psychologist, Pennsylvania (License #PS-004660-L)

**PROFESSIONAL EXPERIENCE**

Professor of Psychology and Psychiatry, University of Pittsburgh, 2005 to present  
Adjunct Professor, Robotics Institute, Carnegie Mellon University, 1997 to present  
Secondary appointment, Intelligent Systems Program, University of Pittsburgh, 2018 to present

Chair, Steering Committee for the *IEEE Conference on Automatic Face and Gesture Recognition* (2011 – present).

Executive Board, Association for the Advancement of Affective Computing, 2009 – present.

Advisory Board, [Real Eyes](#), 2013 to present

Advisory Board, Creative Non-Fiction, 2015 to present

Consultant, Emokit, 2017 to present

Advisory Board, AffecTech Innovative Training Network, 2017 to present

Advisory Board, Affectiva, 2011-2013

Affiliated Faculty, Virginia Commonwealth University, 2009 to 2012

Associate Professor of Psychology and Psychiatry, University of Pittsburgh, 1989 to 2005

Assistant Professor of Psychology and Psychiatry, University of Pittsburgh, 1983 to 1989

## **RESEARCH GRANT SUPPORT**

### *ACTIVE RESEARCH GRANTS*

Principle Investigator, “Automatic Multimodal Affect Detection for Research and Clinical Use.” National Institute of Mental Health, 8/1/2017 – 4/30/2022.

Co-Principal Investigator (PI: Wayne Goodman), “Adaptive DBS in Non-Motor Neuropsychiatric Disorders: Regulating Limbic Circuit Imbalance.” National Institutes of Health, 9/30/2016 – 6/30/2022. TDC (U. Pittsburgh) \$577,900.

Co-Principal Investigator, “Deep Brain Stimulation for Depression Using Directional Current Steering and Individualized Network Targeting.” National Institute of Neurological Disorders and Stroke, 9/30/2017 to 6/30/2022.

Principal Investigator, “Collaborative Research: Health Behavior Informatics.” National Science Foundation, 9/1/2017 – 8/31/2021.

Co-Investigator (PI: Wayne Goodman, Baylor Medical School), “Measuring Automated Behavioral Observations & Vocal Expressions while Recording from the Brain. National Institutes of Health, x/xx/2018 – x/xx/2019.

Principle Investigator, “Craniofacial Microsomia: Facial Expression from Ages 1 to 3 Years.” National Institutes of Health, 9/1/2017 – 8/31/2019.

Principal Investigator, “CI-SUSTAIN: Collaborative Research: Multimodal Corpus of Spontaneous Behavior for Automated Emotion Analysis,” National Science Foundation, 8/1/2016-7/31/2019.

Co-Investigator (PI: Z. Hammal), “Automatic Multimodal Assessment of Occurrence and Intensity of Pain for Research and Clinical Use,” National Institutes of Health, 3/1/2017 – 2/28/2019.

Investigator/Consultant (PI: L. Jeni), “Protective Mask Sizing App.” Department of Defense, 9/27/2016 – 11/26/2019.

Principal Investigator, “Modeling the Dynamics of Early Communication and Development.” National Institutes of Health, 8/1/2013 – 7/31/2018. Total costs: \$2,147,458.

Principal Investigator, “Collaborative Research: Learning and Sensory-Based Engagement, Arousal, and Self-Efficacy Modeling for Adaptive Web-Empowerment Trauma Treatment.” National Science Foundation, 8/16/2014 – 8/15/2018.

### *OTHER ACTIVE GRANTS*

Principal Investigator, “Doctoral Consortium for the ACM International Conference on Multimodal Interaction.” National Science Foundation, 9/1/2014 – 08/31/2018.

### *RESEARCH GRANTS UNDER REVIEW*

Co-Investigator (PI: Z. Hammal), "Efficient and Cost-Effective Multimodal System for Pain Measurement in Low Back Pain." National Institutes of Health, 4/1/2019 – 3/31/2024.

Co-Investigator (PI: N. Allen), "MAPS: Mobile Assessment for the Prediction of Suicide." National Institute of Mental Health, 12/1/2018 – 11/30/2022.

Partner Investigator (PI: R. Goecke), "Improving the Specificity of Affective Computing via Multimodal Analysis." Australian Research Council, 1/1/2018 – 12/31/2020.

#### *PAST RESEARCH GRANTS*

Principal Investigator, "Automated Facial Expression Analysis for Research and Clinical Use." National Institute of Mental Health, 4/1/2012 – 7/31/2017.

Co-Investigator (PI: Matthew Speltz, Seattle Children's Hospital), "Craniofacial Microsomia: Longitudinal Outcomes in Children Pre-Kindergarten (Supplement)." National Institutes of Health, 9/1/2013 – 12/30/2017.

Partner Investigator (PI: Sridha Sridharan), "Large Scale, Personalized, Facial Action Unit Detection for Expression Recognition." Australian Research Council, 1/1/2014 – 12/31/2016.

Principal Investigator, "Collaborative Research: CI-ADDO-EN: Multidimensional and Multimodal Dynamic Spontaneous Emotion Corpus for Automated Facial Behavior and Emotion Analysis." National Science Foundation, 9/1/2012 – 8/31/2016. Total costs: \$110,001.

Co-Investigator (PI: Fernando De la Torre). "Face De-Identification." National Institutes of Health, 9/1/2014 – 8/30/2016.

Principle Investigator, "Collaborative Research: Communication, Perturbation, and Early Development." National Science Foundation, 03/01/2011 – 07/31/2015. Total costs: \$283,452.

Co-Investigator (PI: Fernando De la Torre), "Face De-Identification." Federal Highway Administration. 02/01/2014 – 02/01/2015. Total costs: \$313,707.

Partner Investigator (PI: Roland Goecke, Australian National University), "Affective Sensing Technology for the Detection and Monitoring of Depression and Melancholia." Australian Research Council, 1/01/2013 – 12/31/2015.

Collaborator, "Computational Behavioral Science: Modelling, Analysis, and Visualization of Social and Communicative Behavior," NSF, 8/1/2010 – 7/31/2015.

Scientific Advisor, Network of Excellence on Social Signal Processing (SSPNet NoE), "European Commission's Seventh Framework Program." European Commission, 2/1/2009 – 1/31/2014.

Principal Investigator, "Facial Expression Analysis by Computer Processing." National Institute of Mental Health: 5/1/06 – 4/30/12. Total costs: \$2,358,836.

Co-Principal Investigator with Lijun Yin, "EAGER: Spontaneous 4D-Facial Expression Corpus for Automated Facial Image Analysis." National Science Foundation, 9/1/2011 – 8/31/2012. Total costs: \$44,216.

Co-Principal Investigator with Simon Lucey, "Skyping Alan Turing: "A Grand-Challenge" for ICT Science," CSIRO, 12/1/2010 – 11/30/2011. Total costs: \$100,000.

Co-Investigator (PI: Michael Sayette, University of Pittsburgh). "Reinforcing Effects of Alcohol during Group Formation." National Institute of Alcohol Abuse and Alcoholism, 9/30/2005 – 7/31/2011. Total costs: \$1,263,074.

Principal Investigator, "Automated Facial Expression Recognition System (AFERS)." Platinum Solutions and Technical Support Working Group, 3/26/09 – 3/25/10. Total costs: \$244,540.

Co-Principal Investigator, "Automated Measurement of Facial Expression in Autism: Deficits in Facial Nerve Function," Autism Speaks, 10/1/07 – 9/30/2010. Total costs: \$450,000.

Co-Principal Investigator (PI: Kenneth M. Prkachin, University of Northern British Columbia). "Properties of Pain Expression." Canadian Institutes of Health Research. 10/1/05 – 9/30/09. Total direct costs: \$269,584.

- Principal Investigator, "Collaborative Research DHB: Coordinated Motion and Facial Expression in Dyadic Conversation." The National Science Foundation, 1/1/06 – 12/31/09. Total costs: \$730,616.
- Co-Principal Investigator, "Computer Assisted System to Increase Speed and Reliability of Manual FACS Coding." Reallear, LLC & Naval Research Laboratory, 9/1/07 – 8/31/09. Total costs: \$710,000.
- Co-Principal Investigator (PI: Judy Moskowitz), "A Pilot test of Automated Facial Image Analysis for Health-Relevant Facial Expressions," UCSF Academic Senate Committee on Research. Total costs: \$15,000.
- Co-Principal Investigator with Nathan Fox, "Psychophysiology of Risk for Depression." Part of program project grant, "Risk Factors for Childhood Onset Depression" (M Kovacs, PI). National Institute of Mental Health: 8/1/97 – 7/31/07. Approximate total costs exclusive of Program Project: \$3,750,000.
- Co-Principal Investigator with Takeo Kanade, "Multimodal Analysis of Face and Body Gesture Indicators of Communicative Intent," Naval Research Laboratory, 5/1/05 – 4/30/06. Total costs: \$866,364.
- Principal Investigator, "Facial Expression Analysis by Computer Processing." National Institute of Mental Health: 5/1/01 – 4/30/06. Total direct costs (TDC): \$1,541,786.
- Co-Principal Investigator with Daniel Messinger, "Collaborative Proposal: Automated Measurement of Infant Facial Expressions and Human Ratings of Their Emotional Intensity." National Science Foundation, 8/01/04 – 7/31/05. Total Costs: \$100,000.
- Co-Investigator (PI: T. Kanade, Carnegie Mellon University), "Space-Time Face- and Body Biometric for Human Identification from Video." Defense Advanced Research Projects Agency, 8/1/00 – 7/31/04. Total costs: \$1,032,000.
- Principal Investigator, "Consortium on Nonverbal Communication for Human-Computer Interaction." Advanced Telecommunications Research Media Integration Center, Kyoto, Japan: 2/1/00 – 1/31/03, \$18,010 (TDC).
- Co-Principal Investigator with P. Lewinsohn (Oregon Research Institute), "Parental Depression and Infant Development." National Institute of Mental Health: 4/1/97 – 3/31/02, \$2,379,187 (TDC).
- Co-Principal Investigator (PI: T. Kanade, Carnegie Mellon University), "Facial Expression Coding System Project." Central Intelligence Agency, 8/1/00 – 7/31/01, \$41,086 (TDC).
- Principal Investigator, "Facial Expression Analysis by Computer Processing." National Institute of Mental Health: 5/1/97 – 4/30/01, \$915,053 (TDC).
- Co-Investigator (PI: M. Sayette, University of Pittsburgh), "Affective and Cognitive Processes in Smoking Craving." National Institute of Mental Health: 9/1/96 – 8/31/00, \$383,872 (TDC).
- Principal Investigator, "Facial Expression Analysis by Computer Processing." National Institute of Mental Health: 8/1/95 – 7/31/97, \$348,973 (TDC).
- Co-Principal Investigator (PI: J. Belsky, Pennsylvania State University), "NICHD Child Care Network." National Institute of Child Health and Development: 1/10/90 – 1/9/95, \$1,696,240 (TDC)
- Principal Investigator, "Mother-Infant Coordination of Vocalization and Affect." National Science Foundation: 4/1/90 – 4/31/94, \$95,041 (TDC)
- Co-Principal Investigator (PI: S.B. Campbell, University of Pittsburgh), "Postpartum Depression: A Risk Factor for Infants?" National Institute of Mental Health: 3/86 – 2/94, \$616,945 (TDC)
- Co-Investigator (PI: K. Meadow, Gallaudet University), "Interaction and Support: Mothers and Deaf Infants," National Institutes of Health: 1/88 – 9/90, \$26,214 (TDC)
- Principal Investigator, "Bidirectional Influence in Mother-Infant Interaction." National Institute of Mental Health: 1/85 – 12/85, \$14,979 (TDC)

- Principal Investigator, Faculty Initiative Grant, Provost's Advisory Committee for Faculty Computing, University of Pittsburgh: 1/92, \$8495 (TDC)
- Principal Investigator, "Neonatal Spontaneous Motor Behavior: Is It Rhythmic?" Faculty of Arts and Sciences Research Stipend, University of Pittsburgh: 7/86 – 12/86, \$2500 (TDC)
- Principal Investigator, "Three-Month-Old Infants' Reaction to Contingent Changes in Maternal Behavior." NIH Biomedical Research Support Grant: 1/84 – 12/85, \$4000 (TDC)
- Principal Investigator, "Behavioral Effects in Neonates of Gestational Alcohol Exposure." Mental Health Clinical Research Center, Western Psychiatric Institute and Clinic: 1/84 – 12/85, \$4000 (TDC)
- Principal Investigator, "Face-to-Face Interaction of High- risk Mother-infant Pairs and Its Relation to Cognitive Development at 12 and at 18 Months." NIH Biomedical Research Support Grant: 1/84 – 5/84, \$1750 (TDC).

### INDIVIDUAL FELLOWSHIPS SPONSORED AND AWARDED

- Adena Zlochower, University of Pittsburgh Chancellor's Undergraduate Research Fellowship, 1991–1992.
- Erika Forbes, National Science Foundation Pre-doctoral Fellowship, 1997–2001.
- Karen Schmidt, National Institute of Mental Health Post-Doctoral Fellowship, 2000–2002.
- Christina Staszal, University of Pittsburgh Chancellor's Undergraduate Research Fellowship, 2001–2002.
- Joanna Sterling, University of Pittsburgh Chancellor's Undergraduate Research Fellowship and Brackenridge Fellowship, 2010–2011.
- Tess Bailie, Hot Metal Bridge Post-Baccalaureate Fellowship, 2011–2012.

### PEER-REVIEWED JOURNALS\*

- Escalera, S., Baro, X., Guyon, I., Escalante, H.J., Tzimiropoulos, G., Valstar, M., Pantic, M., Cohn, J.F., & Kanade, T. (2018, in press). Guest editorial: The computational face. *IEEE Transactions on Pattern Analysis and Machine Learning*, *X(x)*, xxx-xxx.
- Martin, K. B., Hammal, Z., Ren, G., Cohn, J. F., Cassell, J., Ogihara, M., . . . Messinger, D. S. (2018, in press). Objective measurement of head movement differences in children with and without autism spectrum disorder *Molecular Autism*, *9(14)*, xxx-xxx.
- Hammal, Z., Cohn, J. F., Wallace, E. R., Heike, C. L., Birgfeld, C. B., Oster, H., & Speltz, M. L. (2018). Facial expressiveness in infants with and without craniofacial microsomia: Preliminary findings. *Cleft Palate-Craniofacial Journal*.
- Chu, W.S., De la Torre, F., & Cohn, J.F. (2017). [Selective transfer machine for personalized facial action unit detection](#). *IEEE Transactions on Pattern Recognition and Machine Intelligence*, *39(3)*, 529-545. PMID: 25242877
- Chu, W.S., De la Torre, F., Cohn, J. F., & Messinger, D. S. (2017). [A branch-and-bound framework for unsupervised common event discovery](#). *International Journal of Computer Vision*, *123(3)*, 372-391.
- Dibeklioglu, H., Hammal, Z., & Cohn, J. F. (2017). Dynamic multimodal measurement of depression severity using deep autoencoding. *IEEE Journal of Biomedical and Health Informatics*, *99*, xxx-xxx.

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- Tulyakov, S., Jeni, L. A., Sebe, N., & Cohn, J. F. (2017, in press). Viewpoint-consistent 3D face alignment. *IEEE Transactions on Pattern Analysis and Machine Intelligence*.
- Szirtes, G., Orozco, J., Petras, I., Szolgay, D., Utasi, A., & Cohn, J. F. (2017). Behavioral cues help predict impact of advertising on future sales. *Image and Vision Computing*, **65**, 49-58.
- Corneanu, C., Oliu, M., Cohn, J. F., & Escalera, S. (2016). [Survey on RGB, thermal, and multimodal approaches for facial expression analysis: History, trends, and affect-related applications](#). *IEEE Transactions on Pattern Analysis and Machine Intelligence*, *38*(8), 1548 – 1568.
- Ding, X., Chu, W.S., De la Torre, F., & Cohn, J. F. (2016). [Facial action unit event detection by cascade of tasks](#). *Image and Vision Computing Journal*.
- Girard, J.M. & Cohn, J.F. (2016). [A primer on observational measurement](#). *Assessment*, *23*(4). 404-413.
- Jeni, L. A., Cohn, J. F., & Kanade, T. (2017). [Dense 3d face alignment from 2d videos for real time use](#). *Computer Vision and Image Understanding*, *58*, 13-24.
- Zafeirioud, S., Zhao, G., Kotsia, I., Pietikainen, M., Cohn, J., & Chellappa, R. (2016). [Editorial of special issue on spontaneous facial behaviour analysis](#). *Computer Vision and Image Understanding*.
- Zeng, J., Chu, W.-S., De la Torre, F., Cohn, J. F., & Xiong, Z. (2016). [Confidence preserving machine for facial action unit detection](#). *IEEE Transactions on Image Processing*.
- Zhao, K., Chu, W.-S., Torre, F. D. I., Cohn, J. F., & Zhang, H. (2016). [Joint patch and multi-label learning for facial action unit detection](#). *IEEE Transactions on Image Processing*.
- Fairbairn, C. E., Sayette, M. A., Wright, A. G. C., Levine, J. M., & Cohn, J. F. (2015). [Extraversion and the rewarding effects of alcohol in a social context](#). *Journal of Abnormal Psychology*, *X*, xxx-xxx. PMID: PMC4595151
- Fairbairn, C. E., Sayette, M. A., Amole, M., Dimoff, J. D., & Cohn, J. F. (2015). [Speech Volume Indexes Gender Differences in the Social-Emotional Effects of Alcohol](#). *Experimental and Clinical Psychopharmacology*. doi: 10.1037/pha0000021. PMID: PMC4555987
- Girard, J. M., & Cohn, J.F. (2015). [Automated audiovisual depression analysis](#). *Current Opinion in Psychology*. doi:10.1016/j.copsyc.2014.12.010 PMID: PMC4539261
- Hammal, Z., Cohn, J. F., Heike, C., & Speltz, M. L. (2015). [Automatic measurement of head and facial movement for analysis and detection of infant positive and negative affect](#). *Frontiers in Human-Media Interaction*.
- Hammal, Z., Cohn, J.F., & Messinger, D. S. (2015). [Head movement dynamics during play and perturbed mother-infant interaction](#). *IEEE Transactions on Affective Computing*.
- Vinciarelli, A., Esposito, A., Andre, E., Bonin, F., Chetouani, M., Cohn, J. F., . . . Salah, G. R. A. (2015). [Open challenges in modeling, analysis and synthesis of human behavior in human-human and human-machine interactions](#). *Cognitive Computation*. doi: 10.1007/s12559-015-9326-z
- Girard, J. M., Cohn, J. F., & De la Torre, F. (2014). [Estimating smile intensity: A better way](#). *Pattern Recognition Letters*. doi:10.1016/j.patrec.2014.10.004.
- Girard, J. M., Cohn, J. F., Sayette, M. A., Jeni, L., & De la Torre, F. (2014). [Spontaneous facial expression in unscripted interactions can be measured automatically](#). *Behavior Research Methods*. Doi:10.3758/s13428-014-0536-1. PMID: 25488104
- Girard, Jeffrey M, Cohn, Jeffrey F, Mahoor, Mohammad H., Mavadati, Seyed M., Hammal, Zakia, & Rosenwald, Dean. (2014). [Nonverbal social withdrawal in depression: Evidence from manual and automatic analyses](#). *Image and Vision Computing Journal*, *32*, 641-647 . PMID: 25378765
- Hammal, Z., Cohn, J.F., & George, D.T. (2014). [Interpersonal coordination of head motion in distressed couples](#). *IEEE Transactions on Affective Computing*. PMID: 26167256
- McDuff, D., El Kalioubi, R., Cohn, J. F., & Picard, R. (2014). [Predicting ad liking and purchase intent: Large-scale analysis of facial responses to ads](#). *IEEE Transactions on Affective Computing*, *PP*(99), 1-13.

- Trutoiu, L., Carter, E., Pollard, N., Cohn, J. F., & Hodgins, J. (2014.). [Spatial and temporal linearities in posed and spontaneous smiles](#). *ACM Transactions on Applied Perception*.
- Zhang, X., Yin, L., Cohn, J. F., Canavan, S., Reale, M., Horowitz, A., Liu, P., & Girard, J. M. (2014). [A high-resolution spontaneous 3d dynamic facial expression database](#). *Image and Vision Computing*, 32, 692-706.
- Fairbairn, C. E., Sayette, M., Creswell, K. G., Cohn, J. F., & Levine, J. M. (2013). [The effects of alcohol on the emotional displays of Whites in interracial groups](#). *Emotion*, 13(3), 468-477. PMID: 23356562
- Mattson, W. I., Cohn, J. F., Mohammad, M. H., & Messinger, D. S. (2013). [Darwin's Duchenne: Eye constriction during infant joy and distress](#). *PLOS ONE*, 8(11). doi: 10.1371/journal.pone.0080161. PMID: 24278255
- Mavadati, S. M., Mahoor, M. H., Bartlett, K., Trinh, P., & Cohn, J. F. (2013). [DISFA: A spontaneous facial action intensity database](#). *IEEE Transactions on Affective Computing*, 4(2), 151-160.
- Moore, G. A., Powers, C. J., Bass, A. J., Cohn, J. F., Propper, C. B., Allen, N. B., & Lewinsohn, P. M. (2013). [Dyadic interaction: greater than the sum of its parts?](#). *Infancy*, 18(4), 490-515. PMCID: PMC3811963
- Rahu, Mamoona Arif, Grap, Mary Jo, Cohn, J. F., Munro, C. L., Lyon, D. E., & Sessler, C. N. (2013). [Facial expression as an indicator of pain in critically ill intubated adults during endotracheal suctioning](#). *American Journal of Critical Care*, 22(5), 412-422. PMCID: PMC3913066
- Yang, Y., Fairbairn, C., & Cohn, J.F. (2013). [Detecting depression severity from intra- and interpersonal vocal prosody](#). *IEEE Transactions on Affective Computing*, 4(2), 142-150.
- Chew, S. W., Lucey, P., Lucey, S., Saragih, J., Cohn, J. F., & Sridharan, S. (2012). [In the pursuit of effective affective computing: The relationship between features and registration](#). *IEEE Transactions on Systems, Man, and Cybernetics - Part B*. 42(4), 1-12. PMID: 22581139
- Feng, X., Forbes, E. E., Kovacs, M., George, C. J., Lopez-Duran, N., Fox, N. A., & Cohn, J.F. (2012). [Children's Depressive Symptoms in Relation to EEG Frontal Asymmetry and Maternal Depression](#). *Journal of Abnormal Child Psychology*, 40(2), 265-276. PMCID: PMC3262060
- Lucey, P., Cohn, J. F., Prkachin, K. M., Solomon, P., & Matthews, I. (2012). [Painful monitoring: Automatic pain monitoring using the UNBC-McMaster shoulder pain expression archive database](#). *Image, Vision, and Computing Journal*, 30, 197-205.
- Messinger, D. S., Mahoor, M. H., & Cohn, J. F. (2012). [The eyes have it: Making positive expressions more positive and negative expressions more negative](#). *Emotion*, 12(3), 430-436. PMID: 22148997
- Sayette, M. A., Creswell, K. G., Dimhoff, J. D., Fairbairn, C. E., Cohn, J. F., Heckman, B. W., et al. (2012). [Alcohol and group formation: A multimodal investigation of the effects of alcohol on emotion and social bonding](#). *Psychological Science*, 23(8), 869-878. doi: 10.1177/0956797611435134. PMID: 22760882
- Boker, S. M., Cohn, J. F., Theobald, B.-J., Matthews, I., Mangini, M., Spies, J. R., et al. (2011). [Something in the way we move: Motion, not perceived sex, influences nods in conversation](#). *Journal of Experimental Psychology*, 37(3), 874-891. PMID: 21463081
- Lucey P, Cohn JF, Matthews I, Lucey S, Sridharan S, Howlett J, Prkachin KM. (2011). [Automatically detecting pain in video through facial action units](#). *Systems, Man, and Cybernetics – Part B*, 41(3), 664-674. doi: 10.1109/TSMCB.2010.2082525. PMID: 21097382
- Saragih, J. M., Lucey, S., & Cohn, J. F. (2011). [Deformable model fitting by regularized landmark mean-shift](#). *International Journal of Computer Vision*, 91(2), 200-215. doi:10.1007/s11263-010-0380-4
- Zhu, Y., De la Torre, F., Cohn, J. F., & Zhang, Y. J. (2011). [Dynamic cascades with bidirectional bootstrapping for action unit detection in spontaneous facial behavior](#). *IEEE Transactions in Affective Computing*, 2(2), 1-13.

- Cohn, J. F. (2010). [Advances in behavioral science using automated facial image analysis and synthesis](#). *IEEE Social Signal Processing Magazine*, 128(6), 128-133.
- Cohn, J. F., & Sayette, M. A. (2010). [Spontaneous facial expression in a small group can be automatically measured: An initial demonstration](#). *Behavior Research Methods*, 42(4), 1079-1086. PMID: 21139175
- Gross, R., Matthews, I., Cohn, J. F., Kanade, T., & Baker, S. (2010). [Multi-PIE](#). *Image and Vision Computing*, 28(5), 807-813.
- Wang Y, Lucey S, Cohn JF, Saragih J. (2010). [Non-rigid Face Tracking with Local Appearance Consistency Constraint](#). *Image and Vision Computing*, 28(5), 781-789. PMID: 25242852
- Ambadar, Z., Cohn, J.F., & Reed, L.I. (2009). [All smiles are not created equal: Morphology and timing of smiles perceived as amused, polite, and embarrassed/nervous](#). *Journal of Nonverbal Behavior*, 33 (1), 17-34. PMCID: PMC2701206.
- Ashraf, A. B., Lucey, S., Cohn, J. F., Chen, T., Prkachin, K., & Solomon, P. (2009). [The painful face: Pain expression recognition using active appearance models](#). *Image and Vision Computing*, 27(12), 1788-1796. PMID: 22837587
- Boker, S. M., Cohn, J. F., Theobald, B.-J., Matthews, I., Brick, T., & Spies, J., (2009). [Effects of damping head movement and facial expression in dyadic conversation using real-time facial expression tracking and synthesized avatars](#). *Philosophical Transactions B of the Royal Society*, 364 (1535), 3485-3495. PubMed PMID: 19884143.
- Lucey, S., Wang, Y., Cox, M., Sridharan, S., & Cohn, J.F. (2009). [Efficient constrained local model fitting for non-rigid face alignment](#). *Image and Vision Computing*, 27 (12), 1804-1813. PMID: 20046797
- Messinger, D.S., Mahoor, M.H., Chow, S.M., & Cohn, J.F. (2009). [Automated measurement of facial expression in infant-mother interaction: A pilot study](#). *Infancy*, 14 (3), 285-305. PubMed PMID: 19885384; PubMed Central PMCID: PMC2746084.
- Pantic, M. & Cohn, J.F. (2009). [Visual and multimodal analysis of human spontaneous behavior: Introduction to the special issue of Image & Vision Computing Journal](#). *Image & Vision Computing*, 27, 1741-1742. PMID: 20160957
- Pollak, S. D., Messner, M., Kistler, D. J., & Cohn, J. F. (2009). [Development of perceptual expertise in emotion recognition](#). *Cognition*, 110(2), 242-247. PubMed PMID: 19059585; PubMed Central PMCID: PMC2673797.
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**MANUSCRIPTS UNDER REVIEW**

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**TUTORIALS, WORKSHOPS, AND DEMOS**

- Girard, J.M. & Cohn, J.F. (May 2018). Statistical methods for affective computing. *International Conference on Automatic Face and Gesture Recognition*, Xi'an, China.
- Esplen, M.J., Leung, Y., & Cohn, J.F. (April 2018). Developing AI-based therapist assistant for online group therapy programs: Promises, challenges and implications for other therapies, *The Future of Psychotherapy*, Toronto, Canada.
- Goodman, W., Cohn, J.F., & Borton, D. (April 2018). Automated facial affect recognition (AFAR) with adaptive DBS for intractable OCD. *Brain Behavior Quantification*, NIH, Bethesda, MD.
- Cohn, J.F. (March 2018). Automatic multimodal analysis and synthesis for research and clinical use. *Workshop on Behavioral Phenotyping*, The Simon Foundation, NY, NY.
- Cohn, J.F. (March 2017). Multimodal affect analysis and synthesis for research and clinical use. *Biometrics and Beyond: Harnessing computer vision and machine learning to measure real world social interactions in psychiatric populations*. National Institute of Mental Health, Bethesda, MD.
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- Jeni, L., Kanade, T., & Cohn, J.F. (October 2016). ZFace. *European Conference on Computer Vision*, Amsterdam, the Netherlands.
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- Cohn, J.F. (May 2016). Automated face analysis and synthesis for research and clinical use. *Integrative Conference on Technology, Social Media, and Behavioral Health*, Pittsburgh, PA.
- Cohn, J.F. (September 2015). Sentiment and other affects: What are measuring? How well are we doing? 1st International Workshop on Automatic Sentiment Analysis in the Wild (WASA'15), Xi'an, China.
- De la Torre, F., Girard, J.M., & Cohn, J.F. (September 2015). Facial expression analysis. *IEEE International Conference on Biometrics Theory and Applications*, Washington, DC.
- Jeni, L., Kanade, T., & Cohn, J.F. (May 2015). ZFace. *IEEE International Conference on Automatic Face and Gesture Detection*, Ljubljana, Slovenia.
- Phillips, J.P., Boyer, K., Beveridge, R., & Cohn, J.F. (May 2015). *The Promise and Perils of Found Data*. *IEEE International Conference on Automatic Face and Gesture Detection*, Ljubljana, Slovenia.
- De la Torre, F., CHU, WS, Xiong, X., & Cohn, J.F. (May 2015), IntraFace. *IEEE International Conference on Automatic Face and Gesture Detection*. FG2015 Best Demo Award.
- Cohn, J.F. (March 2015). Face processing. *Society for Affective Science*. San Francisco, CA.
- Jeni, L. A., Cohn, J. F., & Kanade, T. (September 2014). Dense 3D face alignment from 2d video for analysis and synthesis, *European Conference on Computer Vision*, Zurich, Switzerland.
- De la Torre, F. & Cohn, J.F. (October 2012). Machine perception of human behavior: Component analysis for the analysis, synthesis, and understanding of human communication. *Pavis School on Computer Vision And Pattern Recognition*, Sestri Levante, Italy.
- De la Torre, F. & Cohn, J.F. (June 2012). Facial expression analysis. *Looking at people: The past, the present and the future. Tutorial at CVPR 2012*, Providence, RI.
- Research Domain Criteria (RDoC) Workshop on Systems for Social Processes*. National Institute of Mental Health, Bethesda, MD.
- Cohn, J. F. (March 2011). Social signaling in depression. *IEEE International Conference on the Psychology of Face and Gesture Recognition*, Santa Barbara, CA.
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- Working Group on Multimodal Communication, *Cyberinfrastructure for Collaborative Research in the Social and Behavioral Sciences*. NSF grant to University of Chicago.
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## INVITED PRESENTATIONS

- Cohn, J.F. (August 2018). How can multimodal affective computing inform clinical treatment? University of Oulu, Oulu, Finland.

- Cohn, J.F. (August 2018). Applications and challenges of affective computing technology. University of Oulu, Oulu, Finland.
- Cohn, J.F. (May 2018). Automatic multimodal analysis and synthesis of behavior for research and clinical use. *Affective Computing and Intelligent Interaction - Asia*, Beijing, China.
- Cohn, J.F. (May 2018). Automatic face analysis and synthesis for health informatics. *Face and Gesture Analysis for Health Informatics (FGAHI)*, Xi'an, China.
- Cohn, J.F. (April 2018). How can Artificial Intelligence tools be used to support psychotherapists? *Future of Psychotherapy*, University of Toronto, Toronto, Canada.
- Cohn, J.F. (March 2018). Automatic multimodal analysis and synthesis for research and clinical use. *Nara Institute of Science and Technology*, Nara, Japan.
- Cohn, J.F. (March 2018). Automatic multimodal analysis and synthesis for research and clinical use. *Intelligent Systems Program*, University of Pittsburgh, Pittsburgh, PA.
- Cohn, J.F. (February 2018). Automatic multimodal analysis and synthesis for research and clinical use. *Simons Foundation*, NY, NY.
- Cohn, J.F. (February 2018). Multimodal analysis of psychopathology from behavioral signals. *Menninger Clinic*, Houston, Texas.
- Cohn, J.F. (May 2017). Automated facial expression analysis and synthesis for research and clinical use. *Computational Modelling of Affect and Behavior - From Observations to Understanding*, University of Canberra, Australia.
- Cohn, J.F. (February 2017). Automated facial expression analysis and synthesis for research and clinical use. *SPSP Preconference on Nonverbal Behavior*. San Antonio, TX.
- Cohn, J.F. (June 2016). Emotion in the dynamics of face and body motion. *ChaLearn Looking at People and Faces in the Wild: Face Analysis Workshop and Challenge*. Las Vegas, Nevada.
- Cohn, J.F. (February 2016). Automatic face analysis for research and clinical use. *Wisconsin Institute for Discovery*, University of Wisconsin.
- Cohn, J.F. (January 2016). Automatic face analysis for research and clinical use. *Department of Psychology*, Ohio State University.
- Cohn, J.F. & Jeni, L (January 2016). Automated 3D face and gaze estimation and expression detection. *The 6th Symposium on International Collaborative Laboratories*, Pittsburgh, PA.
- Cohn, J.F. (October 2015). Automated facial expression analysis and synthesis for research and clinical use. *Signal Analysis and Interpretation Laboratory*, University of Southern California, Los Angeles, CA.
- Cohn, J.F. (June 2015). *Automated face analysis: New developments, findings, current challenges, and opportunities*. Imperial College London.
- Cohn, J.F. (September 2014). Intra- and interpersonal functions of head motion in emotion communication. *ECCV Workshop on ChaLearn Looking at People: Pose recovery, action/interaction, gesture recognition*. Zurich, Switzerland.
- Cohn, J.F. (September 2014). Automated face analysis for affective computing. *ECCV Workshop on Spontaneous Facial Expression Analysis*. Zurich, Switzerland.
- Cohn, J.F. (May 2014). *Automated face analysis for computational behavioral science*. University of Binghamton, Binghamton, NY.
- Cohn, J.F. (March 2014). Discoveries in emotion, depression, and communication by automated face analysis and synthesis. *Emotion Out of the Shadows*. Queens College, Belfast, UK.
- Cohn, J.F. (December 2013). Computational behavioral science of psychopathology. *Emotion Recognition in the Wild Challenge and Workshop (EmotiW 2013)*. Sydney, Australia.
- Cohn, J.F. (October 2013). [Beyond group differences: Specificity of nonverbal behavior and interpersonal communication in depression](#). *Third International Audio/Visual Emotion Challenge and Workshop: Depression and Continuous Emotion*, Barcelona, Spain.
- Cohn, J.F. (September 2013). Social risk and depression: Computational evidence from facial expression and vocal prosody. *Second International Workshop on Context-Based Affect Recognition*, Geneva, Switzerland.

- Cohn, J.F. (February 2013). Social risk and depression: Computational evidence from facial expression and vocal prosody. *Georgia Tech, College of Computing, Atlanta, GA.*
- Cohn, J.F. (July 2012). Face and voice of depression. *Institute for Creative Technologies, USC, Los Angeles, CA.*
- Cohn, J.F. (June 2012). Nonverbal communication and facial expression. *IEEE International Conference on Computer Vision and Pattern Recognition Workshop on Gesture Recognition, Providence, RI.*
- Cohn, J.F. (January 2012). Advances in behavioral science using automated facial and vocal image analysis and synthesis, *MIT Media Lab, Cambridge, MA.*
- Cohn, J.F. (December 2011). Advances in behavioral science using automated facial and vocal image analysis and synthesis, *Queensland University of Technology, Sponsored by IEEE, Brisbane, Australia.*
- Cohn, J.F. (November 2011). Machine learning for affective computing: findings and issues. *Queensland Center for Advanced Technology (QCAT), Brisbane, Australia.*
- Cohn, J. F. (October 2011). Machine learning for affective computing: findings and issues. *Machine Learning for Affective Computing (MLAC) Workshop, Affective Computing and Intelligent Interaction, Memphis, TN.*
- Cohn, J.F. (September 2011). Advances in behavioral science using automated facial and vocal image analysis and synthesis. *Workshop On Technology & Autism Research: Towards A Computational Science Of Behavior, Boston, MA.*
- Cohn, J.F. (September 2011). Advances in behavioral science using automated facial and vocal image analysis and synthesis. *Department of Decision Sciences, Carnegie Mellon University, Pittsburgh, PA.*
- Cohn, J. F. (May 2011). Advances in behavioral science using automated facial image analysis and synthesis. *City University of New York.*
- Cohn, J. F. (March, 2011). Emotion recognition or emotion understanding? *IEEE Workshop on Facial Expression Recognition and Analysis Grand Challenge (FERA), Santa Barbara, CA.*
- Cohn, J.F. (October, 2010). Facial expression analysis for forensic science and practice. *World Congress of Forensic Science and Polygraph, Cartagena, Columbia.*
- Cohn, J.F. (October, 2010). Social signal processing in depression. *ACM International Conference on Multimodal Interfaces Workshop on Social Signal Processing, Florence, Italy.*
- Cohn, J.F. (August 2010). Bimodal communication of depression severity by face and voice. *Workshop on Predictive Models of Human Communication Dynamics, USC Institute of Creative Technologies, Marina del Rey, CA.*
- Cohn, J.F. (September 2009). Co-constructing social signals. *IEEE International Workshop on Social Signaling. Amsterdam, The Netherlands.*
- Cohn, J.F. (June 2009). Use of active appearance models for analysis and synthesis of naturally occurring behavior. *2nd IEEE Workshop on CVPR for Human Communicative Behavior Analysis (CVPR4HB), Miami, Fl.*
- Cohn, J.F. (April 2009). Effects of damping facial expression in dyadic conversation using real-time facial expression tracking and synthesized avatars. *Royal Society, Computation of Emotion in Man and Machines, London, Great Britain.*
- Cohn, J.F. (September 2008). Facial dynamics reveals person identity and communicative intent, regulates person perception and social interaction. *International Conference on Audio-Visual Speech Processing, Tangalooma, Australia.*
- Cohn, J.F. (September 2008). Configuration and timing of facial expression. *Weta Digital, Wellington, New Zealand.*
- Cohn, J.F. (September 2008). Making sense of faces by orientation, (a)symmetry, and timing. *Workshop on Psychology of Face and Gesture Recognition, Amsterdam, The Netherlands.*

- Cohn, J.F. (June 2008). Look to the dynamics. *CVPR Workshop for Human Communicative Behaviour Analysis (CVPR4HB'08)*, Anchorage, Alaska.
- Cohn, J.F. (March 2008). Facial expression and emotion. *The Magic of Body Language*, Tilburg University, Tilburg, The Netherlands.
- Cohn, J.F. (March 2008). Affective computing: Facial expression and emotion. *Digital Human Symposium, National Institute of Advanced Science and Technology*, Tokyo, Japan.
- Cohn, J.F. (December 2007). Automated facial image analysis for psychology and biomedicine. *Rutgers University Center for Cognitive Science*, New Brunswick, NJ.
- Cohn, J.F. (January 2007). Foundations of human-centered computing: Facial expression and emotion. *International Joint Conference on Artificial Intelligence, Workshop on AI for Human Computing*, Hyderabad, India, 5-12.
- Cohn, J.F. (November 2006). Foundations of human computing: Facial expression and emotion. *Proceedings of the ACM International Conference on Multimodal Interfaces (ICMI'06)*, Banff, Canada.
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- Cohn, J.F. (June 2006). Multi-modal analysis of face and body gesture indicators of communicative intent. *NSF Workshop on Detecting and Countering IED's*. Washington, DC.
- Cohn, J.F. (June 2006). CMU/Pitt Automatic Facial Image Analysis System. *2nd International Forum on Children's Emotional Development and Competence*. Nanjing, China.
- Kanade, T., Hu, C., & Cohn, J.F. (October 2005). Facial expression analysis. *IEEE International Workshop on Modeling and Analysis of Faces and Gestures*. Beijing, China.
- Cohn, J.F. (October 2005). Dynamics of mother-infant interaction. *The IEEE International Workshop on modeling people and human interaction*, Beijing, China.
- Cohn, J.F. (September 2005) (Keynote address). Measuring facial expression using FACS, facial EMG, and computer vision. *International Conference on Methods and Techniques in Behavioral Research*, Wageningen, The Netherlands.
- Cohn, J.F. (August 2005). Configuration and timing of facial actions. Department of Electrical Engineering, Ohio State University, Columbus, Ohio.
- Cohn, J.F. (December 2004). Machine and human perception of emotion expression and paralinguistic communication. *User Interface Technologies Seminar Series*, IBM T.J. Watson Research Center, Yorktown Heights, New York.
- Cohn, J.F. (December 2004). Machine and human perception of emotion expression and paralinguistic communication. *Artificial Intelligence Seminar*, Carnegie Mellon University, Pittsburgh, Pennsylvania.
- Cohn, J.F. (November 2004). Machine and human perception of emotion expression and paralinguistic communication. *Henkels Visiting Scholar Colloquium*, Notre Dame University, South Bend, Indiana.
- Cohn, J.F. (October 2004). Machine and human perception of emotion expression and paralinguistic communication. Delft University of Technology, Delft, the Netherlands.
- Cohn, J.F. (October 2004). Configuration and timing of multimodal communication. *Altenberg Workshop in Theoretical Biology*, Konrad Lorenz Institute for Evolution and Cognition Research. Altenberg, Austria.
- Cohn, J.F. (December 2003). Automatic Face Analysis. *Frontier Silver Robot Project Kick-off Workshop*, Jeju Island, South Korea.

- Cohn, J.F. (December 2003). Configuration, timing, & symmetry of facial expression by Automatic Face Analysis. Computer Science and Engineering, Sejong University, Seoul, South Korea.
- Cohn, J.F. (November 2003). Automatic analysis of the configuration, timing, & symmetry of facial expression. Institute for Personality and Social Research, University of California Berkeley.
- Cohn, J.F. & Schmidt, K.S. (June 2003). The timing of facial motion in posed and spontaneous smiles. *International Conference on Active Media Technology*, Chongqing, China.
- Cohn, J.F. (January 2003). Facial expression: Applications and analysis. Department of Psychobiology, New York State Psychiatric Institute, New York, NY.
- Cohn, J.F., Xiao, J., Moriyama, T., Gao, J., Ambadar, Z., & Kanade, T. (August 2002). Action unit recognition in spontaneous facial behavior. *International Conference on Methods and Techniques in Behavioral Research*, Amsterdam, Netherlands.
- Cohn, J.F. (May 2002). Automatic facial expression analysis. Department of Psychology, University of California, Santa Barbara, California.
- Cohn, J.F. (February 2002). Facial Expression: Interpretation and automatic analysis. Child Study Center and Department of Psychology, Pennsylvania State University, State College, Pennsylvania.
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- Cohn, J.F. (April 2001). Computer perception of human emotion. Department of Psychology, Bucknell University, Lewisburg, Pennsylvania.
- Cohn, J.F. (March 2001). Automated detection, tracking, and recognition of facial expression. Department of Psychology, Duke University, Durham, North Carolina.
- Cohn, J.F., Lien, J.J., Kanade, T., Hua, W., & Zlochower, A. (September 1998). Beyond prototypic expressions: Discriminating subtle changes in the face. *IEEE Workshop on Robot and Human Communication*, Takamatsu, Japan.
- Cohn, J.F. (September 1998). Computer perception of emotion in the face and voice. Robotics Institute Colloquium, Carnegie Mellon University, Pittsburgh, Pennsylvania.
- Cohn, J. F. (1992). Influence of maternal depression on infant affect regulation. Rochester Symposium on Developmental Psychopathology, University of Rochester, Rochester, New York.

## **PUBLISHED ABSTRACTS**

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- Messinger, D.S., Martin, K.B., Cohn, J., & Hammal, Z. (May 2018). An early behavioral index of ASD from automated microanalysis of movement dynamics. Paper presented at the *Society of Biological Psychiatry Annual Meeting*. New York, NY.
- Wulf, T.M., Girard, J.M., Bruni, P.T., Cohn, J.F., & Benight, C.C. (November 2017). Emotion expression varies with PTSD severity. *International Society for Traumatic Stress Studies*, Chicago, IL.
- Girard, J.M., Amole, M.C., Cyranowski, J.M., Swartz, H.A., Cohn, J.F., & Wright, A.G.C. (July 2017). Associations between spontaneous head pose and the dimensions of interpersonal behavior. *Society for Interpersonal Theory and Research*, Pittsburgh, PA.
- Haines, N. B., Southward, M. W., Hendricks, P., Cohn, J. F., Cheavens, J. S., & Ahn, W.-Y. (April 2017). Reading picture-induced positive and negative emotions using facial expressions and machine learning *Society for Affective Science*, Boston, MA.
- Martin, K.B., Hammal, Z., Cohn, J.F., Cassell, J., Gang R., Oighara, M., Britton, J.C., Gutierrez, A., Messinger, D.S. (October 2016). Temporal and frequency feature integrations for head

- movement pattern analysis. *University of Miami Neural Engineering Symposium*, Miami, FL.
- Martin, K., Messinger, D.S., Hammal, Z., Cohn, J.F., Cassell, J. et al. (October 2016). Automated measurement of head movement in children with and without ASD. *University of Miami Neural Engineering Symposium*, Miami, FL.
- Hammal, Z., Cohn, J.F., & Messinger, D.S. (May 2015). Head Movement Dynamics During Play and Perturbed Mother-Infant Interaction. *Association for Psychological Science*, New York, NY.
- Cohn, J.F., Girard, J.M., Morency, L.P., Scherer, S., & Williamson, J.R. (May 2013). Affective Computing for the Assessment of Depression. *Association for Psychological Science*, San Francisco: CA.
- Messinger, Daniel, Mattson, Whitney, Mahoor, Mohammad, & Cohn, Jeffrey F. (2013). Rule based similarities between positive and negative facial expressions. *International Society for Research in Emotion*, Berkeley, CA.
- Cohn, J. F., Girard, J. M., & Rosenwald, D. (May 2012). Face and voice communicate change in depression severity. *Association for Psychological Science*, Chicago, IL
- Fairbairn, C. E., Sayette, M. A., Cohn, J. F., Levine, J. M., Antimarino, M. A., Sayers, W. M. (June, 2012). The effect of alcohol on White members of interracial groups. *Research Society on Alcoholism* at San Francisco, CA.
- Lambert, B., Gutierrez, A., Mattson, W. I., Artigas, J., Martinez, O. Kimijima, M., Cassell, J., Cohn, J. F., & Messinger, D.S. (May 2012). Responding to joint attention requests from virtual and non-virtual social partners. *International Meeting for Autism Research*, Toronto, Canada.
- Mattson, W. I., Cohn, J.F., Mahoor, M. H., Messinger, D.S. (May 2012). Beyond Smiles: Duchenne Distress in Infants. *Association for Psychological Science (APS)*, Chicago, IL, USA.
- Mattson, W., Cohn, J. F., Mahoor, M. H., & Messinger, D. S. (June 2012). Duchenne smiling in the Face-to-Face/Still Face. *International Conference for Infant Studies*, Minneapolis, MN.
- Sayette, M. A., Creswell, K. G., Dimoff, J. D., Fairbairn, C. E., Cohn, J. F., Heckman, B. W., et al. (October 2012). Alcohol intake: Seduction and self-regulation. *Society of Experimental Social Psychology*, Austin, Texas.
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## **SYNERGISTIC ACTIVITIES**

### Patents

*Face de-identification.* U.S. Patent 9,799,096 issued October 24, 2017, “System and Method for Processing Video to Provide Facial De-Identification.” A system and method. For real-time image and video face de-identification that removes the identity of the subject while preserving the facial behavior. The facial features of the source face are replaced with that of the target face while preserving the facial actions of the source face on the target face.

*Self-adaptive matrix completion for heart rate estimation from face videos.* Contrary to previous approaches that estimate the HR by processing all the skin pixels inside a fixed region of interest, we introduce a strategy to dynamically select face regions for HR estimation. Our approach, inspired by recent advances on matrix completion theory, allows us to predict the HR while simultaneously discovering the best regions of the face to be used for estimation. (Tulyakov et al., 2016). U.S. Patent Application Serial No. 15/631,346, filed June 24, 2016.

Facial expression recognition.

*Data processing methods for predictions of media content performance.* US Application No: 15/653051, filed July 18, 2017.

### Databases

*Cohn-Kanade AU-Coded Face Image Database.* (Kanade, Cohn, & Tian, 2000; Lucey & Cohn et al., 2010). Widely used internationally for research in computer vision and graphics, Cohn-Kanade is the most comprehensive test-bed to date for comparative studies of facial expression analysis. It includes 2105 digitized image sequences from 182 adult subjects of varying ethnicity, performing multiple tokens of most primary FACS action units.

<http://www.consortium.ri.cmu.edu/ckagree/>

*CMU Multi-PIE Database.* (Gross, Matthews, Cohn, Baker, & Kanade, 2010). The development of face recognition algorithms critically depends on the availability of facial image data spanning conditions of interest in a carefully controlled fashion. Neutral and emotion expressions were recorded on four occasions using a hardware-synchronized network of 15 video cameras and 18 flashes. A total of 337 subjects were recorded, with 129 subjects appearing in all four sessions. The database contains more than 750,000 images. For licensing inquiries, contact Office of Technology Transfer, Carnegie Mellon University. <http://www.multipie.org>

*DISFA: A Spontaneous Facial Action Intensity Database.* Twenty-seven young adults were video-recorded by a stereo camera while they viewed video clips intended to elicit spontaneous emotion expression. Each video frame was manually coded for presence, absence, and intensity of facial action units according to the Facial Action Unit Coding System. To provide a baseline for use in future research, protocols and benchmarks for automated action unit intensity measurement are reported. <http://doi.ieeecomputersociety.org/10.1109/T-AFFC.2013.4>

*UNBC-McMaster Shoulder Pain Expression Archive.* Two hundred video sequences from of subjects with shoulder pain injuries performing range of motion exercises with their affected and unaffected shoulders. Sequences are FACS intensity coded. Self- and observer report measures are available as well. <http://www.pitt.edu/~jeffcjohn/PainArchive/index.htm>  
<http://www.consortium.ri.cmu.edu/index.php>

*Binghamton-Pittsburgh Spontaneous Facial Expression Database (BP4D).* Well-validated emotion inductions were used to elicit expressions of emotion and paralinguistic communication. Frame-level ground-truth for facial actions was obtained using the Facial Action Coding System. Facial features were tracked in both 2D and 3D domains using both person-specific and generic approaches. The work promotes the exploration of 3D spatiotemporal features in subtle facial expression, better understanding of the relation between pose and motion dynamics in facial action units, and deeper understanding of naturally occurring facial action. (U. Pittsburgh ref. #03204). [http://www.cs.binghamton.edu/~lijun/Research/3DFE/3DFE\\_Analysis.html](http://www.cs.binghamton.edu/~lijun/Research/3DFE/3DFE_Analysis.html)

*BP4D+.* Is a well-annotated, multimodal, multidimensional spontaneous emotion corpus of 140 participants. Emotion inductions were highly varied. Data were acquired from a variety of sensors

of the face that included high-resolution 3D dynamic imaging, high-resolution 2D video, and thermal (infrared) sensing, and contact physiological sensors that included electrical conductivity of the skin, respiration, blood pressure, and heart rate. Facial expression was annotated for both the occurrence and intensity of facial action units from 2D video by experts in the Facial Action Coding System (FACS). The corpus further includes derived features from 3D, 2D, and IR (infrared) sensors and baseline results for facial expression and action unit detection.

*AMFED facial expression dataset.* Computer classification of facial expressions requires large amounts of data and this data needs to reflect the diversity of conditions seen in real applications. Public datasets help accelerate the progress of research by providing researchers with a benchmark resource. We present a comprehensively labeled dataset of ecologically valid spontaneous facial responses recorded in natural settings over the Internet. <http://www.affdex.com/facial-expression-dataset-am-fed/>

*Sayette GFT database.* Despite the important role that facial expressions play in interpersonal communication and our knowledge that interpersonal behavior is influenced by social context, no currently available facial expression database includes multiple interacting participants. The Sayette Group Formation Task (GFT) database addresses the need for well-annotated video of multiple participants during unscripted interactions. The database includes 172,800 video frames from 96 participants in 32 three-person groups. To aid in the development of automated facial expression analysis systems, GFT includes expert annotations of FACS occurrence and intensity, facial landmark tracking, and baseline results for linear SVM, deep learning, active patch learning, and personalized classification. Baseline performance is quantified and compared using identical partitioning and a variety of metrics (including means and confidence intervals). <http://www.jeffcohn.net/Resources>

### Software

*Zface.* To enable real-time, person-independent 3D registration from 2D video, we developed a 3D cascade regression approach in which facial landmarks remain invariant across pose over a range of approximately 60 degrees. Because no assumptions are required about illumination or surface properties, the method can be applied to a wide range of imaging conditions that include 2D video and un-calibrated multi-view video. The method has been validated in a battery of experiments that evaluate its precision of 3D reconstruction and extension to multi-view reconstruction. Experimental findings strongly support the validity of real-time, 3D registration and reconstruction from 2D video. Jeni, Kanade, & Cohn (2015). Available from: <http://www.consortium.ri.cmu.edu/index.php>

<http://zface.org>

*Intraface: A publicly-available software package for automated facial feature tracking, head pose estimation, facial attribute recognition, and facial expression analysis from video.* Includes a newly developed technique for unsupervised synchrony detection to discover correlated facial behavior between two or more persons, a relatively unexplored problem in facial image analysis. Achieves state-of-the-art results for emotion expression and action unit detection in three FERA, CK+ and RU-FACS; measured audience reaction to a talk given by one of the authors; and discovered synchrony for smiling in videos of parent- infant interaction (U. Pittsburgh reference #03345, #03346). Based on Xiong & De la Torre (2013), Chu, De la Torre, & Cohn (2013), and Zhu, De la Torre, Cohn, & Zhang (2011). Available free of charge for academic use at <http://www.humansensing.cs.cmu.edu/intraface/>. PATENT PENDING

*Face Analysis SDK:* A library for facial geometry. Tracks 68 facial landmarks using non-rigid structure from motion and performs facial expression transfer. SDK is based on Saragih, Lucey, & Cohn (2011 a,b). <http://face.ci2cv.net/>

*Cylindrical Head Tracker.* Robust full motion recovery of head pose by dynamic templates and re-registration techniques. Based on Xiao, Kanade, & Cohn (2003). <http://www.consortium.ri.cmu.edu/index.php>

*Performance Metrics Package for Imbalanced Data.* With the exception of area under the ROC curve, comparisons of classifiers both within and between databases are confounded by imbalanced distributions. To enable valid evaluation of classifier performance, the Performance Metrics Package enables skew-normalized estimates of a wide range of metrics (Jeni, Cohn, et al., 2013). <http://www.pitt.edu/~jeffcohn/skew/>

*Early Event Detection.* Source code for training classifiers to detect onsets of facial expression and other behaviors (Hoai & Torre, 2012) <http://www.robots.ox.ac.uk/~minhhoai/projects/mmed.html>

*Continuous rating software.* <http://www.pitt.edu/~jmg174/resources.html>

Automatic Facial Expression Analysis. (Cohn & Kanade, 2007).

*Schematic pitch coding.* Generates graphic representations of  $f_0$  contours and quantitative estimates of acoustic parameters, utterance durations, and turn-taking pauses. (Katz, Cohn, & Moore, 2000).

*Icode.* Computer-assisted coding of digital video using Matlab. <http://www.pitt.edu/~emotion/download/framegrabber.zip>

## **MEDIA**

My research in parent-infant interaction, depression, and facial expression analysis has appeared in both print and electronic media in the U.S. and internationally. Maternal depression research was featured in the documentary “*Breaking the Blues*” and in articles in *Psychology Today*, the *APA Monitor*, and the *Philadelphia Inquirer* among other print media. My work in facial expression analysis has been the topic of film documentaries in the U.S., Europe, and Japan, TV in Europe, radio in Europe, Australia, and the U.S. and international newspapers including the *Washington Post*, *Chicago Tribune*, and the *Times of London*. Most recently, it was featured in a DVD produced by Thomson/Wadsworth publishers for distribution with Introductory Psychology textbooks and in a documentary by Quest of Paul Ekman’s *Emotions Revealed*, <http://www.channels.com/episodes/show/2434237/Emotions-Revealed>

## **TEACHING EXPERIENCE**

[Abnormal Psychology](#) (undergraduate),

Developmental Psychopathology (undergraduate)

Introductory Psychology (undergraduate)

[Psychology of Emotion](#) (undergraduate, graduate)

Psychological Assessment (graduate)

Infant Social and Emotional Development (graduate)

## **EDITING AND EDITORIAL BOARDS**

Associate Editor, *IEEE Transactions on Affective Computing*, 2010 to 2018

Co-Editor, *IEEE Transactions on Affective Computing: Special Issue on Human Behavior Analysis "in-the-wild* (2018).

Co-Editor, *IEEE Transactions on Pattern Analysis and Machine Learning: Special Issue on the Computational Face* (2017).

Co-Editor, *Pattern Recognition Letters: Special Issue on Personalized- and Context-sensitive Interfaces in the Wild* (2016).

Co-Editor, *Computer Vision and Image Understanding: Special Issue on Spontaneous Facial Expression Analysis* (2015).



Co-Editor, Special Issue on Best of International Conference on Multimodal Communication, *ACM Transactions on Interactive Intelligent Systems* (2015-2016).

Co-Editor, Special Issue on Best of Face and Gesture Recognition, *Image and Vision Computing Journal* (2015, 2016, and 2009)

*Child Development*, 1989 to 1996

*Developmental Psychology*, 1992 to 1998

*Infant Behavior and Development*, 1994 to 1999

*Infancy*, 2003 - 2008

## **CONFERENCE PROGRAM CHAIR AND COMMITTEES**

### *CONFERENCE CHAIR*

Co-Chair, *IEEE International Conference on Automatic Face and Gesture Recognition (FG 2017)*, Washington, DC.

Co-Chair, *IEEE International Conference on Automatic Face and Gesture Recognition (FG 2015)*, Ljubljana, Slovenia. <http://www.fg2015.org>

Co-Chair, *16<sup>th</sup> International Conference on Multimodal Interfaces (ICMI 2014)*, Istanbul, Turkey. <http://icmi.acm.org/2014/>

Co-Chair with M. Pantic & Anton Nijholt, *International Conference on Affective Computing and Intelligent Interaction (ACII 2009)*, Amsterdam, the Netherlands. [http://archive.emotion-research.net/acii2009/content/org\\_committee](http://archive.emotion-research.net/acii2009/content/org_committee)

Co-Chair with T. Huang, R. Cowie, & M. Pantic, *IEEE International Conference on Automatic Face and Gesture Recognition (FG 2008)*, Amsterdam, The Netherlands.

### *ADVISORY COMMITTEE*

IEEE International Conference on Automatic Face and Gesture Recognition (FG 2019), Lille, France.

IEEE International Conference on Automatic Face and Gesture Recognition (FG 2018), Xi'an, China. <http://fg2018.org>

### *WORKSHOP CHAIR OR AREA CHAIR*

Co-Chair, Facial Expression Recognition and Analysis Challenge (FERA 2017), Washington, DC.

Co-Chair, 1st Workshop on 3D Face Alignment in the Wild (3DFAW) & Challenge. *European Conference on Computer Vision (ECCV 2016)*, Amsterdam, The Netherlands.

Co-Chair, Workshop on Human Behavior Understanding (HBU 2016), *European Conference on Computer Vision (ECCV 2016)*, Amsterdam, The Netherlands.

Co-Chair with M. Valstar, G. McKeown, L. Yin, & M. Pantic, *Facial Expression Recognition and Analysis Challenge (FERA 2015)*, Ljubljana, Slovenia.

Area Chair, Best Paper Award Chair, Test of Time Award Chair, and Advisory Committee member, *IEEE International Conference on Automatic Face and Gesture Recognition (FG 2013)*, Shanghai, China.

Co-Chair with R. Cowie, T. Huang, M. Pantic, B. Schuller, & M. Turk, *Fourth IEEE CVPR Workshop on Human Communicative Behavior Analysis (2011)*, Colorado Springs, Colorado.

Chair, Best Paper Committee, *IEEE International Conference on Face and Gesture Recognition (2011)*. Santa Barbara, CA.

Co-Chair with T. Huang, R. Cowie, & M. Pantic, *Third IEEE Workshop on CVPR for Human Communicative Behavior Analysis (CVPR4HB 2010)*, San Francisco, California.

Co-Chair with T. Huang, R. Cowie, & M. Pantic, *Second IEEE Workshop on CVPR for Human Communicative Behavior Analysis (CVPR4HB 2009)*, Miami, Florida.

Co-Chair with T. Huang, R. Cowie, & M. Pantic, *First IEEE Workshop on CVPR for Human Communicative Behavior Analysis (CVPR4HB 2008)*, Anchorage, Alaska.

Co-Chair with M. Pantic, & A. Niholt (2007). *International Joint Conference on Artificial Intelligence, Workshop on AI for Human Computing*, Hyderabad, India,

Special Section Co-Chair with Maja Pantic, Automatic Facial Expression Analysis. *IEEE International Conference on Systems, Man & Cybernetic, (SMC 2004)*, the Hague, the Netherlands.

#### *PROGRAM COMMITTEE*

*The 3rd International Workshop on Face and Facial Expression Recognition from Real-World Videos at ICPR, 2018.* Beijing, China.

*IEEE International Conference on Computer Vision and Pattern Recognition (CVPR 2018)*, Salt Lake City, UT.

*Face and Gesture Analysis for Health Informatics 2018, Xi'an, China.*

Senior Programming Committee, *International Conference on Multimodal Interaction (ICMI 2016)*, Tokyo, Japan.

Advisory Board Member, *International Conference on Informatics, Electronics & Vision (ICIEV 2016)*, Dhaka, Bangladesh.

*5<sup>th</sup> Audio/Visual+ Emotion Challenge and Workshop (AVEC 2015)*, Brisbane, Australia.

Senior Program Committee, *Sixth International Conference on Affective Computing and Intelligent Interaction (ACII 2016)*, Xi'an, China.

*ChaLearn Looking at People 2014. IEEE European Conference on Computer Vision*, Zurich, Switzerland.

*ICME Workshops "Multimedia Affective Computing (MAC 2014)*. Chengdu, China.

*3<sup>rd</sup> International Conference on Informatics, Electronics, & Vision (ICIEV 2014)*, Dhaka, Bangladesh.

*2nd International Workshop on Emotion Representation, Analysis and Synthesis in Continuous Time and Space (EmoSpace 2013)*, Barcelona, Spain.

*International Workshop on Techniques Towards Companion Technologies (T2CT 2013)*, Edinburgh, Scotland.

*ASE International Conference on Social Computing (2013)*, Washington, DC.

*IEEE Fourth International Workshop on Human Behavior Understanding. ACM Conference on Multimedia (2013)*, Barcelona, Spain.

*IEEE Symposium Series on Computational Intelligence (SSCI 2013)*, Singapore.

Senior Program Committee, *International Conference on Affective Computing and Intelligent Interaction (ACII 2013)*, Geneva, Switzerland.

*What's in a Face? ECC Workshop (2012)*, Florence, Italy.

*First International Workshop on Wide Spectrum Social Signal Processing (WS<sup>3</sup>P 2012)*, Amsterdam, The Netherlands.

*ASE/IEEE International Conference on Social Computing (2012)*, Amsterdam, The Netherlands.

*First International Workshop on Context-Based Affect Recognition.* (2012). Amsterdam, The Netherlands.

*International Workshop on Pattern Recognition and Image Processing (PRIP 2012),* Chennai, India.

*EACL 2012 Workshop on Computational Approaches to Deception Detection,* Avignon, France.  
*Machine Learning for Affective Computing (MLAC 2011).* Memphis, TN.

*Third International Conference on Social Computing* (2011). Boston, MA.

*Affective Computing and Intelligent Interaction (ACII 2011).* Memphis, Tennessee.

*IEEE International Conference on Automatic Face and Gesture Recognition (FG 20011),* Santa Barbara, California.

*IEEE FG 2011 Facial Expression Recognition and Analysis Challenge (FERA2011).* Santa Barbara, California.

*IEEE International Workshop on Emotion Synthesis, Representation, and Analysis in Continuous spaces (EmoSPACE 2011),* Santa Barbara, California.

*ACM Second International Workshop on Social Signal Processing (2010),* Fierenze, Italy.

*IEEE Workshop on Human Behaviour Understanding* (2010), Istanbul, Turkey.

*IEEE International Workshop on Human-Computer Interaction (HCI2009),* Kyoto, Japan.

*Eight International Conference on Intelligent Virtual Agents (IVA'08),* Tokyo, Japan.

*IEEE Workshop on Human Computer Interaction (HCI 2007),* Rio De Janeiro, Brazil.

*IEEE Workshop on Analysis and Modeling of Faces and Gestures (AMFG-07),* Rio De Janeiro, Brazil.

*Twentieth International Joint Conference on Artificial Intelligence (IJCAI-07),* Hyderabad, India.

*Fifth International Conference on Development and Learning (ICDL-06),* Bloomington, Indiana.

*IEEE International Workshop on Human-Computer Interaction, 2005,* Beijing, China

*IEEE International Workshop on modeling People and Human Interaction (PHI'05),* Beijing, China.

*IEEE International Conference on Automatic Face and Gesture Recognition (FG 2006),* Southampton, England.

*IEEE Workshop on Analysis and Modeling of Faces and Gesture (AMFG 2005),* Beijing, China.

*Fourth International Conference on Development and Learning (ICDL-05): From Interaction to Cognition..* Osaka, Japan.

*International Conference on Active Media Technology (AMT 2005),* Takamatsu, Japan.

*Third International Conference on Development and Learning (ICD 2004): Developing Social Brains,* La Jolla, California.

*IEEE Computer Society Conference on Computer Vision and Pattern Recognition, (CVPR 2004),* Washington, DC.

*3rd International Conference on Entertainment Computing, (ICEC 2004),* Eindhoven, the Netherlands.

*7<sup>th</sup> European Meeting of the Association for the Advancement of Assistive Technology in Europe (AAATE 2003),* Dublin, Ireland.

*Florida Association for Artificial Intelligence Research Society (FLAIRS 2003), Special Track: Integrating Emotion and Cognition in Formal Models, St. Augustine, Florida.*

*International Computer Science Conference: Active Media Technology (AMT 2003), Chongqing, China.*

*IEEE International Conference on Multimodal Interfaces (ICMI 2002), Pittsburgh, PA.*

*First International Workshop on Entertainment Computing, (IWEC 2002), Chiba, Japan.*

*IEEE International Workshop on Cues in Communication (CUES 2001), Kauai, Hawaii.*

*International Computer Science Conference: Active Media Technology (AMT 2001), Hong Kong, China.*

Chair, Panel 14, Affect and Temperament, *Society for Research in Child Development: Biennial Meeting (SRCD 1999), Albuquerque, NM.*

## **GRANT REVIEWS**

National Institutes of Health

NIH Cognition and Perception Special Emphasis Panel, 2015

NIH Language and Communication Special Emphasis Panels, 2014-2015

NIH NIDCR Special Emphasis Panels, 2014-2015

College of CSR Reviewers (2010 – 2012)

National Institutes of Health Psychosocial Development, Risk, and Prevention Study Section (2005 – 2008)

*Ad hoc* member:

National Institute of Alcohol Abuse and Alcoholism

National Institute of Child Health and Development

National Institute of Mental Health

National Institute of Health Bio-behavioral Regulation, Learning and Ethology Study Section

National Institute of Mental Health Social and Group Processes Study Section, Interim member 1998-99

National Science Foundation

Scientific Directorate of the Center for Interdisciplinary Research (ZiF) (Germany)

Swiss National Science Foundation

Council of Physical Sciences of the Netherlands Organization for Scientific Research

Engineering and Physical Sciences Research Council (United Kingdom)

## **JOURNAL AND CONFERENCE REVIEWS**

*Abnormal Psychology*

*Autism*

*Behavioral and Brain Sciences*

*Behavior Research Methods*

*Biological Psychiatry*

*Biological Psychology*

*IEEE Transactions on Vision, Image, and Signal Processing*

*IEEE Signal Processing Magazine*

*IET Computer Vision*

*Image*

*Image and Vision Computing*

*Child Development*  
*Current Directions in Psychological Science*  
*Development and Psychopathology*  
*Developmental Psychology*  
*Emotion*  
*Emotion and Cognition*  
*Eurographics*  
*Florida Artificial Intelligence Research Society*  
*Journal of Experimental Psychology –Applied*  
*Journal of Experimental Social Psychology*  
*Journal of Nonverbal Behavior*  
*Journal of Personality and Social Psychology*  
*Journal of Vision*  
*Human-Computer Interaction*  
*IEEE Transactions on Biomedical Engineering*  
*IEEE Transactions on Multimedia*

*Infancy*  
*Infant Behavior and Development*  
*International Journal on Artificial Intelligence Tools*  
*International Journal on Computer Vision*  
*International Journal of Human-Computer Studies*  
*Journal of Cognitive Engineering and Decision Making*  
*Journal of Language and Speech*  
*Journal of Nonverbal Behavior*  
*Journal of Vision*  
*PlosOne*  
*Psychological Assessment*  
*Psychological Bulletin*  
*Psychophysiology*  
*Social Development*  
*Society for Research in Child Development*

### **CLINICAL EXPERIENCE**

Consultation and assessment, 1983 to 2014

Clinical Supervision, Clinical Psychology Center, University of Pittsburgh, 1983 to 2000.

APA-Approved Internship in Child Clinical and Pediatric Psychology, University of Maryland School of Medicine, Department of Pediatrics, Division of Pediatric Psychology, 1982-1983

Clinical Associate, Pediatric Psychology Program, Bay State Medical Center, Springfield, MA, 1981-1982

Clinician, Psychological Services Center, University of Massachusetts, 1978-1981

### **ADMINISTRATIVE EXPERIENCE**

University Research Council, University of Pittsburgh, 2006 to 2013.

Dietrich School Tenure Appeals Committee, 2012 – to present

Dietrich School Tenure Selection Council, Alternate, 2013-2014.

Chair, Computer Committee, Department of Psychology, University of Pittsburgh, 2003 to 2007.

Chair, Colloquium Committee, Department of Psychology, University of Pittsburgh, 1989 to 1992, 2007 to 2010.

Director of Admissions, Clinical Psychology Program, University of Pittsburgh, 1985 to 1990, 1998, 2000.

Faculty Research Grants Committee, 1995-1997. (Chair, 1997).

FAIS Administrator (Computer Administrator), Department of Psychology, 1991 to 1999.

IRB Pre-Scientific Review, Department of Psychology, 2001-present.

Racial Justice Committee, Department of Psychology, University of Pittsburgh, 1984 to 1988.

Undergraduate Curriculum Committee, Psychology Department, University of Pittsburgh, 1988 to 1989

**PROFESSIONAL AFFILIATIONS**

American Association for the Advancement of Science

Association for Computing Machinery

American Psychological Association

American Psychological Society

Association for the Advancement of Affective Computing (AAAC)

Institute of Electronic and Electrical Engineers

International Society of Infant Studies

International Society for Research in Emotion

Society for Research in Child Development