Welcome Message

It is our pleasure and privilege to welcome you to the Sixth IEEE International Conference on Biometrics: Theory, Applications and Systems (BTAS 2013). The Washington DC area continues to play host to this premier biometrics conference. We hope your experience at BTAS is rewarding both professionally and personally!

Advances in sensor design, computational power, pattern recognition, image and signal processing, computer vision, cryptography, mobile computing, and machine learning have facilitated the development of biometric methods for a wide range of applications. The interplay between forensics and biometrics, and the need for identity management schemes in applications ranging from national security to healthcare, has accelerated the development of biometric solutions in both military and civilian applications. Biometric-based national ID card initiatives in countries such as India have highlighted the need for designing biometric techniques that are robust, scalable and computationally efficient. At the same time, privacy and security concerns related to the acquisition, storage and transmission of biometric data have generated research in template protection, anti-spoofing methods and vulnerability analysis. Furthermore, performance prediction models are being developed and large-scale evaluation studies are being conducted to assess the feasibility of deploying biometric systems in unconstrained environments.

Consequently, BTAS continues to attract high quality papers covering a broad range of biometric modalities including face, fingerprint, ocular, voice, palmprint, hand geometry, gait, ear, ECG, and soft biometrics, as well as related topics such as anti-spoofing, biometric databases, biometric cryptosystems, cancellable biometrics, covariate analysis, aging effects, large scale deployments, multi-biometric fusion, performance evaluation, security and privacy, social impact analysis, template protection and usability studies. This year BTAS received a total of 137 submissions. The paper selection process, coordinated by the Program Chairs, was 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 consisting of over 100 biometric experts conducted the reviews. Each submission was reviewed by three experts who were asked to comment on the strengths, weaknesses, novelty and impact of the work. The reviewers were also asked to justify their recommendation for accepting or rejecting a submission. During the author rebuttal phase, authors were given the opportunity to provide a response to the reviewers' comments and concerns. The Program Chairs used the reviewers' comments along with the authors' response to render a final decision on each paper. As a result of this well-organized process, 34 submissions were selected for presentation in the Oral track, while 39 submissions were selected for presentation in the Poster track. The selected papers will be presented in 8 oral sessions and 3 poster sessions. In addition, each poster session will be preceded by a spotlight session where the authors will have two minutes to highlight the contents of their poster. As always, we hope to see many intense, productive and enlightening discussions at the oral and poster sessions.

BTAS 2013 will feature 4 tutorials: "Spoofing and Anti-Spoofing in Biometrics" by Sébastien Marcel; "Face Recognition by Humans and Machines" by Alice D'Oro; "Iris Recognition: From Origin to Current Research Frontiers" by Kevin Bowyer; and "1-to-1 Forensic Facial Comparison" by Richard Vorder Bruegge. These tutorials will allow participants to interact with experts in the field.

Additionally, there will be three exciting plenary lectures by prominent researchers. Yoshua Bengio will present "Deep Learning using AI" on September 30, Alessandro Acquisti will discuss "Privacy in the Age of Augmented Reality" on October 1, and Mark Burge will highlight "IARPA's Janus Program" on October 2. These lectures are expected to generate plenty of interesting and stimulating discussions during the conference.

The technical program will also consist of 9 demos that will be showcased during the poster sessions on September 30 and October 1. BTAS 2013 will also feature exhibits by 3dMD, Digital Signal Corporation and IET Journals. In addition, the Career Pathways and Doctoral Symposium (CPDS) will allow young researchers to meet with a panel of distinguished scientists and leaders from academia and industry who will share their workplace experiences, and discuss challenges and mechanisms for career advancement.

BTAS 2013 will have two social events: the Reception on September 30 sponsored by Progeny, and the Banquet and Awards ceremony on October 1 sponsored by Lumidigm and Safran Morpho. These events will be a great opportunity to renew old acquaintances and establish new connections.

We are grateful to a number of researchers for their exceptional assistance in organizing this event. These include Karl Ricanek, Local Arrangements chair; Trina Russ, Finance chair; Richa Singh, Publications chair; Thirumacos Bourliai and Stephanie Schuckers, Demos and Competitions chairs; Kuntal Sengupta, Shishir K. Shah and Theocharis Theocharis, Professional Development Activities chairs; Chris Boeohnen, Exhibits chair; Bernadette Dorizzi and Norman Poh, Tutorial chairs; Ajay Kumar, Publicity chair; Antzita Dantcheva and Georgios Evangelopoulos, Media chairs; Christoph Busch and Jim Macey, Panel chairs; and Xi Zhao, Registration chair. We are deeply indebted to Harriet Baldwin and Julie Dowling for their service as Conference Secretariat. We would also like to thank the BTAS 2013 Advisory Committee (Kevin Bowyer, Rama Chellappa, Patrick Flynn, Anil Jain, Josef Kittler, Stan Li, Jonathon Philips, Sudeep Sarkar, and Tieniu Tan) for their valuable suggestions and feedback during the planning and organization process.

BTAS benefits significantly from its several industrial sponsorships and we want to acknowledge and thank the contributions of these industrial partners: Lumidigm and Safran Morpho are Platinum Sponsors; Progeny Systems is a Gold Sponsor; Digital Signal Corporation is a Silver Sponsor; IET Journals is a Bronze Sponsor; and Cognitec is a General Sponsor. To all the sponsors and their representatives in attendance, thank you!

As an IEEE conference, BTAS is co-sponsored by the IEEE Biometrics Council and the IEEE Systems, Man and Cybernetics Society. Plans are already underway for a joint BTAS and ICB meeting (IJCB 2014) to be held in Florida, USA. If this is your first BTAS meeting, welcome! If you are a BTAS veteran, welcome back! In either case, we hope you have a productive and enjoyable meeting, and that BTAS continues to capture the most exciting contributions from our talented research community.

Ioannis A. Kakadiaris and Arun Ross, General Chairs

Mark N. Ikon, Nalini Ratha, Zhenan Sun, Massimo Tistarelli, Program Chairs

http://www.btas2013.org/
# Program Schedule

## Sunday, September 29, 2013

**Sunday 09:00 – 12:00**  
**Tutorial I: Spoofing and Anti-Spoofing in Biometrics: lessons learned from the TABULA RASA project**  
Sébastien Marcel (Idiap Research Institute, Switzerland)  
Venue: Francis Scott Key Salon A

**Sunday 09:00 – 12:00**  
**Tutorial II: Face Recognition by Humans and Machines**  
Alice J. O'Toole (The University of Texas at Dallas, USA)  
Venue: Francis Scott Key Salon B

**Sunday 12:00 – 2:00**  
Lunch: On Your Own

**Sunday 14:00 – 17:00**  
**Tutorial III: Iris Recognition: From Origin to Current Research Frontiers**  
Kevin Bowyer (University of Notre Dame, USA)  
Venue: Francis Scott Key Salon A

**Sunday 14:00 – 17:00**  
**Tutorial IV: 1-to-1 Forensic Facial Comparison**  
Richard W. Vorder Bruegge (Federal Bureau of Investigation, USA)  
Venue: Francis Scott Key Salon B

## Monday, September 30, 2013

**Monday 07:30 - 08:10**  
Breakfast  
Venue: Capital View Ballroom

**Monday 08:10 - 08:40**  
Welcome by General Chairs & Program Committee Chairs

**Monday 08:40 - 10:00**  
**Oral I: 2D Face Recognition**  
Session Chair: Patrick Flynn (University of Notre Dame, USA)  
Venue: Capital View Ballroom

**Monday 08:40 - 10:00**  
**O-01: Appearance, Context and Co-occurrence Ensembles for Identity Recognition in Personal Photo Collections**  
Archana Sapkota (University of Colorado, Colorado Springs, USA), Raghuraman Gopalani (AT&T Research, USA), Eric Zavesky (AT&T Labs Research, USA)  
Terrance Boult (University of Colorado, Colorado Springs, USA)

**Monday 08:40 - 10:00**  
**O-02: Video-to-Video Face Matching: Establishing a Baseline for Unconstrained Face Recognition**  
Lacey Best-Rowden (Michigan State University, USA), Brenda Kalre (Noblis, USA), Joshua Klonz (Michigan State University, USA), Anil Jain (Michigan State University, USA)

**Monday 08:40 - 10:00**  
**O-03: Picture-Specific Cohort Score Normalization for Face Pair Matching**  
Yunlian Sun (University of Sassari, Italy), Massimo Tistarelli (University of Sassari, Italy), Norman Poh (University of Surrey, UK)

**Monday 10:00 - 10:45**  
Poster and Demo Spotlight - I  
Session Chair: Xiaoming Liu (Michigan State University, USA)  
Venue: Capital View Ballroom

**Monday 10:00 - 10:45**  
**P-01: Similarity of Iris Texture Between Siblings**  
William Vranderic (University of Notre Dame, USA), Kevin Bowyer (University of Notre Dame, USA)  
**P-02: Personal Authentication Using Hand Vein and Knuckle Shape Point Cloud Matching**  
Qishen Zhang (Beijing Institute of Technology, China), Ya Zhou (Beijing Institute of Technology, China), Xiaoming Hu (Beijing Institute of Technology, China), Danting Wang (Beijing Institute of Technology, China)  
**P-03: Face Recognition Using Early Biologically Inspired Features**  
M in Li (IBM China Research Lab, China), Nalini Ratha (IBM Watson Research Center, USA), Weihong Qian (IBM China Research Lab, China), Shenghua Bao (IBM China Research Lab, China), Zhong Su (IBM China Research Lab, China)  
**P-04: Efficient Processing of MRFs for Unconstrained-Pose Face Recognition**  
Sherwin Rahimzadeh Arashloo (Urmia University, Iran), Josef Kittler (University of Surrey, UK)  
**P-05: Identity Verification Using Iris Images: Performance of Human Examiners**  
Kevin MCGinn (University of Notre Dame, USA), Samuel Tarin (University of Notre Dame, USA), Kevin Bowyer (University of Notre Dame, USA)  
**P-06: Non-Iris Occlusions Detection**  
Michal Haindl (Institute of Information Theory and Automation of the AS CR, Czech Republic), Milos Krupicka (Czech Technical University, Czech Republic)  
**P-07: Minimizing the Impact of Low Interoperability between Optical Fingerprint Sensors**  
Emanuela Marasco (West Virginia University, USA), Luca Lugini (West Virginia University, USA), Bojan Cucic (West Virginia University, USA), Thirimachos Bourlai (West Virginia University, USA)  
**P-08: Decision Fusion from Parts and Samples for Robust Iris Recognition**  
Immaculada Tomeo-Reyes (Queensland University of Technology, Australia), Vipin Chandran (Queensland University of Technology, Australia)
Monday 10:45 - 12:15
Poster and Demo Session - I
[Papers and Demos in the Spotlight Session will be showcased here]
Venue: Potomac Ballroom Salon C&D
Coffee Break

Monday 12:15 - 14:00
Doctoral Symposium and Career Pathways (By Invitation Only)
Venue: Lincoln Room

Monday 12:15 - 14:00
Lunch: On your own

Monday 14:00 - 15:20
Oral II: Iris Biometrics
Session Chair: James Matey (NIST, USA)
Venue: Capital View Ballroom

O-05: Adaptive and Localized Iris Weight Map for Accurate Iris Recognition under Less Constrained Environments
Chun-Wei Tan (The Hong Kong Polytechnic University, HK), Ajay Kumar (The Hong Kong Polytechnic University, HK)

O-06: Coupled Feature Selection for Cross-sensor Iris Recognition
Lihu Xiao (Institute of Automation, Chinese Academy of Sciences, China), Zhenan Sun (NLPR, China), Ran He (Chinese Academy of Sciences, China), Tieniu Tan (Chinese Academy of Sciences, China)

O-07: Code-level Information Fusion of Low-Resolution Iris Image Sequences for Personal Identification at a Distance
Jing Lu (University of Science and Technology of China, China), Zhenan Sun (NLPR, China), Tieniu Tan (Chinese Academy of Sciences, China)

O-08: Effects of Iris Surface Curvature on Iris Recognition
Joseph Thompson (University of Notre Dame, USA), Patrick Flynn (University of Notre Dame, USA), Kevin Bowyer (University of Notre Dame, USA), Hector Santos-Villalobos (Oak Ridge National Laboratory, USA)

Monday 15:20 - 16:10
Keynote Lecture - I
Session Chair: Massimo Tistarelli (University of Sassari, Italy)
Venue: Capital View Ballroom

Deep Learning towards AI
Prof. Yoshua Bengio
Department of Computer Science and Operations Research
Canada Research Chair in Statistical Learning Algorithms, Canada

Monday 16:10 - 16:30
Coffee Break
Venue: Capital View Foyer

Monday 16:30 - 17:50
Oral III: Behavioral Biometrics
Session Chair: Sebastien Marcel (Idiap Research Institute, Switzerland)
Venue: Capital View Ballroom

P-09: Biometric Authentication via Complex Oculomotor Behavior
Oleg Komogortsev (Texas State University, USA), Corey Holland (Texas State University, USA)

P-10: Age Estimation with Expression Changes Using Multiple Aging Subspaces
Chao Zhang (West Virginia University, USA), Guesdeng Guo (West Virginia University, USA)

P-11: Are Iris Crypts Useful in Identity Recognition?
Feng Shen (University of Notre Dame, USA), Patrick Flynn (University of Notre Dame, USA)

P-12: Transient Biometrics using Finger Nails
Igor Barros Barbosa (Norwegian University of Science and Technology, Norway), Theoharis Theoharis (Norwegian University of Science and Technology, Norway), Christian Schellewald (Norwegian University of Science and Technology, Norway), Cham Athwal (Birmingham City University, UK)

Demos
D-01: Continuous User Authentication via Typing Behavior
Joseph Roth (Michigan State University, USA), Xiaoming Uu (Michigan State University, USA), Dimitri Metaxas (Rutgers University, USA)

D-02: Trusted BWI: Privacy and Trust Enhanced Biometric Web Identities
Abdallah Albahdai (University of Colorado, Colorado Springs, USA), Hamdan Alzahrani (University of Colorado, Colorado Springs, USA), Lalit Jain (University of Colorado, Colorado Springs, USA), Terrance Boul (University of Colorado, Colorado Springs, USA)

D-03: Demonstration of the Effect of Pupil Dilation on Iris Recognition
Esteran Ortiz (University of Notre Dame, USA)

D-04: Altered Fingerprints: Detection and Matching
Soweon Yoon (Michigan State University, USA), Kai Cao (Michigan State University, USA), and Amil Jain (Michigan State University, USA)

D-05: The FaceSketchID System
Scott Klum (Michigan State University, USA)
### Program Schedule

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<th>Session</th>
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<td>Reception (Sponsored by Progeny)  &lt;br&gt;Venue: Capital View Ballroom</td>
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<tr>
<td><strong>Tuesday 07:30 - 08:40</strong></td>
<td>Breakfast  &lt;br&gt;Venue: Capital View Ballroom</td>
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<td><strong>Tuesday 08:40 - 10:00</strong></td>
<td>Oral IV: 3D Face Analysis  &lt;br&gt;Session Chair: Trina Russ (Digital Signal Corporation, USA)  &lt;br&gt;Venue: Capital View Ballroom</td>
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<td><strong>Tuesday 10:00 - 10:45</strong></td>
<td>Poster and Demo Spotlight - II  &lt;br&gt;Session Chair: Brendan Klare (Noblis, USA)  &lt;br&gt;Venue: Capital View Ballroom</td>
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<tr>
<td><strong>Tuesday 10:45 - 12:00</strong></td>
<td>Lunch  &lt;br&gt;Venue: Capital View Ballroom</td>
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<tr>
<td><strong>Tuesday 12:00 - 16:00</strong></td>
<td>Poster Sessions  &lt;br&gt;Venue: Capital View Ballroom</td>
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<td><strong>Tuesday 16:00 - 17:30</strong></td>
<td>Poster and Demo Spotlight - III  &lt;br&gt;Venue: Capital View Ballroom</td>
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<tr>
<td><strong>Tuesday 17:30 - 19:00</strong></td>
<td>Reception (Sponsored by Progeny)  &lt;br&gt;Venue: Capital View Ballroom</td>
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### Oral Presentations

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<td>O-09: Long Term Facial Parts Tracking in Thermal Imaging for Uncooperative Emotion Recognition</td>
<td>Eslam Mostafa (University of Louisville, USA), Aly Farag (University of Louisville, USA), Ahmed Shalaby (University of Louisville, USA), Asem Ali (University of Louisville, USA), Travis Gault (University of Louisville, USA), Ali Mahmoud (University of Louisville, USA)</td>
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<td>O-10: Biometric Identification Using the Dynamic Features of the Eyes</td>
<td>Ali Darwish (American University of Sharjah, UAE), Michel Pasquier (American University of Sharjah, UAE)</td>
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<td>O-11: Behavioral Biometric Verification of Student Identity in Online Course Assessment and Authentication of Authors in Literary Works</td>
<td>John Monaco (Pace University, USA), John Stewart (Lake Erie College, USA), Sung-Hyuk Cha (Pace University, USA), Charles Tappert (Pace University, USA)</td>
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<td>O-12: Continuous Mobile Authentication Using A Novel Graphic Touch Gesture Feature</td>
<td>Xi Zhao (University of Houston, USA), Tao Feng (University of Houston, USA), Weidong Shi (University of Houston, USA)</td>
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### Poster Presentations

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<tr>
<th>Poster Presentation</th>
<th>Authors</th>
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<td>P-13: Scaling-Robust Fingerprint Verification with Smartphone Camera in Real-life Scenarios</td>
<td>R Raghavendra (Gjøvik University College, Norway), Christoph Busch (Fraunhofer Institute, Germany), Bian Yang (Gjøvik University College, Norway)</td>
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<td>P-14: Structural Similarity based Image Quality Map for Face Recognition across Plastic Surgery</td>
<td>Yunlian Sun (University of Sassari, Italy), Massimo Tistarelli (University of Sassari, Italy), Davide Maltoni (University of Bologna, Italy)</td>
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<td>P-15: Variation in Accuracy of Textured Contact Lens Detection Based on Iris Sensor and Contact Lens Manufacturer</td>
<td>James Doyle (University of Notre Dame, USA), Kevin Bowyer (University of Notre Dame, USA), Patrick Flynn (University of Notre Dame, USA)</td>
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<td>P-16: Augmenting SIFT with 3D Joint Differential Invariants for Multimodal, Hybrid Face Recognition</td>
<td>Marinella Cadoni (University of Sassari, Italy), Andrea Lagorio (University of Sassari, Italy), Enrico Grosso (University of Sassari, Italy)</td>
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P-17: Latent Fingerprint Indexing: Fusion of Level 1 and Level 2 Features
Alessandra Paulino (Michigan State University, USA), Eryun Liu (Michigan State University, USA), Kai Cao (Michigan State University, USA), Anil Jain (Michigan State University, USA)

P-18: A Linear Regression Analysis of the Effects of Age Related Pupil Dilation Change in Iris Biometrics
Estefan Oriz (University of Notre Dame, USA), Kevin Bowyer (University of Notre Dame, USA), Patrick Flynn (University of Notre Dame, USA)

P-19: Recognition of Motion Blurred Iris Images
Jing Liu (University of Science and Technology of China, China), Zhenan Sun (NLP, China), Tienniu Tan (Chinese Academy of Sciences, China)

P-20: Off-Angle Iris Correction using a Biological Model
Joseph Thompson (University of Notre Dame, USA), Hector Santos-Villalobos (Oak Ridge National Laboratory, USA), Mahmut Karakaya (Oak Ridge National Laboratory, USA), Del Barstow (Oak Ridge National Laboratory, USA), David Bolme (Oak Ridge National Laboratory, USA), Christopher Boehm (Oak Ridge National Laboratory, USA)

P-21: SNOW: Understanding the Causes of Strong, Neutral, and Weak Face Impostor Pairs
Amanda Sgroi (University of Notre Dame, USA), Kevin Bowyer (University of Notre Dame, USA), Patrick Flynn (University of Notre Dame, USA), Jonathon Phillips (National Institute of Standards and Technology, USA)

P-22: An Image Statistics Approach towards Efficient and Robust Refinement for Landmarks on Facial Boundary
Felix Juefei-Xu (Carnegie Mellon University, USA), Marios Savvides (Carnegie Mellon University, USA)

P-23: On the Existence of Face Quality Measures
Jonathon Phillips (National Institute of Standards and Technology, USA), Ross Beveridge (Colorado State University, USA), David Bolme (Oak Ridge National Laboratory, USA), Bruce Draper (Colorado State University, USA), Geof Givens (Colorado State University, USA), Yul Man Lui (Colorado State University, USA), Su Cheng (National Institute of Standards and Technology, USA), Mohammad Naveem Teli (Colorado State University, USA), Hao Zhang (Colorado State University, USA)

P-24: On RGB-D Face Recognition using Kinect
Gaurav Goswami (IIIT Delhi, India), Samarth Bharadwaj (IIIT Delhi, India), Mayank Vatsa (IIIT Delhi, India), Richa Singh (IIIT Delhi, India)

P-25: LivDet-Iris 2013 Liveness Detection Competition 2013 (Poster only)
David Yambay (Clarkson University, USA), Jay Doyle (University of Notre Dame, USA), Adam Czajka (Warsaw University of Technology, Poland), Kevin Bowyer (University of Notre Dame, USA), Stephanie Schuckers (Clarkson University, USA)

D-06: Face Recognition with Kinect
Cesare Ciaccio (West Virginia University, USA), Guodong Guo (West Virginia University, USA), Brian W. Seer (West Virginia University, USA)

D-07: WS-Biometric Devices
Karen Marshall (National Institute of Standards and Technology, USA), Kayee Kwong (National Institute of Standards and Technology, USA)

D-08: An End-to-end Tool for Creating Image Quality Assessment Algorithms
Michael Hapgood (Neya Systems LLC, USA), Parag Batavia (Neya Systems LLC, USA)

D-09: Off-the-person Electrocardiography for Biometric Applications
Hugo Plácido da Silva (IT - Instituto de Telecomunicações, Portugal)

Tuesday 10:45 - 12:15
Poster and Demo Session - II
(Papers and Demos in the Spotlight Session will be showcased here)
Venue: Francis Scott Key Ballroom

Tuesday 12:15 - 14:00
Lunch: On your own

Tuesday 14:00 - 15:20
Oral V: Finger and Ocular Biometrics
Session Chair: Richa Singh (IIIT Delhi, India)
Venue: Capital View Ballroom

O-17: Fingerprint Liveness Detection using Binarized Statistical Image Features
Luca Ghiani (University of Cagliari, Italy), Adeenour Haddad (University of Oulu, Finland), Gian Luca Marcilis (University of Cagliari, Italy), Fabio Roli (University of Cagliari, Italy)

O-18: A Multi-Finger Knuckle Recognition System for Door Handle
Shoichiro Aoyama (Tohoku University, Japan), Koichi Ito (Tohoku University, Japan), Takafumi Aoki (Tohoku University, Japan)

O-19: Eyebrow Shape Analysis by Using a Modified Functional Curve Procrustes Distance
Yishi Wang (University of North Carolina, USA), Cuixian Chen (University of North Carolina, USA), Midori Albert (University of North Carolina, USA), Yaw Chang (University of North Carolina, USA), Karl Ricanek (University of North Carolina, USA)

O-20: Is the Eye Region More Reliable Than the Face? - A Preliminary Study of Face-based Recognition on Transgender Dataset
Gayatri Mahalingam (University of North Carolina, USA), Karl Ricanek (University of North Carolina, USA)
Wednesday, October 02, 2013

**Oral VII: Evaluation Metrics and Datasets**

Session Chair: Ross Beveridge (Colorado State University, USA)
Venue: Capital View Ballroom

- O-25: Open Source Biometric Recognition
  Joshua Klontz (Michigan State University, USA), Brendan Klare (Noblis, USA), Scott Klum (Michigan State University, USA), Anil Jain (Michigan State University, USA), Mark Burge (United States Naval Academy, USA)

- O-26: Large Scale Unconstrained Openset Face Database
  Archana Sapkota (University of Colorado, Colorado Springs, USA), Terrance Boult (University of Colorado, Colorado Springs, USA)

- O-27: Relating ROC and CMC Curves via the Biometric Menagerie
  Brian Decann (West Virginia University, USA), Arun Ross (Michigan State University, USA)

- O-28: Relations among Security Metrics for Template Protection Algorithms
  Manabu Inuma (Josai University, Japan), Akira Otsuka (National Institute of Advanced Industrial Science and Technology, Japan)

**Breakfast**

Venue: Capital View Ballroom

Wednesday 07:30 - 08:40

**Poster and Demo Spotlight - III**

Session Chair: Mayank Vatsa (IIIT Delhi, India)
Venue: Capital View Ballroom

- P-26: Generating Registration-Free Cancelable Fingerprint Templates Based on Minutia Cylinder-Code Representation
  Ning Zhang (Chinese Academy of Science, China), Xi Zhang (Chinese Academy of Science, China), Yali Zang (Chinese Academy of Science, China), Xiaofei Jia (Chinese Academy of Science, China), Jie Tian (Chinese Academy of Science, China)

- P-27: Secure Privacy-Preserving Protocols for Outsourcing Continuous Authentication of Smartphone Users with Touch Data
  Sathy Govindarajan (New York Institute of Technology, USA), Paolo Gasti (New York Institute of Technology, USA), Kiran Balagani (New York Institute of Technology, USA)

- P-28: Combining Gait and Face for Tackling the Elapsed Time Challenges
  Yu Guan (University of Warwick, UK), Xingjie Wei (University of Warwick, UK), Chang-Tsun Li (University of Warwick, UK), Gian Luca Marcialis (University of Cagliari, Italy), Fabio Roli (University of Cagliari, Italy), Massimo Tistarelli (University of Sassari, Italy)

Tuesday, September 30, 2013

**Keynote Lecture – II**
Session Chair: Kevin Bowyer (University of Notre Dame, USA)
Venue: Capital View Ballroom

Privacy in the Age of Augmented Reality
Prof. Alessandro Acquisti
Associate Professor at the Heinz College, Carnegie Mellon University, USA

**Coffee Break**
Venue: Capital View Foyer

Tuesday 16:10 - 16:30

**Oral VI: Anti-spoofing and Vulnerability Analysis**
Session Chair: Robert Rowe (Lumidigm, USA)
Venue: Capital View Ballroom

- O-21: Spoofing in 2D Face Recognition with 3D Masks and Anti-spoofing with Kinect
  Nesli Erdogmus (Idiap Research Institute, Switzerland), Sebastien Marcel (Idiap Research Institute, Switzerland)

- O-22: A One-Class Classification Approach to Generalised Speaker Verification
  Spoofting Countermeasures Using Local Binary Patterns
  Federico Alegre (EURECOM, France), Asmaa Amehraye (EURECOM, France), Nicholas Evans (EURECOM, France)

- O-23: On the Vulnerability of an EEG-based Biometric System to Hill-climbing Attacks
  Algorithms Comparison and Possible Countermeasures
  Emanuele Majorana (University Roma Tre, Italy), Gabriel Hine (University Roma Tre, Italy), Daria La Rocca (University Roma Tre, Italy), Patrizio Campisi (University of Roma Tre, Italy)

- O-24: Targeted Impersonation As A Tool For The Detection Of Biometric System Vulnerabilities
  John Bustard (University of Southampton, UK), Mark Nixon (University of Southampton), John Carter (University of Southampton, UK)

Tuesday 19:00 - 22:00

Banquet and Awards Program (Sponsored by Lumidigm and Safran Morpho)
Venue: Capital View Ballroom

Wednesday 10:00 - 10:45

Poster and Demo Spotlight - III
Session Chair: Mayank Vatsa (IIIT Delhi, India)
Venue: Capital View Ballroom

- P-26: Generating Registration-Free Cancelable Fingerprint Templates Based on Minutia Cylinder-Code Representation
- P-27: Secure Privacy-Preserving Protocols for Outsourcing Continuous Authentication of Smartphone Users with Touch Data
- P-28: Combining Gait and Face for Tackling the Elapsed Time Challenges
P-29: Efficient Human Recognition System using Ear and Profile Face
Rajeev Rathore (Indian Institute of Technology Kanpur, India), Surya Prakash (Indian Institute of Technology Indore, India), Phalguni Gupta (Indian Institute of Technology Kanpur, India)

Abdul Serwadda (Louisiana Tech University, USA), Vr Phoha (Louisiana Tech University, USA), Zibo Wang (Louisiana Tech University, USA)

P-31: Finger ECG Signal for User Authentication: Usability and Performance
Hugo Plácido da Silva (IT - Instituto de Telecomunicações, Portugal), André Lourenço (Instituto Superior de Engenharia de Lisboa/ IT - Instituto de Telecomunicações, Portugal), Ana Fred (IT - Instituto de Telecomunicações, Portugal), Anil Jain (Michigan State University, USA)

P-32: Context based Face Anti-Spoofing
Jukka Komulainen (University of Oulu, Finland), Abdenour Hadid (University of Oulu, Finland), Matti Pietikäinen (University of Oulu, Finland)

P-33: A Novel Methodology for the Interoperability Evaluation of An Iris Segmentation Algorithm
Irina Gertsovich (Blekinge Institute of Technology, Sweden), Josef Ström Bartunek (Blekinge Institute of Technology, Sweden), Mikael Nilsson (Lund University, Sweden), Lars Håkansson (Blekinge Institute of Technology, Sweden)

P-34: A Baseline for Assessing Biometrics Performance Robustness: A Case Study across Seven Iris Datasets
Yooyoung Lee (National Institute of Standards and Technology, USA), James Filliben (National Institute of Standards and Technology, USA), Ross Micheals (National Institute of Standards and Technology, USA), Michael Garris (National Institute of Standards and Technology, USA), Jonathon Phillips (National Institute of Standards and Technology, USA)

P-35: Investigating Mobile Device Picking-up Motion as a Novel Biometric Modality
Tao Feng (University of Houston, USA), Xi Zhao (University of Houston, USA), Weidong Shi (University of Houston, USA)

P-36: Complexion as a Soft Biometric in Human-Robot Interaction
Wallace Lawson (Naval Research Lab, USA), Eric Martinson, Greg Trafton (Naval Research Lab, USA)

P-37: The Challenge of Face Recognition from Digital Point-and-Shoot Cameras
Ross Beveridge (Colorado State University, USA), Jonathon Phillips (National Institute of Standards and Technology, USA), David Bolme (Oak Ridge National Lab, Bruce Draper (Colorado State University, USA), Geoff Givens (Colorado State University, USA), Yui Man Lui (Colorado State University, USA), Mohammad Nayeem Teli (Colorado State University, USA), Hao Zhang (Colorado State University, USA), W. Todd Scruggs (Science Applications International Corporation, USA), Kevin Bowyer (University of Notre Dame, USA), Patrick Flynn (University of Notre Dame, USA), Su Cheng (National Institute of Standards and Technology, USA)

P-38: Effect of Calibration Data on Forensic Likelihood Ratio from a Face Recognition System
Tauseef Ali (University of Twente, Netherlands), Luuk Spreeuwers (University of Twente, Netherlands), Raymond Veldhuis (University of Twente, Netherlands), Didier Meuwly (Netherlands Forensic Institute, Netherlands)

P-39: Trusted BWI: Privacy and Trust Enhanced BiometricWeb Identities
Abdullah Alahdah (University of Colorado, Colorado Springs, USA), Hamdan Alzahrani (University of Colorado at Colorado Springs, USA), Lalit Jain (University of Colorado at Colorado Springs, USA), Terrance Boul (University of Colorado, Colorado Springs, USA)

P-40: Automated Clarity and Quality Assessment for Latent Fingerprints
Anush Sankaran (IIIT Delhi, India), Mayank Vatsa (IIIT Delhi, India), Richa Singh (IIIT Delhi, India)

Wednesday 10:45-12:15
Poster and Demo Session - III
[Papers and Demos in the Spotlight Session will be showcased here]
Venue: Francis Scott Key Ballroom
Coffee Break

Wednesday 12:15-14:00
Lunch: On Your Own

Wednesday 14:00-14:50
Keynote Lecture – III
Session Chair: Ioannis Kakadiaris (University of Houston, USA)
Venue: Capital View Ballroom
IARPA's Janus Program
Dr. Mark Burge, Program Director at IARPA

Wednesday 14:50-16:50
Oral VIII: Papers with the Best Reviews
Session Chair: Zhenan Sun (NLPR, China) and Arun Ross (Michigan State University, USA)
Venue: Capital View Ballroom
O-29: Quality-dependent View Transformation Model for Cross-view Gait Recognition
Daigo Muramatsu (Osaka University, Japan), Yasushi Yagi (Osaka University, Japan), Yasushi Makihara (Osaka University, Japan), Tauseef Ali (University of Twente, Netherlands), Luuk Spreeuwers (University of Twente, Netherlands), Raymond Veldhuis (University of Twente, Netherlands), Didier Meuwly (Netherlands Forensic Institute, Netherlands)
### Program Schedule

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<td>Stephen Siena (Carnegie Mellon University, USA), Vishnu Naresh Boddeti (Carnegie Mellon University, USA), Vijayakumar Bhagavatula (Carnegie Mellon University, USA)</td>
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<td>O-31</td>
<td>LFIQ: Latent Fingerprint Image Quality</td>
<td>Soweon Yoon (Michigan State University, USA), Kai Cao (Michigan State University, USA), Eryun Liu (Michigan State University, USA), Anil Jain (Michigan State University, USA)</td>
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<td>O-32</td>
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<td>Wei Tang (Harbin University of Science and Technology, China), Yukun Liu (Harbin University of Science and Technology, China)</td>
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<td>Propagation of Facial Identities in a Social Network</td>
<td>Tao Wu (University of Maryland, College Park, USA), Jonathon Phillips (National Institute of Standards and Technology, USA), Rama Chellappa (University of Maryland, College Park, USA)</td>
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<td>Raoul Johnson (University of Colorado, Colorado Springs, USA), Walter Scheirer (Harvard University, USA), Terrance Boult (University of Colorado, Colorado Springs, USA)</td>
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**Wednesday 16:50 - 17:00**

- **Closing Comments**
- **Venue:** Capital View Ballroom
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