10th International Symposium on Visual Computing (ISVC’14)
December 8-10, 2014, Las Vegas, Nevada, USA
Contents

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## Symposium Overview

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<tr>
<th>Time</th>
<th>Monday 8&lt;sup&gt;th&lt;/sup&gt;</th>
<th>Tuesday 9&lt;sup&gt;th&lt;/sup&gt;</th>
<th>Wednesday 10&lt;sup&gt;th&lt;/sup&gt;</th>
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</thead>
<tbody>
<tr>
<td>08:30 am – 9:30 am</td>
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<td>Keynote (Ballroom 5)</td>
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<tr>
<td>9:40 am – 10:40 am</td>
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<td>Parallel Sessions (Ballrooms 2-5)</td>
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<tr>
<td>10:40 am – 11:10 am</td>
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<td>Coffee Break</td>
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<td>11:10 am – 12:10 am</td>
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<td>Parallel Sessions (Ballrooms 2-5)</td>
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<tr>
<td>12:10 pm – 1:30 pm</td>
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<td>Lunch Break (on your own)</td>
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<tr>
<td>1:30 pm – 2:30 pm</td>
<td>Keynote (Ballroom 5)</td>
<td>Poster Session * (Ballrooms 2-5)</td>
<td>Keynote (Ballroom 5)</td>
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<tr>
<td>2:40 pm – 3:40 pm</td>
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<td>Parallel Sessions (Ballrooms 2-5)</td>
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<tr>
<td>3:40 pm – 4:10 pm</td>
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<td>Coffee Break</td>
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<tr>
<td>4:10 pm – 6:00 pm</td>
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<td>Parallel Sessions (Ballrooms 2-5)</td>
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**Registration Desk hours:**  Sunday, Dec 7<sup>th</sup> 5:00pm - 8:30pm  
Monday, Dec 8<sup>th</sup> – Wednesday, Dec 10<sup>th</sup>: 7:30am – 5:30pm  

**Banquet Dinner:** Tuesday, Dec 9<sup>th</sup>:  7:00pm – 9:30pm (Ballrooms 1-2)

*The poster session runs from 1:30pm to 3:30pm.
<table>
<thead>
<tr>
<th>Time</th>
<th>Parallel Sessions</th>
</tr>
</thead>
</table>
| 9:40-12:10       | ST: Computational Bioimaging I  
Chair: João Manuel R. S. Tavares  
Elham Sakhaee and Alireza Entezari  
Roles of Various Brain Structures on Non-Invasive Lateralization of Temporal Lobe Epilepsy  
Fariborz Mahmoudi, Mohammad-Reza Nazem-Zadeh, Hassan Bagher-Ebadian, Jason M. Schwalb, and Hamid Soltanian-Zadeh  
Learning Splines for Sparse Tomographic Reconstruction  
Elham Sakhaee and Alireza Entezari  |
|                  | Computer Graphics I  
Chair: Jeffrey Holcomb (Ballroom 4)  
Automatic Photorealistic 3D Inner Mouth Restoration from Frontal Images  
Masahide Kawai, Tomoyori Iwao, Akinobu Maejim, and Shigeo Morishima  
Local Polynomial G¹ PN Quads  
Chavdar Papazov  
Voronoi Diagrams of Line Segments in 3D, with Application to Automatic Rigging  
Jeffrey W. Holcomb and Jorge A. Cobb  |
| 9:40             | Learning Splines for Sparse Tomographic Reconstruction  
Elham Sakhaee and Alireza Entezari  |
| 10:00            | Rigid Multimodal/Multispectral Image Registration  
based on the Expectation-Maximization Algorithm  
| 10:20            | Roles of Various Brain Structures on Non-Invasive Lateralization of Temporal Lobe Epilepsy  
Fariborz Mahmoudi, Mohammad-Reza Nazem-Zadeh, Hassan Bagher-Ebadian, Jason M. Schwalb, and Hamid Soltanian-Zadeh  |
| 10:40-11:10      | Coffee Break  |
| 11:10            | Noise Analysis and Removal in 3D Electron Microscopy  
Joris Roels, Jan Aelterman, Jonas De Vylder, Hiep Luong, Yvan Saeyes, Saskia Lippens and Wilfried Philips  |
| 11:30            | Ensemble Registration: Incorporating Structural Information into Groupwise Registration  
Sri Purwani and Carole Twining  |
| 11:50            | Motion and Tracking  
Chair: Andreas E. Savakis (Ballroom 3)  
Direct estimation of dense scene flow and depth from a monocular sequence  
Yosra Mathlouthi, Amar Mitiche, and Ismail Ben Ayed  
3D Deformable Spatial Pyramid for Dense 3D Motion Flow of Deformable Object  
Junhwa Hur, Hwasup Lim and Sang Chul Ahn  
Visual Tracking Extensions for Accurate Target Recovery in Low Frame Rate Videos  
Yoav Liberman and Adi Perry  |
| 11:10            | Efficient Object Localization and Segmentation in Weakly Labeled Videos  
Mrigank Rochan and Yang Wang  |
| 11:30            | Image Dehazing Using Regularized Optimization  
Jiaxi He, Cishen Zhang and Iftat Al Baqee  |
| 11:50            | Real-time Depth-Image-Based Rendering for 3DTV using OpenCL  
Roberto Gerson de Albuquerque Azvedo, Fernando Ismério, Alberto Barbosa Raposo, and Luiz Fernando Gomes Soares  |
| 12:10-1:30       | Lunch (on your own)  |

Monday, December 8th
| 1:30-2:30 | Keynote: **Bernd Froehlich**, Bauhaus-Universität Weimar, Germany (Ballroom 5) |
| 2:40-5:10 | **Parallel Sessions** |
| 2:40 | **Segmentation**<br>Chair: **Matthias Reso** (Ballroom 5) | **Visualization**<br>Chairs: **Ying Zhu** (Ballroom 4) |
| 2:40 | Resistance-Geodesic Distance and its Use in Image Processing and Segmentation<br>**Jan Gaura and Eduard Sojka** | A Human Perception based Performance Evaluation of Image Quality Metrics<br>**Rameez Wajid, Atif Bin Mansoor,** and **Marius Pedersen** |
| 3:00 | Compact Description of the Segments on the Segmented Digital Image<br>**Tamaz Sulaberidze, Otar Tavadshvili, Tea Totua, Zurab Alimbarashvili** | Visual Analysis of 3D Data by Isovalue Clustering<br>**Susanne K. Suter, Bo Ma,** and **Alienza Entezari** |
| 3:20 | Commonality Preserving Image-Set Clustering based on Diverse Density<br>**Takayuki Fukui** and **Toshikazu Wada** | VideoZoom: An Interactive System for Video Summarization, Browsing and Retrieval<br>**Kai Juengling, Scott Blunsden,** and **Cristina Versino** |
| 3:40-4:10 | **Coffee Break** |
| 4:10 | A Pedestrian-pedestrian and Pedestrian-vehicle Interaction Motion Model for Pedestrians Tracking<br>**Hao Sheng, Shukai Liu, Hengshan Ji, Jiachi Chen,** and **Zhang Xiong** | Adaptive Visualization of Social Media Data for Policy Modeling<br>**Kawa Nazemi, Dirk Burkhardt, Wilhelm Retz,** and **Jorn Kohlhammer** |
| 4:30 | Interactive Segmentation of High-Resolution Video Content using Temporally Coherent Superpixels and Graph Cut<br>**M. Reso, B. Scheuermann, J. Bachalsky, B. Rosenhahn,** and **J. Ostermann** | Combining Computational Models and Interactive Visualization to Support Rational Decision Making<br>**Tobias Ruppert, Jurgen Bernard, Thorsten May,** and **Jorn Kohlhammer** |
| 4:50 | Extracting Noise-resistant Skeleton on Digital Shapes for Graph Matching<br>**Aurelie Leborgne, Julien Mille,** and **Laure Tougue** | NetTimeView: Applying Spatio-Temporal Data Visualization Techniques to DDoS Attack Analysis<br>**Ayush Shrestha, Ying Zhu,** and **Kebina Manandhar** |
| 2:40-5:10 | **ST: 3D Mapping, Modeling and Surface Reconstruction**<br>Chair: **Corey Miller** (Ballroom 3) | **ST: Unmanned Autonomous Systems**<br>Chair: **George Bebis** (Ballroom 2) |
| 2:40 | Shape from Specular Flow with Near-field Environment Motion Field<br>**Hongsong Li, Ting Song, Zehuan Wu, Jiandong Ma,** and **Gangyi Ding** | Using Accurate Feature Matching for Unmanned Aerial Vehicle Ground Object Tracking<br>**Alok Desai, Dah-Jye Lee,** and **Meng Zhang** |
| 3:00 | Enhancement of 3D Capture of Room-sized Dynamic scenes with Pan-Tilt-Zoom Cameras<br>**Asad Ullah Naweed, Lu Chen, Mingsong Dou,** and **Henry Fuchs** | μ-UAV Based Dynamic Target Tracking for Surveillance & Exploration<br>**Harish Bhaska, Jorge Dias, Lakmal Seneviratne,** and **Mohammed Al-Mualla** |
| 3:20 | Loop Closing for Visual Pose Tracking during Close-Range 3-D Modeling<br>**Klaus H. Strobl** | Telemetry-based search window correction for airborne tracking<br>**Pau Climent-Perez, Georgios Lazaridis, Georg Hummel, Martin Russ,** **Dorothy N. Monekosso,** and **Paolo Remagnino** |
| 3:40-4:10 | **Coffee Break** |
| 4:10 | Reconstruction of a Complex Mirror Surface from a Single Image<br>**Hongsong Li, Ting Song, Zehuan Wu, Jiandong Ma,** and **Gangyi Ding** | Fuzzy-Based Automatic Landmark Recognition in Aerial Images Using ORB for Aerial Auto-Localization<br>**Paulo Silva Filho, Marcel Rodrigues, Osamu Saotome,** and **Elicio H. Shiguemori** |
| 4:30 | Passive 3D Scene Reconstruction via Hyperspectral Imagery<br>**Corey A. Miller and Thomas J. Walls** | Semantic Segmentation of Low Frame-Rate Image Sequence Using Statistical Properties of Optical Flow for Remote Exploration<br>**Shun Inagaki** and **Atsushi Imiya** |
| 4:50 | Constructing Point Clouds from Underwater Stereo Movies<br>**Jesus Pulido, Ricardo Dutra da Silva, Dawn Sumner,** **Helio Pedrini,** and **Bernd Hamann** |
## Tuesday, December 9th

<table>
<thead>
<tr>
<th>Time</th>
<th>Medical Imaging</th>
<th>Computer Graphics II</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:40-12:10</td>
<td><strong>Chair: Gurman Gill (Ballroom 5)</strong></td>
<td><strong>Chair: Tim McGraw (Ballroom 4)</strong></td>
</tr>
</tbody>
</table>
| 9:40 | Coupled Dictionary Learning for Automatic Multi-Label Brain Tumor Segmentation in Flair MRI images | Shape Modeling with Fractals
|       | Saif Dawood Salman Al-Shaikhli, Michael Ying Yang, Bodo Rosenhahn | Tim McGraw and Donald Herring |
| 10:00 | Volumetric Topological Analysis on In Vivo Trabecular Bone Magnetic Resonance Imaging | GPU based particle coding scheme for virtual cutting of meshfree particle systems
| 10:20 | Segmentation of Lungs with Interstitial Lung Disease in CT Scans: A TV-L^1 Based Texture Analysis Approach | Constrained PatchMatch for Image Completion
|       | Gurman Gill and Reinhard R. Beichel | Guillaume Chican and Mohamed Tamaazousti |

### Coffee Break

<table>
<thead>
<tr>
<th>Time</th>
<th>ST: Tracking for Human Activity Monitoring</th>
<th>N/A</th>
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<tbody>
<tr>
<td>9:40-12:10</td>
<td><strong>Chair: Antonis Argyros (Ballroom 3)</strong></td>
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<tr>
<td>9:40</td>
<td>Robust and Efficient Tracker using Dictionary of Binary Descriptors and Locality Constraints</td>
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<td>Breton Minnehan, Henry Spang V, and Andreas Savakis</td>
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<tr>
<td>10:00</td>
<td>Fast Human Pose Tracking with a Single Depth Sensor using Sum of Gaussians Models</td>
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<td>Meng Ding and Guoliang Fan</td>
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<tr>
<td>10:20</td>
<td>Human Centered Scene Understanding based on Depth Information - How to Deal with Noisy Skeleton Data?</td>
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<td>Rainer Planinc and Martin Kampel</td>
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### Coffee Break

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<thead>
<tr>
<th>Time</th>
<th>Body Joint Tracking in Low Resolution Video using Region-based Filtering</th>
<th>N/A</th>
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<tbody>
<tr>
<td>11:10</td>
<td>Binu M Nair, Kimberly D Kendricks, Vijayan K Asari, and Ronald F Tuttle</td>
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<tr>
<td>11:30</td>
<td>Human Action Recognition Using Histograms of Oriented Optical Flows from Depth</td>
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<td>Baris Can Ustundag and Mustafa Unel</td>
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<tr>
<td>11:50</td>
<td>Scale-Adaptive Object Tracking with Diverse Ensembles</td>
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<td>Sara Elkerdawy, Abdelrahman Eidesokey, Ahmed Salaheldin, Mohamed ElHelw</td>
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### Lunch (on your own)
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Chair</th>
<th>Details</th>
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<tbody>
<tr>
<td>1:30-3:30</td>
<td><strong>Poster Session</strong> (Ballrooms 2-5)</td>
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<tr>
<td>3:30-6:00</td>
<td><strong>Parallel Sessions</strong></td>
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<tr>
<td>3:30</td>
<td><strong>Feature Extraction and Matching II</strong></td>
<td>Mircea Nicolescu (Ballroom 5)</td>
<td>Weighted Pooling Based on Visual Saliency for Image Classification Byeongho Heo, Hawook Jeong, Jiyun Kim, Sang-II Choi, Jin Young Choi</td>
</tr>
<tr>
<td>3:50</td>
<td></td>
<td></td>
<td>Video-based Self-positioning for Intelligent Transportation Systems Applications Parag S. Chandakkar, Ragav Venkatesan and Baoxin Li</td>
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<tr>
<td>4:10-4:40</td>
<td><strong>Coffee Break</strong></td>
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<tr>
<td>3:30-6:00</td>
<td><strong>ST: Visual Perception and Robotic Systems</strong></td>
<td>Hung La (Ballroom 3)</td>
<td>Proactive 3D Robot Mapping in Environments with Sparse Features Jianhao Du, Weihua Sheng, Qi Cheng, and Meiqin Liu</td>
</tr>
<tr>
<td>3:50</td>
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<td></td>
<td>Object Recognition using constraints from Primitive Shape Matching ikhil Somaniz, Caixia Cay, Alexander Perzyloz, Markus Rickertz, and Alois Knolly</td>
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<tr>
<td>4:10-4:40</td>
<td><strong>Coffee Break</strong></td>
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<tr>
<td>7:00-9:30</td>
<td><strong>Banquet Dinner</strong></td>
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<td>Banquet Dinner (Ballrooms 1-2) Keynote: Rama Chellappa, University of Maryland, USA</td>
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**Note:** The details provided are based on the extracted text and may not cover all aspects of the session contents.
### Wednesday, December 10th

#### Keynote: Arun Ross, Michigan State University, USA (Ballroom 5)

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<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Chair</th>
<th>Location</th>
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<tbody>
<tr>
<td>8:30-9:30</td>
<td>Keynote</td>
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<td>Ballroom 5</td>
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<tr>
<td>9:40-12:10</td>
<td>Parallel Sessions</td>
<td></td>
<td>Ballroom 5</td>
</tr>
<tr>
<td>9:40</td>
<td>ST: Computational Bioimaging II</td>
<td>Chair: João Manuel R. S. Tavares</td>
<td>Ballroom 5</td>
</tr>
<tr>
<td>9:40</td>
<td>Fast Mesh-Based Medical Image Registration</td>
<td>Ahmadreza Baghaie, Zeyun Yu, and Roshan M. D'souza</td>
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</tr>
<tr>
<td>10:00</td>
<td>Multimodal Non-Rigid Registration Methods Based on Demons Models and Local Uncertainty Quantification used in 3D Brain Images</td>
<td>I. Reducindoa, A. Mejia-Rodriguez, E. Arce-Santanaa, D. Campos-Delgadoa, E. Scalco, G. Cattaneo, and G. Rizzo</td>
<td></td>
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<tr>
<td>10:20</td>
<td>Principal Axes-based Asymmetry Assessment Methodology for Skin Lesion Image Analysis</td>
<td>Maria João M. Vasconcelos, Luís Rosado and Márcia Ferreira</td>
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<tr>
<td>10:40-11:10</td>
<td>Coffee Break</td>
<td></td>
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<tr>
<td>11:10</td>
<td>Analysis of Biomedical Images based on Automated Methods of Image Registration</td>
<td>João Manuel R. S. Tavares</td>
<td></td>
</tr>
<tr>
<td>11:30</td>
<td>Spatio-Temporal Level-Set based Cell Segmentation in Time-Lapse Image Sequences</td>
<td>Fatima Boukari and Sokratis Makrogiannis</td>
<td></td>
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<tr>
<td>11:50</td>
<td>Texture retrieval using Cauchy-Schwarz divergence and generalized Gaussian mixtures</td>
<td>Hassan Rami, Ahmed Drissi El Maliani, Mohammed El Hassouni, and Driss Aboutajdine</td>
<td></td>
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<tr>
<td>12:10-1:30</td>
<td>Lunch (on your own)</td>
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#### 3D Computer Vision

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Chair: Vijayan Asari</th>
<th>Location</th>
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<tbody>
<tr>
<td>9:40</td>
<td>Spatial Uncertainty Model of a Three-View RGB-D Camera System</td>
<td>Chen Zhu, Simon Bilgeri, and Christoph Gunther</td>
<td>Ballroom 3</td>
</tr>
<tr>
<td>10:00</td>
<td>3D Estimation of Isometric Surfaces Using a ToF-Based Approach</td>
<td>S. Jafar Hosseini and Helder Araujo</td>
<td></td>
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<tr>
<td>10:40-11:10</td>
<td>Coffee Break</td>
<td></td>
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<tr>
<td>11:10</td>
<td>Shape from Refocus</td>
<td>R. Huber-Mork, S. Stolc, D. Soukup, B. Hollander</td>
<td></td>
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<tr>
<td>11:30</td>
<td>Ultrasound Surface Extraction Using Radial Basis Functions</td>
<td>Rickard Englund and Timo Ropinski</td>
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</tr>
<tr>
<td>11:50</td>
<td>Sphere Packing Aided Surface Reconstruction for Multi-View Data</td>
<td>Kun Liu, Patricio A. Galindo, Rhaleb Zayer</td>
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<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Chair: Alexei N. Skurikhin</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>9:40</td>
<td>A Nonstationary Hidden Markov ModelWith Approximately Infinitely-Long Time-Dependencies</td>
<td>Sotirios P. Chatzis, Dimitrios I. Kosmopoulos, and George M. Papadourakis</td>
<td>Ballroom 4</td>
</tr>
<tr>
<td>10:00</td>
<td>Proximity Clustering for Revealing a Semantically Dominant Class</td>
<td>Tushar Sandhan, Kimin Yun and Jin Young Choi</td>
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<tr>
<td>10:20</td>
<td>One-shot Learning of Sketch Categories with Co-regularized Sparse Coding</td>
<td>Yonggang Qi, Wei-Shi Zheng, Tao Xiang, Yi-Zhe Song, Honggang Zhang, and Jun Guo</td>
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<tr>
<td>10:40-11:10</td>
<td>Coffee Break</td>
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<tr>
<td>11:10</td>
<td>Hierarchical Spanning Tree-structured Approximation for Conditional Random Fields: An Empirical Study</td>
<td>Alexei N. Skurikhin</td>
<td></td>
</tr>
<tr>
<td>11:30</td>
<td>Thresholding a Random Forest Classifier</td>
<td>Florian Baumann, Fangda Li, Arne Ehlers, Bodo Rosenhahn</td>
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</tr>
<tr>
<td>11:50</td>
<td>Textural retrieval using Cauchy-Schwarz divergence and generalized Gaussian mixtures</td>
<td>Hassan Rami, Ahmed Drissi El Maliani, Mohammed El Hassouni, and Driss Aboutajdine</td>
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### Note:
- Parallel Sessions for ST: Computational Bioimaging II and Recognition are both located in Ballroom 5.
- The 3D Computer Vision session is located in Ballroom 3.
- Lunch is available on your own from 12:10-1:30.
# Keynote: Luc Vincent, Google, USA (Ballroom 5)

## Parallel Sessions

### Applications
Chair: Yoshinori Kuno (Ballroom 5)

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<tr>
<th>Time</th>
<th>Session</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:40</td>
<td>A new coin segmentation and graph-based identification method for numismatic application</td>
<td>Xingyu Pan, Kittu Purtat, Laure Tougne</td>
</tr>
<tr>
<td>3:00</td>
<td>Evaluating Depth-Based Computer Vision Methods for Fall Detection Under Occlusions</td>
<td>Zhong Zhang, Christopher Conly, and Vassilis Athitsos</td>
</tr>
<tr>
<td>3:20</td>
<td>A novel modeling for video summarization using constraint satisfaction programming</td>
<td>Haykel Boukadida, Sid-Ahmed Berrani, and Patrick Gros</td>
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</tbody>
</table>

#### Coffee Break

### Face Processing and Recognition
Chair: Dah-Jye Lee (Ballroom 4)

<table>
<thead>
<tr>
<th>Time</th>
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<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:40</td>
<td>Bayesian Framework For Accurate Eye Center Localization</td>
<td>Zhou Liu, Heng Yang, Ming Dong, and Jing Hua</td>
</tr>
<tr>
<td>3:00</td>
<td>Facial Point Localization using Combination Method under Occlusion</td>
<td>Jongju Shin, Jieun Kim, and Dajjin Kim</td>
</tr>
<tr>
<td>3:20</td>
<td>Personalized Modeling of Facial Action Unit Intensity</td>
<td>Shuang Yang, Ognjen Rudovic, Vladimir Pavlovic and Maja Pantic</td>
</tr>
</tbody>
</table>

### Virtual Reality
Chair: Jiri Jara (Ballroom 3)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:40</td>
<td>Evaluation of Image Feature Descriptors for Marker-less AR Applications</td>
<td>Hiroshi Koyasu, Kotaro Nozaki, and Hitoshi Maekawa</td>
</tr>
<tr>
<td>3:00</td>
<td>Study of 2D Vibration Summing for Improved Intensity Control in Vibrotactile Array Rendering Undergraduates</td>
<td>Nicholas G. Lipari and Christoph W. Borst</td>
</tr>
<tr>
<td>3:20</td>
<td>AR-based Hologram Detection on Security Documents using a Mobile Phone</td>
<td>Andreas Hartl, Clemens Arth, and Dieter Schmalstieg</td>
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</tbody>
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#### Coffee Break

### Coffee Break

### Virtual Reality

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:10</td>
<td>Automated Bird Plumage Coloration Quantification in Digital Images</td>
<td>Tejas S. Borkar and Lina J. Karam</td>
</tr>
<tr>
<td>4:30</td>
<td>Which phoneme-to-viseme maps best improve visual-only computer lip-reading?</td>
<td>Helen L. Bear, Richard W. Harvey, Barry John Theobald and Yuxuan Lan</td>
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<td>4:50</td>
<td>iris and Pupil Measurement on Low Resolution Images for Driver Observation</td>
<td>Emin Tarayan, Matthias Hoffken, Andra Stefania Herta and Ulrich Kresse</td>
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### Virtual Reality

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<td>AR-based Hologram Detection on Security Documents using a Mobile Phone</td>
<td>Andreas Hartl, Clemens Arth, and Dieter Schmalstieg</td>
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### Virtual Reality

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<td>Chunling Fan, Yonggang Zhao, and Liangbing Feng</td>
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<td>4:30</td>
<td>A Haptic-based Application for Active Exploration of Facial Expressions by the Visually Impaired</td>
<td>Shamima Yamin, Troy McDaniel and Sethuraman Panchanathan</td>
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<td>Affine Invariant Harris-Bessel Interest Point Detector</td>
<td>Sasan Mahmoodi, Nasim Saba</td>
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<td>On Detectability of Moroccan Coastal Upwelling in Sea Surface Temperature Satellite Images</td>
<td>Ayoub Tamim, Khalid Minaoui, Khalid Daoudi, Abderrahman Atilah, and Driss Aboutajdine</td>
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<td>High-Order Diffusion Tensor Connectivity Mapping on the GPU</td>
<td>Tim McGraw and Donald Herring</td>
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<td>A Sequential 3D Curve-Thinning Algorithm Based on Isthmuses</td>
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<td>Automatic Identification of CAPTCHA Schemes</td>
<td>M. A. Asim K. Jawana, Muhammad Murtaza Khan, Muhammad U. Ilyas</td>
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<td>Object Detection Based on Multiresolution CoHOG</td>
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<td>Who Shot the Picture and When?</td>
<td>Gagan Kanojia, Sri Raghu Maireddi, Sai Chowdary Gullapally, and Shanmuganathan Raman</td>
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<tr>
<td>Matching Affine Features with the SYBA Feature Descriptor</td>
<td>Alok Desai, Dah-Jye Lee, and Dan Ventura</td>
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<td>Boosted Fractal Integral Paths for Object Detection</td>
<td>Arne Ehlers, Florian Baumann, Bodo Rosenhahn</td>
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<td>Depth Estimation Within a Multi-Line-Scan Light-Field Framework</td>
<td>D. Soukup, R. Huber-Mork, S. Stolc, B. Hollander</td>
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<tr>
<td>A Weighted Regional Voting Based Ensemble of Multiple Classifiers for Face Recognition</td>
<td>Jing Cheng and Liang Chen</td>
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<td>DEPTH DATA-DRIVEN REAL-TIME ARTICULATED HAND POSE RECOGNITION</td>
<td>Young-Woon Cha, Hwasup Lim, Min-Hyuk Sung, and Sang Chul Ahn</td>
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<tr>
<td>3-D Model Alignment for Retrieval from Part of Model considering the Rotation, Scaling and Translation with Projections around an Axis</td>
<td>Yohei Kayanuma, Fumiko Umeda, and Akira Kawanaka</td>
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<tr>
<td>Strokes detection for skeletonisation of characters shapes</td>
<td>Cyrille Berger</td>
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<tr>
<td>Face Detection and Tracking for Intent Recognition</td>
<td>K.T. Luhandjula, B.J. van Wyk, K. Djouani, Y. Amirat</td>
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**Note:** The table above lists the posters presented at the Poster Session held on Tuesday, December 9th from 1:30pm to 3:30pm in Ballrooms 2-5. Each poster is accompanied by the title, authors, and a brief description of the research topic.
### Poster Session (cont'd)
**Tuesday, December 9th (1:30pm-3:30pm)**

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<td>Violence Detection in Video by Using 3D Convolutional Neural Networks</td>
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<td>Concealed Target Detection with Fusion of Visible and Infrared</td>
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<td>Enhancement of Hazy Color Images Using a Self-Tunable Transformation Function</td>
<td>Saibabu Arigela and Vijayan K Asari</td>
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<tr>
<td>Determine Absolute Soccer Ball Location in Broadcast Video Using SYBA Descriptor</td>
<td>Alok Desai, Dah-Jye Lee, and Craig Wilson</td>
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<td>Colour perception graph for characters segmentation</td>
<td>Cyrille Berger</td>
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<tr>
<td>Initial Closed-Form Solution to Mapping from Unknown Planar Motion of an Omni-directional Vision Sensor</td>
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<td>Generating Super-resolved Depth Maps using low-cost sensors and RGB Images</td>
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<td>Learning and Association of Features for Action Recognition in Streaming Video</td>
<td>Binu M Nair and Vijayan K Asari</td>
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<td>Cell Classification in 3D Phase-Contrast Microscopy Images via Self-Organizing Maps</td>
<td>Mi-Sun Kang, Hye-Ryun Kim and Myoung-Hee Kim</td>
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<td>Pose-Aware Smoothing Filter for Depth Images</td>
<td>Seungpyo Hong and Jinwook Kim</td>
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<td>Scene Understanding for Auto-Calibration of Surveillance Cameras</td>
<td>Lucas Teixeira, Fabiola Mafta, and Atta Badii</td>
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<td>A Multi-View Profilometry System Using RGB Channel Separated Fringe Patterns And Unscented Kalman Filter</td>
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<td>A 3D Tracker for Ground-Moving Objects</td>
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<td>Counting the Crowd at a Carnival</td>
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<td>Image Retrieval Based on Statistical and Geometry Features</td>
<td>Yu Liu, Liangbing Feng, Xing Wang, Ning Guo</td>
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<td>PixSearcher: Searching Similar Images in Large Image Collections through Pixel Descriptors</td>
<td>Tuan Nhon Dang and Leland Wilkinson</td>
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<td>Shortest enclosing walks with a non-zero winding number in directed weighted planar graphs: a technique for image segmentation</td>
<td>Alexey Malistov</td>
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<td>Intuitive Alignment of Point-Clouds with Painting-based Feature Correspondence</td>
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<td>Precise 3D measurements for tracked objects from synchronized stereo-video sequences</td>
<td>Panagiotis Agrafiotis, Andreas Georgopoulos, Anastasios D. Doulamis, Nikolaos D. Doulamis</td>
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<td>Artificial Intelligence Gaming Assistant for Google Glass</td>
<td>Scott Bouloutian, Edward Kim</td>
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<td>Adding Color Sensitivity to the Shape Adaptive Image Ray Transform</td>
<td>Ah-Reum Oh and Mark S. Nixon</td>
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<td>A Fast Algorithm for Reconstructing hv-Convex Binary Images from their Horizontal Projection</td>
<td>Norbert Hantos and Peter Balazs</td>
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<tr>
<td>Gaussian Process Dynamical Models for Emotion Recognition</td>
<td>Hernan F. Garcia, Mauricio A. Alvarez and Alvaro Orozco</td>
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<tr>
<td>Evaluation of Perceptual Biases in Facial Expression Recognition by Humans and Machines</td>
<td>Xing Zhang, Lijun Yin, Daniel Hipp, and Peter Gerhardstein</td>
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<td>Handwritten Signature Verification based on Enhanced Direction and Grid Features</td>
<td>Serestina Viriri</td>
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<tr>
<td>Improving Human Gait Recognition Using Feature Selection</td>
<td>Faezeh Tafazzoli, George Bebis, Sushil Louis and Muhammad Hussain</td>
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<tr>
<td>Automatic Recognition of Microcalcifications in Mammography Images through Fractal Texture Analysis</td>
<td>Hernan Dario, Vargas Cardona, Alvaro A. Orozco and Mauricio A. Alvarez</td>
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<tr>
<td>Bayesian Shape Models With Shape Priors for MRI Brain Segmentation</td>
<td>Hernan F. Garcia, Mauricio A. Alvarez and Alvaro Orozco</td>
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<tr>
<td>Disocclusion Mitigation for Image Based Point Cloud Imposters</td>
<td>Chad Mourning, Scott Nykl, and David Chelberg</td>
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<td>Adaptive Visualization of Linked-Data</td>
<td>Kawa Nazemi, Dirk Burkhardt, Reimond Retz, Arjan Kuiper, and Jorn Kohlhammer</td>
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<td>Parkinson Data Analysis and Interpretation with Data Visualization Methods</td>
<td>Mehdi Ghayoumi and Ye Zhao</td>
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<td>IntelliViz- A Tool for Visualizing Social Networks with Hashtags</td>
<td>Jesse Tran, Quang Vinh Nguyen and Simeon Simoff</td>
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<td>3D Previsualization using a Computational Photography Camera</td>
<td>Clifford Lindsay and Emmanuel Agu</td>
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<td>Formation Control of Multiple Rectangular Agents with Limited Communication Ranges</td>
<td>Thang Nguyen and Hung Manh La</td>
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<td>Extrinsic Calibration Between 2D Laser Range Finder and Fisheye Camera</td>
<td>Yong Fang, Cindy Cappelle, Yassine Ruichek</td>
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<td>Hardware/Software Co-Design of Embedded Real-Time KD-Tree Based Feature Matching Systems</td>
<td>Saad Shoaib, Rehan Hafiz, and Muhammad Shafique</td>
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Graphs in Graphics: An Undirected Trip through the Algorithmic Forest
Gopi Meenakshisundaram (M. Gopi)
University of California, Irvine

Abstract
Graph algorithms are fundamental to many fields including operations research, physically based simulation, mechanics, logistics management, and sensor networks. In this talk, we will celebrate a few graph algorithms that have helped us make significant progress in geometry processing for graphics applications. Since the time graphs were used only for representations such as the tree representation of traced rays in ray tracing and scene graph representation of environments in interactive rendering, the uses of graph and graph algorithms in graphics have become more and more sophisticated. Various graph algorithms such as spanning trees, bipartite graph matching, graph isomorphisms, 1-factor and 2-factor computations, etc., have been used to process the geometry and topology in order to compress this information, linearly order the primitives for rendering and storage, simplify the geometry for rendering, efficiently represent the geometry for in-core cache coherency, compute topological features such as fundamental cycles, and so on. In this talk we will take a trip through these graph algorithms and their impact on geometry and topological processing in graphics.

Speaker Bio-Sketch: Gopi Meenakshisundaram is a Professor of Computer Science in the Department of Computer Science at University of California, Irvine. He received his BE from Thiagarajar College of Engineering, Madurai, MS from Indian Institute of Science, Bangalore, and PhD from University of North Carolina at Chapel Hill. His research interests include geometry and topology in computer graphics, massive geometry data management for interactive rendering, and biomedical sensors, data processing, and visualization. His work on representation of manifolds using single triangle strip, hierarchy-less simplification of triangulated manifolds, use of redundant representation for big data for interactive rendering, and biomedical image processing have received critical acclaim including best paper awards in two Eurographics conferences and in ICVGIP. He is a gold medalist for academic excellence at Thiagarajar College of Engineering, a recipient of the Excellence in Teaching Award at UCI and a Link Foundation Fellow. He served as the program co-chair and papers co-chair of ACM Interactive 3D Graphics conference in 2012 and 2013 respectively, area chair for ICVGIP in 2010 and 2012, program co-chair for International Symposium on Visual Computing 2006, an associate editor of the Journal of Graphical Models, and a guest editor of IEEE Transactions on Visualization and Computer Graphics.
KEYNOTE TALK
Monday, December 8, 2014
1:30 PM – 2:30 PM / Ballroom 5

ISVC 2014: 10th International Symposium on Visual Computing
Monte Carlo Resort & Casino
Las Vegas, NV, USA

Collaboration in Multi-User Virtual Reality

Bernd Froehlich
Professor of Virtual Reality Systems

Computer Science and Media, Faculty of Media
Bauhaus-Universität Weimar, Weimar
Germany

Abstract
Immersive telepresence allows distributed groups of users to meet in a shared virtual 3D world. Our approach uses two coupled projection-based multi-user setups, each providing multiple users with perspectively correct stereoscopic images. At each site, the users and their local interaction space are continuously captured using a cluster of registered depth and color cameras. The captured 3D information is transferred to the respective other location, where the remote participants are virtually reconstructed in life-size. Local and remote users can jointly or independently explore virtual environments and virtually meet face-to-face for discussions. We structure collaborative activities of collocated and remote users using Photoportals. Virtual photos and videos serve as three-dimensional references to objects, places, moments in time and activities of users. They can be shared among users and serve as portals to the captured information. Our Photoportals also provide access to intermediate or alternative versions of a scenario and allow the review of recorded task sequences that include life-size representations of captured users.

Speaker Bio-Sketch: Bernd Froehlich is a full professor of Computer Science at Bauhaus-Universität Weimar. He is chair of the Virtual Reality and Visualization Re-search Group. He focuses on basic and applied research in multi-user virtual reality and 3D user interfaces, visualization and rendering algorithms for very large datasets as well as information visualization. After completing his PhD in computer science at the Technical University of Braunschweig, he worked at the German National Research Center for Information Technology (GMD) and was a research associate with the computer science department at Stanford University. He is a cofounder and member of the steering committee of the IEEE Symposium on 3D User Interfaces, chair of the steering committee of the IEEE Virtual Reality conference and received the 2008 Virtual Reality Technical Achievement Award. Froehlich serves as an associate editor of the journals IEEE Computer Graphics and Applications and Frontiers in Virtual Environments.
KEYNOTE TALK
Tuesday, December 9, 2014
8:30 AM – 9:30 AM / Ballroom 5

ISVC 2014: 10th International Symposium on Visual Computing
Monte Carlo Resort & Casino
Las Vegas, NV, USA

Visualization and Visual Analytics in Personal Life

Melanie Tory
Associate Professor of Computer Science
Department of Computer Science
University of Victoria, Victoria, BC
Canada

Abstract
For each and every one of us as individuals, "big data" impinges on our personal lives as well as our professional lives. This includes managing our social networks, our music libraries, and our photo collections, and tracking our fitness, health, and sustainability behaviour. Using Visualization and Visual Analytics tools within our personal context offers substantial opportunity for us as individuals to gain insight and knowledge about ourselves and our communities. However, designing tools to support the analysis of data in one’s non-professional life brings a unique set of research and design challenges. Personal Visualization and Personal Visual Analytics extend research in visualization and visual analytics to the personal domain and aim to empower individuals to develop insights and discover knowledge relevant to their personal lives. In this talk, I will explore some of the new research challenges that arise when we consider visualization and visual analytics in a personal context.

Speaker Bio-Sketch: Melanie Tory is an Associate Professor of Computer Science at the University of Victoria, where she conducts research in visualization and visual analytics. Tory received the Ph.D. degree in Computing Science from Simon Fraser University in 2004 and held an NSERC PDF at the University of British Columbia from 2004-2006. Her research applies to a wide variety of areas spanning natural sciences and engineering, business, and personal informatics; for example, recent projects have focused on the domains of Business Intelligence and Building Design Engineering. Tory actively contributes to the visualization research community. She is Papers Co-chair for IEEE InfoVis 2014-15.
Is Computer Vision Pattern Recognition by a Different Name?

Rama Chellapa
Minta Martin Professor of Engineering
Department of Electrical and Computer Engineering
University of Maryland, College Park, MD
USA

Abstract
As someone who has been working in computer vision and pattern recognition for over three decades, I have watched with interest and some discomfort as much of the work in the field has become a straightforward application of pattern recognition methodology. More often than not, contemporary techniques follow the same "data-feature-SVM" paradigm. This approach has generated several successful algorithms for object detection, face verification, etc. More recently, deep learning has produced state-of-the-art results on datasets such as ImageNet and LFW.

While I am a devoted student of pattern recognition from Purdue, I would argue that this formula can only take us so far. In order to be robust to domain shifts due to factors such as occlusion and variation in pose, illumination, blur, and resolution, appropriate models of these effects must be properly utilized. That is, in order to reap long-term gains in computer vision, one should adopt a more balanced approach that effectively combines imaging and geometric models with the available training data. Supporting examples from iris, face, object, and event recognition will be presented.

Speaker Bio-Sketch: Rama Chellappa is a Minta Martin Professor of Engineering and the Chair of the ECE department at the University of Maryland. Prof. Chellappa received the K.S. Fu Prize from the International Association of Pattern Recognition (IAPR). He is a recipient of the Society, Technical Achievement and Meritorious Service Awards from the IEEE Signal Processing Society. He also received the Technical Achievement and Meritorious Service Awards from the IEEE Computer Society. At UMD, he received college and university level recognitions for research, teaching, innovation and mentoring of undergraduate students. In 2010, he was recognized as an Outstanding ECE by Purdue University. Prof. Chellappa served as the Editor-in-Chief of PAMI. He is a Golden Core Member of the IEEE Computer Society, served as a Distinguished Lecturer of the IEEE Signal Processing Society and as the President of IEEE Biometrics Council. He is a Fellow of IEEE, IAPR, OSA, AAAS and ACM and holds four patents.
Facial Cosmetics, Spoof Attacks, Data Privacy: Biometrics in the Real World

Arun Ross
Associate Professor
Department of Computer Science and Engineering
Michigan State University, USA

Abstract
Biometrics is the science of recognizing individuals based on their physical and behavioral attributes such as fingerprints, face, iris, voice and signature. The past decade has witnessed tremendous progress in this field, including the deployment of biometric solutions in diverse applications such as border security, national ID cards, amusement parks, access control, and smartphones. Despite these advancements, biometric systems have to contend with a number of challenges related to data quality, spoof attacks, and personal privacy. This talk will highlight some of the recent progress made in the field of biometrics; present our lab’s work on makeup invariant face recognition, fingerprint spoof detection, and biometric data privacy; and discuss some of the challenges that have to be solved in order to promote the widespread use of this technology.

Speaker Bio-Sketch: Arun Ross is an Associate Professor in the Department of Computer Science and Engineering at Michigan State University (MSU) and the Director of the i-PRoBe Lab. Prior to joining MSU in 2013, he was in the faculty of West Virginia University (WVU) from 2003 to 2012. He also served as the Assistant Site Director of the NSF Center for Identification Technology and Research (CITeR) between 2010 and 2012. Arun received the B.E. (Hons.) degree in Computer Science from the Birla Institute of Technology and Science, Pilani, India, and the M.S. and Ph.D. degrees in Computer Science and Engineering from Michigan State University. He is the coauthor of the textbook “Introduction to Biometrics” and the monograph “Handbook of Multibiometrics,” and the co-editor of “Handbook of Biometrics”. He is a recipient of the JK Aggarwal Prize, IAPR Young Biometrics Investigator Award (YBIA), the NSF CAREER Award, and was designated a Kavli Frontier Fellow by the National Academy of Sciences in 2006. He was an Associate Editor of IEEE Transactions on Information Forensics and Security (2009 – 2013), and IEEE Transactions on Image Processing (2008 – 2013). He currently serves as Area Editor of the Computer Vision and Image Understanding Journal, Associate Editor of the Image and Vision Computing Journal, Vice President of Education of the IEEE Biometrics Council, and Vice Chair of the IAPR TC4 on Biometrics. URL: http://www.cse.msu.edu/~rossarun/
KEYNOTE TALK
Wednesday, December 10, 2014
1:30 PM – 2:30 PM / Ballroom 5

ISVC 2014: 10th International Symposium on Visual Computing
Monte Carlo Resort & Casino
Las Vegas, NV, USA

Google Street View: Overview & Computer Vision Challenges

Luc Vincent
Director, Engineering
Google, USA

Abstract
From its humble beginnings in 2007, Google Street View has grown to become a global product available in over 50 countries, and an indispensable feature of Google Maps. It is the result of a massive engineering effort by a team including software engineers, product managers, optical designers, mechanical engineers, UI designers, computer vision scientists, operations experts, and scores of others. The initial vision for Street View was provided by Google co-founder Larry Page: back in 2002, he personally collected street scene videos from his moving car in order to bootstrap a new research initiative focused on making street level imagery useful. Turning this initial vision into a product required developing major new pieces of technology, including robust data collection platforms (vans, cars, tricycles, snowmobiles, "trekkers", etc.), systems for computing accurate pose from imperfect sensors, various software components to stitch, blend, color correct and warp collected imagery, a number of systems to address privacy issues, and a lot more. This presentation will give an overview and brief history of the Street View project, and highlight some of the unique computer vision challenges that are keeping the engineering team busy.

Speaker Bio-Sketch: Luc Vincent joined Google in 2004 to work on the Google Books project. While he was ramping up Google's Optical Character Recognition efforts, he got involved in an early stage project whose goal was to capture a large amount of street level imagery and make it universally accessible and useful. Under Luc's leadership, this project became Google Street View and launched officially in May 2007. Luc is now an engineering director in charge of Street View and other map-related imagery projects. Before Google, Luc was Chief Scientist, and then Vice President of Document Imaging at LizardTech, a developer of advanced image compression software. Prior to this, he led an R&D team at the prestigious Xerox Palo Alto Research Center (PARC). He was also Director of Software Development at Scansoft (now Nuance) and held various technical management and individual contributor positions at Xerox Corporation. Luc has over 60 publications in the area of computer vision, image analysis, and document understanding. He has served as an Associate Editor for the IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), and for the Journal of Electronic Imaging. He has also chaired SPIE's conferences on Document Recognition, the International Symposium on Mathematical Morphology (ISMM), and been in the program committee of numerous conferences and workshops. Luc earned his B.S. from Ecole Polytechnique, M.S. in Computer Science from University of Paris XI, and PhD in Mathematical Morphology from the Ecole des Mines de Paris in 1990.
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(Area 2) Computer Graphics

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(Area 3) Virtual Reality

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(Area 4) Visualization

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Special Tracks

ST1: Computational Bioimaging
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ST2: 3D Mapping, Modeling and Surface Reconstruction
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ST3: Tracking for Human Activity Monitoring
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ST4: Unmanned Autonomous Systems
Organizers:
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ST5: Intelligent Transportation Systems
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ST6: Visual Perception and Robotic Systems
Organizers:
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