2016 Eighth International Conference on Quality of Multimedia Experience (QoMEX 2016)

Lisbon, Portugal 6-8 June 2016



IEEE Catalog Number: ISBN:

CFP16QOM-POD 978-1-5090-0355-6

Copyright © 2016 by the Institute of Electrical and Electronics 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:
 CFP16QOM-POD

 ISBN (Print-On-Demand):
 978-1-5090-0355-6

 ISBN (Online):
 978-1-5090-0354-9

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







Sessions and Papers

Monday, June 6

Keynote Talk 1: Perceptual Coding: Hype or Hope?

Speaker: C.-C. Jay Kuo, University of Southern California

Chair: Klaus Diepold, TUM

Oral Session 1: QoE for New Imaging Systems

Chair: Frederic Dufaux, ParisTech

- 1. Perceptual Quality of 4K-Resolution Video Content Compared to HD 102

 Glenn Van Wallendael, Paulien Coppens, Tom Paridaens, Niels Van Kets, Wendy Van den Broeck and Peter Lambert
- Perceived Dynamic Range of HDR Images 210
 Award candidate: Vedad Hulusic, Giuseppe Valenzise, Edoardo Provenzi, Kurt Debattista and Frederic Dufaux
- 3. Subjective and Objective Evaluation of HDR Video Coding Technologies 150 Philippe Hanhart, Martin Rerabek and Touradj Ebrahimi

Oral Session 2: QoE for Multimedia Streaming

Chair: Tobias Hossfeld, University of Duisburg-Essen

- QoE-aware Service Delivery: A Joint-Venture Approach for Content and Network Providers 318
 Arslan Ahmad, Alessandro Floris and Luigi Atzori
- 2. On User-Centric Analysis and Prediction of QoE for Video Streaming using Empirical Measurements 264
 Award candidate: Maria Plakia, Michalis Katsarakis, Paulos Charonyktakis, Ioannis Markopoulos and Maria Papadopouli
- 3. MPEG DASH Some QoE-based Insights into the Tradeoff between Audio and Video for Live Music Concert Streaming under Congested

4. ERWIN - Enabling the Reproducible Investigation of Waiting Times for Arbitrary Workflows 120

Award candidate: Thomas Zinner, Matthias Hirth, Valentin Fischer and Oliver Hohlfeld

Special Session 1: Sound Quality and Audio Quality of Experience

Chair: Bruno Fazenda, University of Salford

1. Determining and Labeling the Preference Dimensions of Spatial Audio Replay $180\,$

Jon Francombe, Tim Brookes, Russell Mason and James Woodcock

2. Next Generation Audio System Assessement using the Multiple Stimulus Ideal Profile Method 282

Award candidate: Nick Zacharov, Chris Pike, Frank Melchior and Thierry Worch

- 3. Relationship Between Hedonic Preference and Audio Quality in Tests of Music Production Quality 114

 Alex Wilson and Bruno Fazenda
- 4. Bitrate Classification of Twice-Encoded Audio using Objective Quality Features 228 Colm Sloan, Naomi Harte, Damien Kelly, Anil Kokaram and Andrew Hines
- 5. Assessment of Spherical Microphone Array Auralizations using Open-Profiling of Quality (OPQ) 61

 Johannes Nowak, Kai-Peter Jurgeit and Judith Liebetrau

Poster Session 1

Chair: Tomás Brandão, IT, ISCTE-IUL

Long Papers

1. Understanding How Image Quality Affects Deep Neural Networks 222

Samuel Dodge and Lina Karam

2. A Review on Conventional Psychoacoustic Evaluation Tools, Methods and Algorithms 31

Alexander Stojanow and Judith Liebetrau

- 3. Computational Modeling of Artistic Intention: Quantify Lighting Surprise for Painting Analysis 84
 Saboya Yang, Gene Cheung, Patrick Le Callet, Jiaying Liu and Zongming Guo
- 4. Perceptual Image Quality Enahncement for Solar Radio Image 90

Long Xu, Lin Ma, Zhuo Chen, Xianyou Zeng and Yihua Yan

- 5. Interactive vs. non-Interactive Subjective Evaluation of IP Network Impairments on Audiovisual Quality in Videoconferencing Context 174

 Ines Saidi, Lu Zhang, Vincent Barriac and Olivier Deforges
- 6. Evaluating Color Difference Measures in Images 25

Benhur Ortiz Jaramillo, Asli Kumcu and Wilfried Philips

Short Papers (Not available in IEEE Xplore)

1. Duration Neglect in Multi-episodic Perceived Quality N/A

Dennis Guse, Anna Wunderlich, Benjamin Weiss and Sebastian Möller

2. StreamSim: A Video Streaming Simulation Toolchain for Unreliable Transport Mechanisms N/A

Alexander Martin Dethof, Werner Robitza and Marie-Neige Garcia

- 3. Towards Using Entertaining 3D Video Sequences in Entertainment-oriented Subjective Experiments N/A Dawid Juszka
- 4. Diving Into Perceptual Space: Quality Relevant Dimensions for Video Telephony N/A

Falk Schiffner and Sebastian Möller

5. Crowd Workers Proven Useful: A Comparative Study of Subjective Video Quality Assessment N/A

Dietmar Saupe, Franz Hahn, Vlad Hosu, Igor Zingman, Masud Rana and Shujun Li

6. To Involve or not to Involve? Investigating the Contribution of Innovative Users to Subjective Video QoE Ratings N/A

Karel Vandenbroucke, Aron-Levi Herregodts, Dimitri Schuurman and Lieven De Marez

7. Revealing the Dark Side of WebRTC Statistics Collected by Google Chrome N/A

Doreid Ammar, Poul Heegaard, Min Xie, Katrien De Moor and Markus Fiedler

Personal Testemony 1: "Quality research": From academia to industry and back again

Speaker: Amy Reibman, Purdue University

Chair: Fernando Pereira, IST-IT

Tuesday, June 7

Keynote Talk 2: Thinking Big: The 5 Senses

Speaker: Marianna Obrist, University of Sussex

Chair: Ulrich Reiter, TH-KOELN

Oral Session 3: Objective Quality Assessment

Chair: Lina Karam, Arizona State University

1. Reduced-Reference Image Quality Assessment Based on DCT Subband Similarity 73

Amnon Balanov, Arik Schwartz and Yair Moshe

2. On the Accuracy of Objective Image and Video Quality Models: New Methodology for Performance Evaluation 108

Award candidate: Lukas Krasula, Karel Fliegel, Patrick Le Callet and Milos Klima

3. Comparing Simple Video Quality Measures for Loss-Impaired Video Sequences on a Large-Scale Database 138

Ahmed Aldahdooh, Enrico Masala, Olivier Janssens, Glenn Van Wallendael and Marcus Barkowsky

Oral Session 4: Cloud and Crowdsourcing: Emerging Challenges

Chair: Peter Schelkens, ETRO-VUB

1. Perception of Quality in Cloud Computing Based Services 43

Aleksandar Karadimche and Danco Davcev

2. Impact of Test Condition Selection in Adaptive Crowdsourcing Studies on Subjective Quality 126

Award candidate: Michael Seufert, Ondrej Zach, Tobias Hoßfeld, Martin Slanina and Phuoc Tran-Gia

- 3. Analysis and QoE Evaluation of Cloud Gaming Service Adaptation Under Different Network Conditions: the Case of NVIDIA GeForce NOW 294 Mirko Sužnjevic, Ivan Slivar and Lea Skorin-Kapov
- 4. Consumer-Photo Quality Assessment: Challenges and Pitfalls in Crowdsourcing 306

Michele Saad, Patrick Mcknight, Jacob Quartuccio, David Nicholas, Ramesh Jaladi and Philip Corriveau

Special Session 2: User Factors in Multimedia Experiences

Pierre Lebreton, Alexander Raake and Marcus Barkowsky	s relation with recillical knowledge 90
2. Personalizing User Interfaces for Improving Quality of Experi Sharath Chandra Guntuku, Sujoy Roy, Lin Weisi, Kelvin Ng, N	-
3. Quantifying Audience Experience in the Wild: Heuristics for D Chen Wang, Jacqueline Wong, Xintong Zhu, Thomas Röggla	
4. Using Individual Data to Characterize Emotional User Experie Romain Cohendet, Matthieu Perreira Da Silva, Anne-Laure G	•
5. The Influence of Human Factors on Olfaction based Mulsem Niall Murray, Yuansong Qiao, Gabriel Muntean and Brian Lee	
Poster Session 2	
Chair: António Pinheiro, UBI	
Long Papers	
 An evaluation of Heart Rate and Electrodermal Activity as an Objection Darragh Egan, John Barrett, Yuansong Qiao, Sean Brennan, Chris 	ctive QoE Evaluation Method for Immersive Virtual Reality Environments 270 tian Timmerer and Niall Murray
Video Content Analysis Method for Audiovisual Quality Assessment Baris Konuk, Emin Zerman, Gokce Nur and Gozde Bozdagi Akar	ent 276
3. A Common Lexicon for Spatial Sound Quality Assessment - Lates Nick Zacharov, Chris Pike and Torben Holm Pedersen	t Developments 288
4. Perception and Automated Assessment of Audio Quality in User On Bruno Fazenda, Iain Jackson, Paul Kendrick, Trevor Cox and France	
5. A Summary on Acoustic Room Divergence and Its Effect on Exten Stephan Werner, Florian Klein, Thomas Mayenfels and Karlheinz	•
6. Towards Training Naive Participants for a Perceptual Annotation Friedemann Köster, Dennis Guse, Christian Miethaner and Sebas	
7. Free Viewpoint Video Quality Assessment based on Morphologica Dragana Sandic, Federica Battisti, Dragan Kukolj, Patrick Le Calle	
Short Papers (Not available in IEEE Xplore)	
$ \hbox{\bf 2. Towards Automated Subjective Quality Assessments } N/A \\ \mbox{\bf Maximilian Krumpholz, Benjamin Rainer and Christian Timmerer } $	
3. Evaluation of the Performance of ITU-T G.1070 Model for Packet Ines Saidi, Vincent Barriac, Lu Zhang and Olivier Deforges	Loss and Desynchronization Impairments N/A
 Generating Realistic YouTube-like Stall Patterns for HTTP Video S Martín Varela, Hyunwoo Nam, Henning Schulzrinne and Toni Mäl 	
5. KPI Mapping for Virtual Infrastructure Scaling for a Realistic Video Rufael Mekuria, Michael McGrath, Christos Tselios, Dirk Griffioen	
	iizar and Narciso García
7. Games and Frames: A Strange Tale of QoE Studies N/A	

Florian Metzger, Albert Rafetseder, Christian Schwartz and Tobias Hoßfeld

Panel: QoE: from Academia to Industry, where are we?

Moderator: Ian Burnett, UTS

Panelists: Sebastian Möller, TU Berlin

Anna Ukhanova, Google Switzerland

Christian Timmerer, Alpen-Adria-Universität, Klagenfurt

José Pascoal, NOS

Wednesday, June 8

Keynote Talk 3: Quality of Experience in Haptic Communication

Speaker: Eckehard Steinbach, Technical University of Munich

Chair: Maria Paula Queluz, IST-IT

Oral Session 5: Audio and Speech Quality Assessment

Chair: Alexander Raake, TU Ilmenau

- 1. Towards a Universal Value Scale for Quantifying the Quality of Speech Communication Across Services 13

 Sebastian Möller and Jens Berger
- 2. (Re-)Actions Speak Louder Than Words? A Novel Test Method for Tracking User Behavior in Web Video Services 49 Werner Robitza and Alexander Raake
- Training Listeners for Spatial Audio Quality Evaluation in MUSHRA with a Special Focus on Loop Setting
 Nadja Schinkel-Bielefeld

Oral Session 6: Subjective Quality Assessment

Chair: Mylene Farias, University of Brasilia

- 1. Visual Attention as a Dimension of QoE: Subtitles in UHD Videos 37

 Toinon Vigier, Yoann Baveye, Josselin Rousseau and Patrick Le Callet
- 2. Visual Quality Assessment of Reconstructed Background Images 216

Aditee Shrotre and Lina Karam

- 3. 1Mbit is enough: Video Quality and Individual Idiosyncrasies in Multiparty HD Video-Conferencing 258 Marwin Schmitt, Judith Redi, Pablo Cesar and Dick Bulterman
- 4. How to Benchmark Objective Quality Metrics from Paired Comparison Data? 252

Philippe Hanhart, Lukáš Krasula, Patrick Le Callet and Touradj Ebrahimi

Special Session 3: Visual Perception Modeling for Image/Video Compression

Perceptual Evaluation of Compressive Sensing Image Recovery Bo Hu, Leida Li, Jiansheng Qian and Yuming Fang	
2. Closing The Gap: Visual Quality Assessment Considering Viewing Conditions 55 Yucheng Zhu, Guangtao Zhai, Ke Gu and Zhaohui Che	
3. Ambiguity-based Evaluation of Objective Quality Metrics for Image Compression 156 Manri Cheon and Jong-Seok Lee	
4. Annoyance Models for Videos with Spatio-Temporal Artifacts 312 Alexandre F. Silva, Mylene C. Q. Farias and Judith A. Redi	
5. Estimation of Perceptual Redundancies of HEVC Encoded Dynamic Textures 79 Karam Naser, Vincent Ricordel and Patrick Le Callet	
Poster Session 3	
Chair: Paulo Correia, IST-IT	
Long Papers	
1. Exploring the Introduction of Stereoscopic Depth in Applications to Change Perceived Quality Diego González-Zúñiga, Alberto Acuña-Silvera, Enric Martí-Godia and Jordi Carrabina	
2. Spatio-temporal Error Concealment Technique for High Order Multiple Description Coding Schemes Including Subjective Assessment Ahmed Aldahdooh, Marcus Barkowsky and Patrick Le Callet	67
3. Software to Stress Test Image Quality Estimators 162 He Liu and Amy R. Reibman	
4. 3D-HEVC Visual Quality Assessment: Database and Bitstream Model 168 Wei Zhou, Ning Liao, Zhibo Chen and Weiping Li	
5. A Bag of Words Description Scheme Based on SSIM for Image Quality Assessment 234 Miguel Fidalgo-Fernandes, Marco V. Bernardo and Antonio M.G. Pinheiro	
6. No-Reference Image Quality Assessment Based on Statistics of Local Ternary Pattern 246 Pedro Garcia Freitas, Welington Akamine and Mylene C.Q. Farias	
7. Using Region-of-Interest for Quality Evaluation of DIBR-based View Synthesis Methods 192 Andrei Purica, Giuseppe Valenzise, Beatrice Pesquet-Popescu and Frederic Dufaux	
Short Papers (Not available in IEEE Xplore)	
1. The SJTU HDR Video Sequence Dataset N/A Li Song, Yankai Liu, Xiaokang Yang, Rong Xie and Wenjun Zhang	
2. AVRate: An Open Source Modular Audio/Visual Subjective Evaluation Test Interface N/A Pierre Lebreton, Marie-Neige Garcia and Alexander Raake	
3. From a Different Point of View: How the Field of View of Light Field Displays affects the Willingness to Pay and to Use N/A Péter András Kara, Peter Tamas Kovacs, Maria G. Martini, Attila Barsi, Kristof Lackner and Tibor Balogh	
4. Audio-Video Databases for H.264-bitstream-based Quality Assessment of IPTV Services N/A Marie-Neige Garcia, Peter List, Bernhard Feiten, Ulf Wüstenhagen and Alexander Raake	
5. Quality of Immersive Experience in Storytelling: A Framework N/A Chenyan Zhang, Aud Sissel Hoel and Andrew Perkis	
6. Analysis of Gaze Patterns during Aesthetic Photo Quality Assessment N/A Hyeongnam Jang and Jong-Seok Lee	
7. On Test Principles for a QoE Evaluation Using Real Services N/A	

Albrecht Kurze and Maximilian Eibl

Personal Testemony 2: Back to my future as a researcher!

Speaker: Touradj Ebrahimi, EPFL

Chair: Fernando Pereira, IST-IT