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PROGRAM

Data Compression Conference (DCC 2016)

Sponsored by U. Arizona, Brandeis U., Microsoft Research, IEEE Signal Processing Society
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Snowbird, Utah, March 29 - April 1, 2016

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Yan Ye, *Interdigital, Inc.*

SCHEDULE OVERVIEW:

Tuesday Evening, March 29:

Registration and Reception (7pm - 10pm)

Wednesday, March 30:

Morning:	Technical Sessions 1, 2	(8:00am - 12:20pm)
Mid-Day:	Panel Presentation	(2:00pm - 3:30pm)
Afternoon:	Technical Sessions 3, 4	(4:00pm - 7:20pm)

Thursday, March 31:

Morning:	Technical Sessions 5, 6	(8:00am - 12:20pm)
Mid-Day:	Keynote Presentation	(2:00pm - 3:00pm)
Afternoon:	Technical Session 7	(3:20pm - 5:40pm)
Evening:	Poster Session and Reception	(6:00pm - 8:30pm)

Friday, April 1:

Morning & Mid-Day:	Technical Sessions 8,9,10	(8:00am - 2:40pm)

TUESDAY EVENING
Registration / Reception, 7:00-10:00pm (Golden Cliff Room)

WEDNESDAY MORNING

SESSION 1, ***Compressed Data Structures, Part 1***

Break: 10:20am - 10:40am

SESSION 2, ***Recent Developments in Video Coding, Part 1***

Wednesday Lunch Break: 12:20pm - 2:00pm

WEDNESDAY MID-DAY

Panel Presentation

2:00pm - 3:30pm

Video Coding: Recent Developments for HEVC and Future Trends

Abstract:

This special event at DCC 2016 will consist of a keynote talk by Gary Sullivan (co-chair of the MPEG & VCEG Joint Collaborative Team on Video Coding) followed by a panel discussion with key members of the video coding and standardization community. Highlights of the presentation will include HEVC Screen Content Coding (SCC), High Dynamic Range (HDR) video coding, the Joint Exploration Model (JEM) for advances in video compression beyond HEVC, and recent initiatives in royalty-free video coding.

Panel Members:

Anne Aaron
Manager, Video Algorithms - Netflix

Arild Fuldseth
Principal Engineer, Video Coding - Cisco Systems

Marta Karczewicz
VP, Technology, Video R&D and Standards - Qualcomm

Jörn Ostermann
Professor - Leibniz Universität Hannover Institute for Information Processing

Jacob Ström
Principal Researcher - Ericsson

Gary Sullivan
Video Architect - Microsoft

Yan Ye
Senior Manager, Video Standards - InterDigital

WEDNESDAY AFTERNOON

SESSION 3

Break: 5:20pm - 5:40pm

SESSION 4

THURSDAY MORNING

SESSION 5, *Genome Compression*

Break: 10:20am - 10:40am

SESSION 6, *Recent Developments in Video Coding, Part 2*

Thursday Lunch Break: 12:20pm - 2:00pm

THURSDAY MID-DAY

Keynote Address

2:00pm - 3:00pm

JPEG PLENO: Towards a New Standard for Plenoptic Image Compression

Touradj Ebrahimi

École Polytechnique Fédérale De Lausanne (EPFL)

EPFL and JPEG Convener

Abstract:

JPEG format is today a synonymous of modern digital imaging, and one of the most popular and widely used standards in recent history. Images created in JPEG format now exceeds one billion per day in their number, and most of us can count a couple, if not more JPEG codecs in devices we regularly use in our daily lives; in our mobile phones, in our computers, in our tablets, and of course in our cameras. JPEG ecosystem is strong and continues an exponential growth for the foreseeable future. A significant number of small and large successful companies created in the last two decades have been relying on JPEG format, and this trend will likely continue.

A question to ask our selves is: will we continue to have the same relationship to flat snapshots in time (the so-called Kodak moments) we call pictures, or could there be a different and enhanced experience created when capturing and using images and video, that could go beyond the experience images have been providing us for the last 120 years? Several researchers, artists, professionals, and entrepreneurs have been asking this same question and attempting to find answers, with more or less success. Stereoscopic and multi-view photography, panoramic and 360-degree imaging, image fusion, point cloud, high dynamic range imaging, integral imaging, light field imaging, and holographic imaging are among examples of solutions that have been proposed as future of imaging.

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(keynote abstract continued)

Recent progress in advanced visual sensing has made it feasible to capture visual content in richer modalities when compared to conventional image and video. Examples include Kinect by Microsoft, mobile sensors in Project Tango by Google and Intel, light-field image capture by Lytro, light-field video by Raytrix, and point cloud acquisition by LIDAR (Light Detection And Ranging). Likewise, image and video rendering solutions are increasingly replying on richer modalities offered by such news sensors. Examples include Head Mounted Displays by Oculus and Sony, 3D projector by Ostendo and 3D light field display solutions by Holografika. This promises a major change in the way visual information is captured, processed, stored, delivered and displayed.

JPEG PLENO evolves around an approach called plenoptic representation, relying on a solid mathematical concept known as plenoptic function. This promises radically new ways of representing visual information when compared to traditional image and video, offering richer and more holistic information. The plenoptic function describes the structure of the light information impinging on observers' eyes, directly measuring various underlying visual properties like light ray direction, multi-channel colours, etc.

The road-map for JPEG PLENO follows a path that started in 2015 and will continue beyond 2020, with the objective of making the same type of impact that the original JPEG format has had on today's digital imaging starting from 20 years ago. Several milestones are in work to approach the ultimate image representation in well-thought, precise, and useful steps. Each step could potentially offer an enhanced experience when compared to the previous, immediately ready to be used in applications, with potentially backward compatibility. Backward compatibility could be either at the coding or at the file format level, allowing an old JPEG decoder of 20 years ago to still be able to decode an image, even if that image won't take full advantage of the intended experience, which will be only offered with a JPEG PLENO decoder.

This talk starts by providing various illustrations the example applications that can be enabled when extending conventional image and video models toward plenoptic representation. Doing so, we will discuss use cases and application requirements, as well as example of potential solutions that are or could be considered to fulfill them. We will then discuss the current status of development of JPEG PLENO standard and discuss various milestones ahead. The talk will conclude with a list of technical challenges and other considerations that need to be overcome for a successful completion of JPEG PLENO.

THURSDAY AFTERNOON

SESSION 7

POSTER SESSION AND RECEPTION

6:00 - 8:30pm
In the Golden Cliff Room.

(Titles are listed at the end this program; abstracts of each presentation appear in the proceedings.)

FRIDAY MORNING

SESSION 8

Break: 10:20am - 10:40am

SESSION 9, *Recent Developments in Video Coding, Part 3*

FRIDAY MID-DAY

Break: 12:20pm - 12:40pm

SESSION 10, ***Compressed Data Structures, Part 2***

Poster Session

(listed alphabetically by first author)