

2020 15th IEEE International Conference on Automatic Face and Gesture Recognition (FG 2020)

**Buenos Aires, Argentina
16-20 November 2020**

Pages 1-456



**IEEE Catalog Number: CFP20074-POD
ISBN: 978-1-7281-3080-4**

**Copyright © 2020 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP20074-POD
ISBN (Print-On-Demand):	978-1-7281-3080-4
ISBN (Online):	978-1-7281-3079-8

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

2020 15th IEEE International Conference on Automatic Face and Gesture Recognition (FG 2020) **FG 2020**

Table of Contents

Message from the General and Program Chairs .xxi.....	
Organizing Committee .xxii.....	
Area Chairs .xxiv.....	
Program Committee .xxv.....	
Workshop Committees .xxix.....	
Competition Committees .xxxii.....	
Sponsors .xxxiv.....	

MAIN CONFERENCE

Image Enhancement for Remote Photoplethysmography in a Low-Light Environment .1.....	
<i>Lin Xi (Beihang University), Weihai Chen (Beihang University), Changchen Zhao (Zhejiang University of Technology), Xingming Wu (Beihang University), and Jianhua Wang (Beihang University)</i>	
Toward Fast and Accurate Human Pose Estimation via Soft-Gated Skip Connections .8.....	
<i>Adrian Bulat (Samsung AI Center), Jean Kossaifi (Samsung AI Center), Georgios Tzimiropoulos (Samsung AI Center), and Maja Pantic (Samsung AI Center)</i>	
Head2Head: Video-Based Neural Head Synthesis .16.....	
<i>Mohammad Rami Koujan (University of Exeter), Michail Christos Doukas (Imperial College London), Anastasios Roussos (Institute of Computer Science, Foundation for Research and Technology), and Stefanos Zafeiriou (Imperial College London)</i>	
Real-Time Facial Expression Recognition "In The Wild" by Disentangling 3D Expression from Identity .24.....	
<i>Mohammad Rami Koujan (University of Exeter), Luma Alharbaawe (University of Exeter), Giorgos Giannakakis (Foundation for Research and Technology), Nicolas Pugeault (University of Exeter), and Anastasios Roussos (Foundation for Research and Technology)</i>	
ATFaceGAN: Single Face Image Restoration and Recognition from Atmospheric Turbulence .32.....	
<i>Chun Pong Lau (UMIACS), Hossein Souri (UMIACS), and Rama Chellappa (UMIACS)</i>	

Gesture Agreement Assessment Using Description Vectors .40.....	
<i>Naveen Madapana (Purdue University), Glebys Gonzalez (Purdue University), and Juan Wachs (Purdue University)</i>	
IF-GAN: Generative Adversarial Network for Identity Preserving Facial Image Inpainting and Frontalization .45.....	
<i>Kunjian Li (Sichuan University) and Qijun Zhao (Sichuan University)</i>	
A Recurrent Cycle Consistency Loss for Progressive Face-to-Face Synthesis .53.....	
<i>Enrique Sanchez (Samsung AI Center) and Michel Valstar (University of Nottingham)</i>	
FT-RCNN: Real-Time Visual Face Tracking with Region-Based Convolutional Neural Networks .61.....	
<i>Yiming Lin (Imperial College London), Jie Shen (Imperial College London, Samsung), Shiyang Cheng (Samsung), and Maja Pantic (Imperial College London, Samsung)</i>	
Face Video Generation from a Single Image and Landmarks .69.....	
<i>Kritaphat Songsri-in (Imperial College London) and Stefanos Zafeiriou (Imperial College London, University of Oulu)</i>	
DriverMHG: A Multi-Modal Dataset for Dynamic Recognition of Driver Micro Hand Gestures and a Real-Time Recognition Framework .77.....	
<i>Okan Köpüklü (Technical University of Munich), Thomas Ledwon (LMU Munich), Yao Rong (Technical University of Munich), Neslihan Kose (Intel Deutschland GmbH), and Gerhard Rigoll (Technical University of Munich)</i>	
How are Attributes Expressed in Face DCNNs? .85.....	
<i>Prithviraj Dhar (University of Maryland), Ankan Bansal (University of Maryland), Carlos D. Castillo (University of Maryland), Joshua Gleason (University of Maryland), P. Jonathon Phillips (National Institute of Standards and Technology), and Rama Chellappa (University of Maryland)</i>	
End-to-end Facial and Physiological Model for Affective Computing and Applications .93.....	
<i>Joaquim Comas (Pompeu Fabra University), Decky Aspandi (Pompeu Fabra University), and Xavier Binefa (Pompeu Fabra University)</i>	
Generative Model-Based Loss to the Rescue: A Method to Overcome Annotation Errors for Depth-Based Hand Pose Estimation .101.....	
<i>Jiayi Wang (Max Planck Institute for Informatic), Franziska Mueller (Max Planck Institute for Informatic), Florian Bernard (Max Planck Institute for Informatic), and Christian Theobalt (Max Planck Institute for Informatic)</i>	
Clustering Based Contrastive Learning for Improving Face Representations .109.....	
<i>Vivek Sharma (KIT, MIT), Makarand Tapaswi (INRIA), M. Saquib Sarfraz (KIT, Daimler TSS), and Rainer Stiefelhagen (KIT)</i>	
Face Denoising and 3D Reconstruction from A Single Depth Image .117.....	
<i>Yicheng Zhong (Peking University), Yuru Pei (Peking University), Peixin Li (Peking University), Yuke Guo (Luoyang Institute of Science and Technology), Gengyu Ma (Usens Inc), Meng Liu (Huawei Technologies), Wei Bai (Huawei Technologies), WenHai Wu (Huawei Technologies), and Hongbin Zha (Peking University)</i>	

Gated Variational AutoEncoders: Incorporating Weak Supervision to Encourage Disentanglement .125.....	Matthew J. Vowels (University of Surrey), Necati Cihan Camgoz (University of Surrey), and Richard Bowden (University of Surrey)
Recognizing Gestures from Videos using a Network with Two-Branch Structure and Additional Motion Cues .133.....	Jiaxin Zhou (Saitama University) and Takashi Komuro (Saitama University)
DeepVI: A Novel Framework for Learning Deep View-Invariant Human Action Representations using a Single RGB Camera .138.....	Konstantinos Papadopoulos (University of Luxembourg), Enjie Ghorbel (University of Luxembourg), Oyeade Oyedotun (University of Luxembourg), Djamila Aouada (University of Luxembourg), and Björn Ottersten (University of Luxembourg)
DeeSCo: Deep Heterogeneous Ensemble with Stochastic Combinatory Loss for Gaze Estimation .146	Edouard Yvinec (Datakalab), Arnaud Dapogny (Datakalab), and Kevin Bailly (Datakalab, Sorbonne Université)
MoDuL: Deep Modal and Dual Landmark-Wise Gated Network for Facial Expression Recognition 153	Sacha Bernheim (Sorbonne Université), Estèphe Arnaud (Sorbonne Université), Arnaud Dapogny (datakalab), and Kévin Bailly (Sorbonne Université)
EV-Action: Electromyography-Vision Multi-Modal Action Dataset .160.....	Lichen Wang (Northeastern University), Bin Sun (Northeastern University), Joseph Robinson (Northeastern University), Taotao Jing (Northeastern University), and Yun Fu (Northeastern University)
Hybrid Video and Image Hashing for Robust Face Retrieval .168.....	Ruikui Wang (Chinese Academy of Sciences, University of Chinese Academy of Sciences), Shishi Qiao (Chinese Academy of Sciences, University of Chinese Academy of Sciences), Ruiping Wang (Chinese Academy of Sciences, University of Chinese Academy of Sciences), Shiguang Shan (Chinese Academy of Sciences, University of Chinese Academy of Sciences), and Xilin Chen (Chinese Academy of Sciences, University of Chinese Academy of Sciences)
Robustness Analysis of Face Obscuration .176.....	Hanxiang Hao (Purdue University), David Güera (Purdue University), János Horváth (Purdue University), Amy R. Reibman (Purdue University), and Edward J. Delp (Purdue University)
Block Mobilenet: Align Large-Pose Faces with <1MB Model Size .184.....	Bin Sun (Northeastern University), Jun Li (Northeastern University), and Yun Fu (Northeastern University)
Deep Entwined Learning Head Pose and Face Alignment Inside an Attentional Cascade with Doubly-Conditional Fusion .192.....	Arnaud Dapogny (Datakalab), Kevin Bailly (Datakalab, Sorbonne Université), and Matthieu Cord (Sorbonne Université)

End-to-end Spatial Attention Network with Feature Mimicking for Head Detection .199.....	
<i>Junjie Zhang (National University of Defense Technology), Yuntao Liu (National University of Defense Technology), RongChun Li (National University of Defense Technology), and Yong Dou (National University of Defense Technology)</i>	
Spatio-Temporal Attention and Magnification for Classification of Parkinson's Disease from Videos Collected via the Internet .207.....	
<i>Mohammad Rafayet Ali (University of Rochester), Javier Hernandez (Microsoft Research), E. Ray Dorsey (University of Rochester), Ehsan Hoque (University of Rochester), and Daniel McDuff (Microsoft Research)</i>	
PAS-Net: Pose-Based and Appearance-Based Spatiotemporal Networks Fusion for Action Recognition .215.....	
<i>Changzhen Li (Chinese Academy of Sciences), Jie Zhang (Chinese Academy of Sciences), Shiguang Shan (Chinese Academy of Sciences), and Xilin Chen (Chinese Academy of Sciences)</i>	
Neural Sign Language Translation by Learning Tokenization .222.....	
<i>Alptekin Orbay (Boğaziçi University) and Lale Akarun (Boğaziçi University)</i>	
Set Operation Aided Network for Action Units Detection .229.....	
<i>Huiyuan Yang (Binghamton University-SUNY), Taoyue Wang (Binghamton University-SUNY), and Lijun Yin (Binghamton University-SUNY)</i>	
Recognizing Perceived Emotions from Facial Expressions .236.....	
<i>Saurabh Hinduja (University of South Florida), Shaun Canavan (University of South Florida), and Lijun Yin (Binghamton University)</i>	
Learning Monocular Face Reconstruction using Multi-View Supervision .241.....	
<i>Zhixin Shu (Adobe Research), Duygu Ceylan (Adobe Research), Kalyan Sunkavalli (Adobe Research), Eli Shechtman (Adobe Research), Sunil Hadap (Amazon Lab126), and Dimitris Samaras (Stony Brook University)</i>	
Dual-Attention GAN for Large-Pose Face Frontalization .249.....	
<i>Yu Yin (Northeastern University), Songyao Jiang (Northeastern University), Joseph P. Robinson (Northeastern University), and Yun Fu (Northeastern University)</i>	
Taking Control of Intra-Class Variation in Conditional GANs Under Weak Supervision .257.....	
<i>Richard Marriott (IDEMIA, Ecole Centrale de Lyon), Sami Romdhani (IDEMIA), and Liming Chen (Ecole Centrale de Lyon)</i>	
Synthesising 3D Facial Motion from "In-the-Wild" Speech .265.....	
<i>Panagiotis Tzirakis (Imperial College London), Athanasios Papaioannou (Imperial College London), Alexandros Lattas (Imperial College London), Michail Tarasiou (Imperial College London), Björn Schuller (Imperial College London), and Stefanos Zafeiriou (Imperial College London)</i>	

Pseudo-Convolutional Policy Gradient for Sequence-to-Sequence Lip-Reading .273.....	Mingshuang Luo (Chinese Academy of Sciences, University of Chinese Academy of Sciences), Shuang Yang (Chinese Academy of Sciences, University of Chinese Academy of Sciences), Shiguang Shan (Chinese Academy of Sciences, University of Chinese Academy of Sciences), and Xilin Chen (Chinese Academy of Sciences, University of Chinese Academy of Sciences)
Attention Fusion for Audio-Visual Person Verification Using Multi-Scale Features .281.....	Stefan Hörmann (Technical University of Munich), Abdul Moiz (Technical University of Munich), Martin Knoche (Technical University of Munich), and Gerhard Rigoll (Technical University of Munich)
Semi-Supervised Emotion Recognition using Inconsistently Annotated Data .286.....	S L Happy (Université Côte d’Azur), Antitza Dantcheva (Université Côte d’Azur), and Francois Bremond (Université Côte d’Azur)
Self-Supervised Deformation Modeling for Facial Expression Editing .294.....	ShahRukh Athar (Stony Brook University), Zhixin Shu (Stony Brook University, Adobe Research), and Dimitris Samaras (Stony Brook University)
Landmarks-Assisted Collaborative Deep Framework for Automatic 4D Facial Expression Recognition .302.....	Muzammil Behzad (University of Oulu), Nhat Vo (University of Oulu), Xiaobai Li (University of Oulu), and Guoying Zhao (University of Oulu)
Face Attributes as Cues for Deep Face Recognition Understanding .307.....	Matheus Alves Diniz (Federal University of Minas Gerais) and William Robson Schwartz (Federal University of Minas Gerais)
3D Face Mask Anti-Spoofing via Deep Fusion of Dynamic Texture and Shape Clues .314.....	Song Chen (Beihang University), Weixin Li (Beihang University), Hongyu Yang (Beihang University), Di Huang (Beihang University), and Yunhong Wang (Beihang University)
CLIFER: Continual Learning with Imagination for Facial Expression Recognition .322.....	Nikhil Churamani (University of Cambridge) and Hatice Gunes (University of Cambridge)
Slim-CNN: A Light-Weight CNN for Face Attribute Prediction .329.....	Ankit Kumar Sharma (University of Central Florida) and Hassan Foroosh (University of Central Florida)
An EEG-Based Multi-Modal Emotion Database with Both Posed and Authentic Facial Actions for Emotion Analysis .336.....	Xiaotian Li (Binghamton University), Xiang Zhang (Binghamton University), Huiyuan Yang (Binghamton University), Wenna Duan (Binghamton University), Weiying Dai (Binghamton University), and Lijun Yin (Binghamton University)
Multimodal Deep Learning Framework for Mental Disorder Recognition .344.....	Ziheng Zhang (University of Cambridge), Weizhe Lin (University of Cambridge), Mingyu Liu (University of Oxford), and Marwa Mahmoud (University of Cambridge)

Modelling the Statistics of Cyclic Activities by Trajectory Analysis on the Manifold of Positive-Semi-Definite Matrices .351.....	
<i>Ettore Maria Celozzi (University of Florence), Luca Ciabini (University of Florence), Luca Cultrera (University of Florence), Pietro Pala (University of Florence), Stefano Berretti (University of Florence), Mohamed Daoudi (IMT Lille Douai, University of Lille), and Alberto Del Bimbo (University of Florence)</i>	
Can We Read Speech Beyond the Lips? Rethinking RoI Selection for Deep Visual Speech Recognition .356.....	
<i>Yuanhang Zhang (Chinese Academy of Sciences, University of Chinese Academy of Sciences), Shuang Yang (Chinese Academy of Sciences), Jingyun Xiao (Chinese Academy of Sciences, University of Chinese Academy of Sciences), Shiguang Shan (Chinese Academy of Sciences, University of Chinese Academy of Sciences), and Xilin Chen (Chinese Academy of Sciences, University of Chinese Academy of Sciences)</i>	
Deformation Flow Based Two-Stream Network for Lip Reading .364.....	
<i>Jingyun Xiao (Chinese Academy of Sciences, University of Chinese Academy of Sciences), Shuang Yang (Chinese Academy of Sciences), Yuanhang Zhang (Chinese Academy of Sciences, University of Chinese Academy of Sciences), Shiguang Shan (Chinese Academy of Sciences, University of Chinese Academy of Sciences), and Xilin Chen (Chinese Academy of Sciences, University of Chinese Academy of Sciences)</i>	
Automatic Detection of Self-Adaptors for Psychological Distress .371.....	
<i>Weizhe Lin (University of Cambridge), Indigo Orton (University of Cambridge), Mingyu Liu (University of Oxford), and Marwa Mahmoud (University of Cambridge)</i>	
Temporal Triplet Mining for Personality Recognition .379.....	
<i>Dario Dotti (Maastricht University), Esam Ghaleb (Maastricht University), and Stylianos Asteriadis (Maastricht University)</i>	
Towards Automatic Monitoring of Disease Progression in Sheep: A Hierarchical Model for Sheep Facial Expressions Analysis from Video .387.....	
<i>Francisca Pessanha (University of Porto), Krista McLennan (University of Chester), and Marwa Mahmoud (Cambridge University)</i>	
Hand Tracking from Monocular RGB with Dense Semantic Labels .394.....	
<i>Peter Thompson (University of Manchester) and Aphrodite Galata (University of Manchester)</i>	
3D Landmark Localization in Point Clouds for the Human Ear .402.....	
<i>Eimear O' Sullivan (Imperial College London) and Stefanos Zafeiriou (Imperial College London, Facesoft)</i>	
Metric-Scale Truncation-Robust Heatmaps for 3D Human Pose Estimation .407.....	
<i>István Sárándi (RWTH Aachen University), Timm Linder (Robert Bosch GmbH), Kai O. Arras (Robert Bosch GmbH), and Bastian Leibe (RWTH Aachen University)</i>	

First Investigation Into the Use of Deep Learning for Continuous Assessment of Neonatal Postoperative Pain .415.....	
<i>Md Sirajus Salekin (University of South Florida), Ghada Zamzmi (University of South Florida), Dmitry Goldgof (University of South Florida), Rangachar Kasturi (University of South Florida), Thao Ho (University of South Florida), and Yu Sun (University of South Florida)</i>	
Mutual Information Maximization for Effective Lip Reading .420.....	
<i>Xing Zhao (Zhejiang University of Technology), Shuang Yang (Chinese Academy of Sciences), Shiguang Shan (Chinese Academy of Sciences, University of Chinese Academy of Sciences), and Xilin Chen (Chinese Academy of Sciences, University of Chinese Academy of Sciences)</i>	
Leveraging Shared and Divergent Facial Expression Behavior Between Genders in Deception Detection .428.....	
<i>Gazi Naven (University of Rochester), Taylan Sen (University of Rochester), Luke Gerstner (University of Rochester), Kurtis Haut (University of Rochester), Melissa Wen (University of Rochester), and Ehsan Hoque (University of Rochester)</i>	
Dynamic Versus Static Facial Expressions in the Presence of Speech .436.....	
<i>Ali N. Salman (The University of Dallas at Texas) and Carlos Busso (The University of Dallas at Texas)</i>	
Generative Video Face Reenactment by AUs and Gaze Regularization .444.....	
<i>Josep Farnadas (Universitat de Barcelona), Meysam Madadi (Universitat Autònoma de Barcelona), Cristina Palmero (Universitat de Barcelona, Universitat Autònoma de Barcelona), and Sergio Escalera (Universitat de Barcelona, Universitat Autònoma de Barcelona)</i>	
Simple and Effective Approaches for Uncertainty Prediction in Facial Action Unit Intensity Regression .452.....	
<i>Torsten Wörtwein (Carnegie Mellon University) and Louis-Philippe Morency (Carnegie Mellon University)</i>	

MAIN CONFERENCE - SPECIAL SESSIONS

Beyond MAGIC: Matching Collaborative Gestures using an Optimization-Based Approach .457.....	
<i>Edgar Rojas-Muñoz (Purdue University) and Juan P. Wachs (Purdue University)</i>	
Learning Guided Attention Masks for Facial Action Unit Recognition .465.....	
<i>Nagashri Lakshminarayana (University at Buffalo), Srirangaraj Setlur (University at Buffalo), and Venu Govindaraju (University at Buffalo)</i>	
Deep Weakly Supervised Domain Adaptation for Pain Localization in Videos .473.....	
<i>Gnana Praveen R (Ecole Technologie Supérieure), Eric Granger (Ecole Technologie Supérieure), and Patrick Cardinal (Ecole Technologie Supérieure)</i>	
A General Remote Photoplethysmography Estimator with Spatiotemporal Convolutional Network	
481	
<i>Si-Qi Liu (Hong Kong Baptist University) and Pong C. Yuen (Hong Kong Baptist University)</i>	

Apathy Classification by Exploiting Task Relatedness .489.....	489
<i>S L Happy (INRIA Sophia Antipolis), Antitza Dantcheva (INRIA Sophia Antipolis), Abhijit Das (INRIA Sophia Antipolis), Francois Bremond (INRIA Sophia Antipolis), Radia Zeghari (University Cote d'Azur), and Philippe Robert (CoBTeK, Memory center CHU)</i>	
Learning Privacy-Enhancing Face Representations through Feature Disentanglement .495.....	495
<i>Blaž Bortolato (University of Ljubljana), Marija Ivanovska (University of Ljubljana), Peter Rot (University of Ljubljana), Janez Križaj (University of Ljubljana), Philipp Terhörst (Fraunhofer Institute for Computer Graphics Research IGD), Naser Damer (Fraunhofer Institute for Computer Graphics Research IGD), Peter Peer (University of Ljubljana), and Vitomir Štruc (University of Ljubljana)</i>	
Using a Skeleton Gait Energy Image for Pathological Gait Classification .503.....	503
<i>João Loureiro (Instituto de Telecomunicacoes, Instituto Superior Tecnico) and Paulo Lobato Correia (Instituto de Telecomunicacoes, Instituto Superior Tecnico)</i>	
Kinematic Tracking of Rehabilitation Patients With Markerless Pose Estimation Fused with Wearable Inertial Sensors .508.....	508
<i>R. James Cotton (Shirley Ryan AbilityLab, Northwestern University)</i>	
A Video is Worth More than 1000 Lies. Comparing 3DCNN Approaches for Detecting Deepfakes .515	515
<i>Yaohui Wang (Inria, Universite C'ote d'Azur) and Antitza Dantcheva (Inria, Universite C'ote d'Azur)</i>	
Towards a Visual Sign Language Dataset for Home Care Services .520.....	520
<i>D. Kosmopoulos (University of Patras), I. Oikonomidis (Foundation for Research and Technology), C. Constantinopoulos (University of Patras), N. Arvanitis (University of Patras), K. Antzakas (University of Patras), A. Bifis (University of Patras), G. Lydakis (Foundation for Research and Technology), A. Roussos (Foundation for Research and Technology), and A. Argyros (Foundation for Research and Technology)</i>	
Visual Saliency Detection Guided by Neural Signals .525.....	525
<i>Simone Palazzo (University of Catania), Francesco Rundo (STMicroelectronics, ADG—Central R&D), Sebastiano Battiato (University of Catania), Daniela Giordano (University of Catania), and Concetto Spampinato (University of Catania)</i>	
Image-Based Pose Representation for Action Recognition and Hand Gesture Recognition .532.....	532
<i>Zeyi Lin (Chinese Academy of Sciences, University of Chinese Academy of Sciences), Wei Zhang (Chinese Academy of Sciences, University of Chinese Academy of Sciences), Xiaoming Deng (Chinese Academy of Sciences), Cuixia Ma (Chinese Academy of Sciences, University of Chinese Academy of Sciences), and Hongan Wang (Chinese Academy of Sciences, University of Chinese Academy of Sciences)</i>	
Estimation of Orofacial Kinematics in Parkinson's Disease: Comparison of 2D and 3D Markerless Systems for Motion Tracking .540.....	540
<i>Diego L. Guarin (Toronto Rehabilitation Institute), Aidan Dempster (Toronto Rehabilitation Institute), Andrea Bandini (Toronto Rehabilitation Institute), Yana Yunusova (University of Toronto), and Babak Taati (Toronto Rehabilitation Institute)</i>	

- Emotion or Expressivity? An Automated Analysis of Nonverbal Perception in a Social Dilemma .544
Su Lei (University of Southern California), Kalin Stefanov (University of Southern California), and Jonathan Gratch (University of Southern California)
- Video2Report: A Video Database for Automatic Reporting of Medical Consultancy Sessions .552...
Laura Schiphorst (Utrecht University), Metehan Doyran (Utrecht University), Sabine Molenaar (Utrecht University), Albert Ali Salah (Utrecht University), and Sjaak Brinkkemper (Utrecht University)

WORKSHOPS

1st Workshop on Applied Multimodal Affect Recognition (AMAR)

- Nonverbal Behavioral Patterns Predict Social Rejection Elicited Aggression .557.....
Megan Quarmley (Temple University), Zhibo Yang (Stony Brook University), Shahrukh Athar (Stony Brook University), Gregory Zelinsky (Stony Brook University), Dimitris Samaras (Stony Brook University), and Johanna Jarcho (Temple University)
- Mood Versus Identity: Studying the Influence of Affective States on Mobile Biometrics .562.....
Tempestt Neal (University of Florida) and Shaun Canavan (University of South Florida)
- A Computational View of the Emotional Regulation of Disgust using Multimodal Sensors .567.....
Vidhathi Kota (Rochester Institute of Technology), Geeta Madhav Gali (Rochester Institute of Technology), and Ifeoma Nwogu (Rochester Institute of Technology)
- iSAM: Personalizing an Artificial Intelligence Model for Emotion with Pleasure-Arousal-Dominance in Immersive Virtual Reality .572.....
Aviv Elor (University of California, Santa Cruz) and Asiiyah Song (University of California, Santa Cruz)
- Multimodal Fusion of Physiological Signals and Facial Action Units for Pain Recognition .577.....
Saurabh Hinduja (University of South Florida), Shaun Canavan (University of South Florida), and Gurmeet Kaur (University of South Florida)
- Learning a Privacy-Preserving Global Feature Set for Mood Classification Using Smartphone Activity and Sensor Data .582.....
Sayde King (University of South Florida), Mohamed Ebraheem (University of South Florida), Khadija Zanna (University of South Florida), and Tempestt Neal (University of South Florida)
- Summarizing Driving Behavior to Support Driver Stress Analysis .587.....
André Roberto Ortoncelli (Universidade Tecnológica Federal do Paraná), Luciano Silva (Universidade Federal do Paraná), Olga Regina Perreira Bellon (Universidade Federal do Paraná), Tiago Mota de Oliveira (Universidade Federal do Paraná), and Juliana Daga (Autoescola Milênio)

Affect Recognition in-the-wild: Uni/Multi-Modal Analysis & VA-AU-Expression Challenges

Multitask Emotion Recognition with Incomplete Labels .592.....	Didan Deng (Hong Kong University of Science and Technology), Zhaokang Chen (Hong Kong University of Science and Technology), and Bertram E. Shi (Hong Kong University of Science and Technology)
Two-Stream Aural-Visual Affect Analysis in the Wild .600.....	Felix Kuhnke (Leibniz University Hannover), Lars Rumberg (Leibniz University Hannover), and Jörn Ostermann (Leibniz University Hannover)
Latent-Based Adversarial Neural Networks for Facial Affect Estimations .606.....	Decky Aspandi (Pompeu Fabra University), Adria Mallol-Ragolta (University of Augsburg), Björn Schuller (University of Augsburg, Imperial College London), and Xavier Binefa (Pompeu Fabra University)
Multi-Modal Sequence-to-Sequence Model for Continuous Affect Prediction in the Wild Using Deep 3D Features .611.....	Sowmya Rasipuram (Accenture Technology Labs), Junaid Hamid Bhat (Accenture Technology Labs), and Anutosh Maitra (Accenture Technology Labs)
Facial Expression Recognition for In-the-Wild Videos .615.....	Hanyu Liu (Chinese Academy of Sciences, Beijing University of Posts and Telecommunications), Jiabei Zeng (Chinese Academy of Sciences), and Shiguang Shan (Chinese Academy of Sciences, University of Chinese Academy of Sciences)
Unique Class Group Based Multi-Label Balancing Optimizer for Action Unit Detection .619.....	Ines Rieger (Fraunhofer Institute for Integrated Circuits IIS), Jaspar Pahl (Fraunhofer Institute for Integrated Circuits IIS), and Dominik Seuss (Fraunhofer Institute for Integrated Circuits IIS)
Affective Expression Analysis in-the-Wild using Multi-Task Temporal Statistical Deep Learning Model .624.....	Nhu-Tai Do (Chonnam National University), Tram-Tran Nguyen-Quynh (Chonnam National University), and Soo-Hyung Kim (Chonnam National University)
Multi-Modal Expression Recognition in the Wild Using Sequence Modeling .629.....	Sowmya Rasipuram (Accenture Technology Labs), Junaid Hamd Bhat (Accenture Technology Labs), and Anutosh Maitra (Accenture Technology Labs)
M3F: Multi-Modal Continuous Valence-Arousal Estimation in the Wild .632.....	Yuan-Hang Zhang (University of Chinese Academy of Sciences), Rulin Huang (University of Chinese Academy of Sciences), Jiabei Zeng (Chinese Academy on Sciences), and Shiguang Shan (Chinese Academy on Sciences, University of Chinese Academy of Sciences)
Analysing Affective Behavior in the First ABAW 2020 Competition .637.....	Dimitrios Kollias (Imperial College London), Attila Schult (Realeyes), Elnar Hajiye (Realeyes), and Stefanos Zafeiriou (Imperial College London)

How are You Feeling? Multimodal Emotion Learning for Socially-Assistive Robot Navigation .644	
<i>Aniket Bera (University of Maryland at College Park), Tanmay Randhavane (University of North Carolina at Chapel Hill), Rohan Prinja (University of North Carolina at Chapel Hill), Kyra Kapsaskis (University of North Carolina at Chapel Hill), Austin Wang (University of North Carolina at Chapel Hill), Kurt Gray (University of North Carolina at Chapel Hill), and Dinesh Manocha (University of Maryland at College Park)</i>	
The FaceChannel: A Light-Weight Deep Neural Network for Facial Expression Recognition. .652...	
<i>Pablo Barros (Italian Institute of Technology), Nikhil Churamani (University of Cambridge), and Alessandra Sciutti (Italian Institute of Technology)</i>	
A Weightless Regression System for Predicting Multi-Modal Empathy .657.....	
<i>Leopoldo A. D. Lusquino Filho (Universidade Federal do Rio de Janeiro), Luiz F. R. Oliveira (Universidade Federal do Rio de Janeiro), Hugo C. C. Carneiro (Universidade Federal do Rio de Janeiro), Gabriel P. Guarisa (Universidade Federal do Rio de Janeiro), Aluizio Lima Filho (Universidade Federal do Rio de Janeiro), Felipe M. G. França (Universidade Federal do Rio de Janeiro), and Priscila M. V. Lima (Universidade Federal do Rio de Janeiro)</i>	

Faces and Gestures in E-health and Welfare (FaGEW)

Vision-Based Individual Factors Acquisition for Thermal Comfort Assessment in a Built Environment .662.....	
<i>Jinsoong Liu (Aalborg University), Isak Worre Foged (Aalborg University), and Thomas B. Moeslund (Aalborg University)</i>	
Impairments in Decoding Facial and Vocal Emotional Expressions in High Functioning Autistic Adults and Adolescents .667.....	
<i>Anna Esposito (Università della Campania "L. Vanvitelli"), Italia Cirillo (Università della Campania "L. Vanvitelli"), Antonietta M. Esposito (INGV, Sez. di Napoli Osservatorio Vesuviano), Leopoldina Fortunati (University of Udine), Gian Luca Foresti (Università di Udine), Sergio Escalera (CVC and University of Barcelona), and Nikolaos Bourbakis (Wright State University)</i>	
Introduction and Analysis of an Event-Based Sign Language Dataset .675.....	
<i>Ajay Vasudevan (Instituto de Microelectronica de Sevilla, CSIC and Universidad de Sevilla), Pablo Negri (University of Buenos Aires), Bernabe Linares-Barranco (Instituto de Microelectronica de Sevilla, CSIC and Universidad de Sevilla), and Teresa Serrano-Gotarredona (Instituto de Microelectronica de Sevilla, CSIC and Universidad de Sevilla)</i>	
Feature Selection for Zero-Shot Gesture Recognition .683.....	
<i>Naveen Madapana (Purdue University) and Juan Wachs (Purdue University)</i>	
SILFA: Sign Language Facial Action Database for the Development of Assistive Technologies for the Deaf .688.....	
<i>Emely Pujólli da Silva (University of Campinas), Paula Dornhofer Paro Costa (University of Campinas), Kate Mamhy Oliveira Kumada (Federal University of ABC), and José Mario De Martino (University of Campinas)</i>	

Explainable Early Stopping for Action Unit Recognition .693.....	
<i>Ciprian Corneanu (University of Barcelona), Meysam Madadi (University of Barcelona), Sergio Escalera (University of Barcelona), and Aleix Martinez (Ohio State University)</i>	
FineHand: Learning Hand Shapes for American Sign Language Recognition .700.....	
<i>Al Amin Hosain (George Mason University), Panneer Selvam Santhalingam (George Mason University), Parth Pathak (George Mason University), Huzefa Rangwala (George Mason University), and Jana Košecká (George Mason University)</i>	
Spectral Correspondence Framework for Building a 3D Baby Face Model .708.....	
<i>Araceli Morales (Pompeu Fabra University), Antonio R. Porras (Sheikh Zayed Institute for Pediatric Surgical Innovation), Liyun Tu (Sheikh Zayed Institute for Pediatric Surgical Innovation), Marius George Linguraru (Sheikh Zayed Institute for Pediatric Surgical Innovation), Gemma Piella (Pompeu Fabra University), and Federico M. Sukno (Pompeu Fabra University)</i>	
Seniors' Ability to Decode Differently Aged Facial Emotional Expressions .716.....	
<i>Anna Esposito (Università della Campania "L. Vanvitelli"), Terry Amorese (Università della Campania "L. Vanvitelli"), Nelson Mauro Maldonado (Università di Napoli Federico II), Alessandro Vinciarelli (University of Glasgow), Maria Ines Torres (University of the Basque Country), Sergio Escalera (University of Barcelona), and Gennaro Cordasco (Università della Campania "L. Vanvitelli")</i>	
The MAGIC of E-Health: A Gesture-Based Approach to Estimate Understanding and Performance in Remote Ultrasound Tasks .723.....	
<i>Edgar Rojas-Muñoz (Purdue University) and Juan P. Wachs (Purdue University)</i>	
Automatic Stress Detection Evaluating Models of Facial Action Units .728.....	
<i>Giorgos Giannakakis (Foundation for Research and Technology Hellas), Mohammad Rami Koujan (University of Exeter), Anastasios Roussos (Foundation for Research and Technology Hellas), and Kostas Marias (Foundation for Research and Technology Hellas, Hellenic Mediterranean University)</i>	

The Third Facial Micro-Expressions Grand Challenge (MEGC): New Learning Methods for Spotting and Recognition

Spatio-Temporal Fusion for Macro-and Micro-Expression Spotting in Long Video Sequences .734..	
<i>Li-Wei Zhang (Chinese Academy of Sciences), Jingting Li (Chinese Academy of Sciences), Su-Jing Wang (Chinese Academy of Sciences), Xian-Hua Duan (Jiangsu University of Science and Technology), Wen-Jing Yan (Wenzhou University), Hai-Yong Xie (University of Science and Technology of China), and Shu-Cheng Huang (Jiangsu University of Science and Technology)</i>	
Spotting Macro-and Micro-Expression Intervals in Long Video Sequences .742.....	
<i>Ying He (Chinese Academy of Sciences), Su-Jing Wang (Chinese Academy of Sciences), Jingting Li (Chinese Academy of Sciences), and Moi Hoon Yap (Manchester Metropolitan University)</i>	

Local Bilinear Convolutional Neural Network for Spotting Macro-and Micro-Expression Intervals in Long Video Sequences .749.....	
<i>Hang Pan (University of Science and Technology Beijing), Lun Xie (University of Science and Technology Beijing), and Zhiliang Wang (University of Science and Technology Beijing)</i>	
Typical and Reverse Other-Race Effect on Tibetan Students' Emotional Face Recognition .754.....	
<i>Zhanling Cui (Hebei Normal University), Yingjun Zhao (Hebei Normal University), Jin Guo (Hebei Normal University), Huibo Du (Hebei Normal University), and Jijia Zhang (Renmin University of China)</i>	
The Ability to Recognize Microexpression and Detect Deception in the Elderly .761.....	
<i>Liping He (Jiangxi University of Traditional Chinese Medicine), Xunbing Shen (Jiangxi University of Traditional Chinese Medicine), Zhencai Chen (Jiangxi University of Traditional Chinese Medicine), Keding Li (Jiangxi University of Traditional Chinese Medicine), Zhenan Liu (Jiangxi University of Traditional Chinese Medicine), and Ruirui Zhuo (Jiangxi University of Traditional Chinese Medicine)</i>	
Adaptive Mask for Region-Based Facial Micro-Expression Recognition .765.....	
<i>Walied Merghani (Sudan University of Science and Technology) and Moi Hoon Yap (Manchester Metropolitan University)</i>	
SAMM Long Videos: A Spontaneous Facial Micro-and Macro-Expressions Dataset .771.....	
<i>Chuin Hong Yap (Manchester Metropolitan University), Connah Kendrick (Manchester Metropolitan University), and Moi Hoon Yap (Manchester Metropolitan University)</i>	
MEGC2020 - The Third Facial Micro-Expression Grand Challenge .777.....	
<i>Jingting Li (Chinese Academy of Sciences), Su-Jing Wang (Chinese Academy of Sciences), Moi Hoon Yap (Manchester Metropolitan University), John See (Multimedia University), Xiaopeng Hong (Xi'an Jiaotong University), and Xiaobai Li (University of Oulu)</i>	

International Workshop on Automated Assessment for Pain

Using Deep 3D Features and an LSTM Based Sequence Model for Automatic Pain Detection in the Wild .781.....	
<i>Sowmya Rasipuram (Accenture Technology Labs), Bukka Nikhil Sai (International Institute of Information Technology), Dinesh Babu Jayagopi (International Institute of Information Technology), and Anutosh Maitra (Accenture Technology Labs)</i>	
Exploring Multidimensional Measurements for Pain Evaluation using Facial Action Units .786.....	
<i>Xiaojing Xu (UC San Diego) and Virginia R. de Sa (UC San Diego)</i>	
Automatic Pain Detection on Horse and Donkey Faces .793.....	
<i>Hilde I. Hummel (Utrecht University), Francisca Pessanha (Porto University), Albert Ali Salah (Utrecht University), Thijs J. P.A.M. van Loon (Utrecht University), and Remco C. Veltkamp (Utrecht University)</i>	

COMPETITIONS

2020 ChaLearn LAP Workshop FG: Identity-preserving human detection (IPHD)

ChaLearn LAP 2020 Challenge on Identity-Preserved Human Detection: Dataset and Results .801...

Albert Clapés (Universitat Autònoma de Barcelona, Universitat de Barcelona), Julio C.S. Jacques Junior (Universitat Autònoma de Barcelona, Universitat Oberta de Catalunya), Carla Morral (Universitat de Barcelona), and Sergio Escalera (Universitat Autònoma de Barcelona, Universitat de Barcelona)

Noise Robust Hard Example Mining for Human Detection with Efficient Depth-Thermal Fusion .809

Zijian Zhao (Chinese Academy of Sciences), Jie Zhang (Chinese Academy of Sciences), and Shiguang Shan (Chinese Academy of Sciences)

EmoPain Face and Movement Behaviour Challenge

Multimodality Pain and Related Behaviors Recognition Based on Attention Learning .814.....

Van Thong Huynh (Chonnam National University), Hyung-Jeong Yang (Chonnam National University), Guee-Sang Lee (Chonnam National University), and Soo-Hyung Kim (Chonnam National University)

LSTM-DNN Based Approach for Pain Intensity and Protective Behaviour Prediction .819.....

Yi Li (Monash University), Shreya Ghosh (Monash University), Jyoti Joshi (Monash University), and Sharon Oviatt (Monash University)

ALANet:Autoencoder-LSTM for Pain and Protective Behaviour Detection .824.....

Xinhui Yuan (ChangChun University of Science and Technology) and Marwa Mahmoud (University of Cambridge)

A Curriculum Learning Approach for Pain Intensity Recognition from Facial Expressions .829.....

Adria Mallol-Ragolta (University of Augsburg), Shuo Liu (University of Augsburg), Nicholas Cummins (University of Augsburg), and Björn Schuller (University of Augsburg, Imperial College London)

Automatic Recognition of Low-Back Chronic Pain Level and Protective Movement Behaviour using Physical and Muscle Activity Information .834.....

Fasih Haider (University of Edinburgh), Pierre Albert (University of Edinburgh), and Saturnino Luz (University of Edinburgh)

Three-Level Training of Multi-Head Architecture for Pain Detection .839.....

Saandeep Aathreya Sidhapur Lakshminarayan (University of South Florida), Saurabh Hinduja (University of South Florida), and Shaun Canavan (University of South Florida)

Multimodal Multilevel Fusion for Sequential Protective Behavior Detection and Pain Estimation .844.....

Md Taufeeq Uddin (University of South Florida) and Shaun Canavan (University of South Florida)

EMOPAIN Challenge 2020: Multimodal Pain Evaluation from Facial and Bodily Expressions .849..

Joy O. Egede (University of Nottingham), Siyang Song (University of Nottingham), Temitayo A. Olugbade (University College London), Chongyang Wang (University College London), Amanda C. De C. Williams (University College London), Hongying Meng (University College London), Min Aung (University of East Anglia), Nicholas D. Lane (University of Oxford), Michel Valstar (University of Nottingham), and Nadia Bianchi-Berthouze (University College London)

4th Recognizing Families In the Wild (RFIW)

Recognizing Families In the Wild (RFIW): The 4th Edition .857.....

Joseph P. Robinson (Northeastern University), Yu Yin (Northeastern University), Zaid Khan (Northeastern University), Ming Shao (University of Massachusetts Dartmouth), Siyu Xia (Southeast University), Michael Stopa (Konica Minolta), Samson Timoner (ISM Connect), Matthew A. Turk (Toyota Technological Institute at Chicago), Rama Chellappa (University of Maryland), and Yun Fu (Northeastern University)

A Multi-Task Comparator Framework for Kinship Verification .863.....

Stefan Hörmann (Technical University of Munich), Martin Knoche (Technical University of Munich), and Gerhard Rigoll (Technical University of Munich)

Challenge Report: Recognizing Families In the Wild Data Challenge .868.....

Zhipeng Luo (DeepBlueAI), Zhiguang Zhang (DeepBlueAI), Zhenyu Xu (DeepBlueAI), and Lixuan Che (DeepBlueAI)

Achieving Better Kinship Recognition Through Better Baseline .872.....

Andrei Shadrikov (Independent Researcher)

Multi-View Deep Features for Robust Facial Kinship Verification .877.....

Oualid Laiadi (University of Biskra, University Polytechnique Hauts-de-France), Abdelmalik Ouamane (University of Biskra), Abdelhamid Benakcha (University of Biskra), Abdelmalik Taleb-ahmed (University Polytechnique Hauts-de-France), and Abdenour Hadid (University of Oulu)

Retrieval of Family Members Using Siamese Neural Network .882.....

Jun Yu (University of Science and Technology of China), Guochen Xie (University of Science and Technology of China), Mengyan Li (University of Science and Technology of China), and Xinling Hao (University of Science and Technology of China)

Recognizing Families through Images with Pretrained Encoder .887.....

Tuan-Duy H. Nguyen (Vietnam National University, Ho Chi Minh City), Huu-Nghia H. Nguyen (Vietnam National University, Ho Chi Minh City), and Hieu Dao (Vietnam National University, Ho Chi Minh City)

Deep Fusion Siamese Network for Automatic Kinship Verification .892.....

Jun Yu (University of Science and Technology of China), Mengyan Li (University of Science and Technology of China), Xinlong Hao (University of Science and Technology of China), and Guochen Xie (University of Science and Technology of China)

Joint Challenge on Compound Emotion Recognition and Multimodal (Audio, Facial and Gesture) based Emotion Recognition (CER\&MMER)

Two-Stage Recognition and Beyond for Compound Facial Emotion Recognition	900
<i>Zhiyuan Zhang (Pingan Life Insurance of China), Miao Yi (Pingan Life Insurance of China), Juan Xu (Pingan Life Insurance of China), Rong Zhang (Pingan Life Insurance of China), and JianPing Shen (Pingan Life Insurance of China)</i>	
Challenge Report: Compound Emotion Challenge	905
<i>Zhipeng Luo (DeepBlueAI) and Zhiguang Zhang (DeepBlueAI)</i>	
Multimodal (Audio, Facial and Gesture) Based Emotion Recognition Challenge	908
<i>Gou Wei (DD_VISION), Li Jian (DD_VISION), and Sun Mo (DD_VISION)</i>	
Two Stage Emotion Recognition using Frame-Level and Video-Level Features	912
<i>Carla Viegas (Carnegie Mellon University)</i>	

DEMOS

Real-time Action Unit Intensity Detection	916
<i>Saurabh Hinduja (University of South Florida) and Shaun Canavan (University of South Florida)</i>	
Sign Language Recognition in Virtual Reality	917
<i>Jacob Schioppo (University of South Florida), Zachary Meyer (University of South Florida), Diego Fabiano (University of South Florida), and Shaun Canavan (University of South Florida)</i>	
ReenactNet: Real-Time Full Head Reenactment	918
<i>Mohammad Rami Koujan (University of Exeter), Michail Christos Doukas (Imperial College London), Anastasios Roussos (Institute of Computer Science, Foundation for Research and Technology), and Stefanos Zafeiriou (Imperial College London)</i>	
Understanding Consumer Attention on Mobile Devices	919
<i>Natalia Efremova (University of Oxford), Navid Hajimirza (Lumen Research), David Bassett (Lumen Research), and Felipe Thomaz (University of Oxford)</i>	

Author Index