

16th IEEE International Conference on

Automatic Face and Gesture Recognition 2021

Program Booklet

FG-2021

December 15-18, 2021

JODHPUR, INDIA



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Welcome Message

Message from the General Chairs and Program Chairs

Welcome all to FG2021!

We are now celebrating the 16th IEEE International Conference on Automatic Face and Gesture Recognition (FG2021) and we are delighted to welcome you all to this annual event. As most of you know, FG is the premier international conference on vision-based automatic face and body behavior analysis and applications. Since our first meeting in Zurich in 1994, the FG conference has grown from a biennial conference to an annual meeting, effective 2017 and has been hosted in countries across the world including in Europe, the Americas, and Asia. Originally, FG2021 was planned to be an in-person meeting hosted in the historic city of Jodhpur, India. However, due to the COVID-19 pandemic situation, the organizing committee decided to hold FG2021 as an online conference from December 15 to 18, 2021.

We are very excited to share that FG2021 has five keynote talks. Pawan Sinha from MIT will talk on “Butterfly Effects” in Perceptual Development. Yves-Alexandre de Montjoye from Imperial College London will be presenting the research on Using Data while Protecting Privacy in the Digital Era. Shalini De Mello from NVIDIA will present Human-centric Vision in the Real World: Challenges and Opportunities and Gang Hua from Wormpex AI Research will talk on Customer Behavior (Demand) Prediction in Brick-and-Mortar Stores from Product Recognition. Pramod Verma from UIDAI and EkSetp Foundation will share his experience on Building for a Billion: Learning from India's Population Scale Digital Infrastructure Journey. In addition, NVIDIA is organizing a techno-devops session titled Developing Large Scale Intelligent Video Analytics Solutions using NVIDIA Stack. We are also organizing an “Ask me anything” session - a Q&A session where participants can ask questions on professional career, views on the field, or FG and the General Chairs will respond to those questions.

This year, in two rounds of paper submissions, we received a record number of submissions and with about 35% acceptance rate, accepted 142 papers including special session and competition papers to be presented in 10 oral and 4 poster sessions. Thank you for choosing FG as an outlet for your work. To perform a rigorous double-blind review of all submissions, the Program Chairs invited a technical committee of over 200 reviewers and 18 Area Chairs. We thank them all for their time and efforts in evaluating the submissions and upholding the high standards of research quality that FG is widely known for. Papers in the main track underwent a 2-stage review process: a review phase and an author-rebuttal phase. In the review phase, all submissions were reviewed by at least three experts who commented on the strengths, weaknesses, novelty, and impact of the work. In the author-rebuttal phase, authors had the opportunity to respond to the reviewers' comments and concerns. Throughout, the Area Chairs and reviewers could initiate discussions via the submission system. Next, Area Chairs prepared meta-reviews and their recommendation for each submission. Finally, Program Chairs rendered a final decision on each submission based on the reviewers' comments, the Area Chair recommendations and meta-reviews, and the authors' responses (and occasionally

Welcome Message

reading the entire submission). In addition, the papers authored by General Chairs and PC Chairs were reviewed outside CMT as a separate and independent reviewing process. Accepted papers cover a wide range of topics, from the latest advances in automated face and gesture analysis to state-of-the-art advances in applied technologies. A special issue on “Best of Face & Gesture 2021” in the IEEE Transactions on Biometrics, Behavior, and Identity Science (T-BIOM) will follow the conference. Finally, Workshop on Face and Gesture Analysis for COVID-19 (FG4COVID19) is also organized as part of FG2021 where two keynote speakers and peer reviewed papers focus on the most recent and advanced work related to face and gesture analysis in the scope of COVID-19.

A large event such as FG cannot take place without the contributions of many people. We would like to express our sincere thanks to the Area Chairs and the Technical Program Committee members who gave their time and expertise generously to create this excellent program. We are grateful to the members of the organization team who worked diligently and effectively to solicit an outstanding collection of workshop, challenges, special sessions, doctoral consortium, industry connect, and to publicize the conference, handle the publications, finances and registration, and deal with the many details involved in putting together a first-rate conference. Many thanks to our generous host institution, IIT Jodhpur and iHub Drishti. We would also like to express our thanks to the FG steering committee for their advice and guidance. We would like to warmly acknowledge all our sponsors, Google, NVIDIA, CCS Computers, and Mukh Technologies, in supporting us in these testing times. Special acknowledgment to IEEE Computer Society and IEEE Biometrics Council for supporting the conference both technically and financially. We would like to thank Kanika Gehlot and all volunteers for extending their help in the conference organization. All these support enables us to provide a range of additional services to the conference attendees and the participation of graduate students in the Doctoral Consortium. We will be using VirtualChair (built over Gather.Town) for virtual conference sessions. We thank the VirtualChair team for working with us with very tight deadlines. Last but by no means least, we thank all authors who will share their research findings and progress at the conference and in workshop papers, and our rich array of informal meetings. Their work is the reason the conference exists.

With warmest wishes for an enjoyable conference!

Rachael Jack, Vishal Patel, Pavan Turaga, and Mayank Vatsa


FG 2021 Program Chairs

Rama Chellappa, Alex (Sandy) Pentland, and Richa Singh


FG 2021 General Chairs


Speaker Details

Keynote Speakers


Name	Pawan Sinha	
Title	"Butterfly Effects" in Perceptual Development	
Abstract	<p>A young child's difficulties with face recognition led us to explore how a typicalities in early perceptual development can impact later proficiencies. In the specific context of children who have been created for congenital blindness, we and others have found some consistent deficits in post-operative face recognition performance. These deficits have typically been attributed to the pre-operative deprivation the children experienced during 'sensitive periods' of development. However, we suggest that there may be an additional factor at work: Differences in *post-operative* visual experiences of newly-sighted children relative to those of typically developing infants. These differences may skew early visual learning and lead to abnormalities in recognition processes. We call these 'butterfly effects' given that they involve potentially large consequences of small initial perturbations in visual experience. Such hypothesized butterfly effects have relevance for three goals: 1. accounting for observed deficits in newly-sighted children, 2. understanding why some aspects of normal visual development unfold in the way they do, and 3. formulating effective training regimens for computational vision systems.</p>	
Bio	<p>Pawan Sinha is a tenured professor of vision and computational neuroscience in the Department of Brain and Cognitive Sciences at MIT. He received his undergraduate degree in computer science from the Indian Institute of Technology, New Delhi and his Masters and doctoral degrees in Artificial Intelligence from the Department of Computer Science at MIT. He has also had extended research stays at the University of California, Berkeley, Xerox Palo Alto Research Center, the Sarnoff Research Center in Princeton, and the Max-Planck Institute for Biological Cybernetics in Tübingen, Germany.</p> <p>Prof. Sinha's research interests span neuroscience, artificial intelligence, machine learning, and public health Using a combination of experimental and computational modeling techniques, research in his laboratory focuses on understanding how the human brain learns to interpret and recognize complex sensory signals, such as images and videos. Prof. Sinha's experimental work on these issues involves studying healthy individuals and also those with neurological disorders such as autism. The goal is not only to derive clues regarding the nature and development of human visual skills, but also to create more powerful and robust AI systems.</p> <p>Prof. Sinha founded Project Prakash in 2005 with the twin objectives of providing treatment to children with severe visual impairments and also understanding mechanisms of learning and plasticity in the brain. This project has provided insights into several fundamental questions about brain function (even some that had remained open for the past three centuries) while also transforming the lives of many blind children by bringing them the gift of sight.</p> <p>Prof. Sinha is a recipient of the Pisart Vision Award from the Lighthouse Guild, the inaugural Asia Game Changers Award, the PECASE – US Government's highest award for young scientists, the Alfred P. Sloan Foundation Fellowship in Neuroscience, the John Merck Scholars Award for research on developmental disorders, the Jephtha and Emily Wade Award for creative research, the Troland Award from the National Academies, the Distinguished Alumnus Award from IIT Delhi, and the Oberdorfer Award from the ARVO Foundation. His laboratory's research has appeared in several leading scientific journals including Nature, Science, Nature Neuroscience, Proceedings of the National Academy of Sciences and Proceedings of the Royal Society. This work has been profiled in several media channels including the New York Times, Washington Post, Wall Street Journal, New Yorker, ABC News, New Scientist, National Public Radio and TIME magazine.</p> <p>Prof. Sinha's teaching has consistently received high ratings from students. He has received the Dean's Award for Advising and Teaching at MIT. To enhance scientific literacy on a broader scale, he has written a series of newspaper articles on various aspects of normal and abnormal brain function with the goal of bringing the latest findings in neuroscience to the attention of the general public.</p> <p>Prof. Sinha has served on the program committees for prominent scientific conferences on object and face recognition and is currently a member of the editorial board of ACM's Journal of Applied Perception. He is a founder of Imagen Inc, a company that applies insights regarding human image processing to challenging real-world machine vision problems. Imagen was the winner of the MIT Entrepreneurship competition. Prof. Sinha was named a Global Indus Technovator, and was also inducted into the Guinness Book of World Records for creating the world's smallest reproduction of a printed book.</p>	

Speaker Details


Name	Yves-Alexandre de Montjoye	
Title	Using Data while Protecting Privacy in the Digital Era	
Abstract	<p>We live in a time when information about most of our movements and actions is collected and stored in real time. The availability of large-scale behavioral data dramatically increases our capacity to understand and potentially affect the behavior of individuals and collectives.</p> <p>The use of this data, however, raises legitimate privacy concerns. Anonymization is meant to address these concerns: allowing data to be fully used while preserving individuals' privacy. In this talk, I will first discuss how traditional data protection mechanisms fail to protect people's privacy in the age of big data. More specifically, I will show how the mere absence of obvious identifiers such as name or phone number or the addition of noise are not enough to prevent re-identification. Second, I will describe what I see as a necessary evolution of the notion of data anonymization towards an anonymous use of data. I will then conclude by discussing some of the modern privacy engineering techniques currently developed to allow large-scale behavioral data to be used while giving individual strong privacy guarantees.</p>	
Bio	<p>Yves-Alexandre de Montjoye is an Associate Professor at Imperial College London. He currently is a Special Adviser on AI and Data Protection to EC Justice Commissioner Reynders and a Parliament-appointed expert to the Belgian Data Protection Agency (APD-GBA). In 2018-2019, he was a Special Adviser to EC Competition Commissioner Vestager co-authoring the Competition Policy for the Digital Era report. His research has been published in Science and Nature Communications and has enjoyed wide media coverage (BBC, CNN, New York Times, Wall Street Journal, Harvard Business Review, etc.). His work on the shortcomings of anonymization has appeared in reports of the World Economic Forum, FTC, European Commission, and the OECD. Yves-Alexandre worked for the Boston Consulting Group and acted as an expert for both the Bill and Melinda Gates Foundation and the United Nations. He received his PhD from MIT in 2015 and obtained, over a period of 6 years, an M.Sc. from UC Louvain in Applied Mathematics, an M.Sc. (Centralien) from École Centrale Paris, an M.Sc. from KU Leuven in Mathematical Engineering as well as his B.Sc. in engineering from UC Louvain.</p>	

Name	Shalini De Mello	
Title	Human-centric Vision in the Real World: Challenges and Opportunities	
Abstract	<p>Human-centric vision, or the ability of machines to perceive and analyze humans, is the gateway to human-computer interaction (HCI). It is foundational technology, which is an essential component of any AI system with wide-ranging applications across product categories. From our nascent successes of shipping face detection solutions in digital cameras some fifteen years ago, HCI has witnessed phenomenal growth. Today, many successful and robust HCI technologies are ubiquitous in everyday products from cell phones to cars, including those for face, gaze and body tracking, and face recognition. Much of this growth has been driven by the availability of large and diverse datasets, adequate compute power and the advent of deep learning. However, we are only just getting started and much exciting new work lays ahead. In this talk, I will describe several cutting-edge HCI technologies that we have invented at NVIDIA along with our journey of converting them into successful real-world shipped products. I will describe open challenges encountered along the way, which present rich opportunities for continued research and development in the field. Finally, I will close with thoughts on what lays ahead, both in terms of unexplored/underdeveloped fundamental HCI technologies and the exciting novel applications areas that they can enable in the future.</p>	
Bio	<p>Shalini De Mello is a Principal Research Scientist and Lead in the Learning and Perception research group at NVIDIA. She has been a researcher there since 2013. She received doctoral and master's degrees in Electrical and Computer Engineering from the University of Texas at Austin in 2008 and 2004, respectively. Her primary research interests are in designing computer vision and machine learning algorithms for perceiving and analyzing humans -- particularly their face, gaze and gestures. Over her career, she has researched and invented technologies for face recognition and detection, 2D and 3D head pose estimation, gaze estimation, conditional 2D facial image synthesis, facial action unit estimation and gesture recognition, among others. In addition, she is interested in learning AI algorithms with limited supervision and data and has recently been pushing the boundaries of what is possible with this ideology in the context of human-centric vision. She holds over 30 patents and her research has led to the development of incorporated into several innovative human-centric NVIDIA products, including NVIDIA DriveIX for intelligent AI-based automotive interfaces and NVIDIA Maxine for smart video conferencing solutions.</p>	

Speaker Details


Name	Gang Hua	
Title	Customer Behavior (Demand) Prediction in Brick-and-Mortar Stores from Product Recognition	
Abstract	<p>Although e-commerce accounts for more and more of total retail sales over the past decades, traditional brick-and-mortar stores still account for over 70% of total sales. Certain categories of retail businesses, such as convenience stores, still offer a unique value that online retailers cannot compete with: the ability to quickly and easily walk in and out to obtain what you want in just a few minutes.</p> <p>Meanwhile, how to increase the operation efficiency of brick-and-mortar stores by leveraging digital transformation, akin to that of e-commerce, caught the attention from industry, sometimes dubbed the name “new retail.” To achieve this, the first step is to transform the real-world physical information from the brick-and-mortar stores into digital form, where computer vision plays an essential role. Then, we may build and apply mathematical models to infer key customer behaviors such as their demands of different products, which naturally leads to optimized decisions of key operation steps such as assortment planning.</p> <p>In this talk, I will elaborate on and share how we may directly infer customer shopping behaviors from the product display map (combined with product sales records). Such product display maps represent how each product is presented in the shelf, which are obtained through a full digitization of the storefront, i.e., recognizing shelves and estimating their poses, recognizing products along with in-shelf positions using state-of-the-art computer vision technologies. The system built upon these technologies are running 24/7 in our storefronts at Convenience Bee, a new and fast-growing convenience store chain in mainland China. I will use real data from our stores to illustrate the technologies behind.</p>	
Bio	<p>Gang Hua is the Chief Technology Officer of Convenience Bee, and Chief Scientist of its AI Research Branch, Wormpex AI Research. His research focuses on computer vision, pattern recognition, machine learning, robotics, towards general Artificial Intelligence, with primary applications in cloud and edge intelligence, and currently with a focus on new retail intelligence.(See http://www.ganghua.org/).</p> <p>Before that, he served in various roles at Microsoft (2015-18) as the Science/Technical Adviser to the CVP of the Computer Vision Group, Director of Computer Vision Science Team in Redmond and Taipei ATL, and Senior Principal Researcher/Research Manager at Microsoft Research. He was an Associate Professor at Stevens Institute of Technology (2011-15). During 2014-15, he took leave and worked on the Amazon-Go project. He was a Visiting Researcher (2011-14) and a Research Staff Member (2010-11) at IBM Research T. J. Watson Center, a Senior Researcher (2009-10) at Nokia Research Center Hollywood, and a Scientist (2006-09) at Microsoft Live labs Research. He received his Ph.D. degree in ECE from Northwestern University in 2006.</p> <p>He is an IEEE Fellow, an IAPR Fellow, and an ACM Distinguished Scientist for contributions to Computer Vision and Multimedia. He is the recipient of the 2015 IAPR Young Biometrics Investigator Award for contributions to Unconstrained Face Recognition from Images and Videos, and a recipient of the 2013 Google Research Faculty Award. He is a General Chair of ICCV25, a Program Chair for CVPR19&22, and has served as Area Chairs for CVPR21, ECCV20 CVPR17, ICCV17, ACM MM17&15&12&11, CVPR15, ICCV11, ICIP12&13&15, ICASSP12&13. He is currently serving as an Associate Editors for T-PAMI, IJCV, CVIU and MVA. He was an Associate Editor in Chief for CVIU, an Associate Editor for IEEE T-IP (2012-15, 2017-19), IEEE T-CSVT (2015-19), and Vision and View Department Editor for IEEE Multimedia Magazine (2011-16).</p> <p>He has published more than 200 peer reviewed papers in top conferences such as CVPR/ICCV/ECCV, and top journals such as T-PAMI and IJCV. He holds 20 issued U.S Patents and also has more than 20 more U.S. Patents Pending.</p>	


Speaker Details

Name	Pramod Varma	
Title	Building for a Billion: Learning from India's Population Scale Digital Infrastructure Journey	
Abstract	"India has been building a set of digital building blocks from identity to payment to credentialing to data across domains over the last decade. This loosely coupled, interoperable, federated set of digital building blocks, generally known as India Stack, has allowed India to leapfrog in the areas of social welfare and financial inclusion. Most of these are in the form of protocols and open APIs allowing the market, society, and government actors to build diverse innovation in the form of apps and platforms on top. India is now extending these design principles to further build additional building blocks in education, health, and other domains to make nonlinear transformation at a billion people scale. In this talk, Pramod, who has been the Chief Architect for most of these digital building blocks, speaks about the big picture, learnings, and the impact."	
Bio	<p>Dr. Pramod Varma is the CTO of EkStep Foundation, a not-for-profit creating learner- centric, open source, digital public goods under Project Sunbird (sunbird.org). These digital building blocks are used to provide learning opportunities to 200 million children in India and also in other learning, skilling, and capacity building efforts in India and other countries. In addition, he continues to be the Chief Architect of Aadhaar, India's digital identity program that has successfully covered more than 1.2 billion people in a short span of 7 years. He also helped architect various India Stack layers such as eSign, Digital Locker, and Unified Payment Interface (UPI), and Data Empowerment and Protection Architecture (DEPA), all of which are now working at population scale in India. He is also the co-founder of Beckn Foundation, the genesis author and angel donor of the open source beckn protocol (becknprotocol.io) for creation of decentralized open discovery, fulfillment, and commerce networks.</p> <p>He is an advisor to Unique Identification Authority of India (UIDAI), National Payment Corporation (NPCI), Goods and Services Tax Network (GSTN), National Health Authority (NHA), Securities and Exchange Board of India (SEBI), Turing Institute Identity Initiative in the UK, and helps with many digital public infrastructure initiatives in India and across the globe.</p> <p>Pramod holds a Master's and Ph.D. degree in Computer Science along with a second Master's in Applied Mathematics. His interests include Internet scale distributed architectures and intelligent systems. He is passionate about technology, science, society, and teaching.</p>	

Speaker Details

Workshop Speakers

Name	Naser Damer	
Title	Masked Face Recognition: From Human Performance to Presentation Attacks	
Abstract	The pandemic has led to the wide use of face masks, essential to keep the pandemic under control. The effect of mask-wearing on face recognition in a collaborative environment is a sensitive issue with implications on many aspects of the identity management processes. This talk will give an insight into the effect of facial masks on automatic face recognition and will build on that to discuss the validity of evaluation protocols, the possible efforts to reduce the effect of masks, the human expert performance in masked face recognition, and the effect of masks on face presentation attack detection.	
Bio	Naser Damer is a senior researcher at the competence center Smart Living & Biometric Technologies, Fraunhofer IGD. He received his PhD in computer science from the Technischen Universität Darmstadt (2018). He is a researcher at Fraunhofer IGD since 2011 performing research management, applied research, scientific consulting, and system evaluation. His main research interests lie in the fields of biometrics, machine learning and information fusion. He has published more than 80 scientific papers in these fields. Dr. Damer is a Principal Investigator at the National Research Center for Applied Cybersecurity ATHENE in Darmstadt, Germany. He lectures on Biometric recognition and security, as well as on Ambient Intelligence at the Technischen Universität Darmstadt. Dr. Damer is a member of the organizing teams of a number of conferences, workshops, and special sessions, including being a program co-chair of BIOSIG and a publication co-chair of IWBF2020. He serves as a reviewer for a number of journals and conferences and as an associate editor for the Visual Computer journal. He represents the German Institute for Standardization (DIN) in the ISO/IEC SC37 international biometrics standardization committee.	

Name	Albert Ali Salah	
Title	Why Regulate Facial Recognition and Surveillance Technologies?	
Abstract	Face recognition as a biometric is widely used, and provides benefits of convenience, improved accessibility, and better law enforcement. However, it is open to numerous criticisms as a surveillance technology, including problems associated with its various biases, with its potential misuses by corporations and oppressive governments, and with the psychological effects it has on the population, when people are put under constant surveillance. While there are other technologies that are potentially much more ubiquitous and powerful for surveillance (such as mobile phones, or web browsers), face recognition technology represents an observing eye, and has an uncanny symbolic power. In the last few years, we have seen an increased pressure from the public to regulate the use of face recognition in various scenarios, across the globe, in parallel with an accelerated technology push for developing systems at massive scales. In this talk, I would like to continue the discussions that started in FG'20 about the role played by the researchers and developers of technology in this debate, in the light of recent developments.	
Bio	Albert Ali Salah is professor and chair of Social and Affective Computing at the Information and Computing Sciences Department of Utrecht University, and adjunct professor at the Department of Computer Engineering of Boğaziçi University. He has co-authored over 200 publications on pattern recognition, multimodal interfaces, and computer analysis of human behavior. He serves as a Steering Board member of ACM ICMI, IEEE FG, and eINTERFACE, as an associate editor of journals including IEEE Trans. on Cognitive and Developmental Systems, IEEE Trans. Affective Computing, and Int. Journal on Human-Computer Studies. Albert was the scientific coordinator of the Data for Refugees (D4R) Challenge that used large scale mobile data to improve the living conditions of millions of Syrian refugees in Turkey. He is a senior research affiliate of DataPop Alliance, and a senior member of IEEE and ACM.	

FG 2021 Program at a Glance

Conference Schedule at a Glance

December 15, 2021	December 16, 2021	December 17, 2021	December 18, 2021
7:30 AM - 8:00 AM ET Opening Session -General Chair Message -Program Chair Message -Awards	7:00 AM – 8:00 AM ET Keynote Speaker: Pawan Sinha	7:00 AM – 8:00 AM ET Techno-DevOps Session Bharat Giddwani and Abhishek Choudhary	7:15 AM -8:00 AM ET Oral Session-8
8:00 AM - 9:00 AM ET Keynote Speaker: Yves-Alexandre de Montjoye	8:00 AM - 9:00 AM ET Oral Session-4	8:00 AM - 9:00 AM ET Oral Session-6	8:00 AM - 9:00 AM ET Keynote Speaker: Pramod Varma
9:00 AM – 9:15 AM ET: Break			
9:15 AM - 10:00 AM ET Oral Session-1	9:15 AM - 10:15 AM ET “Ask Me Anything” Rama Chellappa and Alex Sandy Pentland	9:15 AM - 10:15 AM ET Keynote Speaker: Gang Hua	9:15 AM - 10:00 AM ET Oral Session-9
10:00 AM – 10:45 AM ET Oral Session-2	10:15 AM – 11:15 AM ET Oral Session-5	10:15 AM – 11:15 AM ET Oral Session-7	10:00 AM – 11:00 AM ET Keynote Speaker: Shalini De Mello
10:45 AM – 11:30 AM ET Oral Session-3	11:15 AM – 1:00 PM ET Poster Session-2	11:15 AM – 1:00 PM ET Poster Session-3	11:00 AM – 11:45 AM ET Oral Session-10
11:30 AM – 1:00 PM ET Poster Session-1	1:00 PM ET Onwards Doctoral Consortium Session		11:45 AM – 1:15 PM ET Poster Session-4
			01:15 PM ET Best Poster Awards and Closing

Instructions:

- If your paper is marked as 7+2 min oral presentation, please prepare 7 mins video of your work. If your paper is marked as 12+3 mins oral presentation then, you need to prepare a 12 mins video presentation of your work. If your paper is in poster session then you need to prepare a 2 mins teaser video. Video format should be MOV or MP4. Preferred aspect ratio is 16:9 or 4:3.
- Each paper has to be presented in poster session as well. Single-page PDF in landscape orientation, aspect ratio 16:9 or 4:3 is encouraged.

FG 2021 Conference Program

December 15, 2021

Opening Session

07:30 AM – 08:00 AM ET

- **General Chair Message**
- **Program Chair Message**
- **Awards**

Invited Keynote Speaker

08:00 AM – 09:00 AM ET

Name	Yves Alexandre de Montjoye
Title	Using Data while Protecting Privacy in the Digital Era
Session Chair	Vishal Patel

Oral Session – 1

(7min + 2min Presentation)

9:15 AM – 10:00 AM ET

Session Chair: Jonathon Phillips

ID	Paper Title	Author Names	Time
O1	Identity-Expression Ambiguity in 3D Morphable Face Models	Bernhard Egger; Skylar Sutherland; Safa Medin; Joshua Tenenbaum	9:15 AM – 10:00 AM ET
O2	Self-Supervised Video Pose Representation Learning for Occlusion-Robust Action Recognition	Di Yang; Yaohui Wang; Antitza Dantcheva; Lorenzo Garattoni; Gianpiero Francesca; Francois Bremond	
O3	Masked Batch Normalization to Improve Tracking-Based Sign Language Recognition Using Graph Convolutional Networks	Natsuki Takayama; Gibran Benitez-Garcia; Hiroki Takahashi	
O4	Toward Personalized Emotion Recognition: A Face Recognition Based Attention Method for Facial Emotion Recognition	Mostafa Shahabinejad; Yang Wang; Yuanhao Yu; Jin Tang; Jiani Li	
O5	Adversarial Mask Generation for Preserving Visual Privacy	Aayush Gupta; Ayush Jaiswal; Yue Wu; Vivek Yadav; Pradeep Natarajan	

Oral Session – 2

(7min + 2min Presentation)

10:00 AM – 10:45 AM ET

Session Chair: Abhinav Dhall

ID	Paper Title	Author Names	Time
O6	Contextual Emotion Learning Challenge	Jainendra Shukla; Puneet Gupta; Aniket Bera; Arka Sarkar; Prakhar Goel; Shubhangi Butta; Anup Kumar Gupta; Snehil Sanyal; Debanga Raj Neog; M. K. Bhuyan; Kalyani S. Marathe; Linda Shapiro; Alex Colburn; Varchita B. Lalwani	

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07	The 5th Recognizing Families in the Wild Data Challenge: Predicting Kinship from Faces	Joseph Robinson; Can Qin; Ming Shao; Matthew Turk; Rama Chellappa; Yun Fu	10:00 AM - 10:45 AM ET
08	Solving the Families In the Wild Kinship Verification Challenge by Program Synthesis	Junyi Huang; Maxwell Benjamin Strome; Ian Jenkins; Parker Williams; Bo Feng; Yaning Wang; Roman Z. Wang; Vaibhav Bagri; Newman Cheng; Iddo Drori)	
09	Supervised Contrastive Learning for Facial Kinship Recognition	Ximiao Zhang; Min Xu; Xiuzhuang Zhou; Guodong Guo	
010	Deep Kinship Verification and Retrieval Based on Fusion Siamese Neural Network	Jun Yu; Guochen Xie; Xinlong Hao; Zeyu Cui; Liwen Zhang; Zhongpeng Cai	

Oral Session – 3

(7min + 2min Presentation)

10:45 AM – 11:30 AM ET

Session Chair: Abhijit Das

ID	Paper Title	Author Names	Time
O11	Asymmetric 3D face model for Speech Language Pathologist applications	Gonzalo D. Sad; Facundo T. Reyes; Julián Alvarez	10:45 AM – 11:30 AM ET
O12	BVPNet: Video-to-BVP Signal Prediction for Remote Heart Rate Estimation	Abhijit Das; Hao Lu; Hu Han; Antitza Dantcheva; Shiguang Shan; Xilin Chen	
O13	Goals, Tasks, and Bonds: Toward the Computational Assessment of Therapist Versus Client Perception of Working Alliance	Alexandria K. Vail; Jeffrey M. Girard; Lauren Bylsma; Jeffrey Cohn; Jay Fournier; Holly Swartz; Louis-Philippe Morency	
O14	Facial Action Units and Head Dynamics in Longitudinal Interviews Reveal OCD and Depression severity and DBS Energy	Ali Darzi; Nicole Provenza; Laszlo A. Jeni; David Borton; Sameer Sheth; Wayne Goodman; Jeffrey Cohn	

Poster Session – 1

(The papers presented in the oral session will also be presented in the poster session of the same day.)

11:30 AM – 1:00 PM ET

Session Chair: Antitza Dantcheva and Naser Damer

ID	Paper Title	Author Names	Time
P1	Fusion-based Spatiotemporal Convolutions with Constant Temporal Snapshots for Sign Language Recognition	Yiming Han; Xiaocong Fan; Radhika Bhosale; Ramakrishnan Sundaram; Jonathan Liaw	11:30 AM – 1:00 PM ET
P2	A Coarse-to-Fine Dual Attention Network for Blind Face Completion	Stefan Hörmann; Zhibing Xia; Martin Knoche; Gerhard Rigoll	
P3	Micro-expression Action Unit Detection with Dual-view Attentive Similarity-Preserving	Yante Li; Wei Peng; Guoying Zhao	

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P4	AnonySign: Novel Human Appearance Synthesis for Sign Language Video Anonymisation	Ben Saunders; Necati Cihan Camgoz; Richard Bowden
P5	Pose-Invariant Facial Expression Recognition	Guang Liang; Shangfei Wang; Can Wang
P6	Local Feature Enhancement Network for Set-based Face Recognition	Ziyi Bai; Ruiping Wang; Shiguang Shan; Xilin Chen
P7	Stylized Text-to-Fashion Image Generation	Huixian Zhang; Shuhui Jiang; Yun Fu
P8	Content4All Open Research Sign Language Translation Datasets	Necati Cihan Camgoz; Ben Saunders; Guillaume Rochette; Marco Giovanelli; Giacomo Inches; Robin Nachtrab-Ribback; Richard Bowden
P9	ZF-SSE: Unified Sequential Semantic Encoder for Zero-Few-Shot Learning	Naveen Madapana; Juan Wachs
P10	Self-Supervised Patch Localization for Cross-Domain Facial Action Unit Detection	Yufeng Yin; Liupei Lu; Yizhen Wu; Mohammad Soleymani
P11	Safe Fakes: Evaluating Face Anonymizers for Face Detectors	Sander R. Klomp; Matthew van Rijn; Rob Wijnhoven; Cees Snoek; Peter. H. N. de With
P12	Dense 3D Coordinate Code Prior Guidance for High-Fidelity Face Swapping and Face Reenactment	Anni Tang; Han Xue; Jun Ling; Rong Xie; Li Song
P13	Looking for the Signs: Identifying Isolated Sign Instances in Continuous Video Footage	Tao Jiang; Necati Cihan Camgoz; Richard Bowden
O1	Identity-Expression Ambiguity in 3D Morphable Face Models	Bernhard Egger; Skylar Sutherland; Safa Medin; Joshua Tenenbaum
O2	Self-Supervised Video Pose Representation Learning for Occlusion-Robust Action Recognition	Di Yang; Yaohui Wang; Antitza Dantcheva; Lorenzo Garattoni; Gianpiero Francesca; Francois Bremond
O3	Masked Batch Normalization to Improve Tracking-Based Sign Language Recognition Using Graph Convolutional Networks	Natsuki Takayama; Gibran Benitez-Garcia; Hiroki Takahashi
O4	Toward Personalized Emotion Recognition: A Face Recognition Based Attention Method for Facial Emotion Recognition	Mostafa Shahabinejad; Yang Wang; Yuanhao Yu; Jin Tang; Jiani Li
O5	Adversarial Mask Generation for Preserving Visual Privacy	Aayush Gupta; Ayush Jaiswal; Yue Wu; Vivek Yadav; Pradeep Natarajan
O6	Contextual Emotion Learning Challenge	Jainendra Shukla; Puneet Gupta; Aniket Bera; Arka Sarkar; Prakhari Goel; Shubhangi Butta; Anup Kumar Gupta; Snehil Sanyal; Debanga Raj Neog; M. K. Bhuyan; Kalyani S. Marathe; Linda Shapiro; Alex Colburn; Varchita B. Lalwani
O7	The 5th Recognizing Families in the Wild Data Challenge: Predicting Kinship from Faces	Joseph Robinson; Can Qin; Ming Shao; Matthew Turk; Rama Chellappa; Yun Fu

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O8	Solving the Families In the Wild Kinship Verification Challenge by Program Synthesis	Junyi Huang; Maxwell Benjamin Strome; Ian Jenkins; Parker Williams; Bo Feng; Yaning Wang; Roman Z. Wang; Vaibhav Bagri; Newman Cheng; Iddo Drori)	
O9	Supervised Contrastive Learning for Facial Kinship Recognition	Ximiao Zhang; Min Xu; Xiuzhuang Zhou; Guodong Guo	
O10	Deep Kinship Verification and Retrieval Based on Fusion Siamese Neural Network	Jun Yu; Guochen Xie; Xinlong Hao; Zeyu Cui; Liwen Zhang; Zhongpeng Cai	
O11	Asymmetric 3D face model for Speech Language Pathologist applications	Gonzalo D. Sad; Facundo T. Reyes; Julián Alvarez	
O12	BVPNet: Video-to-BVP Signal Prediction for Remote Heart Rate Estimation	Abhijit Das; Hao Lu; Hu Han; Antitza Dantcheva; Shiguang Shan; Xilin Chen	
O13	Goals, Tasks, and Bonds: Toward the Computational Assessment of Therapist Versus Client Perception of Working Alliance	Alexandria K. Vail; Jeffrey M. Girard; Lauren Bylsma; Jeffrey Cohn; Jay Fournier; Holly Swartz; Louis-Philippe Morency	
O14	Facial Action Units and Head Dynamics in Longitudinal Interviews Reveal OCD and Depression severity and DBS Energy	Ali Darzi; Nicole Provenza; Laszlo A. Jeni; David Borton; Sameer Sheth; Wayne Goodman; Jeffrey Cohn	

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December 16, 2021

Invited Keynote Speaker

07:00 AM – 08:00 AM ET

Name	Pawan Sinha
Title	"Butterfly Effects" in Perceptual Development
Session Chair	Rama Chellappa

Oral Session – 4

(12min + 3min Presentation)

8:00 AM – 9:00 AM ET

Session Chair: Ruiping Wang

ID	Paper Title	Author Names	Time
O15	AULA-Caps: Lifecycle-Aware Capsule Networks for Spatio-Temporal Analysis of Facial Actions	Nikhil Churamani; Sinan Kalkan; Hatice Gunes	8:00 AM – 9:00 AM ET
O16	Local Global Relational Network for Facial Action Units Recognition	Xuri Ge; Pengcheng Wang; Hu Han; Joemon M. Jose; Zhilong Ji; Zhongqin Wu; Xiao Liu	
O17	Your "Attention" Deserves Attention: A Self-Diversified Multi-Channel Attention for Facial Action Analysis	Xiaotian Li; Zhihua Li; Huiyuan Yang; Geran Zhao; Lijun Yin	
O18	A Study of the Human Perception of Synthetic Faces	Bingyu Shen; Brandon Richard Webster; Alice O'Toole; Kevin Bowyer; Walter Scheirer	

Ask Me Anything

09:15 AM – 10:15 AM ET

Name	Rama Chellappa and Alex Sandy Pentland
Moderators	Rachael Jack and Richa Singh

Oral Session – 5

(12min + 3min Presentation)

10:15 AM – 11:15 AM ET

Session Chair: Raghavendra Ramachandra

ID	Paper Title	Author Names	Time
O19	Does Keypoint Estimation Benefit Object Detection? An Empirical Study of One-stage and Two-stage Detectors	Yang Yang; Akshay Asthana; Liang Zheng	10:15 AM – 11:15 AM ET
O20	Human Motion Prediction Using Manifold-Aware Wasserstein GAN	Baptiste Chopin; Naima Otberdout; Mohamed Daoudi; Angela Bartolo	
O21	GROWL: Group Detection With Link Prediction	Viktor Schmuck; Oya Celiktutan	
O22	Affect-Aware Deep Belief Network Representations for Multimodal Unsupervised Deception Detection	Leena Mathur; Maja Matarić	

FG 2021 Conference Program

Poster Session – 2

(The papers presented in the oral session will also be presented in the poster session of the same day.)

11:15 AM – 1:00 PM ET

Session Chair: Oya Celikutan and Albert Ali Salah

ID	Paper Title	Author Names	Time
P14	Compositional Graph Convolutional Networks for 3D Human Pose Estimation	Zhiming Zou; Tianqi Liu; Dapeng Wu; Wei Tang	11:15 AM – 1:00 PM ET
P15	Tensor-based Subspace Factorization for StyleGAN	René Haas; Stella Graßhof; Sami S Brandt	
P16	Generative Adversarial Network for Text-to-Face Synthesis and Manipulation with Pretrained BERT Model	Yutong Zhou; Nobutaka Shimada	
P17	Expression Recognition Across Age	Sk Rahatul Jannat; Shaun Canavan	
P18	Foreign Shadow Robust Makeup Transfer via Hierarchical Deep Aggregation and Disentangled Representation	Chang Zhan; Lin Wang; Feng Liu; Zhaoyang Sun; JinLi Zhou; Shengwu Xiong	
P19	Facial Action Unit Recognition Using Pseudo-Intensities and their Transformation	Junya Saito; Takahisa Yamamoto; Akiyoshi Uchida; Xiaoyu Mi; Kentaro Murase	
P20	Hairstyle Transfer between Face Images	Adéla Šubrtová; Jan Čech; Vojtech Franc	
P21	Dense Face Detection via High-level Context Mining	Qixiang Geng; Dong Liang; Huiyu Zhou; Liyan Zhang; Han Sun; Ningzhong Liu	
P22	Smile Action Unit detection from distal wearable Electromyography and Computer Vision	Monica Perusquia-Hernandez; Felix Dollack; Chun Kwang Tan; Shushi Namba; Saho Ayabe-Kanamura; Kenji Suzuki	
P23	Efficient Human Pose Estimation by Maximizing Fusion and High-Level Spatial Attention	Zhiyuan Ren; Yaohai Zhou; Yizhe Chen; Ruisong Zhou; Yayu Gao	
P24	Two-stream Gabor-AGraph Convolutional Networks for Facial Expression Recognition	Shaoping Jiang; Xiangmin Xu; Fang Liu; Xiaofen Xing; Lin Wang	
P25	FaceQgen: Semi-Supervised Deep Learning for Face Image Quality Assessment	Javier Hernandez-Ortega; Julian Fierrez; Ignacio Serna; Aythami Morales	
P26	Detecting Human-to-Human-or-Object (H2O) Interactions with DIABOLO	Astrid Orcesi; Romaric Audigier; Fritz Poka Toukam; Bertrand Luvison)	
P27	The Imaginative Generative Adversarial Network: Automatic Data Augmentation for Dynamic Skeleton-Based Hand Gesture and Human Action Recognition	Junxiao Shen; John Dudley; Per Ola Kristensson	
P28	Explainable Thermal to Visible Face Recognition Using Latent-Guided Generative Adversarial Network	David Anghelone; Cunjian Chen; Philippe Faure; Arun Ross; Antitza Dantcheva	
P29	TrouSPI-Net: Spatio-temporal attention on parallel atrous convolutions and U-GRUs for skeletal pedestrian action prediction	Joseph J Gesnouin; Steve Pechberti; Bogdan Stanciuлесcu; Fabien Moutarde	
P30	Heterogeneous Face Frontalization via Domain Agnostic Learning	Xing Di; Shuowen Hu; Vishal Patel	
P31	Leveraging Semantic Scene Characteristics and Multi-Stream Convolutional Architectures in a Contextual Approach for Video-Based Visual Emotion Recognition in the Wild	Ioannis Pikoulis; Panagiotis P. Filintisis; Petros Maragos	
P32	Towards the Synthesis of Parent-Infant Facial Interactions	Renke Wang; Yeo Jin Amy Ahn; Daniel Messinger; Ifeoma Nwogu	

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P33	Unknown Aware Feature Learning for Face Forgery Detection	Liang Shi; Jie Zhang; Chenyue Liang; Shiguang Shan
P34	Channel Split Convolutional Neural Network for Single Image Super-Resolution (CSISR)	Kalpesh J Prajapati; Vishal Chudasama; Kishor Upla; Kiran Raja; Raghavendra Ramachandra; Christoph Busch
P35	Exploiting Emotional Dependencies with Graph Convolutional Networks for Facial Expression Recognition	Panagiotis Antoniadis; Panagiotis P Filntisis; Petros Maragos
P36	Weakly-supervised Joint Anomaly Detection and Classification	Snehashis Majhi; Srijan Das; Francois Bremond; Ratnakar Dash; Pankaj Kumar Sa
P37	Geodesic squared exponential kernel for non-rigid shape registration	Florent Jousse; Xavier Pennec; Herve Delingette; Matilde Gonzalez
P38	Unsupervised Compound Domain Adaptation for Face Anti-Spoofing	Ankush Panwar; Pratyush Singh; Suman Saha; Danda Pani Paudel; Luc Van Gool
P39	Lightweight Deep Symmetric Positive Definite Manifold Network for Real-Time 3D Hand Gesture Recognition	Mostefa Ben Naceur; Luc Brun; Olivier L��zoray
P40	Skeleton-based Action Recognition for Human-Robot Interaction using Self-Attention Mechanism	Chaitanya Bandi; Ulrike Thomas
P41	HeadPosr: End-to-end Trainable Head Pose Estimation using Transformer Encoders	Naina Dhingra
P42	Hand Gesture Recognition in Range-Doppler Images Using Binary Activated Spiking Neural Networks	Daniel Auge; Julian Hille; Etienne Mueller; Alois C. Knoll
P43	Dynamic Cross-Feature Fusion for American Sign Language Translation	Tejaswini Ananthanarayana; Nikunj Kotecha; Priyanshu Srivastava; Lipisha Chaudhary; Nicholas Wilkins; Ifeoma Nwogu
O15	AULA-Caps: Lifecycle-Aware Capsule Networks for Spatio-Temporal Analysis of Facial Actions	Nikhil Churamani; Sinan Kalkan; Hatice Gunes
O16	Local Global Relational Network for Facial Action Units Recognition	Xuri Ge; Pengcheng Wang; Hu Han; Joemon M. Jose; Zhilong Ji; Zhongqin Wu; Xiao Liu
O17	Your "Attention" Deserves Attention: A Self-Diversified Multi-Channel Attention for Facial Action Analysis	Xiaotian Li; Zhihua Li; Huiyuan Yang; Geran Zhao; Lijun Yin
O18	A Study of the Human Perception of Synthetic Faces	Bingyu Shen; Brandon Richard Webster; Alice O'Toole; Kevin Bowyer; Walter Scheirer
O19	Does Keypoint Estimation Benefit Object Detection? An Empirical Study of One-stage and Two-stage Detectors	Yang Yang; Akshay Asthana; Liang Zheng
O20	Human Motion Prediction Using Manifold-Aware Wasserstein GAN	Baptiste Chopin; Naima Otberdout; Mohamed Daoudi; Angela Bartolo
O21	GROWL: Group Detection With Link Prediction	Viktor Schmuck; Oya Celiktutan
O22	Affect-Aware Deep Belief Network Representations for Multimodal Unsupervised Deception Detection	Leena Mathur; Maja Matari��

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December 17, 2021

Techno-DevOps Session

07:00 AM – 08:00 AM ET

Name	Bharat Giddwani, NVIDIA and Abhishek Choudhary, CCS
Title	Developing Large Scale Intelligent Video Analytics Solutions using NVIDIA Stack
Session Chair	Mayank Vatsa

Oral Session – 6

(12min + 3min Presentation)

08:00 AM – 09:00 AM ET

Session Chair: Ajay Kumar

ID	Paper Title	Author Names	Time
O23	Generating Master Faces for Dictionary Attacks with a Network Assisted Latent Space Evolution	Ron Shmelkin; Tomer Friedlander; Lior Wolf	8:00 AM – 9:00 AM ET
O24	Expression-Latent-Space-guided GAN for Facial Expression Animation based on Discrete Labels	Xueping Wang; Weixin Li; Di Huang	
O25	Augmented Face Representation Learning via Transitive Distillation	Han Fang; Weihong Deng; Yaoyao Zhong; Jiani Hu; Dongyue Zhao; Xian Li; Dongchao Wen	
O26	Efficient Facial Landmark Detector by Knowledge Distillation	Yuyang Sha	

Invited Keynote Speaker

09:15 AM – 10:15 AM ET

Name	Gang Hua
Title	Customer Behavior (Demand) Prediction in Brick-and-Mortar Stores from Product Recognition
Session Chair	Alex Sandy Pentland

Oral Session– 7

(12min + 3min Presentation)

10:15 AM – 11:15 AM ET

Session Chair: Nalini Ratha

ID	Paper Title	Author Names	Time
O27	Self-Supervised 3D Human Pose Estimation with Multiple-View Geometry	Arij Bouazizi; Julian Wiederer; Ulrich Kressel; Vasileios Belagiannis	10:15 AM – 11:15 AM ET
O28	Invariant Representation Learning for Infant Pose Estimation with Small Data	Xiaofei Huang; Nihang Fu; Shuangjun Liu; Sarah Ostadabbas	
O29	Relative Pose Consistency for Semi-Supervised Head Pose Estimation	Felix Kuhnke; Sontje Ihler; Joern Ostermann	
O30	Human Pose Manipulation and Novel View Synthesis using Differentiable Rendering	Guillaume Rochette; Chris Russell; Richard Bowden	

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Poster Session – 3

(The papers presented in the oral session will also be presented in the poster session of the same day.)

11:15 AM – 1:00 PM ET

Session Chair: Benjamin Riggan and Sunpreet Singh Arora

ID	Paper Title	Author Names	Time
P44	Dominant subject recognition by Bayesian learning	Vojtech Franc; Andrii Yermakov	11:15 AM – 1:00 PM ET
P45	Improving Evaluation of Facial Attribute Prediction Models	Bryson Lingenfelter; Emily Hand	
P46	Rethinking Deconvolution for 2D Human Pose Estimation Light yet Accurate Model for Real-time Edge Computing	Masayuki Yamazaki; Eigo Mori	
P47	MD-CSDNetwork: Multi-Domain Cross Stitched Network for Deepfake Detection	Aayushi Agarwal; Akshay Agarwal; Sayan Sinha; Mayank Vatsa; Richa Singh	
P48	Driver Glance Classification In-the-wild: Towards Generalization Across Domains and Subjects	Sandipan Banerjee; Ajjen Joshi; Jay Turcot; Bryan Reimer; Taniya Mishra	
P49	Coupled Systems for Modeling Rapport Between Interlocutors	Srijan Kumar Sharma; Kantha Girish Gangadhara; Fei Xu; Anne Solbu; Mark Frank; Ifeoma Nwogu	
P50	Modeling Dynamics of Facial Behavior for Mental Health Assessment	Minh Tran; Ellen Bradley; Michelle Matvey; Josh Woolley; Mohammad Soleymani	
P51	Adversarial Attacks on Kinship Verification using Transformer	Jiaxuan Zhu; Ming Shao; Chao Xia; Hong Pan; Siyu Xia	
P52	Beyond the Words: Analysis and Detection of Self-Disclosure Behavior during Robot Positive Psychology Interaction	Sharifa Alghowinem; Sooyeon Jeong; Kika Arias; Rosalind Picard; Hae Won Park; Cynthia Breazeal	
P53	When Sketch Face Recognition Meets Mask Obfuscation: Database and Benchmark	Akshay Agarwal; Nalini Ratha; Mayank Vatsa; Richa Singh	
P54	Multi-person gaze-following with numerical coordinate regression	Tianlei Jin; Zheyuan Lin; Shiqiang Zhu; Wen Wang; Shunda Hu	
P55	Federated Test-Time Adaptive Face Presentation Attack Detection with Dual-Phase Privacy Preservation	Rui Shao; Bochao Zhang; Pong Chi Yuen; Vishal Patel	
P56	A Synthesis-Based Approach for Thermal-to-Visible Face Verification	Neehar Peri; Joshua Gleason; Carlos Castillo; Thirimachos Bourlai; Vishal Patel; Rama Chellappa)	
P57	Information-Theoretic Bias Assessment Of Learned Representations Of Pretrained Face Recognition	Jiazhi Li; Wael Abd-Almageed	
P58	Gaussian Mixture Distribution Makes Data Uncertainty Learning Better	Hao Ai; Qingmin Liao; Yiyun Chen; Jiang Qian	
P59	SRL: Separation-and-Recombination Learning for Video Facial Landmark Detection with Limited Data	Wenyan Wu; Yici Cai; Qiang Zhou	
P60	A New RGB-D Gesture Video Dataset for Real-life Scenarios	Zhendong Lu; Guojian Xiao; Zihao Luo; Panji Jin; Kuan Li; Jianping Yin	
P61	KSL-Guide: A Large-scale Korean Sign Language Dataset Including Interrogative Sentences for Guiding the Deaf and Hard-of-Hearing	Soomin Ham; Kibaek Park; Yeong Jun Jang; Youngtaek Oh; Seokmin Yun; Sukwon Yoon; Chang Jo Kim; Han-Mu Park; In So Kweon	
P62	Multi-Modal Learning for AU Detection Based on Multi-Head Fused Transformers	Xiang Zhang; Lijun Yin	
P63	Apparent Personality Recognition from Uncertainty-Aware Facial Emotion	Mani Kumar Tellamekala; Timo Giesbrecht; Michel Valstar	

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	Predictions using Conditional Latent Variable Models	
P64	Facial Action Unit Detection Based on Teacher-Student Learning Framework for Partially Occluded Facial Images	Ryosuke Kawamura; Kentaro Murase
P65	Towards Occlusion Robust Facial Landmark Detector	Yuyang Sha
P66	Emotion-aware Contrastive Learning for Facial Action Unit Detection	Xuran Sun; Jiabei Zeng; Shiguang Shan
P67	Deep Parametric Surfaces for 3D Outfit Reconstruction from Single View Image	Hugo Bertiche; Meysam Madadi; Sergio Escalera
P68	Affect-DML: Context-Aware One-Shot Recognition of Human Affect using Deep Metric Learning	Kunyu Peng; Alina Roitberg; David Schneider; Marios Koulakis; Kailun Yang; Rainer Stiefelhagen
P69	The Importance of Qualitative Elements in Subjective Evaluation of Semantic Gestures	Carolyn Saund; Stacy Marsella
P70	Learning Shape-Appearance Based Attributes Representation for Facial Attribute Recognition with Limited Labeled Data	Kunyan Li; Jie Zhang; Shiguang Shan
P71	Landmark-aware Self-supervised Eye Semantic Segmentation	Xin Cai; Jiabei Zeng; Shiguang Shan
P72	Skeleton-Based Explainable Bodily Expressed Emotion Recognition Through Graph Convolutional Networks	Esam A. H. Ghaleb; Andre Mertens; Stylianos Asteriadis; Gerhard Weiss
P73	Similarity-based Gray-box Adversarial Attack Against Deep Face Recognition	Hanrui Wang; Shuo Wang; Zhe Jin; Yandan Wang; Cunjian Chen; Massimo Tistarelli
O23	Generating Master Faces for Dictionary Attacks with a Network Assisted Latent Space Evolution	Ron Shmelkin; Tomer Friedlander; Lior Wolf
O24	Expression-Latent-Space-guided GAN for Facial Expression Animation based on Discrete Labels	Xueping Wang; Weixin Li; Di Huang
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O30	Human Pose Manipulation and Novel View Synthesis using Differentiable Rendering	Guillaume Rochette; Chris Russell; Richard Bowden

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December 18, 2021

Oral Session – 8

(12min + 3min Presentation)

7:15 AM – 8:00 AM ET

Session Chair: Weihong Deng

ID	Paper Title	Author Names	Time
O31	High-Accuracy RGB-D Face Recognition via Segmentation-Aware Face Depth Estimation and Mask-Guided Attention Network	Meng-Tzu Chiu; Hsun-Ying Cheng; Chien-Yi Wang; Shang-Hong Lai	7:15 AM – 8:00 AM ET
O32	Replay Attention and Data Augmentation Network for 3D Dense Alignment and Face Reconstruction	Zhiyuan Zhou; Lei Li; Suping Wu	
O33	Cross Attentional Audio-Visual Fusion for Dimensional Emotion Recognition	Gnana Praveen Rajasekhar; Eric Granger; Patrick Cardinal	

Invited Keynote Speaker

08:00 AM – 09:00 AM ET

Name	Pramod Varma
Title	Building for a Billion: Learning from India's Population Scale Digital Infrastructure Journey
Session Chair	Richa Singh

Oral Session – 9

(12min + 3min Presentation)

9:15 AM – 10:00 AM ET

Session Chair: Wei Tang

ID	Paper Title	Author Names	Time
O34	Leveraging Affect Transfer Learning for Behavior Prediction in an Intelligent Tutoring System	Nataniel Ruiz; Hao Yu; Danielle Alessio; Mona Jalal; Ajjen Joshi; Thomas Murray; John Magee; Jacob Whitehill; Vitaly Ablavsky; Ivon Arroyo; Beverly Woolf; Stan Sclaroff; Margrit Betke	9:15 AM – 10:00 AM ET
O35	NoPeek-Infer: Preventing reconstruction attacks in distributed predictive inference after on-premise training	Praneeth Vepakomma; Abhishek Singh; Emily T. Zhang; Otkrist Gupta; Ramesh Raskar	
O36	TADPool: Target Adaptive Pooling for Set Based Face Recognition	Nishant Sankaran; Deen D. Mohan; Sergey Tulyakov; Srirangaraj Setlur; Venu Govindaraju	

Invited Keynote Speaker

10:00 AM – 11:00 AM ET

Name	Sahlini De Mello
Title	Human-centric Vision in the Real World: Challenges and Opportunities
Session Chair	Pavan Turaga

FG 2021 Conference Program

Oral Session – 10

(12min + 3min Presentation)

11:00 AM – 11:45 AM ET

Session Chair: Aparna Bharati

ID	Paper Title	Author Names	Time
O37	Spatially Constrained GAN for Face and Fashion Synthesis	Songyao Jiang; Hongfu Liu; Yue Wu; Yun Fu	11:00 AM – 11:45 AM ET
O38	Robust LWIR-based Eye Center Detection through Thermal to Visible Image Synthesis	Suha Reddy Mokalla; Thirimachos Bourlai Suha Reddy Mokalla (University of Georgia); Thirimachos Bourlai (University of Georgia)	
O39	Sign, Attend and Tell: Spatial Attention for Sign Language Recognition	Noha Sarhan; Simone Frintrop	

Poster Session – 4

(The papers presented in the oral session will also be presented in the poster session of the same day.)

11:45 AM – 01:15 PM ET

Session Chair: Alice O'Toole and Ifeoma Nwogu

ID	Paper Title	Author Names	Time
P74	StyleDNA: A High-Fidelity Age and Gender Aware Kinship Face Synthesizer	Che-Hsien Lin; Hung-Chun Chen; Li-Chen Cheng; Shu-Chuan Hsu; Jun-Cheng Chen; Chih-Yu Wang	11:45 AM – 01:15 PM ET
P75	Monocular Human Shape and Pose with Dense Mesh-borne Local Image Features	Shubhendu Jena; Franck Multon; Adnane Boukhayma	
P76	Face Trees for Expression Recognition	Mojtaba Kolahdouzi; Alireza Sepas-Moghaddam; Ali Etemad	
P77	Cross-Quality LFW: A Database for Analyzing Cross-Resolution Image Face Recognition in Unconstrained Environments	Martin Knoche; Stefan Hörmann; Gerhard Rigoll	
P78	Two-stream Global-Guided Attention Network for Facial Expression Recognition	Yaoli Wen; Xiangmin Xu; Fang Liu; Xiaofen Xing; Lin Wang	
P79	GazeGrid: A Novel Interaction Method Based on Gaze Estimation	Luqian Ren; Haoxian Huang; Hao Wang; Zhuo Yang	
P80	Predicting Trust Using Automated Assessment of Multivariate Interactional Synchrony	Adrien Meynard; Gayan Seneviratna; Elliot Doyle; Joyanne Becker; Hau-tieng Wu; Jana Schaich Borg	
P81	Self-Supervised Learning via Multi-view Facial Rendezvous for 3D/4D Affect Recognition	Muzammil Behzad; Guoying Zhao	
P82	SMPL-Based 3D Pedestrian Pose Prediction	Anil Kunchala; Mélanie Bouroche; Lorraine D'Arcy; Bianca Schoen-Phelan	
P83	PoseDet: Fast Multi-Person Pose Estimation Using Pose Embedding	Chenyu Tian; Ran Yu; Xinyuan Zhao; Weihao Xia; Haoqian Wang; Yujiu Yang	
P84	The Many Faces of Anger: A Multicultural Video Dataset of Negative Emotions in the Wild (MFA-Wild)	Roya Javadi; Angelica Lim	
P85	Unimodal Face Classification with Multimodal Training	Wenbin Teng; Chongyang Bai	
P86	Frame-level Feature Tokenization Learning for Human Body Pose and Shape Estimation	Hu Cao; Meining Jia; Suping Wu	

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P87	Face Recognition Based on Panoramic Video	XinYi Zhang; Yun Tie; Lin Qi; Ruizhe Zhang; Juanjuan Cai
P88	ReSORT: an ID-recovery multi-face tracking method for surveillance cameras	Tan Minh Tran; Nguyen Hoang Tran; Soan T. M. Duong; Huy Duc Ta; Chanh D. Tr. Nguyen; Trung Bui; Steven Quoc Hung Truong
P89	Which CNNs and Training Settings to Choose for Action Unit detection? A Study Based on a Large-Scale Dataset	Mina Bishay; Ahmed Ghoneim; Mohamed Ashraf; Mohammad Mavadati
P90	RSFAD: A Large-Scale Real Scenario Face Age Dataset in the wild	Chang Kong; Qiuming Luo; Guoliang Chen
P91	Progressive Text-to-Face Synthesis with Generative Adversarial Network	Xing Qiao; Yanghong Han; Yan Wu; Zili Zhang
P92	Comparing Facial Expressions for Face Swapping Evaluation with Supervised Contrastive Representation Learning	Felix Rosberg; Cristofer Englund
P93	Synthesis-Guided Feature Learning for Cross-Spectral Periocular Recognition	Domenick Poster; Nasser Nasrabadi
P94	UV-based reconstruction of 3D garments from a single RGB image	Albert Rial-Farràs; Meysam Madadi; Sergio Escalera
P95	Adversarially Perturbed Wavelet-based Morphed Face Generation	Kelsey O'Haire; Sobhan Soleymani; Baaria A Chaudhary; Poorya Aghdaie; Jeremy Dawson; Nasser Nasrabadi
P96	From Face to Gait: Weakly-Supervised Learning of Gender Information from Walking Patterns	Andy Catruna; Adrian Cosma; Emilian Radoi
P97	harAGE: A Novel Multimodal Smartwatch-based Dataset for Human Activity Recognition	Adria Mallol-Ragolta; Anastasia Semertzidou; Maria Pateraki; Björn Schuller
P98	Understanding Cross Domain Presentation Attack Detection for Visible Face Recognition	Jennifer L Hamblin (University of Nebraska-Lincoln); Kshitij N Nikhal (University of Nebraska Lincoln); Benjamin Riggan (University of Nebraska-Lincoln)
P99	Emotion Editing in Head Reenactment Videos using Latent Space Manipulation	Valeriya Strizhkova; Yaohui Wang; David Anghelone; Di Yang; Antitza Dantcheva; Francois Bremond
P100	Body Gesture and Head Movement Analyses in Dyadic Parent-Child Interaction as Indicators of Relationship	Sharifa Alghowinem; Huili Chen; Cynthia Breazeal; Hae Won Park
P101	RGBD Face Recognition using Reconstruction based Shared Representation	Soumyadeep Ghosh; Mayank Vatsa; Richa Singh; Afzel Noore
P102	Explaining Face Presentation Attack Detection Using Natural Language	Hengameh Mirzaalian; Mohamed Hussein; Leonidas Spinoulas; Jonathan May; Wael Abd-Almageed
P103	Demystifying Attention Mechanisms for Deepfake Detection	Abhijit Das; Srijan Das; Antitza Dantcheva
O31	High-Accuracy RGB-D Face Recognition via Segmentation-Aware Face Depth Estimation and Mask-Guided Attention Network	Meng-Tzu Chiu; Hsun-Ying Cheng; Chien-Yi Wang; Shang-Hong Lai
O32	Replay Attention and Data Augmentation Network for 3D Dense Alignment and Face Reconstruction	Zhiyuan Zhou; Lei Li; Suping Wu
O33	Cross Attentional Audio-Visual Fusion for Dimensional Emotion Recognition	Gnana Praveen Rajasekhar; Eric Granger; Patrick Cardinal

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O34	Leveraging Affect Transfer Learning for Behavior Prediction in an Intelligent Tutoring System	Nataniel Ruiz; Hao Yu; Danielle Allessio; Mona Jalal; Ajjen Joshi; Thomas Murray; John Magee; Jacob Whitehill; Vitaly Ablavsky; Ivon Arroyo; Beverly Woolf; Stan Sclaroff; Margrit Betke	
O35	NoPeek-Infer: Preventing reconstruction attacks in distributed predictive inference after on-premise training	Praneeth Vepakomma; Abhishek Singh; Emily T. Zhang; Otkrist Gupta; Ramesh Raskar	
O36	TADPool: Target Adaptive Pooling for Set Based Face Recognition	Nishant Sankaran; Deen D. Mohan; Sergey Tulyakov; Srirangaraj Setlur; Venu Govindaraju	
O37	Spatially Constrained GAN for Face and Fashion Synthesis	Songyao Jiang; Hongfu Liu; Yue Wu; Yun Fu	
O38	Robust LWIR-based Eye Center Detection through Thermal to Visible Image Synthesis	Suha Reddy Mokalla; Thirimachos Bourlai Suha Reddy Mokalla (University of Georgia); Thirimachos Bourlai (University of Georgia)	
O39	Sign, Attend and Tell: Spatial Attention for Sign Language Recognition	Noha Sarhan; Simone Frintrop	

Best Poster Awards and Closing

01:15 PM ET

FG2021 Workshop Program

December 15, 2021

International Workshop on Face and Gesture Analysis for COVID-19 (FG4COVID19)

Time (ET)	Title
2:30AM – 2:40AM	Opening
2:40AM - 3:30AM Keynote 1	Invited Speaker: Albert Ali Salah (Utrecht University, The Netherlands) <i>Why Regulate Facial Recognition and Surveillance Technologies?</i>
3:30AM – 3:45AM	Effectiveness of Detection-based and Regression-based Approaches for Estimating Mask-Wearing Ratio Khanh-Duy Nguyen (University of Information Technology, VNU-HCM), Huy Nguyen (SOKENDAI), Trung-Nghia Le (National Institute of Informatics), Junichi Yamagishi (National Institute of Informatics), Isao Echizen (National Institute of Informatics)
3:45AM – 4:00AM	AECNet: Attentive EfficientNet For Crowd Counting Muskan Dosi (IIT Jodhpur), Kartik Thakral (Indian Institute of Technology Jodhpur), Surbhi Mittal (Indian Institute of Technology, Jodhpur), Mayank Vatsa (IIT Jodhpur), Richa Singh (IIT Jodhpur)
4:00AM – 4:10AM	Break
4:10AM – 4:20AM	Fevziye Irem Eyiokur (Karlsruhe Institute of Technology (KIT), Germany) ISL Unconstrained Face Mask Detection and Face Hand Interaction Detection Datasets
4:20AM – 4:35AM	Dual Sensor Indian Masked Face Dataset Shiksha Mishra (Indian Institute of Technology Jodhpur), Puspita Majumdar (IIIT Delhi), Muskan Dosi (IIT Jodhpur), Mayank Vatsa (IIT Jodhpur), Richa Singh (IIT Jodhpur)
4:35AM – 4:50AM	The Effect of Wearing a Face Mask on Face Image Quality Biyang Fu (Fraunhofer IGD), Florian Kirchbuchner (Fraunhofer Institute for Computer Graphics Research IGD), Naser Damer (Fraunhofer IGD)
4:50AM – 5:40AM Keynote 2	Invited Speaker: Naser Damer (Fraunhofer IGD, Germany) <i>Masked face recognition: from human performance to presentation attacks</i>
5:40AM – 5:50AM	Break
5:50AM – 6:05AM	Deep Covariance Feature and CNN-based End-to-End Masked Face Recognition Masum Shah Junayed (Department of Computer Engineering, Bahcesehir University), Arezoo Sadeghzadeh (Bahcesehir University), MD BAHARUL ISLAM (Bahcesehir University)
6:05AM – 6:20AM	Mask-invariant Face Recognition through Template-level Knowledge Distillation Marco Huber (Fraunhofer IGD), Fadi Boutros (Fraunhofer IGD), Florian Kirchbuchner (Fraunhofer Institute for Computer Graphics Research IGD), Naser Damer (Fraunhofer IGD)
6:20AM – 6:35AM	FocusFace: Multi-task Contrastive Learning for Masked Face Recognition Pedro C. Neto (INESC TEC, Universidade do Porto), Fadi Boutros (Fraunhofer IGD), João Ribeiro Pinto (INESC TEC and Universidade do Porto), Naser Damer (Fraunhofer IGD), Ana F. Sequeira (INESC Portugal), Jaime S. Cardoso (INESC Porto, Universidade do Porto)
6:35AM – 6:50AM	Partial Attack Supervision and Regional Weighted Inference for Masked Face Presentation Attack Detection Meiling Fang (Fraunhofer Institute for Computer Graphics Research IGD), Fadi Boutros (Fraunhofer IGD), Arjan Kuijper (Fraunhofer Institute for Computer Graphics Research IGD and Mathematical and Applied Visual Computing group, TU Darmstadt), Naser Damer (Fraunhofer IGD)
6:50AM – 7:00AM	Closing

FG2021 Doctoral Consortium Program

December 16, 2021

Session Chair: Abhinav Dhall and Sunpreet Singh Arora

Time (ET)	Title
1:00 PM – 1:10 PM	Child face age progression and regression to find the missing children Praveen Kumar Chandaliya
1:10 PM – 1:20 PM	Automatic Eye Gaze Estimation with Limited Supervision Shreya Ghosh
1:20 PM – 1:30 PM	Investigating Deep Learning spatio-temporal modelling and spatial attention systems for micro-Expression Recognition Mengjiong Bai
1:30 PM – 1:40 PM	Interpretation of Combined and Complex Charts for Potent Summaries Prerna Mishra
1:40 PM – 1:50 PM	Fairness and Bias in Face and Ocular Based Machine Learning Systems Sreeraj Ramachandran
1:50 PM – 2:00 PM	Harnessing Unlabeled Data for Biometric Face-Based Soft Biometrics Aakash Varma Nadimpalli
2:00 PM – 2:10 PM	A Picture is Worth a Thousand Words: Realistic Facial Image Generation from Text Description Yutong Zhou
2:10 PM – 2:20 PM	Fake Video Content Detection Using Physiological Parameters Lokendra Birla