

2015 IEEE International Symposium on Multimedia (ISM 2015)

**Miami, Florida, USA
14 – 16 December 2015**



IEEE Catalog Number: CFP15197-POD
ISBN: 978-1-5090-0380-8

**Copyright © 2015 by the Institute of Electrical and Electronic Engineers, Inc
All Rights Reserved**

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

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

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

IEEE Catalog Number:	CFP15197-POD
ISBN (Print-On-Demand):	978-1-5090-0380-8
ISBN (Online):	978-1-5090-0379-2

Additional Copies of This Publication Are Available From:

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

CURRAN ASSOCIATES INC.
proceedings
.com

2015 IEEE International Symposium on Multimedia

ISM 2015

Table of Contents

Message from General Co-chairs' Foreword.....	xv
Message from Program Committee Chairs.....	xvii
Message from Workshop Chairs.....	xviii
Organizing Committee.....	xx
Program Committee	xxiii
Workshop Organizers	xxvii

Applications

Shape-Based Pedestrian Segmentation in Still Images	1
<i>Julio Cezar Silveira Jacques Junior and Soraia Raupp Musse</i>	
Democratizing Optometric Care: A Vision-Based, Data-Driven Approach to Automatic Refractive Error Measurement for Vision Screening	7
<i>Tiffany C.K. Kwok, Naomi C.M Shum, Grace Ngai, Hong Va Leong, Grace Amy Tseng, Hoi-yi Choi, Ka-yan Mak, and Chi-Wai Do</i>	
Development of a Web-Based Haptic Authoring Tool for Multimedia Applications	13
<i>Haiwei Dong, Yu Gao, Hussein Al Osman, and Abdulmotaleb El Saddik</i>	
Interactive Crowd Content Generation and Analysis Using Trajectory-Level Behavior Learning	21
<i>Sujeong Kim, Aniket Bera, and Dinesh Manocha</i>	
Planogram Compliance Checking Using Recurring Patterns	27
<i>Song Liu and Hongda Tian</i>	
Endoscopic Video Retrieval: A Signature-Based Approach for Linking Endoscopic Images with Video Segments	33
<i>Christian Beecks, Klaus Schoeffmann, Mathias Lux, Merih Seran Uysal, and Thomas Seidl</i>	
User Reachability in Multi-Apps Environment	39
<i>Kundan Singh</i>	

Feature Extraction from 2D Images for Body Composition Analysis	45
<i>Ligaj Pradhan, Gao Song, Chengcui Zhang, Barbara Gower, Steven B. Heymsfield, David B. Allison, and Olivia Affuso</i>	
Fast Face Model Reconstruction and Synthesis Using an RGB-D Camera and Its Subjective Evaluation	53
<i>Toshihiko Yamasaki, Ibuki Nakamura, and Kiyoharu Aizawa</i>	
Automatic Fight Detection Based on Motion Analysis	57
<i>Eugene Yujun Fu, Hong Va Leong, Grace Ngai, and Stephen Chan</i>	
Collaborative Rehabilitation Support System: A Comprehensive Solution for Everyday Rehab	61
<i>Ziying Tang, Sonia Lawson, David Messing, Jin Guo, Ted Smith, and Jinjuan Feng</i>	
A Novel Algorithm for Vehicle Detection and Tracking in Airborne Videos	65
<i>Mohamed A. Abdelwahab and Moataz M. Abdelwahab</i>	
Automatic Segmentation of Hair in Images	69
<i>Parham Aarabi</i>	
Multiple Human Monitoring with Wireless Fiber-Optic Multimedia Sensor Networks	73
<i>Qingquan Sun</i>	
Quantitative Evaluation of Hair Texture	77
<i>Wenzhangzhi Guo and Parham Aarabi</i>	
Synthetic Voice Harmonization: A Fast and Precise Method	81
<i>Juan Gremes, Nicola Palavecino, Lucas Seeber, and Santiago Herrero</i>	
Songle Widget: Making Animation and Physical Devices Synchronized with Music Videos on the Web	85
<i>Masataka Goto, Kazuyoshi Yoshii, and Tomoyasu Nakano</i>	

Communications and Streaming

Modelling Video Rate Evolution in Adaptive Bitrate Selection	89
<i>Yusuf Sani, Andreas Mauthe, and Christopher Edwards</i>	
Priority-Aware Joint Packet Fragmentation and Error Protection Scheme for H.264 Video over Wireless Channels	95
<i>Seethal Paluri, Kashyap K. R. Kambhatla, Micheal Medley, John. D. Matyas, and Sunil Kumar</i>	
Fine-Grained Scalable Video Caching	101
<i>Qiushi Gong, John W. Woods, Koushik Kar, and Jacob Chakareski</i>	
Network Adaptive Textured Mesh Generation for Collaborative 3D Tele-Immersion	107
<i>Kevin Desai, Kanchan Bahirat, Suraj Raghuraman, and Balakrishnan Prabhakaran</i>	

MOOC-DASH: A DASH System for Delivering High-Quality MOOCs Videos	113
<i>Yi Wang, Wenjun Wu, and Yihua Lou</i>	
SDN Based QoE Optimization for HTTP-Based Adaptive Video Streaming	120
<i>Sangeeta Ramakrishnan, Xiaoqing Zhu, Frank Chan, and Kashyap Kambhatla</i>	
Adaptive Error Protection for the Streaming of Motion JPEG 2000 Video over Variable Bit Error Rate Channels	124
<i>Giuseppe Baruffa and Fabrizio Frescura</i>	
Frame Synchronization of Live Video Streams Using Visible Light Communication	128
<i>Maziar Mehrabi, Sébastien Lafond, and Le Wang</i>	
A Dynamic Alpha Congestion Controller for WebRTC	132
<i>Rasha Atwah, Razib Iqbal, Shervin Shirmohammadi, and Abbas Javadtalab</i>	
Go Green with EnVI: the Energy-Video Index	136
<i>Oche Ejembi and Saleem N. Bhatti</i>	
A Novel Two Pass Rate Control Scheme for Variable Bit Rate Video Streaming	140
<i>M. Venkata Phani Kumar, K.C. Ravi, and Sudipta Mahapatra</i>	
Dynamic MCU Placement for Video Conferencing on Peer-to-Peer Network	144
<i>Md Amjad Hossain and Javed I. Khan</i>	

Content Understanding, Modeling, Management, and Retrieval

Efficient Query Processing in 3D Motion Capture Databases via Lower Bound	
Approximation of the Gesture Matching Distance	148
<i>Christian Beecks, Marwan Hassani, Florian Obeloer, and Thomas Seidl</i>	
Customer Behavior Recognition in Retail Store from Surveillance Camera	154
<i>Jingwen Liu, Yanlei Gu, and Shunsuke Kamijo</i>	
A Novel Unsupervised 2-Stage k-NN Re-Ranking Algorithm for Image Retrieval	160
<i>Dawei Li and Mooi Choo Chuah</i>	
Pose-Robust and Discriminative Feature Representation by Multi-task Deep Learning for Multi-view Face Recognition	166
<i>Jeong-Jik Seo, Hyung-II Kim, and Yong Man Ro</i>	
Probabilistic Ensemble Fusion for Multimodal Word Sense Disambiguation	172
<i>Yang Peng, Daisy Zhe Wang, Ishan Patwa, Dihong Gong, and Chunsheng Victor Fang</i>	
Towards Understanding User Preferences from User Tagging Behavior for Personalization	178
<i>Amandianeze O. Nwana and Tsuhan Chen</i>	

WTA Hash-Based Multimodal Feature Fusion for 3D Human Action Recognition	184
<i>Jun Ye, Kai Li, and Kien A. Hua</i>	
A Novel Semi-Supervised Dimensionality Reduction Framework for Multi-manifold Learning	191
<i>Xin Guo, Yun Tie, Lin Qi, and Ling Guan</i>	
Musical Similarity and Commonness Estimation Based on Probabilistic Generative Models	197
<i>Tomoyasu Nakano, Kazuyoshi Yoshii, and Masatake Goto</i>	
Human Action Recognition Using Hybrid Centroid Canonical Correlation Analysis	205
<i>Nour El Din Elmadi, Yifeng He, and Ling Guan</i>	
SalAd: A Multimodal Approach for Contextual Video Advertising	211
<i>Chen Xiang, Tam V. Nguyen, and Mohan Kankanhalli</i>	
TRACE: Linguistic-Based Approach for Automatic Lecture Video Segmentation Leveraging Wikipedia Texts	217
<i>Rajiv Ratn Shah, Yi Yu, Anwar Dilawar Shaikh, and Roger Zimmermann</i>	
ExploratoryVideoSearch: A Music Video Search System Based on Coordinate Terms and Diversification	221
<i>Kosetsu Tsukuda and Masatake Goto</i>	
Improvement of Image and Video Matting with Multiple Reliability Maps	225
<i>Takahiro Hayashi, Masato Ishimori, Nobuaki Ishii, and Koji Abe</i>	
Stability Improvement of Indirect Matching for Music Information Retrieval	229
<i>Takahiro Hayashi, Nobuaki Ishii, Masato Ishimori, and Koji Abe</i>	
Earth Mover's Distance vs. Quadratic form Distance: An Analytical and Empirical Comparison	233
<i>Christian Beecks, Merih Seran Uysal, and Thomas Seidl</i>	
Self Similarity Wide-Joins for Near-Duplicate Image Detection	237
<i>Luiz Olmes Carvalho, Lício F.D. Santos, Willian D. Oliveira, Agma J.M. Traina, and Caetano Traina Jr.</i>	
Information Fusion of Audio Emotion Recognition Based on Kernel Entropy Component Analysis in Canonical Correlation Space	241
<i>Lei Gao, Lin Qi, and Ling Guan</i>	
Betweenness Centrality Approaches for Image Retrieval	245
<i>Brandeis Marshall, Anuya Ghanekar, John A. Springer, and Eric Matson</i>	
Automatic Video Content Summarization Using Geospatial Mosaics of Aerial Imagery	249
<i>Raphael Viguier, Chung Ching Lin, Hadi AliAkbarpour, Filiz Bunyak, Sharathchandra Pankanti, Guna Seetharaman, and Kannappan Palaniappan</i>	

Effective Content-Based Near-Duplicate Video Detection	254
<i>Merih Seran Uysal, Christian Beecks, Daniel Sabinasz, and Thomas Seidl</i>	
Towards an Efficient Algorithm to Get the Chorus of a Salsa Song	258
<i>Camilo Arévalo, Gerardo M. Sarria M., Mario Julián Mora, and Carlos Arce-Lopera</i>	
A New Glowworm Swarm Optimization Based Clustering Algorithm for Multimedia Documents	262
<i>K. Pushpalatha and V.S. Ananthanarayana</i>	
 Media Representation, Processing, and Quality Measurement	
A Graph-Based Framework for Video Object Segmentation and Extraction in Feature Space	266
<i>Lei Fan and Alexander C. Loui</i>	
Joint Video and Sparse 3D Transform-Domain Collaborative Filtering for Time-of-Flight Depth Maps	272
<i>Thomas Hach, Tamara Seybold, and Hendrik Böttcher</i>	
An Illumination-Robust Approach for Feature-Based Road Detection	278
<i>Zhenqiang Ying, Ge Li, and Guozhen Tan</i>	
Characterization of the HEVC Coding Efficiency Advance Using 20 Scenes, ITU-T Rec. P.913 Compliant Subjective Methods, VQM, and PSNR	282
<i>Andrew Catellier and Margaret Pinson</i>	
Evaluation of Feature Detection in HDR Based Imaging Under Changes in Illumination Conditions	289
<i>Aakanksha Rana, Giuseppe Valenzise, and Frederic Dufaux</i>	
Contour-Based Depth Coding: A Subjective Quality Assessment Study	295
<i>Marco Calemme, Marco Cagnazzo, and Beatrice Pesquet-Popescu</i>	
Non-Local Structure-Based Filter for Video Coding	301
<i>Jian Zhang, Chuanmin Jia, Siwei Ma, and Wen Gao</i>	
Interactive Image Segmentation Using Elastic Interpolation	307
<i>Sachin Meena, Kannappan Palaniappan, and Guna Seetharaman</i>	
A Super-Resolution Method Using Spatio-Temporal Registration of Multi-Scale Components in Consideration of Color-Sampling Patterns of UHDTV Cameras	311
<i>Yasutaka Matsuo and Shinichi Sakaida</i>	
A User-Based Framework for Group Re-Identification in Still Images	315
<i>Nestor Z. Salamon, Julio C.S. Jacques Junior, and Soraia R. Musse</i>	
Analysis and Transcoding Time Prediction of Online Videos	319
<i>Tewodors Deneke, Sébastien Lafond, and Johan Lilius</i>	

Reconstructing Missing Areas in Facial Images	323
<i>Christoph Jansen, Radek Mackowiak, Nico Hezel, Moritz Ufer, Gregor Altstädt, and Kai Uwe Barthel</i>	
Scalable Saliency-Aware Distributed Compressive Video Sensing	327
<i>Jin Xu, Soufiane Djahel, and Yuansong Qiao</i>	
Error Protection with Extended Dual Frame Motion Compensation	331
<i>Da Liu, Li Wang, Chunyan Li, Yuncai Hao, and Fang Yin</i>	
Yet Another Approach for the Measurement of the Degree of Voice Normality: A Simple Scheme Based on Feature Reduction and Single Gaussian Distributions	335
<i>Fay. Ykhlef, W. Benzaba, R. Boutaleb, Jessus B. Alonso, and Far. Ykhlef</i>	
GPU Based Robust Image Registration for Composite Translational, Rotational and Scale Transformations	339
<i>Semih Dinc, Ramazan S. Aygun, and Farbod Fahimi</i>	
An Adaptive H.265/HEVC Encoding Control for 8K UHDTV Movies Based on Motion Complexity Estimation	343
<i>Shota Orihashi, Rintaro Harada, Yasutaka Matsuo, and Jiro Katto</i>	
Run-Time Machine Learning for HEVC/H.265 Fast Partitioning Decision	347
<i>Svetislav Momcilovic, Nuno Roma, Leonel Sousa, and Ivan Milentijevic</i>	

Media Interfaces

Scrubbing Wheel: An Interaction Concept to Improve Video Content Navigation on Devices with Touchscreens	351
<i>Klaus Schoeffmann and Lukas Burgstaller</i>	
Combining Diversity Queries and Visual Mining to Improve Content-Based Image Retrieval Systems: The DiVI Method	357
<i>Lucio F.D. Santos, Rafael L. Dias, Marcela X. Ribeiro, Agma J.M. Traina, and Caetano Traina Jr.</i>	
Human-Based Video Browsing - Investigating Interface Design for Fast Video Browsing	363
<i>Wolfgang Hürst and Rob van de Werken</i>	
An Unified Image Tagging System Driven by Image-Click-Ads Framework	369
<i>Qiong Wu and Pierre Boulanger</i>	
Improving Interactive TV Experience Using Second Screen Mobile Applications	373
<i>Mu Mu, William Knowles, Yusuf Sani, Andreas Mauthe, and Nicholas Race</i>	
Temporal and Spatial Evolution through Images	377
<i>Fernando Branco, Nuno Correia, Armando Rodrigues, João Gouveia, and Rui Nóbrega</i>	

Support to Multimedia Presentations on Multi-head Setups	381
<i>Marcio Ferreira Moreno and Luiz Fernando Gomes Soares</i>	

Mobile Media

Single-View Food Portion Estimation Based on Geometric Models	385
<i>Shaobo Fang, Chang Liu, Fengqing Zhu, Edward J. Delp, and Carol J. Boushey</i>	
Using Pico Projectors to Explore Other Worlds	391
<i>Rossana Santos and Nuno Correia</i>	
Employing Sensors and Services Fusion to Detect and Assess Driving Events	395
<i>Seyed Vahid Hosseinioun, Hussein Al-Osman, and Abdulmotaleb El Saddik</i>	
Smart Toy Car Localization and Navigation Using Projected Light	399
<i>Mingming Fan, Qiong Liu, Shang Ma, and Patrick Chiu</i>	
On Influencing Mobile Live Video Broadcasting Users	403
<i>Stefan Wilk, Dimitri Wulffert, and Wolfgang Effelsberg</i>	
Go Run Go: An Android Game-Story Application for Aiding Motivation to Exercise	407
<i>Chiraphruet Mansart, Siriluck Sukitphittayanon, Panitan Pantongkhum, and Supphachai Thaicharoen</i>	

Security

Towards Security of Native DRM Execution in HTML5	411
<i>David Livshits, Alexandra Mikityuk, Stefan Pham, and Asaf Shabtai</i>	
An Open Source Content Decryption Module to Improve DRM Integration with HTML5 Platforms	417
<i>Stefan Pham, Stefan Arbanowski, and Stefan Kaiser</i>	

Systems and Architectures

A Joint Asymmetric Graphics Rendering and Video Encoding Approach for Optimizing Cloud Mobile 3D Display Gaming User Experience	421
<i>Yao Liu, Yao Liu, and Sujit Dey</i>	
Optimizing HEVC CABAC Decoding with a Context Model Cache and Application-Specific Prefetching	429
<i>Philipp Habermann, Chi Ching Chi, Mauricio Alvarez-Mesa, and Ben Juurlink</i>	
On Virtualization of Red-Button Signaling in Hybrid TV	435
<i>Alexandra Mikityuk, Martin Platschek, and Oliver Friedrich</i>	
Vclick: Endpoint Driven Enterprise WebRTC	441
<i>Kundan Singh and John Yoakum</i>	

WAMINet: An Open Source Library for Dynamic Geospace Analysis Using WAMI	445
<i>Matthew Maurice, Matthew Piekenbrock, and Derek Doran</i>	
OmniViewer: Multi-modal Monoscopic 3D DASH	449
<i>Zhenhuan Gao, Shannon Chen, and Klara Nahrstedt</i>	

Invited Papers

An Immersive Telepresence System Using RGB-D Sensors and Head Mounted Display	453
<i>Xinzhong Lu, Ju Shen, Saverio Perugini, and Jianjun Yang</i>	
Design and Development of a Cloud Based Cyber-Physical Architecture for the Internet-of-Things	459
<i>Kazi Masudul Alam, Alex Sopena, and Abdulmotaleb El Saddik</i>	
Nonlocal Adaptive In-Loop Filter via Content-Dependent Soft-Thresholding for HEVC	465
<i>Xinfeng Zhang, Weisi Lin, Shiqi Wang, and Siwei Ma</i>	
Feature Level Fusion for Bimodal Facial Action Unit Recognition	471
<i>Zibo Meng, Shizhong Han, Min Chen, and Yan Tong</i>	
Multi-modality Mobile Image Recognition Based on Thermal and Visual Cameras	477
<i>Jui-Hsin (Larry) Lai, Chung-Ching Lin, Chun-Fu (Richard) Chen, and Ching-Yung Lin</i>	
Deep Learning for Imbalanced Multimedia Data Classification	483
<i>Yilin Yan, Min Chen, Mei-Ling Shyu, and Shu-Ching Chen</i>	
Efficient Multi-training Framework of Image Deep Learning on GPU Cluster	489
<i>Chun-Fu (Richard) Chen, Gwo Giun (Chris) Lee, Yinglong Xia, W. Sabrina Lin, Toytaro Suzumura, and Ching-Yung Lin</i>	
Stereo Based Tracking-by-Detection for Visual Sensor Networks	495
<i>Berner Panti, Fernando Pereira, and João Ascenso</i>	
Featuring Immediate Revocation in Mikey-Sakke (FIRM)	501
<i>Paulo Martins, Leonel Sousa, and Parashuram Chawan</i>	

MIPR Workshop

Precise Skin-Tone and Under-Tone Estimation by Large Photo Set Information Fusion	507
<i>Parham Aarabi, Ben Manashirov, Edmund Phung, and Kyung Moon Lee</i>	
Distortion Estimation Using Structural Similarity for Video Transmission over Wireless Networks	513
<i>Arun Sankisa, A.K. Katsaggelos, and Peshala V. Pahalawatta</i>	

Calculating a Minimum Playable Duration for HTTP Streaming Media Segments	519
<i>Michael Thornburgh</i>	
Normalized Gaussian Distance Graph Cuts for Image Segmentation	523
<i>Chengcai Leng, Wei Xu, Irene Cheng, Zhihui Xiong, and Anup Basu</i>	
An Automatic Video Reinforcing System Based on Popularity Rating of Scenes and Level of Detail Controlling	529
<i>Yuanyuan Wang, Yukiko Kawai, Kazutoshi Sumiya, and Yoshiharu Ishikawa</i>	
Scene Classification Using External Knowledge Source	535
<i>Esfandiar Zolghadr and Borivoje Furht</i>	
Automatic Content Curation System for Multiple Live Sport Video Streams	541
<i>Kazuki Fujisawa, Yuko Hirabe, Hirohiko Suwa, Yutaka Arakawa, and Keiichi Yasumoto</i>	
Foveated High Efficiency Video Coding for Low Bit Rate Transmission	547
<i>Irene Cheng, Masha Mohammadkhani, Anup Basu, and Frederic Dufaux</i>	
Stepped-Line Text Layout with Phrased Segmentation for Readability Improvement of Japanese Electronic Text	553
<i>Jumpei Kobayashi, Takashi Sekiguchi, Eiji Shinburi, and Toshio Kawashima</i>	

MTEL Workshop

Portable Lecture Capture that Captures the Complete Lecture	559
<i>Paul E. Dickson, Chris Kondrat, Ryan B. Szeto, W. Richards Adrián, Tung T. Pham, and Tim D. Richards</i>	
Personalized Indexing of Attention in Lectures — Requirements and Concept	565
<i>Sebastian Pospiech, Nils Birnbaum, Lars Knipping, and Robert Mertens</i>	
Implications of Short Term Memory Research for the Design of Spaced Repetition Based Mobile Learning Games	571
<i>Florian Schimanke, Sophie Ribbers, Robert Mertens, and Oliver Vornberger</i>	
Classquake: Measuring Students' Attentiveness in the Classroom	577
<i>Kai Michael Höver and Max Mühlhäuser</i>	
Automatic Correction of Programming Exercises in ViPLab	583
<i>Thomas Richter and Jan Vanvinkenroye</i>	
An Adopter Centric API and Visual Programming Interface for the Definition of Strategies for Automated Camera Tracking	587
<i>Benjamin Wulff, Andrew Wilson, Beate Jost, and Markus Ketterl</i>	

Ph.D. Workshop

Multispectral Texture Features from Visible and Near-Infrared Synthetic Face Images for Face Recognition	593
<i>Hyung-II Kim, Seung Ho Lee, and Yong Man Ro</i>	
Content-Based Multimedia Copy Detection	597
<i>Chahid Ouali, Pierre Dumouchel, and Vishwa Gupta</i>	
UStream: Ultra-Metric Spanning Overlay Topology for Peer-to-Peer Streaming Systems	601
<i>Oluwafolake Ojo, Ayodeji Oluwatope, and Olufemi Ogunsola</i>	
Traffic Flow Estimation from Road Surveillance	605
<i>Fozia Mehboob, Muhammad Abbas, Resheed Almotaeryi, Richard Jiang, Somaya Al-Maadeed, and Ahmed Bouridane</i>	
Author Index	609
Location Specification and Representation in Multimedia Databases	615
<i>Hanan Samet</i>	
Exploring the Complementarity of Audio-Visual Structural Regularities for the Classification of Videos into TV-Program Collections	620
<i>Gabriel Sargent, Pierre Hanna, Henri Nicolas, and Frédéric Bimbot</i>	