



PV 2012

19TH INTERNATIONAL PACKET VIDEO WORKSHOP

MUNICH, MAY 10-11

Welcome Message from the Workshop Organizers

We would like to express a very warm welcome to all participants of the 19th International Packet Video Workshop. PV 2012 is taking place on May 10-11, 2012 at the Institute for Advanced Studies at the Technische Universität München (TUM) in Munich, Germany. The workshop is technically co-sponsored by the IEEE Communications Society.

We have received 50 papers out of which 32 have been selected for presentation at the workshop. Each submission was reviewed by at least two members of the Technical Program Committee. We are grateful to all TPC members for their high quality reviews and the timely submission of their evaluations.

We are excited that four internationally renowned experts have accepted our invitation to share their view on packet video with us and to deliver keynote presentations at PV 2012:

- 1) Alexander Raake, Deutsche Telekom Labs/TU Berlin, Germany
- 2) Bernd Girod, Stanford University, USA
- 3) Frank Fitzek, Aalborg University, Denmark
- 4) George Wright, BBC Research, UK

In addition to the regular paper presentations, four special sessions have been prepared for PV 2012:

- 1) Dynamic Adaptive Streaming over HTTP
Organizer: Thomas Stockhammer (Nomor Research GmbH, Germany)
- 2) Streaming of 3D content
Organizers: Gene Cheung (National Institute of Informatics, Japan), Bruno Macchiavello (University of Brasilia, Brazil)
- 3) IPTV: Contribution, Distribution and Consumption of Entertainment-Grade Video
Organizer: Ali Begen (Cisco, Canada)
- 4) Coding and transmission for video conferencing and telepresence
Organizers: Frank Hartung (FH Aachen, Germany), Per Fröjdh (Ericsson Research, Sweden), Mathias Wien (RWTH Aachen, Germany)

We would like to express our gratitude to the Special Session organizers for putting these exciting sessions together.

Our special thanks also go to our industrial sponsors which generously agreed to support PV 2012 financially. These are in alphabetical order: Alcatel-Lucent, DoCoMo Euro-Labs, Hewlett Packard, Nomor Research, and Siemens.

The local organization of PV 2012 has been mainly performed by members of the Institute for Media Technology at TU München and the friendly and competent staff from Interplan AG. We gratefully acknowledge the help of Ingrid Jamrath in managing the overall organization and keeping an eye on the finances. Clemens Schuwerk and Fernanda Brandi put endless hours in preparing the WWW presence of the workshop and the workshop proceedings which you will find on the USB stick in your workshop bag. Without their continuous effort and dedication, this workshop would not have been possible.

We hope that you will enjoy the interactions with colleagues and friends, the keynote talks and special sessions, the workshop dinner, and Munich in spring!

Finally, we would like to thank the Steering Committee for entrusting us with the organization of this workshop.

Munich, May 2012
Christine Guillemot (Technical Program Co-Chair)
Jacob Chakareski (Technical Program Co-Chair)
Eckehard Steinbach (General Chair)

SPONSORS



SIEMENS

no|moir novel mobile radio
research

NTT
docomo

DOCOMO Euro-Labs

Alcatel • Lucent 

 IEEE
COMMUNICATIONS
SOCIETY

 IEEE

ORGANIZATION

Organizing Committee

| | | |
|--------------------------|---------------------|-------------------|
| General Chair | Eckehard Steinbach | TUM, Germany |
| Technical Program Chairs | Christine Guillemot | INRIA, France |
| | Jacob Chakareski | EPFL, Switzerland |
| Finance Chair | Ingrid Jamrath | TUM, Germany |
| Publication Chair | Nikolaos Thomos | EPFL, Switzerland |
| Webpage | Fernanda Brandi | TUM, Germany |
| | Clemens Schuwerk | TUM, Germany |

Steering Committee

| | |
|------------------------|-------------------------------|
| Chang Wen Chen | SUNY Buffalo, USA |
| Tsuhan Chen | Cornell University, USA |
| Reha Civanlar | Ozyegin University, Turkey |
| Pascal Frossard | EPFL, Switzerland |
| Bernd Girod | Stanford University, USA |
| Jin Li | Microsoft, USA |
| Fernando Pereira | IST-IT, Portugal |
| Amy Reibman | AT&T, USA |
| Mihaela van der Schaar | UCLA, USA |
| Ralf Schaefer | HHI, Germany |
| Eckehard Steinbach | TUM, Germany |
| Ming-Ting Sun | University of Washington, USA |

Technical Program Committee

| | | | |
|---------------------|--|--------------------------|---|
| Ali C Begen | Cisco Canada | Jiro Katto | Waseda University |
| Aggelos Katsaggelos | Northwestern University | Wolfgang Kellerer | DoCoMo Euro-Labs |
| Alexander Raake | Deutsche Telecom Labs | Liang Zhou | Nanjing University of Posts and Telecommunications |
| Ghassan AlRegib | GATECH | Maria Martini | Kingston University |
| Amy Reibman | AT&T Research | Marco Tagliasachi | POLIMI |
| Attilio Fiandrotti | POLITO | Marcus Barkowsky | University of Nantes |
| Bruno Macchiavello | University of Brasilia | Mihaela van der Schaar | UCLA |
| Cha Zhang | Microsoft Research | Murat Tekalp | Koc University |
| Chang Wen Chen | University at Buffalo | Jörn Ostermann | University of Hannover |
| Cheng Huang | Microsoft Research | Pamela Cosman | UCSD |
| Ngai-Man Cheung | MERL | Per Fröjd | Ericsson Research |
| Christine Guillemot | INRIA | Béatrice Pesquet-Popescu | Telecom ParisTech |
| Chia-Wen Lin | National Tsing Hua University | Reha Civanlar | Ozyegin University |
| David Bull | University of Bristol | Raouf Hamzaoui | DMU |
| Dilip Krishnaswamy | Qualcomm Research Center | Marco Roccetti | Universiti di Bologna |
| Eckehard Steinbach | TUM, Germany | Kenneth Rose | UC Santa Barbara |
| Oscar Au | HKUST | Thomas Stockhammer | Nomor Research |
| Magda El-Zarki | UC Irvine, USA | Tao Liu | Dialogic Research Inc. |
| Enrico Magli | POLITO | Thierry Turetli | INRIA |
| Yap-Peng Tan | NTU | Thinh Nguyen | Oregon State University |
| Feng Wu | Microsoft Research | Tsuhan Chen | Cornell University |
| Fernanda Brandi | TUM, Germany | Vladan Velisavjevic | Deutsche Telecom Labs |
| Fernando Pereira | IST, LISBOA | Vladimir Stankovic | University of Strathclyde |
| Gene Cheung | National Institute of Informatics, Japan | Wen Gao | Peking University |
| Gwendal Simon | Telecom Bretagne | Xiaowen Dong | EPFL |
| Homer Chen | National Taiwan University | Zhu Li | Huawei Research |
| John Apostolopoulos | HP Labs | Xiaoqing Zhu | CISCO, USA |
| Jin Li | Microsoft Research | Zixiang Xiong | Texas A&M University |
| Jiangtao (Gene) Wen | Tsinghua University | | |

PROGRAM AT A GLANCE

THURSDAY

May 10

FRIDAY

May 11

| | | |
|-------|--|--|
| 08:00 | Registration | |
| 08:50 | Welcome | |
| 09:00 | Keynote 1: "Measuring others' media experience" Alexander Raake (Deutsche Telekom Labs/TU Berlin, Germany) | Keynote 3: "Social Mobile Clouds" Frank Fitzek (Aalborg University, Denmark) |
| 10:00 | Coffee Break | Coffee Break |
| 10:20 | Special Session: Coding and transmission for video conferencing and telepresence Session Chairs: Frank Hartung (FH Aachen, Germany), Per Fröjdh (Ericsson Research, Sweden), Mathias Wien (RWTH Aachen, Germany) | Special Session: IPTV: Contribution, Distribution and Consumption of Entertainment-Grade Video Session Chair: Ali Begen (Cisco, Canada) |
| 12:00 | Poster Teaser (2 minutes each) Session Chair: Jacob Chakareski (EPFL, Switzerland) | Poster Teaser (2 minutes each) Session Chair: Maria Martini (Kingston University, UK) |
| 12:20 | Lunch Break + Poster Session Session Chair: Jacob Chakareski (EPFL, Switzerland) | Lunch Break + Poster Session Session Chair: Maria Martini (Kingston University, UK) |
| 14:00 | Keynote 2: "Zoomable Video" Bernd Girod (Stanford University, USA) | Keynote 4: "Challenges and benefits of diverse IP distribution systems for a major broadcaster" George Wright (BBC Research, UK) |
| 15:00 | Coffee Break | Coffee Break |
| 15:20 | Special Session: Dynamic Adaptive Streaming over HTTP Session Chair: Thomas Stockhammer (Nomor Research, Germany) | Special Session: Streaming of 3D content Session Chairs: Gene Cheung (National Institute of Informatics, Japan), Bruno Macchiavello (University of Brasilia, Brazil) |
| 17:25 | | Closing |
| 17:30 | Bus Departure for Workshop Dinner | |
| 18:15 | Aperitif | |
| 18:45 | Workshop Dinner | |

KEYNOTES

Measuring others' media experience

Alexander Raake, Deutsche Telekom Labs/TU Berlin, Germany

May 10, 09:00

The talk will provide an overview of recent research and standardization activities on audiovisual quality assessment for IP-based multimedia services. It describes packet-header- and bitstream-based as well as hybrid models with access to the user's media player output, and their application to monitoring multimedia Quality of Experience (QoE). But what is QoE, really? Technical as well as principal challenges of multimedia QoE assessment, modeling and monitoring are discussed in the light of human multimodal perception in an entertainment usage scenario.

Zoomable Video

Bernd Girod, Stanford University, USA

May 10, 14:00

We review recent advances in the technology and applications of interactive region-of-interest (IRoI) video streaming, which allows each user to interactively control pan, tilt, and zoom during playback. This is familiar for high-resolution stills (say satellite imagery and maps), but not yet ubiquitous for video. A high-resolution video is available at the source, but either bandwidth or display size prohibits the streaming of the full video to a desktop computer, tablet, or smartphone. Solutions can be built in a standards compliant manner by breaking up the video into tiles at different resolution levels and simultaneously streaming multiple sub-videos that make up the overall display. Over-the-top delivery can use a client-server model or, for live multicast to large audiences, a P2P overlay. I will report our experiences with ClassX, an experimental IRoI video streaming platform for capturing lectures and seminars at Stanford University. In addition to "zoomable video," the system implements sophisticated video analysis techniques for automatic tracking of the lecturer and automatic synchronization of digital presentation slides, thus eliminating most human intervention for producing a compelling interactive viewing experience and reducing cost dramatically. ClassX works with Silverlight, Flash, iOS, and Android clients and is available as open source software at <http://classx.sourceforge.net>

Social Mobile Clouds

Frank Fitzek, Aalborg University, Denmark

May 11, 09:00

This talk will look into the potential of user cooperation. Users may form mobile clouds in order to increase the throughput, decrease delay and energy consumption. In order to increase the willingness to cooperate in such a mobile cloud the egoistic users have to be convinced either by technology driven or socially driven factors. On the technical side network coding is one of the enablers to create new services for mobile clouds. On the social side the social networks are used to enable the cooperation. The talk will highlight some potential use cases such as video distribution in mobile clouds.

Challenges and benefits of diverse IP distribution systems for a major broadcaster

George Wright, BBC Research, UK

May 11, 14:00

The BBC is a major UK Public Sector Broadcaster that operates ten TV channels and >50 radio networks. We deliver our content to viewers and listeners over broadcast and IP networks. Massive scale IP delivery gives a number of challenges as well as many benefits. This talk details some of the R&D input into IP delivery, shares some of the problems we face, and discusses scenarios and approaches which we are examining to continue our experimentation into modern delivery systems whilst maintaining a legacy broadcast network and an integral approach to high quality and open standards.

TECHNICAL PROGRAM

MAY 10 / MORNING

08:00 – 08:50 Registration

08:50 – 09:00 Welcome

09:00 – 10:00 **Keynote 1: “Measuring others' media experience”**
Alexander Raake (Deutsche Telekom Labs/TU Berlin, Germany)

10:00 – 10:20 Coffee Break

10:20 – 12:00 **Special Session: Coding and transmission for video conferencing and telepresence**
Session Chairs: Frank Hartung (FH Aachen, Germany), Per Fröjdh (Ericsson Research, Sweden), Mathias Wien (RWTH Aachen, Germany)

Subjective quality assessment of video conferences and telemeetings

Gunilla Berndtsson, Mats Folkesson, Valentin Kulyk
Ericsson AB, Stockholm, Sweden

Compressed Domain Stitching of HEVC Streams for Video Conferencing Applications

Peter Amon, Madhurani Sapre, Andreas Hutter
Siemens AG, Munich, Germany

Online multipath convolutional coding for real-time transmission

Tuan Tran Thai, Emmanuel Lochin, Jerome Lacan
ISAE, Toulouse, France

Optimized Error Protection for Scalable Video Multicast Streaming on Multiple Channels

Bin Zhang, Mathias Wien
RWTH Aachen, Germany

12:00 – 12:20 **Poster Teaser** (2 minutes each)
Session Chair: Jacob Chakareski (EPFL, Switzerland)

12:20 – 14:00 **Lunch Break + Poster Session**
Session Chair: Jacob Chakareski (EPFL, Switzerland)

A Performance Evaluation Framework for Video Streaming

Florian Metzger, Albert Rafetseder, Kurt Tutschku
University of Vienna, Austria

SDC: Scalable Description Coding for Adaptive Streaming Media

Jason Quinlan*, Ahmed Zahran**, Cormac Sreenan*
* *University College Cork, Ireland*
** *Cairo University, Egypt*

Wireless Video Transmission with Over-the-Air Packet Mixing

Antonios Argyriou
University of Thessaly, Greece

Achieving High-Bitrate Overlay Live Streaming with Proxy Helpers

Dongni Ren, Gary Chan
HKUST, Hong Kong

Providing Service Differentiation for Video Streaming in Hybrid P2P Overlay Network

Suphakit Awiphan, Zhou Su, Jiro Katto
Waseda University, Tokyo, Japan

Distributed Rate Allocation in P2P Networks with Inter-Session Network Coding

Eirina Bourtsoulatze, Nikolaos Thomos, Pascal Frossard
EPFL, Lausanne, Switzerland

Playout Adaptation for Peer-to-peer Streaming Systems under Churn

Ilias Chatzidrossos, György Dán
KTH, Stockholm, Sweden

RapidStream: P2P Streaming on Android

Philipp Eittenberger, Matthias Herbst, Udo Krieger
Otto-Friedrich University, Bamberg, Germany

MAY 10 / AFTERNOON

| | |
|---------------|---|
| 14:00 – 15:00 | Keynote 2: “Zoomable Video” Bernd Girod (Stanford University, USA) |
| 15:00 – 15:20 | Coffee Break |
| 15:20 – 17:00 | Special Session: Dynamic Adaptive Streaming over HTTP Session Chair: Thomas Stockhammer (Nomor Research, Germany) |
| | Adaptation Algorithm for Adaptive Streaming over HTTP Konstantin Miller*, Emanuele Quacchio**, Gianluca Gennari**, Adam Wolisz* * <i>Technische Universität Berlin, Germany</i> ** <i>STMicroelectronics, Milan, Italy</i> |
| | Video Adaptation Proxy for Wireless Dynamic Adaptive Streaming over HTTP Wei Pu*, Zixuan Zou**, Chang Wen Chen* * <i>University at Buffalo, NY, USA</i> ** <i>Huawei Technologies, Co. LTD., Shenzhen, China</i> |
| | Seamless and Efficient Stream Switching of Multi-Perspective Videos Hongchi Zhang *, Xiaoyu Gu**, Anas Al-Nuaimi*, Michael Fahrmaier**, Ryota Ishibashi *** * <i>Technical University of Munich, Germany</i> ** <i>DOCOMO Euro-Labs, Munich, Germany</i> *** <i>NTT Service Integration Labs, Tokyo, Japan</i> |
| | Towards Peer-Assisted Dynamic Adaptive Streaming over HTTP Stefan Lederer, Christopher Müller, Christian Timmerer <i>Alpen-Adria-Universität, Klagenfurt, Austria</i> |
| 17:30 | Bus Departure for Workshop Dinner |
| 18:15 | Aperitif |
| 18:45 | Workshop Dinner |

MAY 11 / MORNING

09:00 – 10:00

Keynote 3: “Social Mobile Clouds”

Frank Fitzek (Aalborg University, Denmark)

10:00 – 10:20

Coffee Break

10:20 – 12:00

Special Session: IPTV: Contribution, Distribution and Consumption of Entertainment-Grade Video

Session Chair: Ali Begen (Cisco, Canada)

Performance Analysis of AL-FEC for RTP-based Streaming Video Traffic to Residential Users

Martin Ellis, Dimitrios Pezaros, Colin Perkins

University of Glasgow, Scotland

Virtual RTCP: A Case Study of Monitoring and Repair for UDP-based IPTV Systems

Alejandra Soni Garcia*, Joerg Ott*, Martin Ellis**, Colin Perkins**

* *Aalto University, Espoo, Finland*

** *University of Glasgow, Scotland*

Scaling Server-Based Channel-Change Acceleration to Millions of IPTV Subscribers

Marc Mignon*, Koen Bouckhout**, Joshua Gahm**, Ali Begen**

* *Belgacom, Brussels, Belgium*

** *Cisco, San Jose, USA*

The Effect of Multi-Generation Encoding in Broadcast Contribution on The End-User Video Quality

Ozgu Alay, Helge Stephansen

T-VIPS, Oslo, Norway

12:00 – 12:20

Poster Teaser (2 minutes each)

Session Chair: Maria Martini (Kingston University, UK)

12:20 – 14:00

Lunch Break + Poster Session

Session Chair: Maria Martini (Kingston University, UK)

Video Quality Evaluation in the Cloud

Christian Keimel, Julian Habigt, Clemens Horch, Klaus Diepold

Technical University of Munich, Germany

Dynamic Scaling of VoD Services into Hybrid Clouds with Cost Minimization and QoS Guarantee

Xuanjia Qiu*, Hongxing Li*, Chuan Wu*, Zongpeng Li**, Francis Lau*

* *The University of Hong Kong*

** *University of Calgary, Canada*

Joint Optimization of Flow Allocation and Data Center Placement in Multi-Service Networks

Jacob Chakareski

EPFL, Lausanne, Switzerland

Psycho-physical Limits of Interocular Blur Suppression and its Application to Asymmetric Stereoscopic Video Delivery

Varuna De Silva*, Hemantha Kodikara Arachchi*, Erhan Ekmekcioglu*, Anil Fernando*, Safak

Dogan*, Ahmet Kondozi*, Saadet Sedef Savas**

* *Univ. of Surrey, Guildford, United Kingdom*

** *Koc University, Istanbul, Turkey*

An Estimation-Theoretic Framework for Spatially Scalable Video Coding with Delayed Prediction

Jingning Han, Vinay Melkote, Kenneth Rose

UC Santa Barbara, USA

Mobile Video Sensitivity to Packet Loss and Packet Delay Variation in Terms of QoE

Tahir Minhas, Oziel Lagunas, Patrik Arlos, Markus Fiedler

Blekinge Institute of Technology, Karlskrona, Sweden

Mobile Video Transmission via Wyner-Ziv Video Coding and Rate Compatible Modulation

Hu Chen* **, Hao Cui* ***, Chang Wen Chen*

* *University at Buffalo, NY, USA*

** *Technical University of Munich, Germany*

*** *University of Science and Technology of China, Hefei, China*

MAY 11 / AFTERNOON

| | |
|---------------|--|
| 14:00 – 15:00 | Keynote 4: “Challenges and benefits of diverse IP distribution systems for a major broadcaster” George Wright (BBC Research, UK) |
| 15:00 – 15:20 | Coffee Break |
| 15:20 – 17:25 | Special Session: Streaming of 3D content Session Chairs: Gene Cheung (National Institute of Informatics, Japan), Bruno Macchiavello (University of Brasilia, Brazil) Content Aware Delivery of Visual Attention based Scalable Multi-View Video over P2P Erhan Ekmekcioglu*, Hemantha Kodikara Arachchi*, Ahmet Kondoz*, Goktug Gurler**, Sedef Savas** * <i>University of Surrey, Guildford, United Kingdom</i> ** <i>Koc University, Istanbul, Turkey</i> Correlation-Aware Packet Scheduling for Multi-Camera Streaming Laura Toni*, Thomas Maugey**, Pascal Frossard** * <i>University of California at San Diego, USA</i> ** <i>EPFL, Lausanne, Switzerland</i> Near-Optimal Content Replication for Interactive Multiview Video Streaming Huan Huang*, Gary Chan*, Gene Cheung**, Pascal Frossard*** * <i>HKUST, Hong Kong</i> ** <i>National Institute of Informatics, Tokyo, Japan</i> *** <i>EPFL, Lausanne, Switzerland</i> Spatial and Temporal Prediction Scheme for 3D Holoscopic Video Coding Based on H.264/AVC Caroline Conti* **, João Lino*, Paulo Nunes**, Luís Soares** * <i>Instituto de Telecomunicações, Lisbon, Portugal</i> ** <i>Instituto Universitário de Lisboa (ISCTE-IUL), Lisbon, Portugal</i> A subjective and objective evaluation of a realistic 3D IPTV transmission chain Pierre Lebreton* ***, Alexander Raake*, Ulf Wüstenhagen**, Thomas Buchholz**, Marcus Barkowsky***, Patrick Le Callet*** * <i>Telekom Innovation Laboratories, TU Berlin, Germany</i> ** <i>Telekom Innovation Laboratories, Deutsche Telekom AG, Berlin, Germany</i> *** <i>University of Nantes, France</i> |
| 17:25 – 17:30 | Closing |

WORKSHOP DINNER

AUGUSTINER KELLER MÜNCHEN

May 10, 18:15

17:30 Bus departure
18:15 Aperitif
18:45 Workshop Dinner

LOCATION (A)

Augustiner Keller München
Arnulfstr. 52
80335 München

BUS TRANSFER

Bus departure for Workshop Dinner is at 17:30, leaving from the workshop location.

PUBLIC TRANSPORT

The “Augustiner Keller München” (A) is located next to the central station (“Hauptbahnhof”) and “Hackerbrücke”. If you decide to use public transport to get to the Workshop Dinner, you have several options:

- U1, U2, U4 or U5 to central station (“Hauptbahnhof”)
- S1-S8 to central station (“Hauptbahnhof”) or “Hackerbrücke”
- Tram 16 or 17 to “Hopfenstraße”

