

12<sup>th</sup> IEEE International Conference on

# Automatic Face and Gesture Recognition

**Pocket Guide**



**FG-2017**

May 30-June 3, 2017

Washington, DC

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# Welcome to FG'17!

It is our pleasure and privilege to welcome you to the 12th IEEE International Conference on Automatic Face and Gesture Recognition – “FG 2017”! This conference series began in 1994, with a meeting organized by Tom Huang, Sandy Pentland and Martin Bichsel, held in Zurich, Switzerland. Tom and Sandy are serving on the Advisory Committee for FG 2017. The conference series came under PAMI TC sponsorship beginning with the second meeting in 1996. Recently, this conference is co-sponsored by the IEEE Computer Society and IEEE Biometrics Council. The FG conference series quickly developed a reputation as a premier conference. FG 2013 was held in Shanghai, China, FG 2015 was held in Ljubljana, Slovenia and this year FG 2017 is in Washington, DC. The Washington area should provide visitors with excellent opportunities for tourism before and after the conference. The conference program promises to be exciting, with broad coverage of the most important current research directions. We hope your experience at FG is rewarding both professionally and personally!

FG 2017 presents the latest advances in automated face and gesture analysis, new findings in computational behavioral science and affective computing, and the latest advances in applied technologies. Over the course of five full days, we will have a rich offering of keynote sessions, workshops, tutorials, special sessions, and challenges, oral presentations, posters, and demos. Keynote speakers will reflect the interdisciplinary vigor of our community. Margaret Livingstone, Takeda Professor of Neurobiology at Harvard University, will present latest findings in the organization of visual processes in temporal cortex, Christopher Boehnen, Senior Program Manager at IARPA, will present on the vital role of face recognition in presentation attack detection and unconstrained face verification and recognition, and Stan Sclaroff, Associate Dean and Professor of Computer Science at Boston University, will present on deep models for video-based gesture and activity recognition and understanding.

Eighteen oral presentations and 75 poster presentations will share the latest findings in automated face, gesture, and body analysis, recognition, and synthesis, psychological and behavioral domains, and newest technologies and applications. These papers were selected through a vigorous selection process, coordinated by the Program Chairs and the Area Chairs, and conducted in two phases: the review phase and the author-rebuttal phase. During the review phase, the submissions were subjected to a rigorous double-blind review process. The Technical Program Committee consisted of over 250 experts who conducted the reviews. Each submission was reviewed by two to four experts who were asked to comment on the strengths, weaknesses, novelty and impact of the work. Following this, the Area Chair assigned to each submission prepared a summary of the main points to be addressed by the authors during their rebuttal. During the author-rebuttal phase, authors were given the opportunity to provide a response to the reviewers' and the area chair's comments and concerns. Following this, the Area Chair assigned to each submission prepared a consolidation report along with a recommendation of “Accept” or “Reject”. The Program Chairs used the recommendation and consolidation reports of the Area Chairs, the reviewers' comments and the authors' response to render a final decision on each paper. The selected papers will be presented in seven oral sessions and three poster sessions. In addition, each poster session will be preceded by a spotlight session in which the authors will have two minutes to highlight the contents of their poster. We anticipate many intense, productive, and enlightening discussions at the oral and poster sessions.

Workshops organized in conjunction with FG'17 will include faces and gestures of human learning, face recognition, adaptive shot learning, and biometrics in the wild. Tutorials will include multi-view face representation, remote physiological measurement from images and video, deep learning for both supervised and unsupervised face analysis, and statistical methods for affective computing. We will have two challenge workshops: Joint Challenge on Dominant and Complementary Emotion Recognition using Micro-Emotion Features and Head-Pose Estimation (DCER & HPE 2017); and 3D Facial Expression Recognition and Analysis Challenge (FERA 2017). For the next generation of researchers, we sponsor the Doctoral Consortium.

We will have a grand banquet, which will include announcement of the next FG, scheduled for spring of 2018, call for proposals for FG 2019 and 2020, and awards for Best Papers, Test of Time Award, Best Demo Award, and Best Reviewer Award.

# Welcome to FG'17!

We are indebted to the tireless and creative efforts of all the members that made FG 2017 possible. The Program Committee handled the review process for over 172 submissions and arranged the week's events. They were aided by over 250 reviewers. The Workshop and Challenge Committee, the organizers of workshops and challenges, and the Demo Committee made critical contributions. Local Arrangements, Finance Chair, Special Sessions Chair, Publicity Chairs, Publication Chairs, and Area Chairs all provided essential service.

We are thankful as well for the generous support of our sponsors. FG is co-sponsored by the continuous support of the IEEE Computer Society and the IEEE Biometrics Council. Other sponsors include Baidu (Platinum Sponsor), Mitsubishi Electric (Gold Sponsor), DiD4 (Silver Sponsor), MUKH technologies (Bronze Sponsor), Systems & Technology Research (Bronze Sponsor), and ObjectVideo Labs (Bronze Sponsor).

In closing, we are thankful to all of the people that have made this meeting possible, including the vital Face and Gesture community. If this is your first FG conference, welcome! If you are an FG veteran, welcome back! We wish you a productive and enjoyable meeting.

Sincerely,

Kevin Bowyer, Rama Chellappa, and Jeff Cohn, General Chairs  
Hatice Gunes, Alice O'Toole, Catherine Pelachaud, and Yan Tong, Program Chairs  
Vishal Patel, Local Arrangements Chairs  
<http://www.fg2017.org/>

# People

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# Supporters



# FG 2017 Conference Program

## Keynotes at a Glance

Wednesday, 31 May 2017, 9:00 - 10:00

### **Margaret Livingstone**

The Development of Category Domains in Temporal Cortex: What You See is What You Get

Thursday, 1 June 2017, 9:00 - 10:00

### **Christopher Boehnen**

New Frontiers in Unconstrained Face Recognition and Presentation Attack Detection

Friday, 2 June 2017, 9:00 - 10:00

### **Stan Sclaroff**

Deep Models for Video-Based Analysis of Human Gesture and Activities

## FG 2017 Keynotes

### **Prof. Margaret Livingstone**

**Keynote:** The Development of Category Domains in Temporal Cortex: What You See is What You Get



There are distinct regions of the brain, reproducible from one person to the next, specialized for processing the most universal forms of human expertise. What is the relationship between behavioral expertise and dedicated brain structures? Do reproducible brain structures mean only certain abilities are innate, or easily learned, or does intensive early experience influence the emergence of expertise and/or dedicated brain circuits? We found that intensive early, but not late, experience influences the formation of category-selective modules in macaque temporal lobe, both for natural stimuli and for stimuli never naturally encountered by monkeys.

This suggests that, as in early sensory areas, experience can drive functional segregation and that this segregation may determine how that information is processed. The pattern of novel domain formation in symbol-trained monkeys indicates the existence of a proto-architecture that governs where experience can exert its effects on brain organization.

### **Dr Christopher Boehnen**

**Keynote:** Face Recognition: Past, Present, and Future



Chris Boehnen is a Senior Program Manager at the Intelligence Advanced Research Projects Activity (IARPA) focused on biometrics, computer vision, and machine learning. He is the PM for the Odin, Janus, N2N Challenge, and BEST programs. He is also joint faculty at the University of Tennessee. Dr. Boehnen was formerly the founder and team lead for the Secure Computer Vision Team at Oak Ridge National Laboratory (ORNL). In his six years at ORNL he served as Principal Investigator on \$11 million in funding spread over 24 different grants which he conceived, proposed, and successfully executed. He

received the ORNL Early Career Award for Engineering and 3 of his papers have received best paper awards at highly competitive conferences including best paper out of 133 submissions at BTAS 2016. Dr. Boehnen received his B.S., M.S. and Ph.D. from the University of Notre Dame Computer Science and Engineering Department. He has been a member of the biometrics research community since 2001 when he began working on the Face Recognition Grand Challenge.



# FG 2017 Conference Program

## Prof Stan Sclaroff

**Keynote:** Deep Models for Video-Based Analysis of Human Gesture and Activities



of the IEEE and IAPR.

Stan Sclaroff joined the Department of Computer Science at Boston University (BU) after completing his PhD at MIT in 1995. He founded the Image and Video Computing research group at BU in 1995. He served as the Chair of the BU Department of Computer Science from 2007-2013. Stan's research interests are in the areas of tracking, video-based analysis of human motion and gesture, deformable shape matching and recognition, as well as image/video database indexing, retrieval, and data mining methods. His most recent work has focused on human tracking algorithms, analysis and identification of hand motion related to sign language, and filtering methods for multimedia retrieval. He is a Fellow

# FG 2017 Conference Program

## Week's Schedule at a Glance

Tuesday, 30 May 2017	Wednesday, 31 May 2017	Thursday, 1 June 2017	Friday, 2 June 2017	Saturday, 3 June 2017
Workshops/Tutorials	Main Conference	Main Conference	Main Conference	Workshops/Challenges
Lunch Break				
Tutorials /DC	Main Conference	Main Conference	Main Conference	Workshops/Challenges
	Reception	Banquet		

## Tuesday & Saturday Schedule at a Glance (Tutorials, Workshops, Doctoral Consortium)

Tuesday, 30 May 2017		
Room 1	Room 2	Room 3
Tutorial 1	Tutorial 2	ASL4GUP 2017
Lunch Break		
Tutorial 3	Tutorial 4	Doctoral Consortium

Saturday, 3 June 2017		
Room 1	Room 2	Room 3
HFR 2017	Bwild 2017	DCER&HPE 2017
Lunch Break		
HFR 2017	Bwild 2017	FERA 2017

## Workshops:

- First International Workshop on Adaptive Shot Learning for Gesture Understanding and Production (ASL4GUP 2017)
- Biometrics in the Wild (BWild 2017)
- Heterogeneous Face Recognition (HFR 2017)

## Challenges:

- Joint Challenge on Dominant and Complementary Emotion Recognition Using Micro Emotion Features and Head-Pose Estimation (DCER&HPE 2017)
- 3d Facial Expression Recognition and Analysis Challenge (FERA 2017)

## Tutorials:

- Tutorial 1: Remote Physiological Measurement from Images and Videos
- Tutorial 2: Multi-view Face Representation
- Tutorial 3: From Deep Unsupervised to Supervised Models for Face Analysis
- Tutorial 4: Statistical Methods for Affective Computing

# FG 2017 Conference Program

## Main Conference Schedule at a Glance

Wednesday, 31 May 2017	Thursday, 1 June 2017	Friday, 2 June 2017
8:45 - 9:00: Opening		
9:00 - 10:00: Keynote: Margaret Livingstone	9:00 - 10:00: Keynote: Christopher Boehnen	9:00 - 10:00: Keynote: Stan Sclaroff
10:00 – 10:30: Coffee break		
10:30 – 11:30: Face Recognition	10:30 – 11:30: Gesture recognition, analysis and synthesis	10:30 – 11:30: Psychological and behavioral analysis
11:30 – 12:30: Facial Expression Recognition	11:30 – 12:10: Face and Landmark Detection	11:30 – 12:30: Poster Highlights III
End of session till - 14:00: Lunch break		
14:00 – 15:30: Special Session: Remote Physiological Measurement from the Face and Body I	14:00 – 15:30: Special Session: Remote Physiological Measurement from the Face and Body II	14:00 – 15:30: Panel Session: Where is the 'social' in face and gesture research? From individual behaviour to dyadic, multi-party and crowd analysis
15:30 – 16:00: Coffee break		
16:00 – 16:40: Aging	16:00 – 16:40: Technologies and Applications	16:00 – 17:00: Special session: Analysis of Group Interactions
16:40 – 17:30: Poster Highlights I	16:40 – 17:30: Poster Highlights II	17:00 – 18:30: Poster Session III
17:30 – 19:00: Poster Session I Doctoral Consortium Face recognition, analysis and synthesis	17:30 – 19:00: Poster Session II	
17:30 – 19:00: Demos	17:30 – 19:00: Demos	
09:00 – 19:00: Exhibits	09:00 – 19:00: Exhibits	09:00 – 19:00: Exhibits
19:30 – 21:30: Reception	19:30 – 22:30: Banquet	

**Tuesday, 30 May 2017**

## **Tutorial: Remote Physiological Measurement from Images and Videos**

Tutor: Daniel McDuff

Room: 1

Time: 9:00 – 12:30 (Half day - Morning)

**Tutorial Description:** In recent years, there have been significant advances in remote imaging methods for capturing physiological signals. Many of these approaches involve analysis of the human face and utilize computer vision to recover very subtle changes caused by human physiology. The resulting signals are clinically important as vital signs and are also influenced by autonomic nervous system activity. There are numerous healthcare and affective computing applications of remote physiological sensing. The first part of this tutorial will cover the fundamentals of remote imaging photoplethysmography. Following this, there will be a deeper dive into state-of-the-art techniques for motion and dynamic illumination tolerance. The impact of frame rate, image resolution and video compression on blood volume pulse signal-to-noise ratio and physiological parameters accuracy will be characterized and discussed. Advancements in multispectral and hyper-spectral imaging will also be presented, highlighting how hardware as well as software can be adapted to improve physiological measurement. Finally, examples of visualization techniques and applications will be presented.

**About the presenter:** *Daniel McDuff* is a researcher at Microsoft Research in Redmond. His research focuses on building sensing and machine learning tools to enable the automated recognition and analysis of emotions and physiology. He is also a visiting scientist at Brigham and Women's Hospital in Boston. Daniel completed his Ph.D. in the Affective Computing Group at the MIT Media Lab in 2014 and has a B.A. and Masters from Cambridge University. Previously, Daniel was Director of Research at Affectiva and a post-doctoral research affiliate at the MIT Media Lab. During his Ph.D. Daniel collaborated on the first methods to show physiological signals could be measured remotely using ordinary webcams. He is serving on the organizing committee for ACHI2017 and has organized several IEEE workshops and special sessions related to physiological and affect measurement and machine learning. His work has been published in a

number of top journals and conferences. His work has received nominations and awards from Popular Science magazine as one of the top inventions in 2011, South-by-South-West Interactive (SXSWi), The Webby Awards, ESOMAR and the Center for Integrated Medicine and Innovative Technology (CIMIT). His projects have been reported in many publications including The Times, the New York Times, The Wall Street Journal, BBC News, New Scientist and Forbes magazine. He has received best paper awards at IEEE Face and Gesture and Body Sensor Networks.

## **Tutorial: Multi-view Face Representation**

Tutors: Zhengming Ding, Handong Zhao, and Yun Fu

Room: 2

Time: 9:00 – 12:30 (Half day - Morning)

**Tutorial Description:** Multi-view face data are extensively accessible nowadays, since various types of features, view-points and different sensors tend to facilitate better face data representation. For example, multiple features attempt to uncover various knowledge within each view to alleviate the final tasks, since each view would preserve shared and its own specific information. Recently there are a bunch of approaches proposed to deal with the multi-view face data. Our tutorial will cover most multi-view face representation approaches, centered around three major face applications, i.e., multi-view face clustering, multi-view face verification and multi-view face identification. The discussed algorithms will include matrix factorization, low-rank modeling, multi-view subspace learning, transfer learning, and deep learning.

**About the presenters:** *Zhengming Ding* received the B.Eng. degree in information security and the M.Eng. degree in computer software and theory from University of Electronic Science and Technology of China (UESTC), China, in 2010 and 2013, respectively. He is currently working toward the PhD degree in the Department of Electrical and Computer Engineering, Northeastern University, USA. His research interests include machine learning and computer vision. Specifically, he devotes himself to develop scalable algorithms for challenging problems in transfer learning scenario. He was the recipient of the Student Travel Grant of ACM MM 14, ICDM 14, AAAI 16 and IJCAI 16. He received the National Institute of Justice Fellowship. He was the recipient of the best paper award (SPIE). He has served as

# FG 2017 Conference Program

the reviewers for IEEE journals: IEEE Transactions on Neural Networks and Learning Systems, IEEE Transactions on Pattern Analysis and Machine Intelligence, etc. He is an IEEE student member and AAAI student member.

*Handong Zhao* received the B.Eng. degree in computer science and the M.Eng. degree in computer technology from Tianjin University, China, respectively. He is currently working toward the PhD degree in the Department of Electrical and Computer Engineering, Northeastern University, Boston, MA. His research interests include machine learning, computer vision, and data mining. He holds the Dean's Fellowship at Northeastern University, and he is the recipient of the Best Paper Honorable Mention Award at the 2013 ACM International Conference on Internet Multimedia Computing and Service (ICIMCS). He serves as the program committee member for IJCAI 2017 and ICMLA 2016. He is also the reviewers for multiple IEEE transactions. He is a student member of IEEE and AAAI.

*Yun Fu* received the B.Eng. degree in information engineering and the M.Eng. degree in pattern recognition and intelligence systems from Xi'an Jiaotong University, China, respectively, and the M.S. degree in statistics and the Ph.D. degree in electrical and computer engineering from the University of Illinois at Urbana-Champaign, respectively. He is an interdisciplinary faculty member affiliated with College of Engineering and the College of Computer and Information Science at Northeastern University since 2012. His research interests are Machine Learning, Computational Intelligence, Big Data Mining, Computer Vision, Pattern Recognition, and Cyber-Physical Systems. He has extensive publications in leading journals, books/book chapters and international conferences/workshops. He serves as associate editor, chairs, PC member and reviewer of many top journals and international conferences/workshops. He received seven Prestigious Young Investigator Awards from NAE, ONR, ARO, IEEE, INNS, UIUC, Grainger Foundation; seven Best Paper Awards from IEEE, IAPR, SPIE, SIAM; three major Industrial Research Awards from Google, Samsung, and Adobe, etc. He is currently an Associate Editor of the IEEE Transactions on Neural Networks and Learning Systems (TNNLS). He is fellow of IAPR, a Lifetime Senior Member of ACM and SPIE, Lifetime Member of AAAI, OSA, and Institute of Mathematical Statistics, member of Global Young Academy (GYA), INNS and Beckman Graduate Fellow during 2007-2008.

## Tutorial: From Deep Unsupervised to Supervised Models for Face Analysis

Tutors: Richa Singh and Mayank Vatsa

Room: 1

Time: 14:00 – 17:00 (Half day - Afternoon)

**Tutorial Description:** Representation learning approaches have become an integral component of designing any pattern analysis system including face recognition. While learning from data is not new, advances in computing hardware and availability of very large training data has instigated widespread attention towards deep learning approaches. Currently, newer deep learning models/architectures and their applications are proposed almost every day. Face recognition literature has also seen a ubiquitous acceptability and results on benchmark databases show that deep learning algorithms have achieved accuracies, which were once considered arduous. The literature on deep learning for face analysis can be divided into three categories: supervised, unsupervised, and semi-supervised. Approaches focusing on synthesizing input such as super-resolution are typically unsupervised, whereas classification/recognition approaches are either supervised or semi-supervised. The applications of deep learning not only focus on face recognition, they also span in several other areas such as kinship verification and super-resolution to address the challenge of recognizing low resolution face images. This tutorial will focus on unsupervised and supervised deep learning models (e.g. autoencoders, Boltzmann machine) and application of different regularization techniques. We will also discuss the applications of these deep regularized architectures in different applications including (i) Face Verification/Classification, (ii) Kinship Verification, (iii) Face Super-resolution, and (iv) Face Presentation Attack Detection.

**About the presenters:** *Richa Singh* received the Ph.D. degree in Computer Science from West Virginia University, Morgantown, USA, in 2008. She is currently an Associate Professor with the IIT Delhi, India and a Visiting Professor at West Virginia University, USA. Her areas of interest are biometrics, pattern recognition, and machine learning. She is a recipient of the Kusum and Mohandas Pai Faculty Research Fellowship at the IIT Delhi, the FAST Award by Department of Science and Technology, India, and several best paper and best poster awards in international conferences. She is also an Editorial Board Member of Information Fusion (Elsevier), and Associate Editor of IEEE Access and the EURASIP Journal on Image and Video Processing (Springer). She served as the Program Co-Chair of IEEE BTAS 2016 and is serving as the General Co-Chair of ISBA 2017.

# FG 2017 Conference Program

*Mayank Vatsa* received the Ph.D. degree in Computer Science from West Virginia University, Morgantown, USA, in 2008. He is currently an Associate Professor with the IIT Delhi, India and Visiting Professor at West Virginia University, USA. His areas of interest are biometrics, image processing, computer vision, and information fusion. He is a recipient of the AR Krishnaswamy Faculty Research Fellowship, the FAST Award by DST, India, and several best paper and best poster awards in international conferences. He has published more than 175 peer-reviewed papers. He is also the Vice President (Publications) of IEEE Biometrics Council, an Associate Editor of the IEEE Access, and an Area Editor of Information Fusion (Elsevier). He served as the PC Co-Chair of ICB 2013, IJCB 2014, and ISBA 2017.

## **Tutorial: Statistical Methods for Affective Computing**

Tutor: Jeffrey Girard and Jeffrey Cohn

Room: 2

Time: 14:00 – 17:00 (Half day - Afternoon)

**Tutorial Description:** From the evaluation of algorithms to the comparison of experimental groups and approaches, statistical methods are indispensable tools for scientists and engineers interested in affective computing. This tutorial will provide training and hands-on experience with several statistical methods with high relevance in this area. These methods include (1) indexes of categorical and dimensional agreement for quantifying inter-rater reliability and classification performance in a variety of research designs, (2) effect sizes and confidence intervals for quantifying the magnitude and precision of parameter estimates in the presence of sampling error, and (3) general linear modeling for quantifying the strength of the relationship between variables of interest. Attendees will learn the statistical basis of these methods, the assumptions that are required for their use, and standard practices for their implementation, interpretation, and reporting. Syntax, functions, and examples will be provided in both R and MATLAB; attendees are encouraged to bring a laptop with one of these software packages installed.

**About the presenters:** *Jeffrey Girard* is currently a doctoral candidate in Clinical Psychology at the University of Pittsburgh. His work takes a deeply interdisciplinary approach to the study of human behavior, drawing insights and tools from psychology, computer science, and statistics. He is particularly interested in developing and applying technology to advance the study of emotion,

interpersonal communication, and psychopathology (e.g., depression). Jeffrey offers a unique and valuable perspective to the affective computing community, especially regarding research design, statistical analysis, and clinical applications.

*Jeffrey Cohn* is Professor of Psychology and Psychiatry at the University of Pittsburgh and Adjunct Professor of Computer Science at the Robotics Institute at Carnegie Mellon University. He leads interdisciplinary and inter-institutional efforts to develop advanced methods of automatic analysis and synthesis of facial expression and prosody and applies those tools to research in human emotion, social development, nonverbal communication, psychopathology, and biomedicine. His research has been supported by grants from the U.S. National Institutes of Health, National Science Foundation, Autism Foundation, Office of Naval Research, and Defense Advanced Research Projects Agency.

# FG 2017 Conference Program

## First International Workshop on Adaptive Shot Learning for Gesture Understanding and Production– ASL4GUP 2017

Organizers: Juan P Wachs  
Richard Voyles  
Susan Fussell  
Isabelle Guyon  
Sergio Escalera

Room: 3

Time: 8:45 – 12:30 (Half Day)

### 8:45 - 9:00: Opening

### 9:00 - 9:40: Keynote

*Susan Goldin-Meadow*

### 9:40 - 10:00: 0/1/N shot gesture recognition

Supervised learning of gesture-action associations for human-robot collaboration, *D. Shukla, O. Erkent and J. Piater*

### 10:00 - 10:30: Coffee break

### 10:30 - 11:00: Keynote

*Aleix Martinez*

### 11:00 - 12:00: 0/1/N shot gesture recognition

1. One-Shot Gesture Recognition: One Step Towards Adaptive Learning, *M. E Cabrera, N. Sanchez-Tamayo, R. Voyles and J. Wachs*
2. Spatio-Temporal Facial Expression Recognition Using Convolutional Neural Networks and Conditional Random Fields, *B. Hasani and M. Maboor*
3. A Semantical & Analytical Approach for Zero Shot Gesture Learning, *N. Madapana and J. Wachs*

### 12:00 - 12:30: Keynote

*Philippe Schyns*

### 12:30 - 12:50:

A simple geometric-based descriptor for facial expression recognition, *D. Acevedo, P. Negri, ME. Buemi, FG. Fernandez*

## The FG2017 Doctoral Consortium

DC Chairs: Anna Esposito  
Ronald Poppe

Room: 3

Time: 12:30 – 19:00

**Accepted students:** Mohammad Ali, Shalini Bhatia, Maria Cabrera, Zhengming Ding, Doan Giang, Hafsa Ismail, Sumit Jha, Jiwen Lu, Zibo Meng, Marion Morel, Wenxuan Mou, Behnaz Nojavanasghari, Ewa Nowara, Emely da Silva, and Xiang Xu

### 12:30 - 14:00: DC Lunch and Introductions

### 14:00 - 15:30: Social and Affective Aspects

4. Artificial Social Intelligence: A Visual Perspective, *Behnaz Nojavanasghari (Carnegie Mellon University)*
5. Automated Social Skills Coach with Real-Time Feedback on Nonverbal Cues, *Mohammad Ali (University of Rochester)*
6. Improving Speech Related Facial Action Unit Recognition by Audiovisual Information Fusion, *Zibo Meng (University of South Carolina)*
7. Automatic Analysis of Affect and Membership in Group Settings, *Wenxuan Mou (Queen Mary University of London)*
8. Affect Analysis using Multimodal Cues, *Shalini Bhatia (University of Canberra)*

### 15:30 - 16:00 Coffee Break

### 16:00 - 17:15: Head Pose and Applications

1. 3D-Aided Pose Invariant 2D Face Recognition, *Xiang Xu (University of Houston)*
2. Robust Feature Learning for View-Unknown Image Classification, *Zhengming Ding (Northeastern University)*
3. Deep Feature Learning for Facial Age Estimation, *Hao Liu (Tsinghua University)*
4. PPGSecure: Biometric Presentation Attack Detection Using Photoplethysmograms, *Ewa Nowara (Rice University)*
5. Study of Visual Attention in Driving Environment, *Sumit Jha (University of Texas at Dallas)*

### 17:15 - 17:45 Coffee Break

### 17:45 - 19:00: Body Movement and Gesture

1. New Cyclical Pattern and Temporal-Spatial Representation for Robust Dynamic Hand Gesture

# FG 2017 Conference Program

- Recognition, *Doan Giang (Hanoi University of Science & Technology)*
2. Learning Gestures for the First Time, *Maria Cabrera (Purdue University)*
  3. Recognition of Non-Manual Expressions in Brazilian Sign Language, *Emely da Silva (University of Campinas)*
  4. Automatic and Generic Assessment of the Quality of Sport Motions, *Marion Morel (Université Pierre et Marie Curie)*
  5. Fall Prediction by Analysing Gait and Postural Sway from Videos, *Hafsa Ismail (University of Canberra)*



# FG 2017 Conference Program

## Wednesday, 31 May 2017

### 8:45 - 9:00: Opening

*Dmytro Derkach (Universitat Pompeu Fabra), Federico Sukno (Universitat Pompeu Fabra)*

**9:00 - 10:00: Keynote:** The Development of Category Domains in Temporal Cortex: What You See is What You Get, *Margaret Livingstone*

**Chair:** Jeff Cohn

### 12:30 - 14:00: Lunch break

Lunch Talk: Presentation by Baidu

### 10:00-10:30 Coffee break

### 14:00 - 15:30: Special Session: Remote Physiological Measurement from the Face and Body I

**Chair:** Daniel McDuff

### 10:30-11:30: Face Recognition

**Chair:** Kevin Bowyer

Format: 15 mins for presentation, 5 mins for questions

1. Eliminating Physiological Information from Facial Videos

*Weixuan Chen (MIT), Rosalind Picard (MIT)*

2. PPGSecure: Biometrics Presentation Attack Detection using Photoplethysmograms

*Ewa Nowara (Rice University), Ashutosh Sabharwal (Rice University), Ashok Veeraraghavan (Rice University)*

3. The Impact of Video Compression on Remote Cardiac Pulse Measurement Using Imaging Photoplethysmography

*Daniel McDuff (Microsoft Research), Ethan Blackford (Ball/AFRL), Justin Estep (AFRL)*

4. Color-Distortion Filtering for Remote-PPG

*Wenjin Wang (Eindhoven University of Technology), Albertus den Brinker (Philips Research), Sander Stuijk (Eindhoven University of Technology), Gerard de Haan (Philips Research)*

1. Template Adaptation for Face Verification and Identification

*Jeffrey Byrne (Systems & Technology Research), Nate Crosswhite (Systems & Technology Research), Chris Stauffer (Visionary Systems Research), Omkar Parkhi (University of Oxford), Qiong Cao (University of Oxford), Andrew Zisserman (University of Oxford)*

2. LDF-Net: Learning a Displacement Field Network for Face Recognition Across Pose

*Lanqing Hu (Institute of Computing Technology, CAS), Meina Kan (Chinese Academy of Sciences), Shiguang Shan (Academy of Science of China), Xilin Chen (Institute of Computing Technology, CAS)*

3. An All-In-One Convolutional Neural Network for Face Analysis

*Rajeev Ranjan (University of Maryland), Swami Sankaranarayanan (University of Maryland College Park), Carlos Castillo (University of Maryland), Rama Chellappa (University of Maryland at College Park)*

### 15:30 - 16:00: Coffee break

### 16:00 - 16:40: Aging

**Chair:** Alice O'toole

Format: 15 mins for presentation, 5 mins for questions

### 11:30 - 12:30: Facial Expression Analysis

**Chair:** Michel Valstar

Format: 15 mins for presentation, 5 mins for questions

1. Small Sample Deep Learning for Newborn Gestational Age Estimation

*Mercedes Torres Torres (University of Nottingham), Michel Valstar (University of Nottingham), Caroline Henry (University of Nottingham), Carole Ward (University of Nottingham), Don Sharkey (University of Nottingham)*

1. Learning Spatial and Temporal Cues for Multi-label Facial Action Unit Detection

*Wen-Sheng Chu (CMU), Fernando de la Torre (CMU), Jeff Cohn (University of Pittsburgh)*

2. Apparent and real age estimation in still images with deep residual regressors on APPA-REAL database

*Eirikur Agustsson (ETH Zurich), Radu Timofte (ETH Zurich), Sergio Escalera (University of Barcelona), Xavier Baro (Universitat Oberta de Catalunya), Isabelle Guyon (Berkeley), Rasmus Rothe (ETH Zurich)*

2. What will Your Future Child Look Like? Modeling and Synthesis of Hereditary Patterns of Facial Dynamics

*Itir Önal Ertuğrul (Middle East Technical University), Hamdi Dibeklioglu (Delft University of Technology)*

3. Local shape spectrum analysis for 3D facial expression recognition

# FG 2017 Conference Program

## 16:40 - 17:30: Poster Highlights I

Chair: Laurel Rieck

Format: 1 min per DC poster, 2 mins per regular poster

Posters from Poster Session I

## 17:30 - 19:00: Poster Session I

### Doctoral Consortium Posters

1. Robust Feature Learning for View-Unknown Image Classification, *Zhengming Ding (Northeastern University)*
2. Deep Feature Learning for Facial Age Estimation, *Hao Liu (Tsinghua University), Jiwen Lu (Tsinghua University), Jianjiang Feng (Tsinghua University), Jie Zhou (Tsinghua University)*
3. Recognition of Non-Manual Expressions in Brazilian Sign Language, *Emely Silva (UNICAMP), Paula Paro Costa (UNICAMP)*
4. Evaluation of the quality of any sport motion, *Marion Morel (ISIR), Catherine Achard (), Richard Kulpa (IRISA-INRIA), Severine Dubuisson (UPMC)*
5. Improving Speech Related Facial Action Unit Recognition by Audiovisual Information Fusion, *Zibo Meng (University of South Carolina), Yan Tong (University of South Carolina)*
6. New Cyclical Pattern and Temporal-Spatial Representation for Robust Dynamic Hand Gesture Recognition, *Doan Giang (HUST), Vu Hai (HUST) Hai Tran (HUST)*
7. Affect Analysis using Multimodal Cues, *Shalini Bhatia (University of Canberra)*
8. Falling Prediction by Analysing Gait and Postural Sway from Video, *Hafsa Ismail (University of Canberra)*
9. Automatic Analysis of Affect and Membership in Group Settings, *Wenxuan Mou (Queen Mary University of London), Hatice Gunes (University of Cambridge), Ioannis Patras (Queen Mary University of London)*
10. Artificial Social Intelligence: A Visual Perspective, *Bebnaz Nojavanasghari*
11. Automated Social Skills Coach with Real-Time Feedback on Nonverbal Cues, *Mohammad Ali (University of Rochester)*
12. Study of Visual Attention in Driving Environment, *Sumit Jha (University of Texas at Dallas)*

### Face Recognition, Analysis and Synthesis Posters

13. Fast, Dense Feature SDM on an iPhone, *Ashton Fagg (QUT), Simon Lucey (CMU), Sridha Sridharan (QUT)*
14. EAC-Net: A Region-based Deep Enhancing and Cropping Approach for Facial Action Unit Detection, *Wei Li (CUNY City College), Zhibang Zhu*

*(CUNY Graduate Center & City College), Farnaz Abtahi (CUNY Graduate Center), Lijun Yin (SUNY at Binghamton)*

15. Self-Error-Correcting Convolutional Neural Network for Learning with Noisy Labels, *Xin Liu (ICT@CAS), Shaoxin Li (Tencent), Meina Kan (ICT, CAS), Shiguang Shan (Academy of Science of China), Xilin Chen (Institute of Computing Technology, CAS)*
16. FaceNet2ExpNet: Regularizing a Deep Face Recognition Net for Expression Recognition, *Hui Ding (University of Maryland), Shaohua Kevin Zhou, Rama Chellappa (University of Maryland at College Park)*
17. A Joint Discriminative Generative Model for Deformable Model Construction and Classification, *Ioannis Marras (Imperial College London), Symeon Nikitidis (Imperial College London), Stefanos Zafeiriou (Imperial College London), Maja Pantic (Imperial College London)*
18. Multi-Output Random Forests for Facial Action Unit Detection, *Arnaud Dapogny (ISIR), Kevin Bailly (UPMC), Severine Dubuisson (UPMC)*
19. A Feedback Estimation Approach For Therapeutic Facial Training, *Cornelia Dittmar (Technische Universität Ilmenau), Joachim Dengler (Friedrich Schiller University Jena), Horst-Michael Gross (Ilmenau University of Technology)*
20. Video-Based Face Association and Identification, *Ching-Hui Chen (University of Maryland), Jun-Cheng Chen, Carlos Castillo, Rama Chellappa (University of Maryland at College Park)*
21. Ordinal Deep Feature Learning for Facial Age Estimation, *Hao Liu (Tsinghua University), Jiwen Lu (Tsinghua University), Jianjiang Feng (Tsinghua University), Jie Zhou (Tsinghua University)*
22. Nested Shallow CNN-Cascade for Face Detection in the Wild, *Jingjing Deng (Swansea University), Xianghua Xie (Swansea University)*
23. Deep Multi-Task Learning for Joint Prediction of Heterogeneous Face Attributes, *Fang Wang (Institute of Computing Technology, CAS), Hu Han (Institute of Computing Technology), Shiguang Shan (Academy of Science of China), Xilin Chen (Institute of Computing Technology, CAS)*
24. Automatic Semantic Face Recognition, *Nawaf Almudhabka (University of Southampton), Mark Nixon (University of Southampton) Jonathon Hare (University of Southampton)*
25. Learning Deep Features for Hierarchical Classification of Mobile Phone Face Datasets in Heterogeneous Environments, *Neeru Narang (West Virginia University), Thirimachos Bourlai (West Virginia University) Michael Martin (), Dimitris Metaxas (Rutgers)*

# FG 2017 Conference Program

26. Fast k-nearest Neighbor Search for Face Identification Using Bounds of Residual Score, *Masato Ishii (NEC), Hitoshi Imaoka (), Atushi Sato ()*
27. A Fully End-to-End Cascaded CNN for Facial Landmark Detection, *Zhenliang He (ICT, CAS), Meina Kan (Chinese Academy of Sciences), Jie Zhang (ICT, CAS), Xilin Chen (Institute of Computing Technology, CAS), Shiguang Shan (Academy of Science of China)*
28. Towards Estimating the Upper Bound of Visual-Speech Recognition: The Visual Lip-Reading Feasibility Database, *Adriana Fernández López (Universitat Pompeu Fabra), Federico Sukno (Universitat Pompeu Fabra), Oriol Martínez (UPF)*
29. Kinship Verification on Families in the Wild with Marginalized Denoising Metric Learning, *Shuyang Wang (Northeastern University), Joseph Robinson (Northeastern University), Yun Fu (Northeastern University)*
30. EPAT: Euclidean Perturbation Analysis and Transform - An Agnostic Data Adaptation Framework for Improving Facial Landmark Detectors, *Yue Wu (Information Sciences Institute), Wael AbdAlmageed (Information Sciences Institute), Stephen Rawls (Information Sciences Institute), Premkumar Natarajan (Information Sciences Institute)*

## 17:30 - 19:00: Demos

**Chair:** Laurel Riek

1. Open-Source Software for Continuous Measurement and Media Annotation, *Jeffrey Girard (University of Pittsburgh)*
2. Gestural Interactions of Embodied Educational Technology Using One-Shot Machine Learning, *Michael Junokas (University of Illinois), Greg Kohlburn (), Ben Lane (), Sabil Kumar (University of Illinois), Robb Lindgren (University of Illinois), Wai-Tat Fu (University of Illinois)*
3. Monitoring Patients in the Wild, *Haibo Wang (Philips Research North America), Kees Zon (Philips Research North America), Ibor Kirenko (Philips Research Eindhoven), Mukul Rocque (Philips Research Eindhoven)*
4. Automatic Immersion of Brands in Videos, *William Marino (Uru), Brunno Attorre (Uru)*
5. Predicting First Impressions with Deep Learning, *Sam Anthony (Harvard University), Mel McCurrie (University of Notre Dame), Walter Scheirer (University of Notre Dame)*

## 9:00 - 19:00 Exhibits

- MUKH; ObjectVideo Labs; STR

# FG 2017 Conference Program

## Thursday, 1 June 2017

**9:00 - 10:00: Keynote:** Face Recognition and Presentation Attack Detection, *Christopher Boehnen*

**Chair:** Kevin Bowyer

### 10:00-10:30 Coffee break

**10:30-11:30: Gesture recognition, analysis & synthesis**

**Chair:** Vitomir Štruc

Format: 15 mins for presentation, 5 mins for questions

1. Occlusion aware hand pose recovery from sequences of depth images  
*Meysam Madadi (CVC-UAB), Sergio Escalera (UB), Alex Carruesco Llorens (UPC), Carlos Andujar (UPC), Xavier Baro (Universitat Oberta de Catalunya), Jordi Gonzalez (Computer Vision Center)*
2. Gesture Recognition Using Enhanced Depth Motion Map and Static Pose Map  
*Zhi Zhang (Xi'an Jiaotong University), Shenghua Wei (Xi'an Jiaotong University), Yonghong Song (Xi'an Jiaotong University), Yuanlin Zhang (Xi'an Jiaotong University)*
3. Sequential Subspace Clustering via Temporal Smoothness  
*Haijun Liu (UESTC)*

**11:30 - 12:10: Face and Landmark Detection**

**Chair:** Ioannis Patras

Format: 15 mins for presentation, 5 mins for questions

1. A Coupled Encoder-Decoder Network for Joint Face Detection and Landmark Localization  
*Lezi Wang (Rutgers), Xiang Yu (NEC Laboratories America), Dimitris Metaxas (Rutgers)*
2. KEPLER: Keypoint and Pose Estimation of Unconstrained Faces by Learning Efficient H-CNN Regressors  
*Amit Kumar (University of Maryland), Azadeh Alavi (University of Maryland), Rama Chellappa (University of Maryland at College Park)*

**End of session - 14:00: Lunch break**

Lunch Talk: Presentation by MERL

**14:00 - 15:30: Special Session: Remote Physiological Measurement from the Face and Body II**

**Chair:** Justin Estep

1. Multi-task Convolutional Neural Network for Patient Detection and Skin Segmentation in Continuous Non-contact Vital Sign Monitoring  
*Sitthichok Chaichulee (University of Oxford), Mauricio Villarrol Montoya (University of Oxford), Joao Jorge (University of Oxford), Carlos Arteta (University of Oxford), Gabrielle Green (Oxford University Hospitals NHS Foundation Trust), Kenny McCormick (Oxford University Hospitals NHS Foundation Trust), Andrew Zisserman (University of Oxford), Lionel Tarassenko (University of Oxford)*
2. Non-Contact Blood Pressure Monitoring Based on Simultaneous Photoplethysmogram and Ballistocardiogram Video Recording  
*Dangdang Shao (Arizona State University), Yuting Yang (Arizona State University), Francis Tsow (Arizona State University), Chenbin Liu (Arizona State University), Nongjian Tao (Arizona State University)*
3. Non-contact vital sign monitoring in the clinic  
*Mauricio Villarrol Montoya (University of Oxford), Joao Jorge (University of Oxford), Chris Pugh (University of Oxford), Lionel Tarassenko (University of Oxford)*
4. Non-contact monitoring of respiration in the neonatal intensive care unit  
*Joao Jorge (University of Oxford), Mauricio Villarrol Montoya (University of Oxford), Sitthichok Chaichulee (University of Oxford), Alessandro Guazzzi (University of Oxford), Sara Davis (Oxford University Hospitals), Gabrielle Green (Oxford University Hospitals NHS Foundation Trust), Kenny McCormick (Oxford University Hospitals NHS Foundation Trust), Lionel Tarassenko (Oxford University)*

### 15:30 - 16:00: Coffee break

**16:00 - 16:40: Technologies and Applications**

**Chair:** M. Ehsan Hoque

Format: 15 mins for presentation, 5 mins for questions

1. Know Your Neighborhood: Proximity-Aware Hierarchical Clustering of Faces  
*Wei-An Lin (University of Maryland), Jun-Cheng Chen (University of Maryland), Rama Chellappa (University of Maryland at College Park)*
2. Exploiting feature representations through similarity learning and ranking aggregation for person re-identification  
*Julio Cesar Jacques Junior (University of Barcelona), Xavier Baro (Universitat Oberta de Catalunya), Sergio Escalera (University of Barcelona)*

# FG 2017 Conference Program

## 16:40 - 17:30: Poster Highlights II

**Chair:** Zakia Hammal

Format: 2 mins per poster

Posters from Poster Session II

## 17:30 - 19:00: Poster Session II

### Technologies and Applications

1. Assessing Public Speaking Ability From Thin Slices of Behavior, *Mathieu Chollet (USC ICT), Stefan Scherer (USC ICT)*
2. BoxFlow: Unsupervised Face Detector Adaptation From Images to Videos, *Jianshu Li (NUS), Jiasbi Feng (National University of Singapore) Luoqi Liu (National University of Singapore) Terence Sim (NUS)*
3. Rule-based Facial Makeup Recommendation System, *Taleb Alashkear (Northeastern University), Songyao Jiang (Northeastern University) Yun Fu (Northeastern University)*
4. Fusion of Valence and Arousal Annotations through Dynamic Subjective Ordinal Modelling, *Adria Ruiz (Universitat Pompeu Fabra), Oriol Martinez (UPF) Xavier Binefa (Pompeu Fabra University) Federico Sukno (Universitat Pompeu Fabra)*
5. Large-scale Affective Content Analysis: Combining Media Content Features and Facial Reactions, *Daniel McDuff (Microsoft Research), Mohammad Soleymani (Université de Geneve)*
6. Extreme Value Analysis for Mobile Active User Authentication, *Pramuditha Perera (Rutgers University), Vishal Patel (Rutgers University)*
7. Towards Multiple User Active Authentication in Mobile Devices, *Pramuditha Perera (Rutgers University), Vishal Patel (Rutgers University)*
8. An Online Tool for the Annotation of 3D Models, *Connah Kendrick (Manchester Metropolitan), Kevin Tan (Manchester Metropolitan University), Tomos Williams (Image Metrics), Moi Hoon Yap (Manchester Metropolitan University)*
9. Large Margin Multi-Modal Triplet Metric Learning, *Xing Di (Rutgers University), Vishal Patel (Rutgers University)*
10. Evaluation of Automated Identity Masking Method (AIM) in Naturalistic Driving Study (NDS), *Asal Baraghizadeh (University of Texas at Dallas), Thomas Karnowski (Oak Ridge National Laboratory), David Bolme (Oak Ridge National Laboratory), Alice O'Toole (University of Texas at Dallas)*
11. Multi-attribute Residual Network (MAResNet) for Soft-biometrics Recognition in Surveillance Scenarios,

*Esube Bekele (NRL), Cody Narber (US Naval Research Lab), Wallace Lawson (US Naval Research Lab)*

12. Estimating Sheep Pain Level Using Facial Action Unit Detection, *Yiting Lu (University of Cambridge), Marwa Mahmoud (Cambridge University) Peter Robinson (University of Cambridge)*

### Gesture Recognition, Analysis and Synthesis

13. Computer Analysis of Sentiment Interpretation in Musical Conducting, *Kelly Karipidou (KTH), Josefin Abnlund (KTH), Anders Friberg (KTH), Simon Alexanderson (KTH), Hedvig Kjellstrom (KTH)*
14. 3D Hand-Object Pose Estimation from Depth with Convolutional Neural Networks, *Duncan Goudie (The University of Manchester), Aphrodite Galata (The University of Manchester)*
15. EGGNOG: A continuous, multi-modal data set of naturally occurring gestures with ground truth labels, *Isaac Wang (University of Florida), Mohtadi Ben Fraj (Colorado State University), Pradyumna Narayana (Colorado State University), Dhruva Patil (Colorado State University), Gururaj Mulay (Colorado State University), Rahul Bangar (Colorado State University), Ross Beveridge (Colorado State University), Bruce Draper (Colorado State University), Jaime Ruiz (University of Florida)*
16. *Modout: Learning Multi-modal Architectures by Stochastic Regularization*, *Fan Li (University of Guelph), Natalia Neveriva (LIRIS), Christian Wolf (LIRIS), Graham Taylor (University of Guelph)*
17. Recognizing Words from Gestures: Discovering Gesture Descriptors Associated with Spoken Utterances, *Shogo Okada (Tokyo Institute of Technology), Kazuhiro Otsuka (NTT Communication Science Laboratories)*

### Body Action and Activity Recognition

18. Pose for Action - Action for Pose, *Umar Iqbal (University of Bonn), Martin Garbade (University of Bonn), Juergen Gall (University of Bonn)*
19. Deep Refinement Convolutional Networks for Human Pose Estimation, *Ioannis Marras (Queen Mary University of London), Petar Palasek (Queen Mary University of London), Ioannis Patras (Queen Mary University of London)*
20. Human Postural Sway Estimation from Noisy Observations, *Hafsa Ismail (University of Canberra, Data61), Ibrahim Radwan (University of Canberra), Hanna Suominen (Data61), Gordon Waddington (University of Canberra), Roland Goecke (University of Canberra)*
21. 3D Multistroke Mapping (3DMM): Transfer of hand-drawn pattern representation for skeleton-based gesture recognition, *Said Yacine Boulahia (IRISA-INRIA/ INSA de Rennes), Eric Anquetil (IRISA-INRIA)*

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/ *INSA de Rennes*, *Richard Kulpa (IRISA-INRIA)*,  
*Franck Multon (IRISA-INRIA)*

22. Recurrent Human Pose Estimation, *Vasileios Belagiannis (University of Oxford)*, *Andrew Zisserman (University of Oxford)*
23. A survey on deep learning based approaches for action and gesture recognition in image sequences, *Hugo Escalante (INAOE)*, *Albert Clapés (Universitat de Barcelona)*, *Sergio Escalera (University of Barcelona)*, *Marco Bella ()*, *Maryam Asadi ()*, *Xavier Baro (Universitat Oberta de Catalunya)*, *Victor Ponce-López (University of Barcelona)*, *Isabelle Guyon (Berkeley)*, *Shobreh Kasaei (Sharif University of Technology)*
24. Seeing Skin in Reduced Coordinates, *Debangna Neog (University of British Columbia)*, *Anurag Ranjan (University of British Columbia)*, *Dinesh Pai (University of British Columbia)*
25. Temporal Archetypal Analysis for Action Segmentation, *Eftychia Fotiadou (Imperial College London)*, *Ioannis Panagakis (Middlesex University)*, *Maja Pantic (Imperial College London)*
26. The DAily Home LIfe Activity Dataset : A High Semantic Activity Dataset for Online Recognition, *Geoffrey Vaquette (CEA)*, *Astrid Orcesi (CEA)*, *Laurent Lucat (CEA LIST)*, *Catherine Achard*

- Banquet Talk by 3DMD

## 17:30 - 19:00: Demos

**Chair:** Laurel Riek

1. Open-Source Software for Continuous Measurement and Media Annotation, *Jeffrey Girard (University of Pittsburgh)*
2. Gestural Interactions of Embodied Educational Technology Using One-Shot Machine Learning, *Michael Junokas (University of Illinois)*, *Greg Kohlburn ()*, *Ben Lane ()*, *Sabil Kumar (University of Illinois)*, *Robb Lindgren (University of Illinois)*, *Wai-Tat Fu (University of Illinois)*
3. Monitoring Patients in the Wild, *Haibo Wang (Philips Research North America)*, *Kees Zon (Philips Research North America)*, *Ihor Kirenko (Philips Research Eindhoven)*, *Mukul Rocque (Philips Research Eindhoven)*
4. Automatic Immersion of Brands in Videos, *William Marino (Uru)*, *Brunno Attorre (Uru)*
5. Predicting First Impressions with Deep Learning, *Sam Anthony (Harvard University)*, *Mel McCurrie (University of Notre Dame)*, *Walter Scheirer (University of Notre Dame)*

## 9:00 - 19:00 Exhibits

- MUKH; ObjectVideo Labs; STR

## 19:30 - 22:30 Banquet

# FG 2017 Conference Program

## Friday, 2 June 2017

**9:00 - 10:00: Keynote:** Deep Models for Video-Based Analysis of Human Gesture and Activities, *Stan Sclaroff*

**Chair:** Rama Chellappa

### 10:00-10:30 Coffee break

**10:30-11:30: Psychological & behavioral analysis**

**Chair:** Rachael Jack

Format: 15 mins for presentation, 5 mins for questions

1. Curriculum Learning for Facial Expression Recognition  
*Liangke Gui (Carnegie Mellon University), Tadas Baltrusaitis (Carnegie Mellon University), LP Morency (Carnegie Mellon University)*
2. Generic to Specific Recognition Models for Membership Analysis in Group Video  
*Wenxuan Mou (Queen Mary University of London), Christos Tzelepis (Centre for Research and Technology Hellas), Vasileios Mezaris (Centre for Research and Technology Hellas), Hatice Gunes (University of Cambridge), Ioannis Patras (Queen Mary University of London)*
3. Predicting First Impressions with Deep Learning  
*Walter Scheirer (University of Notre Dame), Mel McCurrie (University of Notre Dame), Fernando Beletti (University of Notre Dame), Lucas Barbosa (University of Notre Dame), Allen Westendorp (University of Notre Dame), Sam Anthony (Harvard University)*

### 11:30 - 12:30: Poster Highlights III

**Chair:** Hamdi Dibeklioglu

Format: 2 mins per poster

Posters from Poster Session III.

### 12.30 - 14:00: Lunch break

Lunch Talk: Presentation by DI4D

**14:00 - 15:30: Panel:** Where is the 'social' in face and gesture research? From individual behaviour to dyadic, multi-party and crowd analysis

**Chair:** Ronald Poppe

**Panelists:** Alice O' Toole, LP Morency, Michel Valstar, and Shogo Okada

### 15:30 - 16:00: Coffee break

**16:00 - 17:00: Special Session: Analysis of Group Interactions**

**Chair:** Shogo Okada

Format: 15 mins for presentation, 5 mins for questions

1. Group Activity Recognition with Differential Recurrent Convolutional Neural Networks  
*Naijan Zhuang (University of Central Florida), Tiaoerhongjiang Yusufu (University of Central Florida), Jun Ye (University of Central Florida), Kien Hua (University of Central Florida)*
2. Clothing and People - A Social Signal Processing Perspective  
*Maedeh Aghaei (University of Barcelona), Federico Parezan (University of Verona), Mariella Dimicoli (University of Barcelona), Marco Cristani (University of Verona)*
3. Lend me a Hand: Auxiliary Image Data Improves Interaction Detection  
*Coert Gemenen (Utrecht University), Ronald Poppe (University of Utrecht), Remco Veltkamp (Utrecht University)*

### 17:00 - 18:30: Poster Session III

#### Face Recognition, Analysis and Synthesis

1. Noisy Face Image Sets Refining Collaborated with Discriminant Feature Space Learning, *Xin Liu (ICT@CAS), Meina Kan (ICT, CAS) Shiguang Shan (Academy of Science of China) Xilin Chen (Institute of Computing Technology, CAS)*
2. A Quantum Probability Inspired Framework for Image-set based Face Identification, *Negar Hassanpour (University of Alberta), Liang Chen (Univ of N. British Columbia)*
3. Identity-Aware Convolutional Neural Network for Facial Expression Recognition, *Zibo Meng (University of South Carolina), Ping Liu (Sony Electronics) Jie Cai (University of South Carolina) Shizhong Han (University of South Carolina) Yan Tong (University of South Carolina)*
4. A Study of Convolutional Sparse Feature Learning for Human Age Estimation, *Xiaolong Wang (UDEL), Robert Li (Samsung), Yin Zhou (udel), Chandra Kamthamettu (University of Delaware)*
5. Head Pose and Expression Transfer using Facial Status Score, *Tomoki HOSOI ()*
6. Sayette Group Formation Task (GFT) Spontaneous Facial Expression Database, *Jeffrey Girard (University of Pittsburgh), Wen-Sheng Chu (Carnegie Mellon University), Laszlo Jeni (Carnegie Mellon University), Jeff Cohn (University of Pittsburgh), Fernando de la Torre (CMU), Michael Sayette (University of Pittsburgh)*

# FG 2017 Conference Program

7. 3D Facial Geometric Attributes based Anti-spoofing Approach against Mask Attacks, *Yinbang Tang (LIRIS), Liming Chen (LIRIS)*
  8. Unleash the Black Magic in Age: a Multi-task Deep Neural Network Approach for Cross-age Face Verification, *Xiaolong Wang (UDEL), Yin Zhou (udel), Deguang Kong (Samsung), Jon Currey (Samsung), Dawei Li (Samsung Research America, Inc.), Jiayu Zhou (MSU)*
  9. Rapid Synthesis of Massive Face Sets for Improved Face Recognition, *Iacopo Masi (USC), Tal Hassner (USC), Anh Tran (Uni. of Southern California), Gerard Medioni (USC)*
  10. OULU-NPU: A mobile face presentation attack database with real-world variations, *Zinelabidine Boulkenafet (University of Oulu), Jukka Komulainen (), Lei Li (Northwestern Polytechnical University, China) Xiaoyi Feng (), Abdenour Hadid (University of Oulu)*
  11. Robust Facial Landmark Localization Using LBP Histogram Correlation Based Initialization, *Yiyun Pan (Wuhan University Of Technology), Junwei Zhou (Wuhan University of Technology), Yongsheng Gao (), Jianwen Xiang (), Shengnu Xiong (), Yanchao Yang ()*
  12. Deformable Models of Ears in-the-wild for alignment and recognition, *Yuxiang Zhou (Imperial College London), Stefanos Zafeirion (Imperial College London)*
  13. Pooling Facial Segments to Face: The Shallow and Deep Ends, *Upal Mahbub (University of Maryland), Sayantan Sarkar (University of Maryland), Rama Chellappa (University of Maryland at College Park)*
  14. Joint Head Pose Estimation and Face Alignment Framework using Global and Local CNN Features, *Xiang Xu (University of Houston), Ioannis Kakadiaris (University of Houston)*
  15. Face Detection with the Faster R-CNN, *Huaizu Jiang (University of Massachusetts), Erik Learned-Miller (UMass Amherst)*
  16. Apathy is the Root of all Expressions, *Stella Grasshof (Leibniz Universität Hannover), Hanno Ackermann (), Sami Brandt (), Jörn Ostermann ()*
  17. Local-Global Landmark Confidences for Face Recognition, *KangGeon Kim (USC), Feng-Ju Chang (USC), Jongmoo Choi (Uni. of Southern California), LP Morency (CMU), Ramakant Nevatia (), Gerard Medioni (USC)*
  18. Face and Image Representation in Deep CNN Features, *Connor Parde (University of Texas at Dallas), Carlos Castillo (University of Maryland), Matthew Hill (The University of Texas at Dallas), Yolanda Colon (The University of Texas at Dallas), Swami Sankaranarayanan (University of Maryland), Jun-cheng Chen (University of Maryland), Alice O'toole (University of Texas at Dallas)*
  19. Fusing Multilabel Deep Networks for Facial Action Unit Detection, *Mina Bishay (Queen Mary University of London), Ioannis Patras (Queen Mary University of London)*
  20. Fusing Deep Learned and Hand-Crafted Features of Appearance, Shape, and Dynamics for Automatic Pain Estimation, *Joy Egede (University of Nottingham), Michel Valstar (University of Nottingham), Brais Martinez (Amazon)*
  21. Constrained Ensemble Initialization for Facial Landmark Tracking in Video, *Yuan Li (Carnegie Mellon University), Tadas Baltrusaitis (CMU), LP Morency (CMU)*
  22. A Cross Benchmark Assessment of Deep Convolutional Neural Networks for Face Recognition, *P. Jonathon Phillips ()*
  23. Robust and Accurate 3D Head Pose Estimation through 3DMM and Online Head Model Reconstruction, *Yu Yu (Idiap EPFL), Kenneth Funes Mora (Idiap Research Institute), Jean-Marc Odobez ()*
- ### Psychological and Behavioral Analysis
24. Historical heterogeneity predicts smiling: Evidence from large-scale observational analyses, *Jeffrey Girard (University of Pittsburgh), Daniel McDuff (Microsoft Research)*
  25. Implicit Media Tagging and Affect Prediction from RGB-D video of spontaneous facial expressions, *Daniel Hadar (Hebrew University), Talia Tron , Daphna Weinsball*
  26. Five Principles for Crowd-source Experiments in Face Recognition, *Alice O'toole (University of Texas at Dallas), P. Jonathon Phillips ()*
  27. Improving Children's Gaze Prediction via Separate Facial Areas and Attention Shift Cue, *Songjiang Li (Peking University), Wen Cui (Peking University), Jinshi Cui (Peking University), Li Wang (Peking University) Ming Li (Peking University First Hospital), Hongbin Zha (Peking University)*
  28. What makes a gesture a gesture? Neural signatures involved in gesture recognition, *Maria Cabrera (Purdue University), Keisha Novak (Purdue University), Richard Voyles (Purdue University), Daniel Foti (Purdue University), Juan Wachs (Purdue University),*
  29. A Video-Based Facial Behaviour Analysis Approach to Melancholia, *Shalini Bhatia (University of Canberra), Munawar Hayat (University of Canberra), Michael Breakspear (QIMR) Gordon Parker (UNSW), Roland Goecke (University of Canberra)*
  30. Automatic Detection of ADHD and ASD from Expressive Behaviour in RGBD Data, *Shashank Jaiswal (University of Nottingham), Michel Valstar (University of Nottingham), Alinda Gillott (), David Daley ()*
  31. Investigating Facial Behavior Indicators of Suicidal Ideation, *Eugene Laksana (Inst. for Creative Technology),*



# FG 2017 Conference Program

*Tadas Baltrusaitis (CMU), LP Morency (CMU), John  
Pestian (Cincinnati Children's Hospital Medical Center)*

## **9:00 - 19:00 Exhibits**

- MUKH; ObjectVideo Labs; STR

# FG 2017 Conference Program

**Saturday, 3 June 2017**

## **Joint Challenge on Dominant and Complementary Emotion Recognition Using Micro Emotion Features and Head-Pose Estimation – DCER & HPE 2017**

Organizers: Gholamreza Anbarjafari  
Jüri Allik  
Cagri Ozcinar  
Sylwia Hyniewska

Room: 3

Time: 9:00 – 12:30 (Half Day)

**9:00 - 9:15: Opening**

**9:15 - 9:30:** Overview of results, Tracks and Challenge winners

**9:30 - 10:00: Invited talk**

*Yun Raymond Fu*

**10:00 - 10:30: Coffee break**

**10:30 - 11:00: Invited talk**

*Guoying Zhao*

**11:00 - 12:15: Session 1**

1. Joint Challenge on Dominant and Complementary Emotion Recognition Using Micro Emotion Features and Head-Pose Estimation: Databases, *Iris Lusi, Julio C. S. Jacques Junior, Jelena Gorbova, Xavier Baró, Sergio Escalera, Hasan Demirel, Juri Allik, Cagri Ozcinar, Gholamreza Anbarjafari*
2. Multi-modality Network with Visual and Geometrical Information for Micro Emotion Recognition, *Jianzhu Guo, Shuai Zhou, Jinlin Wu, Jun Wan, Xiangyu Zhu, Zhen Lei, Stan Li*
3. Head Pose Estimation Based on 3-D Facial Landmarks Localization and Regression, *Dmytro Derkach, Adria Ruiz, Federico Sueno*
4. Automatic Hidden Sadness Detection Using micro-expressions, *Jelena Gorbova, Marina Marjanovic, Angelina Njegus, Milica Čolović, Hasan Demirel, Gholamreza Anbarjafari*
5. Dominant and Complementary Multi-Emotional Facial Expression Recognition Using C-Support Vector Classification, *Christer Loob, Pejman Rasti, Iris Lusi, Julio C. S. Jacques Junior, Xavier Baró, Sergio Escalera, Tomasz Sapinski, Dorota Kaminska, Gholamreza Anbarjafari*

**12:15 - 12:30: Closing**

**12:30 - 14:00: Lunch break**

## **3D Facial Expression Recognition and Analysis Challenge – FERA 2017**

Organizers: Michel Valstar  
Jeff Cohn  
Lijun Yin  
Maja Pantic

Room: 3

Time: 14:00 – 17:30 (Half Day)

**12:30 - 14:00: Lunch break**

**14:00 - 15:00: Invited talk**

*Fernando de la Torre*

**15:00 - 15:30: Session 1**

1. FERA 2017 - Addressing Head Pose in the Third Facial Expression Recognition and Analysis Challenge, *Lijun Yin, Michel Valstar, Laszlo A Jeni, Jeffrey Cohn, Maja Pantic, Jeffrey M Girard, Enrique Sánchez-Lozano, Zheng Zhang*
2. Multi View Facial Action Unit Detection based on CNN and BLSTM-RNN, *Jun He, Dongliang Li, Bin Yang, Siming Cao, Bo Sun, Lejun Yu*

**15:30 - 16:00: Coffee break**

**16:00 - 17:15: Session 2**

1. Support Vector Regression of Sparse Dictionary-based Features for View-Independent Action Unit Intensity Estimation, *Markus Kächele, Mohammadreza Amirian, Günther Palm, Friedhelm Schwenke*
2. Facial Action Units Detection with Multi-Features and -AUs Fusion, *Qin Jin, Xinrui Li, Shizhe Chen*
3. AUMPNet: simultaneous Action Units detection and intensity estimation on multipose facial images using a single convolutional neural network, *Olga Bellon, Luciano Silva, Júlio C Batista, Vítor Albiero*
4. Pose-independent Facial Action Unit Intensity Regression Based on Multi-task Deep Transfer Learning, *Jimin Pi, Bertram Shi, Yuqian Zhou*
5. View-Independent Facial Action Unit Detection, *Chuangao Tang, Jingwei Yan, Wenming Zheng, Zhen Cui, Yang Li, Qiang Li, Tong Zhang*

**17:15 - 17:30: Announcement of winners & Closing**

# FG 2017 Conference Program

## Heterogeneous Face Recognition – HFR 2017

Organizers: Saquib Sarfraz  
Rainer Stiefelhagen  
Shuowen (Sean) Hu  
Ben Riggan  
Nathan Short

Room: 1

Time: 9:00 – 17:00 (Full Day)

**9:00 - 9:15: Opening**

**9:15 - 9:45: Welcome and overview**

**9:45 - 10:30: Keynote**

*Dr. Boehnen*

**10:30 - 11:30: Session 1**

1. Cross-modal facial attribute recognition with geometric features, *C. Bradley, J. Ventura, T.E. Boulton*
2. Deep network shrinkage applied to cross-spectrum face recognition, *C. Reale, H. Lee, H. Kwon, R. Chellappa*
3. On matching visible to passive infrared face images using image synthesis & denoising, *N. Ochia, T. Bourlai*

**11:30 - 12:30: Panel discussion:** Synergy of heterogeneous face recognition research between government, academia, and industry

**12:30 - 14:00: Lunch break**

**14:00 – 14:45: Keynote**

*Prof. Guillermo:* Not Afraid of the Dark: NIR-VIS Face Recognition via Cross-spectral Hallucination and Low-rank Embedding

**14:45 – 15:30: Keynote**

*Prof. Bourlai:* Face Recognition under Challenging Conditions

**15:30 - 15:45: Coffee break**

**15:45 - 16:45: Session 2**

1. Lower resolution face recognition in surveillance systems using discriminant correlation analysis, *M. Haghghat, M. Abdel-Mottaleb*

2. Multi-level feature learning for face recognition under makeup changes, *Z. Zheng, C. Kambhamettu*
3. Extended spectral to visible comparison based on spectral band selection method for robust face recognition, *N. Vetrekar, R. Ramachandra, K. Raja, R. Gad, C. Busch*

**16:45 - 17:00: Closing**

## Biometrics in the Wild – B-Wild 2017

Organizers: Bir Bhanu  
Abdenour Hadid  
Qiang Ji  
Mark Nixon  
Vitomir Struc

Room: 2

Time: 8:30 – 15:00 (Full Day)

**9:00 - 9:10: Opening**

**9:10 – 10:00: Keynote 1**

Face Recognition: Recent Progress and Opportunities, *Ioannis A. Kakadiaris*

**10:00 - 10:30: Coffee break**

**10:30- 11:30: Face recognition and landmarking**

1. Learning CNNs for face recognition from weakly annotated images, *Vojtech Franc, Jan Cech*
2. Attention-Based Template Adaptation for Face Verification, *Bin Dong, Zhanfu An, Jian Lin, Weibong Deng*
3. Learning Local Responses of Facial Landmarks with Conditional Variational Auto-Encoder for Face Alignment, *Shuying Liu, Yipeng Huang, Jiani Hu, Weibong Deng*

**11:30- 12:30: Face analysis**

1. Age, Gender and Fine-Grained Ethnicity Prediction using Convolutional Neural Networks for the East Asian Face, *Nisha Srinivas, Harleen Atwal, Derek Rose, Gayathri Mahalingam, Karl Ricanek, David Bolme*
2. Metric-Promoted Siamese Network for Gender Classification, *Yipeng Huang, Shuying Liu, Jiani Hu, Weibong Deng*

# FG 2017 Conference Program

3. Boosting-POOF: Boosting Part Based One vs One Feature for Facial Expression Recognition in the Wild, *Zhiwen Liu, Shan Li, Weihong Deng*

**12:30 - 13:40: Lunch break**

**13:40 – 14:30: Keynote**

TBA

**14:30 - 15:30: Iris, Ear and Gait Biometrics**

1. Context-Aware Person Re-identification in the Wild via fusion of Gait and Anthropometric features, *Athira Nambiar, Alexandre Bernardino, Jacinto Nascimento, Ana Fred*
2. Exploiting Data Redundancy for Error Detection in Degraded Biometric Signatures Resulting From in the Wild Environments, *João C. Neves, Hugo Proenca*
3. Training Convolutional Neural Networks with Limited Training Data for Ear Recognition in the Wild, *Ziga Emersic, Dejan Stepec, Vitomir Struc, Peter Peer*

**15:30: Closing**

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