April 5, 2026

JEFFREY F. COHN

jeffcohn@pitt.edu ***https://jeffcohn.net***
jeff@deliberate.ai

DEGREES

PhD (l983) and MS (l98l) in Psychology, University of Massachusetts at Amherst

BA in Sociology, University of Wisconsin at Madison

LICENSE AND CERTIFICATION

Clinical Psychologist, Pennsylvania (License #PS-004660-L), 1988 to 2013

Certified School Psychologist, Pennsylvania, 1988 to 2000

PROFESSIONAL EXPERFIENCE

Co-Founder and Chief Scientist, Deliberate AI, 2020 to present.

Professor Emeritus, University of Pittsburgh, 2024 to present.

Professor, Departments of Psychology and Psychiatry, University of Pittsburgh, 2005 to 2024.

Professor, Intelligent Systems Program, School of Computing and Information Sciences, University of Pittsburgh, 2018 to present.

Courtesy Faculty, Robotics Institute, School of Computer Science, Carnegie Mellon University, 1997 to present.

Advisory Board, SPRING: Socially Pertinent Robots in Gerontological Healthcare (SPRING), 2021 to 2024. https://spring-h2020.eu

Chair, Steering Committee for the IEEE Conference on Automatic Face and Gesture Recognition, 2011 to 2021.

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

Advisory Board, Embodied, 2019 to 2024.

Advisory Board, Real Eyes, 2013 to present.

Advisory Board, Xtrodes, 2022 to 2023.

Advisory Board, Creative Non-Fiction, 2015 to 2018.

Consultant, Emokit, 2017 to 2018.

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.

AWARDS AND HONORS

Fellow, *The Association for the Advancement of Affective Computing*, September 2019.

Highest Impact Paper from *IEEE International Conference on Automatic Face and Gesture Recognition 1999-2004:* "Comprehensive Database for Facial Expression Analysis" (2000). Authors: Takeo Kanade, Jeffrey F. Cohn, & Yingli Tian.

Best Paper Award (2015). *IEEE International Conference on Automatic Face and Gesture Recognition,* Ljubljana, Slovenia.

Best Paper Award (2012), *ACM International Conference on Multimodal Interaction*, Santa Monica, CA.

RESEARCH GRANT SUPPORT

ACTIVE RESEARCH GRANTS

Co-Principal Investigator. AURORA (Adaptive Understanding through Real-time Observation, Reporting, and Assistance). Welcome Trust, 05/01/2026 to 04/30/2028.

Co-Principal Investigator. Progressing towards the Qualification Plan of AI-COATM for Automated Depression and Anxiety Severity Measurement. Food and Drug Administration, 02/20/2024 to 02/19/2026.

Co-Investigator (PI: Kahn). Phenotypes RE-imagined to Define Clinical Treatment and Outcome Research (PREDiCTOR). National Institute of Mental Health, 04/2024 to 03/2029.

Co-Investigator (PI: K. Bijanki), "Mapping and Modulating the Spatiotemporal Dynamics of Socio-Affective Processing." National Institutes of Health, 8/1/2021 to 5/31/2026.

RESEARCH GRANTS UNDER REVIEW

Multiple PI with M Aafjes. AI-Clinical Outcome Assessment (AI-COA) for Depression: An Innovative Drug Development Tool. National Institute of Mental Health, 9/2025 to 8/2030.

Co-Investigator (PI: M. Aafjes). MOSAIC (Multi-Omics Sampling, Assessment and Integrated Characterization). ARPA-H, 04/26/2026 to 03/35/2028.

Co-Investigator (PI: C. Cha). "How adolescents view life when they desire death: A multimodal, longitudinal study of protective factors among suicidal youth. National Institute of Mental Health, 12/26/26 to 11/30/2031.

PAST RESEARCH GRANTS

Co-Investigator (PI: Alik Widge), "Fast, Reliable, Electrical Unconscious Detection (FREUD). Department of Defense, 4/1/2023 to 3/30/2025.

Co-Principal Investigator (PI: Sameer Sheth), "Deep Brain Stimulation for Depression Using Directional Current Steering and Individualized Network Targeting." National Institute of Neurological Disorders and Stroke, 9/30/2017 to 6/30/2024.

Partner Investigator (PI: R. Goecke), "Improving the Specificity of Affective Computing via Multimodal Analysis." Australian Research Council, 8/1/2019 to 07/31/2024.

Co-Principal Investigator (PI: Wayne Goodman), "Adaptive DBS in Non-Motor Neuropsychiatric Disorders: Regulating Limbic Circuit Imbalance." National Institutes of Health, 9/30/2016 – 6/30/2024.

Co-Investigator (PI: L. Jeni), "Dynamic Implicit Neural Representations for Avatar Animation." Fujitsu/CMU, 9/1/2021 – /31/2023.

Principle Investigator, "Automatic Multimodal Affect Detection for Research and Clinical Use." National Institute of Mental Health, 8/1/2017 to 4/30/2023.

Co-Investigator (PI: N. Allen), "MAPS: Mobile Assessment for the Prediction of Suicide." National Institute of Mental Health, 9/1/2018 to 7/31/2023.

Principal Investigator, "Collaborative Research: Health Behavior Informatics." National Science Foundation, 9/1/2017 to 8/31/2022.

Principal Investigator, "CI-SUSTAIN: Collaborative Research: Multimodal Corpus of Spontaneous Behavior for Automated Emotion Analysis." National Science Foundation, 8/1/2016 to 7/31/2021.

Co-Investigator (PI: L. Jeni), "Semantic Facial Expression Manipulation." CMU/Fujitsu, 9/01/2019 – 8/31/2021.

Principle Investigator, "Craniofacial Microsomia: Facial Expression from Ages 1 to 3 Years." National Institutes of Health, 9/1/2017 to 8/31/2021.

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 – 8/15/2019.

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

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.

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

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: l/85 – l2/85, $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 l2 and at l8 Months." NIH Biomedical Research Support Grant: l/84 – 5/84, $1750 (TDC).

INDIVIDUAL FELLOWSHIPS SPONSORED AND AWARDED

Tess Bailie, Hot Metal Bridge Post-Baccalaureate Fellowship, 2011–2012.

Erika Forbes, National Science Foundation Pre-Doctoral Fellowship, 1997–2001.

Ilana Gratch, National Institute of Mental Health, Pre-Doctoral Fellowship, 2022-2025.

Karen Schmidt, National Institute of Mental Health Post-Doctoral Fellowship, 2000–2002.

Christina Staszel, 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.

Adena Zlochower, University of Pittsburgh Chancellor's Undergraduate Research Fellowship, 1991– 1992.

PEER-REVIEWED JOURNAL PUBLICATIONS

Aafjes van Doorn, K., Cicconet, M., Cohn, J. F., & Aafjes, M. (2025). Predicting working alliance in psychotherapy: A multi-modal machine learning approach *Psychotherapy Research*. *https://doi.org/10.1080/10503307.2024.2428702*

Aafjes van Doorn, K., Cicconet, M., Bate, J., Cohn, J. F., & Aafjes, M. (2025). Development of an AI-based measure of therapists' skills: A multi-modal proof of concept. *Psychotherapy*.

Auerbach, R. P., Bloom, P. A., Pagliaccio, D., Ranqing Lan, M., Galfalvy, H., Bitran, A., Durham, K., Crowley, R., Joyce W, K., Blanchard, A., Chernick, L. S., Dayan, P. S., Greenblatt, J., Kahn, L. E., Porta, G., Tse, T. C., Cohn, J. F., Morency, L.-P., Brent, D. A., & Allen, N. B. (2025). Using smartphone-derived GPS data to improve the short-term prediction of suicidal thoughts and behaviors in high-risk adolescents. *JAMA Network Open*. *https://doi.org/10.1001/jamanetworkopen.2024.56429*

Girard, J. M., Yermol, D. A., Salah, A. A., & Cohn, J. F. (2025). Computational analysis of expressive behavior in clinical assessment. *Annual Review of Clinical Psychology*. https:// 10.1146/annurev-clinpsy-081423-024140

Girard, J. M., D. Yermoi, L. M. Bylsma, J. F. Cohn, J. Fournier, L.P. Morency and H. A. Swartz (2025). Dynamic and dyadic relationships between facial behavior, working alliance, and treatment outcomes during depression therapy. Journal of Consulting & Clinical Psychology. https://10.1037/ccp0000980

Provenza, N., Rajesh, S., Reyes, G., Katlowitz, K., Pugalenthi, L., Pugalenthi, L., Bechtold, R., Diab, N., Reddy, S., Allam, A., Gandhi, A., Kabotyanski, K., Mansourian, K., Bentley, J., Altman, J., Hinduja, S., Giridharan, N., Banks, G., Shofty, B.,...Sheth, S. (2025 (in press)). High beta power in the ventrolateral prefrontal cortex indexes human approach behavior: A case study. *Journal of Neuroscience*. *https://10.1523/JNEUROSCI.1321-24.2025*

Ahn, Y. A., Ertuğrul, I. Ö., Chow, S.-M., Cohn, J. F., & Messinger, D. S. (2024). How still? Parent-infant interaction during the still-face and later infant attachment. *Infant Behavior & Development*. *https://doi.org/10.1002/icd.2492*

Allawala, A. B., Bijanki, K. R., Adkinson, J., Oswalt, D., Tsolaki, E. et al. (2024). Stereo-Electroencephalography–Guided Network Neuromodulation for Psychiatric Disorders: The Neurophysiology Monitoring Unit. *Operative Neurosurgery*. https://doi.org/10.1227/ons.0000000000001122

Hinduja, S., Nourivandi, T., Cohn, J. F., & Canavan, S. (2024). Time to retire F1 binary score for action unit detection. *Pattern Recognition Letters*.

Hinduja, S., Darzi, A., Ertugral, I. O., Provenza, N., Gadot, R., Storch, E. A., Sheth, S., Goodman, W. K., & Cohn, J. F. (2024, in press). Multimodal prediction of obsessive-compulsive disorder, comorbid depression, and energy of deep brain stimulation. *IEEE Transactions on Affective Computing*.

Sheth, S. A., Shofty, B., Allawala, A., Xiao, J., Adkinson et al., (2024). Stereo-EEG-guided network modulation for psychiatric disorders: Surgical considerations. *Brain Stimulation*, *16*(6), 17921798. https://doi.org/10.1016/j.brs.2023.07.057

Ahn, A., Chow, S.-M., Ertugrul, I. O., Cohn, J. F., & Messinger, D. (2023). Automated measurement of infant and mother Duchenne facial expressions in the Face-to-Face/Still-Face. Infancy, 28(5), 910929. https://doi.org/10.1111/infa.12556

Auerbach, R. P., Lan, R., Galfalvy, H., Alqueza, K., Cohn, J. F., Crowley, R., Durham, K., Joyce, K., Kahn, L. E., Kamath, R., Morrency, L.-P., Porta, G., Srinivasan, A., Zelazny, J., Brent, D. A., & Allen, N. A. (2023). Intensive longitudinal assessment of adolescents to predict suicidal thoughts and behaviors. *Journal of the American Academy of Child and Adolescent Psychiatry, 14*(9), 10101020.

Demchenko, I., Desai, N., Iwasa, S. N., Nezhad, F. G., Zariffa, J., Kennedy, S. H., Rule, N. O., Cohn, J. F., Popovic, M. R., Mulsant, B. H., & Bhat, V. (2023). Manipulating facial musculature with functional electrical stimulation as an intervention for major depressive disorder: a focused search of literature for a proposal. *Journal of NeuroEngineering and Rehabilitation, 20*(64). https://doi.org/10.1186/s12984-023-01187-8

Swartz, H. A., Bylsma, L. M., Fournier, J. C., Cohn, J. F., Girard, J. M., Spotts, C., & Morency, L.-P. (2023, in press). Randomized trial of brief interpersonal psychotherapy and cognitive behavioral therapy for depression delivered both in-person and by telehealth. *Journal of Affective Disorders, 333*, 543-552.

Li, X., Zhang, Z., Zhang, X., Wang, T., Li, Z., Yang, H., Ciftci, U., Ji, Q., Cohn, J. F., & Yin, L. (2023). Disagreement matters: Exploring internal diversification for redundant attention in generic facial action analysis. *IEEE Transactions on Affective Computing*.

Ertugrul, I. O., Ahn, Y. A., Bilalpur, M., Messinger, D. S., Speltz, M. L., & Cohn, J. F. (2022). Infant AFAR: Automated facial action recognition in infants. *Behavior Research Methods*.

Niinuma, K., Ertugrul, I. O., Cohn, J. F., & Jeni, L. A. (2022). Facial expression manipulation for personalized facial action estimation. *Frontiers in Signal Processing*. doi:10.3389/frsip.2022.861641

Sheth, S., Bijanki, K., Metzger, B., Allawala, A., Pirtle, V., Adkinson, J., Myers, J., Mathura, R., Oswalt,

D., Tsolaki, E., Xiao, J., Noecker, A., Strutt, A., Cohn, J. F., McIntyre, C., Mathew, S., Borton, D., Goodman, W., & Pouratian, N. (2022). Deep brain stimulation for depression informed by intracranial recordings. *Biological Psychiatry, 92,* 246-251.

Allawala, A. B., Bijanki, K. R., Goodman, W., Cohn, J. F., Viswanathan, A., Yoshor, D., Borton, D. A., Pouratian, N., & Sheth, S. A. (2021). A novel framework for network-targeted neuropsychiatric deep brain stimulation. *Neurosurgery*.

Niinuma, K., Jeni, L. A., Ertugrul, I. O., & Cohn, J. F. (2021). Systematic evaluation of design choices for deep facial action coding across pose. *Frontiers in Computer Science*.

Provenza, N. R., Sheth, S. A., Rijn, E. M. D., Mathura, R. K., Ding, Y., Vogt, G. S., Avendano-Ortega, M., Ramakrishnan, N., Peled, N., Gelin, L. F. F., Xing, D., Jeni, L. A., Ertugrul, I. O., Barrios-Anderson, A., Matteson, E., Wiese, A. D., Xu, J., Viswanathan, A., Bijanki, K., Storch, E. A., Cohn, J. F., Goodman, W. K., & Borton, D. A. (2021). Long-term ecological assessment of intracranial electrophysiology synchronized to behavioral markers in Obsessive-Compulsive Disorder. *Nature Medicine*.

Alghowinem, S., Gedeon, T., Goecke, R., Cohn, J., & Parker, G. (2023). Depression detection model interpretation via feature selection methods. *IEEE Transactions on Affective Computing,* 14(1), 133-152. doi: 10.1109/TAFFC.2020.3035535.

Chen, M., Chow, S.-M., Hammal, Z., Messinger, D. S., & Cohn, J. F. (2020). A person- and time-varying autoregressive model to capture interactive infant-mother head movement dynamics. *Multivariate Behavioral Research*.

Ertugrul, I.O., Cohn, J.F., Jeni, L.A., Zhang, Z., Yin, L., & Ji, Q. (2020). Crossing domains for AU coding: Perspectives, approaches, and measures. *IEEE Transactions on Biometrics, Behavior and Identity Science (TBIOM)*.

Girard, J. M., Cohn, J. F., Yin, L., & Morency, L.-P. (2020). Reconsidering the Duchenne smile: Examining the relationships between the Duchenne marker, smile intensity, and positive emotion. *Affective Science*.

Girard, J. M., Cohn, J. F., Yin, L., & Morency, L.-P. (2020). Reconsidering the Duchenne smile: Examining the relationships between the Duchenne marker, smile intensity, and positive emotion. *Affective Science*.

Goodman, W. K., Storch, E. A., Cohn, J. F., & Sheth, S. A. (2020). Deep brain stimulation for intractable obsessive-compulsive disorder: Progress and opportunities. *American Journal of Psychiatry*.

Chu, W-S., Cohn, J. F., & Torre, F. D. (2019). Learning facial action units with spatiotemporal cues and multi- label sampling. *Image and Vision Computing, 81,* 1-14.

Ertugrul, I. O., Yang, L., Jeni, L. A., & Cohn, J. F. (2019). D-PAttNet: Dynamic patch-attentive deep network for action unit detection. *Frontiers in Computer Science, 1,* 1-11. doi: 10.3389/fcomp.2019.00011

Hammal, Z., Wallace, E., Speltz, M. L., Heike, C. L., Birgfeld, C. B., & Cohn, J. F. (2019). Dynamics of face and head movement in infants with and without craniofacial microsomia. *Plastic and Reconstructive Surgery Global Open*.

Provenza, N. R., Matteson, E. R., Allawala, A. B., Barrios-Anderson, A., Sheth, S. A., Viswanathan, A., . . . Cohn, J.F., Goodman, W.K., & Borton, D. A. (2019). The case for responsive neuromodulation to treat severe intractable mental disorders. *Frontiers in Neuroscience: Neuroprosthetics*.

Dibeklioglu, H., Hammal, Z., & Cohn, J. F. (2018). Dynamic multimodal measurement of depression severity using deep autoencoding. IEEE Journal of Biomedical and Health Informatics, 22*(2)*, 525536.

Escalera, S., Baro, X., Guyon, I., Escalante, H.J., Tzimiropoulos, G., Valstar, M., Pantic, M., Cohn, J.F., & Kanade, T. (2018). Guest editorial: The computational face. *IEEE Transactions on Pattern Analysis and Machine Learning, 40*(11), 2451-2455.

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, 55*(5), 711-720.

Hammal, Z., Wallace, E., Speltz, M. L., Heike, C. L., Birgfeld, C. B., & Cohn, J. F. (2019). Dynamics of face and head movement in infants with and without craniofacial microsomia. *Plastic and Reconstructive Surgery Global Open*.

Martin, K. B., Hammal, Z., Ren, G., Cohn, J. F., Cassell, J., Ogihara, M., . . . Messinger, D. S. (2018). Objective measurement of head movement differences in children with and without autism spectrum disorder. *Molecular Autism*, *9*(14), xxx-xxx.

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), 372391.

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*.

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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*, Ljubjana, 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.

Rosenberg, E., Messinger, D., & Cohn, J.F. (July 2008). Advanced FACS methodological issues. *The 12th European Conference on Facial Expression*, University of Geneva, Switzerland.

Working Group on Multimodal Communication, *Cyberinfrastructure for Collaborative Research in the Social and Behavioral Sciences*. NSF grant to University of Chicago.

Pantic, M., Sebu, N., Cohn, J.F., & Huang, T. (November 2005). Affective multimodal human-computer interaction. *ACM International Conference on Multimedia,* Singapore.

Pantic, M. & Cohn, J.F. (October 2004). Automatic facial expression analysis. *IEEE Conference on Systems, Man, and Cybernetics*, The Hague, The Netherlands.

Cohn, J. F. et al. (July 2004). Automatic facial expression analysis. Workshop, *International Society for Research in Emotion* (ISRE). New York, NY.

Cohn, J. F. (July 2000). Emotion and paralinguistic communication. Tutorial, *IEEE International Conference on Multimedia and Expo*. New York, NY.

Cohn, J. F. (December 2000). Automated face analysis for emotion recognition. *Neural Information Processing Systems*. Breckenridge, Colorado.

Cohn, J. F. & Katz, G. S. (September 1998). Bimodal expression of emotion by face and voice. *ACM and ATR Workshop on Face/Gesture Recognition and Their Applications.* Bristol, United Kingdom.

INVITED PRESENTATIONS

Cohn, J.F. (July 2025). Computer Vision for Developmental and Clinical Research. Child Development Lab, University of Maryland.

Cohn, J.F. (April 2025). Affective Computing for Clinical Science and Treatment. Intelligent Systems Program, University of Pittsburgh.

Cohn, J.F. (December 2024). Affective Computing for Clinical Science and Treatment. *City University of New York*.

Cohn, J.F. (June 2024). Objective measurement and analysis of internalizing disorders using multimodal machine learning for clinical science and treatment. *Bilkent University*, Ankara, Türkiye.

Cohn, J.F. (June 2024). Objective measurement and analysis of internalizing disorders using multimodal machine learning for clinical science and treatment. *International Symposium for Brain and Cognitive Science*, Ankara, Türkiye.

Cohn, J.F. (May 2024). Objective measurement and analysis of internalizing disorders using multimodal machine learning for clinical science and treatment. *Applied Multimodal Affect Recognition (AMAR),* Istanbul, Turkey.

Cohn, J.F. (March 2024). Affective computing for objective measurement, analysis, and synthesis of internalizing disorders in clinical science and treatment. *Colloquium*. Department of Psychology, University of Pittsburgh.

Cohn, J.F. (December 2023). Computational approaches to objective measurement, analysis, and synthesis of internalizing disorders for clinical science and treatment. *Colloquium*. Teachers College, Columbia University.

Cohn, J.F. (November 2023). Facial expression analysis by computer image processing. *Raj Reddy AI Lecture and Computer Vision Symposium*. Carnegie Mellon University.

Estrin, D., Dagum, P., Matthews, M., Mondal, M., Cohn, J.F., & MacMilliam, C. (March 2023). Lost without a GPS: The promises and the limitations of digital measurements. *Cornell Tech: Behavioral Health Summit*. NY, NY.

Cohn, J.F. (December 2022). Automatic face analysis for clinical research and treatment. *Distinguished Lecture Series*, Department of Computer Science, Stony Brook, NY.

Cohn, J.F. (October 2022). Multimodal measurement of internalizing disorders for behavior understanding and intervention. *Affective Computing and Intelligent Interaction*, Nara, Japan.

Cohn, J.F. (March 2022). Learning about the brain from behavior. NIH Brain Behavior Quantification Workshop, Virtual.

Cohn, J.F. (December 2021). Multimodal measurement of internalizing disorders. Rochon Distinguished Lecture Series, Toronto, Canada.

Cohn, J.F. (November 2020). Building classifiers for adaptive deep brain stimulation in obsessivecompulsive disorder. *IEEE International Conference on Automatic Face and Gesture Recognition*, Buenos Aires, Argentina (virtual).

Cohn, J.F. (May 2019). Generalizability from basic to clinical research. *IEEE International Conference on Automatic Face and Gesture Recognition LENA Workshop,* Lille, France.

Cohn, J.F. (May 2019). Generalizability from basic to clinical research. *Activity and Behavior Computing,* Spokane, WA.

Cohn, J.F. (October 2018). How can multimodal affective computing inform psychological science & treatment? *SIBGRAPI: Brazilian Symposium on Computer Graphics and Image Processing*, Iguazu Falls, Brazil.

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 Audi0/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 Britian.

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.

Cohn, J.F. (October 2006). Foundations of human computing: Facial expression and emotion. *People Image Analysis Consortium Workshop*, Pittsburgh, PA.

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.

Cohn, J.F. (January 2002). Facial expression: Interpretation and automatic analysis. Media Lab Europe, Dublin, Ireland.

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

Aafjes-van Doorn, K., Cicconet, M., Cohn, J. F., & Aafjes, M. (2025, April 23-25). Audiovisual behavioral and physiological markers of suicidal risk: An opportunity for passive ambient screening. *Suicide Research Symposium (SRS)*, Virtual.

Hands Ruz, M., Gratch, I., Zhu, Y., Cohn, J., Cha, C.B. (November, 2025). *Smiling: Exploring a behavioral marker of positive affect while suicidal individuals imagine their future*. The 59th Annual ABCT Convention, New Orleans, Louisiana.

Cohn, J. F., Hinduja, S., Darzi, A., Ertugral, I. O., Provenza, N. R., Aafjes, M., Gadot, R., Sheth, S., & Goodman, W. (2023). Can an unobtrusive AI-based system based on open-ended interviews effectively guide DBS programming for OCD? *International Society for Clinical Trials and Methodology* (ISCTM), Washington, DC.

Hinduja, S., Darzi, A., Ertugrul, I.O, Provenza, N., Gadot, R., Storch, E.A., Sheth, S.A., Goodman, W.K., & Cohn, J.F. (2023). Can an unobtrusive, multimodal mixed-effects regressor based on openended interviews predict OCD severity? *Brain Initiative Meeting*. Washington, DC.

Messinger, D.S, Ahn, Y.A., Ertugral, I. O., Chow, S.-M., & Cohn, J. F. (2023, July 15-19, 2023). Infant and mother Duchenne facial expressions in the face-to-face/still-face. *18th World Congress for the World Association for Infant Mental Health* (WAIMH 2023), Dublin, Ireland.

Provenza, N. R., & et al. (2023). Identification of candidate neural biomarkers of ObsessiveCompulsive symptom intensity and response to deep brain stimulation. *North American Neuromodulation Society,* Las Vegas, Nevada.

Nicole Provenza, Evan Dastin-van Rijn, Chandra Prakash Swamy, Huy Dang, Sameer Rajesh,Nabeel Diab, Laszlo Jeni, Saurabh Hinduja, Michelle Avendano-Ortega, Sarah A. Mckay, Gregory S. Vogt, Bradford Roarr, Andrew Wiese, Ben Shofty, Jeffrey Herron, Kelly Bijanki, Eric Storch, Jeffrey Cohn, Nuri Ince, David Borton, Wayne Goodman, Sameer Sheth (2023). Chronic ecological assessment of intracranial neural activity synchronized to disease-relevant behaviors in obsessive-compulsive disorder. Biological Psychiatry, *93*(9), S8.

Ahn, Y.A., Onal Itrugrul, I., Chow, S.M., Cohn, J.F., & Messinger, D.S. (2022). Automated measurement of infant and mother Duchenne facial expressions in the Face-to-Face/Still-Face. In *New Direction in Face-to-Face Communication, International Conference on Infant Studies. Ottawa*.

Cicconet, M., Jones, J., Barone, B., Kellogg, L., Aafjes-van Doorn, K., Cohn, J., & Aafjes, M. (2022). Depression ClinRO inference using momentary multimodal behavioral and physiological digital biomarkers from decentralized data collection. *International Conference for Clinical Trials and Research Methodology*, Washington, DC. Distinguished Poster Award.

Darzi, A., Hinduja, S., Provenza, N. R., Jeni, L. A., Borton, D. A., Gadot, R., Sheth, S. A., Goodman, W. K., & Cohn, J. F. (June 2022). Behavioral biomarkers of OCD symptom severity and DBS energy. *8th Annual BRAIN Investigator's Meeting*, Washington, DC.

Jones, J., Aafjes-van Doorn, K., Cohn, J. F., & Aafjes, M. (2022). Real-time ai-rater monitoring to improve CLINROs (clinician reported outcomes*). International Conference on CNS Clinical Trials and Methodology*, Boston.

Ahn, Y. A., Ertugrul, I. O., Chow, S.-M., Cohn, J. F., & Messinger, D. S. (2021). Is mother-infant face-toface responsivity affective? *Society for Affective Science*, Virtual.

Bylsma, L.M., Swartz, H.A., Fournier, J.C., Morency, L., Girard, J.M., Cohn, J.F. (2021). Feasibility and Acceptability of IPT-B and Brief CBT for Depression Delivered In-Person and via Telehealth. In H.A. Swartz (chair), Evidence-Based Approaches to Teletherapy: What Do We Know About Remote Delivery of IPT and Related Therapies? Symposium to be presented virtually at the *Biennial Conference of the International Society of Interpersonal Psychotherapy (ISIPT)*.

Elliott, B. T., Girard, J. M., Bylsma, L. M., Cohn, J. F., Fournier, J. C., Morency, L.-P., & Swartz, H. A. (2021). Observing changes in pathological personality traits and interpersonal problems over the course of brief psychotherapy for depression. Poster presented at the *24th Annual Meeting of the Society for Interpersonal Theory and Research*.

Johnson, E. N., Elliott, B. T., Girard, J. M., Bylsma, L. M., Cohn, J. F., Fournier, J. C., Morency, L.-P., & Swartz, H. A. (2021). Predicting working alliance during depression psychotherapy treatment from personality and interpersonal style. Poster presented at the *24th Annual Meeting of the Society for Interpersonal Theory and Research*.

Sheth, S. A., Bijanki, K. R., Metzger, B., Allawala, A., Pirtle, V., Adkinson, J. A., Myers, J., Mathura, R. K., Oswalt, D., Tsolaki, E., Xiao, J., Noecker, A., Cohn, J. F., McIntyre, C. C., Mathew, S. J., Borton, D., Goodman, W., & Pouratian, N. (2021). Deep brain stimulation for treatment-resistant depression informed by intracranial sEEG UH3 NS103549 *Brain Initiative*, Virtual.

Yeojin Ahn, Martin, K., Prince, E., Chow, S.-M., Cohn, J., Wang, J., . . . Messinger, D. (2021). Not-so-still interaction: Parent-infant interaction during the still-face and later infant attachment. *Society for Research in Child Development*, Virtual.

Ahn, Y. A., Martin, K., Prince, E.B., Chow, S.-M., Cohn, J.F., Wang, J. & Messinger, D. S. (July 2020). Parent-infant interaction during the still-face and later attachment security. *International Conference on Infant Studies*, Glasgow, Scotland.

Ahn, Y. A., Bak, T., Onal Ertugrul, I., Banarjee, C., Davila, P., Chow, S., Cohn, J. F., & Messinger, D. (July 2020). Concordant still-face findings for computer vision and expert FACS coders [Poster presentation]. *The 2020 Biennial International Congress of Infant Studies (ICIS*), Glasgow, UK. (Virtual Conference)

Ding, Y., Ertugrul, I. O., Jeni, L., Provenza, N. R., Cohn, J. F., Borton, D., & Goodman, W. (2020). Automated detection of optimal DBS device settings. *Proceedings of the Companion Publication of the 2020 International Conference on Multimodal Interaction*.

Provenza, N. R., Rijn, E. D.-v., McLaughlin, N. C. R., Sheth, S. A., Viswanathan, A., Vogt, G. S., . . . Cohn, J.F., Borton, D.A., & Goodman, W. K. (April 2019). Preliminary experience with developing adaptive Deep Brain Stimulation for Obsessive Compulsive Disorder. *Brain Initiative Investigators' Conference*, Washington, DC.

Chen, M., Miin, S-M, Hammal, Z., Messinger, D., & Cohn, J.F. (March 2019). Time-series modeling of infant-mother head movement dynamics. *Society for Research in Child Development,* Baltimore, MD.

Morency, L.P., Cohn, J.F., & Scherer, S. (September 2018). Dyadic behavior informatics for psychotherapy process and outcome. *NSF Connections in Smart Health Workshop*, Washington, DC.

Goodman, W., Cohn, J.F., & Borton, D. (June 2018). Automated facial affect recognition (AFAR) with adaptive DBS for intractable OCD. *American Society for Sterotactic and Neurosurgery*, Denver, CO.
Messinger, D.S., Martin, K.B., Cohn, J., & Hammal, Z. (May 2018). An early behavioral index of ASD from automated microanalysis of movement dynamics. *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 Faceto-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.

Sayette, M. A., Creswell, K. G., Dimoff, J. D., Fairbairn, C. E., Cohn, J. F., Heckman, B. W., et al. (May 2012). Effects of alcohol on emotion and social bonding during group formation. *Association for Psychological Science,* Chicago, IL.

Cohn, J. F. (March 2011). Social signaling in depression. *IEEE International Workshop on the Psychology of Face and Gesture Recognition*.

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SYNERGISTIC ACTIVITIES

Patents

Image synthesis for personalized facial expression classification

U.S. Patent Number: 12073655

Abstract: A method may include obtaining a facial image of a subject and identifying a number of new images to be synthesized with target AU combinations and categories of intensity. The method may also include synthesizing the number of new images using the facial image of the subject as the base image with the number of target AU combinations and categories of intensity with a number of new images that have different AU combinations than the facial image of the subject. The method may additionally include adding the number of new images to a dataset and training a machine learning system using the dataset to identify a facial expression of the subject.
https://patents.google.com/patent/US12073655B2/en?oq=U.S.+Patent+Number:+12073655

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Assignees: FUJITSU LIMITED, CARNEGIE MELLON UNIVERSITY

Inventors: Koichiro Niinuma, Jeffrey F. Cohn, Laszlo A. Jeni

Image synthesis for balanced datasets

U.S. Patent Number: 11557149

Abstract: A method may include obtaining a dataset including a target Action Unit (AU) combination and labeled images of the target AU combination with at least a first category of intensity for each AU of the target AU combination and a second category of intensity for each AU of the target AU combination. The method may also include determining that the first category of intensity for a first AU has a higher number of labeled images than the second category of intensity for the first AU, and based on the determination, identifying a number of new images to be synthesized in the second category of intensity for the first AU. The method may additionally include synthesizing the number of new images with the second category of intensity for the first AU, and adding the new images to the dataset.

https://patents.google.com/patent/US11557149B2/en?oq=U.S.+Patent+Number:+11557149

Filed: August 14, 2020

Date of Patent: January 17, 2023

Assignees: FUJITSU LIMITED, CARNEGIE MELLON UNIVERSITY

Inventors: Koichiro Niinuma, Laszlo A. Jeni, Itir Onal Ertugrul, Jeffrey F. Cohn

Image normalization for facial analysis

U.S. Patent Number: 11244206B2

Abstract: A method may include obtaining a base facial image, and obtaining a first set of base facial features within the base facial image, the first set of base facial features associated with a first facial AU to be detected in an analysis facial image. The method may also include obtaining a second set of base facial features within the base facial image, the second set of facial features associated with a second facial AU to be detected. The method may include obtaining the analysis facial image, and applying a first image normalization to the analysis facial image using the first set of base facial features to facilitate prediction of a probability of the first facial AU. The method may include applying a second image normalization to the analysis facial image using the second set of base facial features to facilitate prediction of a probability of the second facial AU.

https://patents.google.com/patent/US11244206B2/en?oq=U.S.+Patent+Number:+11244206

Filed: September 6, 2019

Date of Patent: February 8, 2022

Assignees: FUJITSU LIMITED, CARNEGIE MELLON UNIVERSITY

Inventors: Koichiro Niinuma, Laszlo A. Jeni, Itir Onal Ertugrul, Jeffrey F. Cohn

Self-adaptive matrix completion for heart rate estimation from face videos under realistic conditions

U.S. Patent Number: U.S. Patent Number: 10335045B2

Abstract: Recent studies in computer vision have shown that, while practically invisible to a human observer, skin color changes due to blood flow can be captured on face videos and, surprisingly, be used to estimate the heart rate (HR). While considerable progress has been made in the last few years, still many issues remain open. In particular, state-of-the-art approaches are not robust enough to operate in natural conditions (e.g. in case of spontaneous movements, facial expressions, or illumination changes). Opposite 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 useful for robust HR estimation. The present approach, inspired by recent advances on matrix completion theory, allows us to predict the HR while simultaneously discover the best regions of the face to be used for estimation.
https://patents.google.com/patent/US10335045B2/en?oq=U.S.+Patent+Number:+10335045

Filed: June 23, 2017

Date of Patent: July 2, 2019

Assignees: Universita degli Studi Di Trento, Fondazione Bruno Kessler, The Research Foundation for the State University of New York, University of Pittsburgh of the Commonwealth of Higher Education

Inventors: Niculae Sebe, Xavier Alameda-Pineda, Sergey Tulyakov, Elisa Ricci, Lijun Yin, Jeffrey F. Cohn

System and method for processing video to provide facial de-identification

U.S. Patent number: 9799096

Abstract: 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 is described 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. The facial actions of the source face are transferred to the target face using personalized Facial Action Transfer (FAT), and the color and illumination is adapted. Finally, the source image or video containing the target facial features is outputted for display. Alternatively, the system can run in real-time. https://patents.google.com/patent/US9799096B1/en?oq=U.S.+Patent+Number:+9799096

Filed: 2015-07-2015

Date of Patent: 2017-10-24

Assignees: Carnegie Mellon University

Inventors: De la Torre, F., Cohn, J.F. & Huang, Dong

Data Processing Methods for Predictions of Media Content Performance.

U.S. Patent Number 10,540,678.

Abstract: Methods and systems of predicting performance data for a piece of media content that is consumable by a user at a client device are provided. In one or more embodiments, the method collects raw input data, such as from a webcam, indicative of a user's response to the media content as the user watches the content. The data is processed to extract and obtain a series of head pose signals and facial expression signals, which is then input to a classification model. The model maps the performance data of the media content over time in response to the signals evaluated by the method to produce a prediction of the performance of the piece of media content. https://patents.google.com/patent/US10540678B2/fr

Filed: 2017-07-2018

Date of Patent: 2020-01-21

Assignees: Realeyes OU

Inventors: Gábor Szirtes, Javier Orozco, István Petrás, Dániel Szolgay, Ákos Utasi, Jeffrey Cohn

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 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 videorecorded 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 Should 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/~jeffcohn/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. Framelevel 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*
- *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

PyAFAR: Python-based Automated Facial Action Recognition library for use in Infants and Adults. I*s a Python-based, open-source facial action unit detection library for use with adults and infants. Convolutional neural networks were trained on BP4D+ for adults and MIAMI and CLOCK databases for infants. In adults, AU occurrence and intensity detection are enabled for 12 action units (AU). The AU chosen were selected on the criterion that they have base rates greater than 5% in BP4D+. Action unit intensity estimation is enabled for 5 of these AU. In infants, AU occurrence is enabled for 9 action units*

that are involved in expression of positive and negative affect. For both adults and infants, facial landmark and head pose tracking are enabled as well. For adults, multiple persons within a video may be tracked. The library is developed for ease of use. The models are available for fine-tuning and further training. PyAFAR may be easily incorporated into user Python code. https://github.com/AffectAnalysisGroup/PyAFAR.

AFAR: A Deep Learning Based Tool for Automated Facial Affect Recognition. Automated facial affect recognition is crucial to multiple domains (e.g., health, education, entertainment). Commercial tools are available but costly and of unknown validity. Open- source ones lack user-friendly GUI for use by non- programmers. For both commercial and open-source software, evidence of domain transfer and options for retraining for use in new domains typically are lacking. *AFAR is an open-source, deep-learning based, user-friendly tool for automated facial affect recognition.* It consists of a pipeline having four components: (i) face tracking, ii) face registration, (iii) action unit (AU) detection and (iv) visualization. It was written in the widely available MATLAB programming language and runs on Windows, Linux and OS platforms. It has been used to assess treatment response to deep brain stimulation (DBS), [5], investigate cross-domain generalizability [6], and explore facial affect in social interactions. *http://www.jeffcohn.net/Resources/AFAR*

Infant AFAR: Automated detection of facial action units in infants is challenging. Infant faces have different proportions, less texture, fewer wrinkles and furrows, and unique facial actions relative to adults. For these and related reasons, action unit (AU) detectors that are trained on adult faces may generalize poorly to infant faces. To train and test AU detectors for infant faces, we trained convolutional neural networks (CNN) in adult video databases and fine-tuned these networks in two large, manually annotated, infant video databases that differ in context, head pose,

illumination, video resolution, and infant age. AUs were those central to expression of positive and negative emotion. AU detectors trained in infants greatly outperformed ones trained previously in adults. Training AU detectors across infant databases afforded greater robustness to betweendatabase differences than did training database specific AU detectors and outperformed previous state-of-the-art in infant AU detection. The resulting AU detection system, which we refer to as Infant AFAR (Automated Facial Action Recognition), is available to the research community. https://github.com/AffectAnalysisGroup/AFARtoolbox/tree/master/InfantAFAR

PyAFAR: A Python-based, open-source facial action unit detection library for use with adults and infants. Convolutional neural networks were trained on BP4D+ for adults and Miami and CLOCK databases for infants. In adults, AU occurrence and intensity detection are enabled for 12 action units (AU). The AU chosen were selected on the criterion that they have base rates greater than 5% in BP4D+. Action unit intensity estimation is enabled for 5 of these AU. In infants, AU occurrence is enabled for 9 action units that are involved in expression of positive and negative affect. For both adults and infants, facial landmark and head pose tracking are enabled as well. For adults, multiple persons within a video may be tracked. The library is developed for ease of use. The models are available for fine-tuning and further training. PyAFAR may be easily incorporated into user Python code. https://github.com/AffectAnalysisGroup

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 develop 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 reregistration 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_o 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,* the *New York Times* Science Section, and the *Times of London*. 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*.

TEACHING EXPERIENCE

Abnormal Psychology / Psychopathology (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

Co-Editor, Multimodal Approaches for Automated Assessment, Monitoring, and Treatment of Psychopathology, *Frontiers in Computer Science*.

Editorial Board, *Affective Science*, 2019 to 2022.

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 2020),* Buenos Aires, Argentina.

Co-Chair, ACM ICMI Workshop on Multimodal Interaction (2020), Virtual.

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, *16th 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.emotionresearch.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*

12th http://cennser.org/ICIEV/ and 7th http://cennser.org/IVPR

International Conference on Activity and Behavior Computing (ABC2020). Kitakyushu, Japan.

International Conference on Activity and Behavior Computing (ABC2019). Eastern Washington University, USA.

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, *2nd Workshop and Challenge on 3D Face Alignment in the Wild: Dense Reconstruction from Video* (3DFAW-Video) 2019. International Conference on Computer Vision, Seoul, Korea.

Co-Chair, *ICDM Workshop on Translational Multimedia Data Mining for AI-Based Medical Diagnostics - Bridging Digital Intelligence with Clinical Practices* (TMDM 2019), Beijing, China.

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

Senior Award Committee for ICMI 2024.

Ambient Intelligence for Health Care (AMI4HC). Advisory Committee. Vancouver, CA, 2023.

ACCI (9th International Conference on Affective Computing & Intelligent Interaction), Cambridge, MA, 2023. Senior Program Committee.

ICCV Workshop and Challenge on Real-World Recognition from Low-Quality Images and Videos (RLQ2019), 2019, Seoul, South Korea.

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.

5th 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.

3rd 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^{3}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.

7th 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 2*001), 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

National Institute on Deafness and Other Communication Disorders, 2018

Cognition and Perception Special Emphasis Panel, 2015

Language and Communication Special Emphasis Panels, 2014-2015

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)

NIH Biomedical Computing and Health Informatics, 2020

NIH Technology Assisted Clinical Informatics, 2020

National Institute of Alcohol Abuse and Alcoholism

National Institute of Child Health and Development

National Institute on Deafness and Other Communication Disorders

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, 1998-99

National Science Foundation

Netherlands Organization for Scientific Research NWO

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

ACM Transactions on Multimedia

Affective Science

Artificial Intelligence

Autism

Behavioral and Brain Sciences

Behavior Research Methods

Biomedical Behavior Informatics

Biological Psychiatry

International Journal on Computer Vision

IEEE Transactions on Vision, Image, and Signal Processing

IEEE Signal Processing Magazine

IET Computer Vision

Image

Image and Vision Computing

Infancy

Biological Psychology
Child Development
Cognition and Emotion
Computer Methods and Programs in Biomedicine
Computer Vision and Pattern Recognition
Current Directions in Psychological Science
Development and Psychopathology
Developmental Psychology
Emotion
Emotion and Cognition
Eurographics
Evolution and Human Behavior
Expert Systems with Applications
Florida Artificial Intelligence Research Society
Human-Computer Interaction
IEEE International Conference on Social Computing
IEEE Transactions on Biomedical Engineering
IEEE Transactions on Multimedia
Intelligent Virtual Agents
International Journal on Artificial Intelligence Tools
Infant Behavior and Development Intelligent Virtual Agents
International Journal of Synthetic Emotions
Journal of Affective Disorders
Journal of Cognitive Engineering and Decision Making
Journal of Experimental Psychology: Applied
Journal of Experimental Social Psychology
Journal of Language and Speech
Journal of Multimodal User Interfaces
Journal of Nonverbal Behavior
Journal of Personality and Social Psychology
Journal of Psycholinguistics
Journal of Vision
Nature
Pattern Recognition
Pattern Recognition Letters
PlosOne
Psychological Assessment
Psychological Bulletin
Psychophysiology
Social Development
Society for Research in Child Development
Vison and Signal Processing

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, l982-l983

Clinical Associate, Pediatric Psychology Program, Bay State Medical Center, Springfield, MA, l98l-l982

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

ADMINISTRATIVE EXPERIENCE

Dietrich School Tenure Council, 2019 to 2024.

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

Dietrich School Tenure Appeals Committee, 2012 – to present Dietrich

School Tenure Selection Council, 2013-2014, 2022.

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 for Research in Emotion