

## **104<sup>th</sup> MPEG Incheon, Rep. of Korea, 22-26 April 2013, Meeting Report**

**Panos Kudumakis**

**qMedia, Queen Mary University of London**

### **Invited speaker at MPEG Multimedia Ecosystem 2013 Event**

For many MPEG is synonym to audiovisual compression standards. However, MPEG has developed and continues to develop a large number of non-compression related standards. Therefore, a workshop has been organised during the 104<sup>th</sup> MPEG Incheon meeting dedicated to further promote these non-compression related standards to both MPEG and non-MPEG audience. The author had the opportunity to give an invited presentation on one of them, known as MPEG-M: Multimedia Service Platform Technologies ([overview](#)), where he has been involved from its conception to its recent publication by ISO/IEC ([preview](#)). Brief summaries of both the speakers presentations and demonstrations (17 products from 13 institutes at 11 booths) that took place during the workshop are given below.

### **An (edited) excerpt on MPEG-M from the 104<sup>th</sup> MPEG Incheon Press Release**

APIs enable access to other MPEG technologies via MPEG-M -- "The MPEG-M technology specifications (ISO/IEC 23006) have reached the status of International Standard at the 104th MPEG meeting. MPEG-M specifies the means to access individual MPEG tools through standardized APIs and is expected to help the creation of a global market of MPEG-M applications that can run on devices supporting MPEG-M APIs in addition to the other MPEG technologies. The MPEG-M standard should also help the deployment of innovative business models because it will enable the easy design and implementation of media-handling value chains. The standard also provides reference software as open source with a business friendly license. The introductory part of the MPEG-M family of specifications, 23006-1 MPEG-M architecture and technologies, will soon be also freely available on the ISO web site".

### **MPEG-M White Paper approved by the MPEG Communication Group**

Furthermore, MPEG has recently also established a Communication Group to further promote its standards. In the latter framework the first publicly available -- approved by the Communication Group -- white paper on MPEG-M has also been authored. This is featured at the MPEG web site at <http://mpeg.chiariglione.org/>. However, the site will continue to provide both white papers as well as video lectures on MPEG standards (currently features a lecture on Unified Speech and Audio Compression - USAC). So watch the MPEG web site for further info on other standards!

### **Accessing and referencing the MPEG-M White Paper**

Panos Kudumakis, Mark Sandler, Angelos-Christos G. Anadiotis, Iakovos S. Venieris, Angelo Difino, Xin Wang, Giuseppe Tropea, Michael Grafl, Víctor Rodríguez-Doncel, Silvia Llorente and Jaime Delgado, "[MPEG-M: A Digital Media Ecosystem for Interoperable Applications](#)", Ref. as ISO/IEC JTC1/SC29/WG11/N13952, Incheon, Rep. of Korea, Apr. 2013.

## MPEG Multimedia Ecosystem 2013 Event

Beyond MPEG Audio, Video and Graphics Compression  
Songdo Convensia, Incheon, 24-25 April 2013.

I see with great pleasure that an event on MPEG Multimedia ecosystem will be held at 104th MPEG. In the past decade, beside producing standards in its traditional media compression field, MPEG has developed media-related non-codec standards which will enrich the use of multimedia such as Multimedia Service Platform Technologies (MPEG-M), Rich Media User Interfaces (MPEG-U), and Information Exchange with Virtual Worlds (MPEG-V), and more such standards are being developed such as Augmented Reality Application Format (MPEG-ARAF), Compact Descriptors for Visual Search (MPEG-CDVS), Green MPEG, and User Description (MPEG-UD). The MPEG Multimedia ecosystem includes consideration of business aspects by showing how MPEG technologies can be used to build multimedia ecosystems.

I expect that this event will fulfill our goal of promoting those new standards by explaining their breadth and value to the various industries. I thank the event organizers for their cooperation in setting up this impressive event. Please enjoy.

Leonardo Chiariglione  
MPEG Convener

### MPEG Multimedia Ecosystem 2013 Event Speakers



## **MPEG Multimedia Ecosystem 2013 Event Presentations**

### **Better media experiences by profiling the users, Dr. Sanghyun Joo**

Recent services are provided at a user-customized way for user's better satisfaction. This should be started from clear definitions of User and MPEG-UD elaborates to develop service, context, customized usage as well as User Description. We introduce our current status of the MPEG-UD activities and future plans.

### **Pixels - the new hyperlink, Dr. Danito Pau**

A picture is worth a thousand words: fast and convenient to express ideas, or point to objects. Just snap a picture and objects in your image become hyperlinks to the infinite resources of digital media and information. All thanks to MPEG Signature and Compact Descriptor Visual Tools (CDVS).

### **Connecting physical and digital worlds, Dr. Marius Preda**

The recent development of mobile terminals processing capabilities makes possible to anyone to use these bridges. Academia and industry provided, and continue to do, an impressive quantity of algorithms, tools, prototypes and products to create and experiment with AR/MR content. Our vision is that open standards will be a catalyst for developing these bridges.

### **MPEG-AR: Augmented Reality, Dr. Marius Preda**

MPEG improved technologies in both fields - video and graphics, and added new and original tools for sensors and actuators. In ARAF - Augmented Reality Application Format, published as Part 13 of the MPEG-A series, MPEG is grouping key technologies from existing standards in order to offer a unique entry point to developers of AR services and applications.

### **Green MPEG, Dr. Felix C. Fernandes**

The increasing energy-intensive consumption of media content raises serious concerns about energy efficiency. In 2012, to facilitate reduced energy consumption from the encoding, decoding and presentation of media content, MPEG initiated the Green MPEG standardization activity which will be described in this presentation.

### **MPEG-M: Multimedia Service Platform Technologies, Dr. Panos Kudumakis**

MPEG-M defines a collection of multimedia middleware APIs, elementary services and service aggregation mechanisms, to enable innovative services from current IPTV technologies toward seamless integrations of personal content creation, e-commerce, social networks and Internet distribution of digital media.

### **Multi-screen applications with MPEG-U, Dr. Jean-Claude Dufourd**

MPEG-U provides normative interfaces between Widgets and Widget Managers to allow Widgets from different service providers to run, communicate and be transferred within a unique framework. MPEG-U is the perfect technology for the design of communicating, collaborative multi-screen services running across TVs and other devices in the home.

## **MPEG Multimedia Ecosystem 2013 Event Demonstrations**

### **Create and play augmented experiences, Institut MINES Telecom**

One of the key elements of MPEG vision on Augmented Reality (AR) allows, on one side to develop powerful authoring tools and on the other side, optimized browsers exploiting optimally the resources of mobile terminals. This demonstration will show an implementation of the end-to-end content chain for AR and introduces several augmented reality games.

### **Green Video, Samsung**

These demos showcase the energy-efficient video decoding and display with the appropriate metadata to guide the decoder voltage control and display backlight scaling, where the metadata is created at the encoder and embedded in the stream to the receiver.

### **Intelligent Camera, Samsung**

Intelligent Camera captures human facial and body features in order to understand and visualize the users. The sensed features can be used to manipulate any virtual characters, while the degree of adaptation can be controlled by sensor adaptation preferences.

### **Scalable Remote User Interface, KETI**

SRUI is a new framework to provide scalability of User Interface for various consumer devices remotely. We design a new description language to accommodate functions of selecting and filtering RUIs or fragments of a RUI based on MPEG-21 DIDL.

### **Augment Reality Service, Huawei**

Augmented Reality Service demonstrates the basic abilities to implement an AR solution, including image recognition, planar tracking, pose estimation, and 3D rendering. The rendered 3D models in this prototype are synthesized avatars based on facial photos of real people.

### **Social TV Service, Huawei**

Linked TV is the next generation of TV application. It integrates the latest TV technologies such as Over-The-Top (OTT) services and mobile applications into a single solution to provide more attractive user experiences. In a word, tomorrow's TV watching would be far beyond than just watching.

### **Collaborative cross-standard cloud virtualisation, Institut MINES Telecom & Prologue**

MPEG-4 technologies are the key enabler for ensuring open-source cross-standard cloud virtualization. Bandwidth/CPU consumption reduction and increased collaborative user experience are the main benefits.

### **MPEG 3DGC player powered by Embedded GPU, STMicroelectronics**

An embedded 3D Graphics Compression (3DGC) player has been developed and extended on ST Orly platform thus taking benefits using a modern GPU. Real-time rendering of complex 3D models with pre-computed or user-controlled animation is achieved. A 3DGC encoder is implemented.

### **Sensing motion with smart imagers, STMicroelectronics**

An optical flow is computed using visual descriptors and filtered. The application has been optimized on Android tablet. It captures real time images and display gray-scale image with colored optical flow, according to vector direction, over imposed to acquired images.

### **Visual searching and object locking to retrieve meaningful content, STMicroelectronics**

To process the video frames efficiently, a new dataflow processing allows switching between object searching, retrieving and pair wise matching to keep at minimum the number of queries sent to the database. The extraction processor is accelerated through a GPU.

### **Accelerating Visual feature extraction for CDVS, STMicroelectronics**

Hardware "Stripe Based DoG", SBDoG is presented. It includes whole DoG and Interest point detection logic. This is implemented on both 28nm ST technology and FPGA with minimized memory. It is a proven implementation that performs equivalently to Test Model 5.

### **Automatic calorie calculators for outdoor exercise equipment and its health avatar application system, Myongji University**

A health avatar system is presented that can count the number of trials and calculate the calorie consumption on outdoor fitness machines. The personal exercise records are delivered to the database and the mobile health avatar application.

### **MPEG technologies for Information Centric Networking, CEDEO & CNIT**

Information Centric Networks (ICN) information is stored and retrieved based on its "name". Each information unit, when stored, is individually identified so that it can be retrieved by just using its name. CONVERGENCE, an FP7-funded ICN project, has developed a specific comprehensive ICN solution that integrates CCN for the network part and MPEG-7, MPEG-21 and MPEG-M for the middleware part.

### **Open Connected TV (OCTV) CEDEO & DMP**

Connected TV is seen by many as the means to provide the much sought-after convergence between traditional broadcast television and various new forms of video delivery. However, the largely proprietary implementations of Connected TV are a major impediment to the development of a promising new market of content, products, services and applications.

### **Make-up Avatar, ETRI**

Interactive avatar make-up simulation system (IAM) utilizes realistic facial color reproduction technology based on the color science is to create a 3D facial avatar model similar to human face, and to realize realistically make-up effect and special make-up effect using virtual make-up tool.

### **Multi-screen applications with MPEG-U, Telecom ParisTech**

MPEG-U is implemented in the GPAC open source multimedia player which implements the MPEG-4 Systems terminal architecture. Discovery and communication use the UPnP protocol. The demonstration features multiple widget managers, discovery and communication between widgets running on different devices, different OS and even with web applications.