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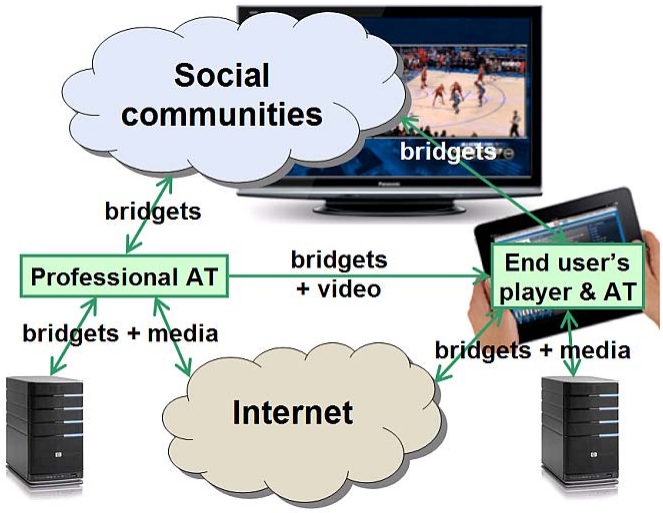
Table of Contents

1 Project Description

BRIDGET will open new dimensions for multimedia content creation and consumption by enhancing broadcast programmes with bridgets: links from the programme you are watching to external interactive media elements such as web pages, images, audio clips, different types of video (2D, multi-view, with depth information, free viewpoint) and synthetic 3D models.

Bridgets can be:



- created automatically or manually by service providers, either from their own content (e.g., archives, Internet and other services) or from wider Internet sources;
- created by end users, either from their local archives or from Internet content;
- transmitted in the broadcast stream or independently;
- independently distributed by users e.g. via social networks;
- filtered by a recommendation engine based on user profile, relevance, quality, etc.;
- enjoyed on the common main screen or a private second screen, in a user-centric and immersive manner, e.g., within 3D models allowing users to place themselves inside an Augmented Reality (AR) scene at the exact location from which the linked content was captured.

To deliver the above, BRIDGET will develop:

- a hybrid broadcast/Internet architecture;
- a professional Authoring Tool (AT) to generate bridgets and dynamic AR scenes with spatialised audio;
- an easy-to-use AT for end users;
- a player to select bridgets, and consume and navigate the resulting dynamic AR scenes.

The AT and player will use a range of sophisticated and innovative technologies extending state-of-the-art media analysis and visual search, and 3D scene reconstruction, which will enable customised and context-adapted hybrid broadcast/Internet services offering enhanced interactive, multi-screen, social and immersive content for new forms of AR experiences. BRIDGET tools will be based on and contribute to international standards, thus ensuring the creation of a true horizontal market and ecosystem for connected TV and contributed media applications.

2 Research & Development Areas of Interest

The last few years have substantially changed the way people relate to visual media: digital TV, IPTV, multichannel, user generated content, interactivity, second screens, etc. BRIDGET has been triggered by the blissful combination of a number of elements:

- The second screen phenomenon is a powerful complement to an existing successful live services, e.g. TV. However, the use of the second screen, while triggered by the service providers' content, often happens independently of them. BRIDGET aims to bring the second screen content closer to that of the service providers, offering a mix of their content and content that is semantically linked.
- There is a set of sophisticated signal processing technologies that are coming of age even for consumer use, such as media analysis and visual search, 3D scene reconstruction, and authoring tools for interactive, multi-screen, social and immersive content. BRIDGET will improve these technologies and use them to leverage the most valuable service provider's asset, the broadcast content, by enriching it with **links to audio or visual content or time portions** that we will call "bridge points" or ***bridgets***.

- By developing easy-to-use bridget authoring tools BRIDGET can stimulate newer forms of creativity for professional- and end user-generated immersive and interactive digital media content.
- BRIDGET is determined to exploit international standards because they lower the threshold of acceptance of such new technologies and create a true horizontal market and ecosystem for connected TV and interactive media applications.

3 Summary of Activities

BRIDGET has had a successful first year: we started in Nov 2013 and held the first workshop to gauge stakeholder interest in Dec 2013. The project concepts were well received and we're now well on our way towards the first full version of our software for them to test at our next workshop, due in Q2 2015.

Having received feedback on BRIDGET use cases and scenarios from industry leaders, the BRIDGET team have developed the architecture standards for the first version of the tools. These include a high level architecture design, the component based model definition (MPEG-Mfunctionalities requirements, definition of a hybrid broadcast/broadband model, (including synchronisation based on audio fingerprinting), definitions for the component engines: Media Analysis, Visual Search, Bridget Description, Fingerprint Extractor, Synchronisation, 3D Compression, 3D Reconstruction and High level interfaces and API for each component.

The components themselves are also advancing at a pace, the media analysis tools offer high speed processing pipelines capable of triaging the vast archive broadcasters typically have.

BRIDGET Media Analysis researchers have developed shot-based temporal segmentation, shot keyframe selection and linear shot grouping technologies. The technologies have been developed targeting not only high accuracy but also, crucially, extremely high processing speeds and configurability, offering various speed/performance trade-offs. All of which allow a user to easily tune the tools to their database size and complexity. Furthermore, while the tools can be used with any coding format or raw video, they have been optimised for the processing of MPEG-1/MPEG-2/MPEG-4 AVC video formats, and are able to perform the minimum amount of video decoding necessary for a given set of operating characteristics.

In addition the Media Analysis team have taken on the complex challenge of face clustering within videos, i.e finding and clustering re-occurring faces under the problematic variations in illumination conditions, pose and facial expression. First they use shot detection and keyframe selection to isolate candidate frames for face detection, the face is represented using features about key points and then each pair of detected faces is compared and their likeness calculated. These pairwise calculations form the basis of a graph cluster which highlights faces that are similar.

The BRIDGET team researching visual search methods have been equally busy, they've come up with a novel approach to combine local descriptors to globally describe an image. This technique is not only exceptionally fast it also out performs many slower more meticulous solutions. You can read all about it in their ICIP 2014 paper [3]. As part of their work into visual search, the BRIDGET researchers have also been benchmarking all the state-of-the art descriptor schemes and their associated compression, concluding that MPEG-CDVS compression of CDVS descriptors offers the best trade-off between performance, size and complexity. This number crunching exercise is important to make sure we get the right tool for the job and serves as the reference for future development.

If that weren't enough they have patents pending on two different techniques. The first is a method to check the geometric consistency between frames in shots. This is important when trying to check for errors in videos with motion and allows the visual search to work more effectively on small or low detail objects. The second technique is used to speed up the underlying Gaussian filtering used in the visual search algorithms making the whole system run faster.

The components related to creating and rendering 3D models have also made significant progress this year. The focus of the work was the extraction of 3D scene information from image-based datasets. For this purpose, several experimental databases for the 3D reconstruction of buildings were captured and shared between partners. A first proposal for a common algorithmic workflow was developed and refined between all partners in order to establish an efficient overall 3D reconstruction processing chain, as well as to ensure dedicated data and information flow between the modules developed by the partners. Further

on, three papers were accepted to major computer vision or graphics conferences/journals. The first detailed a new formula for 3D Rotation Matrix derivatives with respect to its exponential co-ordinates, negating the need to transform into a different co-ordinate space to avoid the previous complex calculations.[1] The second is related to 3D reconstruction and ensuring the texture applied to a reconstructed object from multiple cameras or multiple viewpoints is seamless. They have developed this algorithm to work in non-uniform lighting conditions and show how their approach method also works well on less precisely reconstructed objects; similar to the work of the media analysis team this attitude approach allows the algorithm to be easily tuned to the circumstances in which its use is needed.[2] Finally they have developed a way of detecting outlier points when trying to group points together which lie on the same plane. This is advantageous within BRIDGET because it is more efficient only to store the exterior boundaries of planar objects than to store the whole point cloud.[4] These advances in the efficiency of 3D reconstruction are enabling BRIDGET to take 3D models to the second screen.

All of these components require archives of data on which to work and BRIDGET has been identifying current material in RAI's archives as well as creating fresh material where necessary.

Last but not least these components have been combined with intuitive user interfaces to create the first internal releases of the project applications which are discussed in the next section. The applications are currently being tested against the functionalities that were identified as being needed and will be subject to their first user trials in the next 6 months.

4 Project Applications & User Involvement

4.1 Project Applications

BRIDGET is combining cutting edge research in several areas and presenting it in three applications for use in the creation and consumption of bridgets. There will be a multi-screen player, an authoring tool for professional use and a mini authoring tool for consumer use. The authoring tools will integrate the BRIDGET research which is focussed on making service providers' and personal archives more manageable. It will enable the authors to access and create 3D models and point clouds for inclusion in their bridgets. The player in turn will allow consumption of bridgets across multiple different environments.

4.1.1 Authoring Tool

The first release of the Authoring Tool integrates a vast number of functionalities: integrating research from across the project. In particular, the main supported functionalities are the following: creation of bridget destination templates on ingested content, creation of bridgets, possibly also based on templates, usage of shot detection and audio fingerprinting in order to set up timings and triggers for bridget presentation, visual search in order to detect relevant images from image archives, 3D reconstruction for off-line 3D model generation, encapsulation and compression of bridget-enriched content into bitstreams compatible with MPEG's Augmented Reality Application Format (ARAF; formally, ISO/IEC 23000-13).

4.1.2 BRIDGET Player

The first release of the BRIDGET multi-screen player is able to play bridgets encapsulated into an ARAF format, and render additional media content, point clouds and metadata. Synchronization with the main broadcast content is guaranteed by the integration of the audio fingerprint engine. The first step towards exploitation of BRIDGET technologies in existing services was also accomplished this year, integrating the BRIDGET overall framework with the existing WimTV webTV platform. On the end user's mobile device, therefore, the BRIDGET player has been integrated with the WimTV player into a dedicated application able to seamlessly synchronize and visualise bridgets on top of the existing WimTV on demand and live services.

4.2 User Involvements & Evaluation

The **first BRIDGET workshop** (see Deliverable D2.1), held in Paris, France on 2013-12-16, was attended by all project partners and a broad representation of key stakeholders:

- **six business players from five different countries**: BBC (British Broadcasting Corporation), UK; Mediaset, IT; NRK (Norsk RikskringKasting), NO; ProTV, RO; RTP (Rádio e Televisão de Portugal), PT; Sky Italia, IT;
- **four standards groups**: DVB CM-GEM; DVB TM-CSS; HbbTV; MPEG.

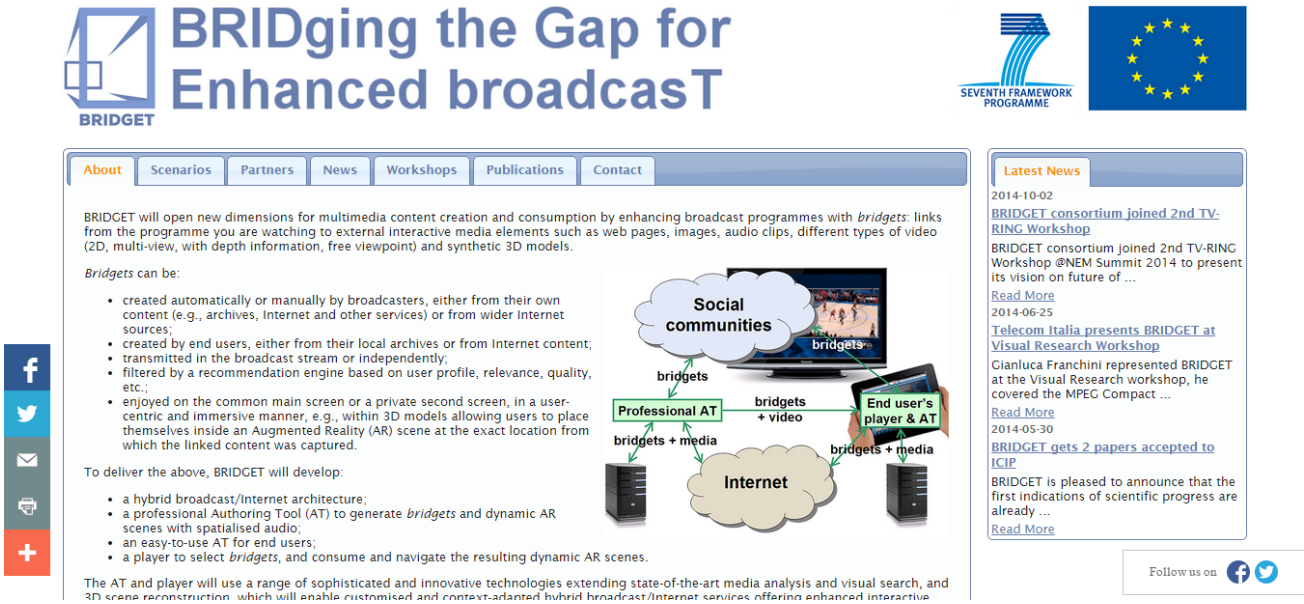
5 Dissemination and Future Exploitation Prospects

5.1 Dissemination Strategy

5.1.1 BRIDGET Web Site

The BRIDGET website (http://ict-bridget.eu) is the project's main public communication tool. It reflects the project's aims, research progress and scientific impact. This is the place where all information related to BRIDGET is stored and made accessible to interested parties.

As the project progresses please use the website to keep up to date with scientific publications of project research groups, Project applications, future workshops, news and events



5.1.2 Dissemination to the Scientific Community and Industry

Dissemination to scientific community is based on bilateral exchange of information with major scientific institutions as well as communication of project achievements in conferences and through publications. The BRIDGET project covers several key challenges in both second screen applications and computer vision and graphics. Dissemination of BRIDGET knowledge within the scientific community is done with presentation of research methodologies, strategies and outcomes in conferences interested by these topics. Ongoing dissemination to the wider academic community has already taken place in peer reviewed international publications.

Promotion of the project's innovative technologies are foreseen in the framework of national and international conferences, exhibitions and scientific events attractive to industry. This is of course most notable in the projects strong presence within the MPEG community where the proposal of a Media Linking Application Format (MLAF) has already been accepted and converted to an ISO/IEC Working Draft [41].

5.1.3 Dissemination in View of Future Exploitation

Complementary to scientific workshops, where research teams from within the project expose their outcomes and welcome other research teams to participate and criticise, industry workshops are also organised that focus on potential commercial applications where potential customers are invited. BRIDGET will lead to industry standards that will enable broadcasters and content producers to better

leverage their content on the second screen. The prototypes and tools will be presented to industry in scientific events complemented with suitable exhibitions such as IBC.

5.1.4 Dissemination to Key Stakeholders

Starting with the workshop held in December 2013, BRIDGET has identified and formed connections with key stakeholders in the area of second screen technology. As well as having RAI, a major broadcaster, as a member of the consortium, links have been made with the BBC (British Broadcasting Corporation), UK; Mediaset, IT; NRK (Norsk RikskringKasting), NO; ProTV, RO; RTP (Rádio e Televisão de Portugal), PT; Sky Italia, IT; all of whom attended the workshop and gave feedback on our proposed scenarios and concepts. We look forward to working with them in the future to gain further insights into how BRIDGET outcomes can be used in their workflows

5.2 Publications by the Project Team in the Period November2013 to October 2014

5.2.1 Papers

[1] **Guillermo Gallego (UPM)**, Anthony Yezzi, "A compact formula for the derivative of a 3-D rotation in exponential coordinates", Springer's Journal of Mathematical Imaging and Vision, available on-line since August 2014 (DOI: 10.1007/s10851-014-0528-x).

[2] **Rafael Pagés, Daniel Berjón, Francisco Morán, Narciso García (UPM)**, "Seamless, Static Multi-Texturing of 3D Meshes", EuroGraphics' Computer Graphics Forum, available on-line since October 2014 (DOI: 10.1111/cgf.12508).

[3] **Syed Husain, Miroslaw Bober (UNIS)**, "Robust and Scalable Aggregation of Local Features for Ultra Large Scale Retrieval", Proceedings of IEEE's International Conference on Image Processing, p. 2799-2803, October 2014 (DOI: unknown as of 2014-12-22).

[4] **Nicola Piotto, Giovanni Cordara (HUA)**, "Statistical Modelling for Enhanced Outlier Detection", Proceedings of IEEE's International Conference on Image Processing, p. 4280-4284, October 2014 (DOI: unknown as of 2014-12-22).

5.2.2 MPEG Standardisation Documents

Twenty eight proposals and technical contributions have been submitted to MPEG, and discussed at its meetings, at the end of which **eighteen** (nine not counting successively refined versions) **output documents** have been agreed upon and approved.

A. Proposals submitted to MPEG for their consideration at the 107th MPEG meeting held in San Jose, CA, US, during 13–17 January 2014

[5] **Miroslaw Bober, Syed Husain (UNIS), Stavros Paschalakis, Karol Wnukowicz (VA)**, "Improved RVD in TM8 - CE2 Response from University of Surrey and Visual Atoms", MPEG contrib. M32330, 107th MPEG mtg., San Jose, CA, US, January 2014.

[6] **Traian Lavric, Marius Preda (IMT)**, "Updates on M26114 (Initial proto design for server-side processing for augmented reality)", MPEG contrib. M32336, 107th MPEG mtg., San Jose, CA, US, January 2014.

[7] **Traian Lavric, Marius Preda (IMT)**, "Updates on AugmentationRegion", MPEG contrib. M32337, 107th MPEG mtg., San Jose, CA, US, January 2014.

[8] **Karol Wnukowicz, Stavros Paschalakis (VA)**, "MPEG-7 eXperimentation Model Update and Testing", MPEG contrib. M32546, 107th MPEG mtg., San Jose, CA, US, January 2014.

B. Proposals submitted to MPEG for their consideration at the 108th MPEG meeting held in Valencia, ES, during 31 March – 4 April 2014

[9] **Massimo Balestri (TI), Miroslaw Bober (UNIS), Leonardo Chiariglione (CED), Giovanni Cordara (HUA), Gianluca Francini, Diego Gibellino (TI), Traian Lavric (IMT), Alberto Messina (RAI), Francisco Morán (UPM), Stavros Paschalakis (VA), Marius Preda (IMT)**, "Proposal for a definition of CDVS engine APIs", MPEG contrib. M33380, 108th MPEG mtg., Valencia, ES, March 2014.

[10] **Stavros Paschalakis (VA), Gianluca Francini (TI), Giovanni Cordara (HUA), Miroslaw Bober (UNIS)**, Lingyu Duan, Kota Iwamoto, Vijay Chandrasekhar, "Editors' Proposed Improvements on Study Text of ISO/IEC CD 15938-13 Compact Descriptors for Visual Search", MPEG contrib. N33489, 108th MPEG mtg., Valencia, ES, March 2014.

[11] **Traian Lavric, Marius Preda (IMT)**, "ARAF guidelines: PROTOs implementations", MPEG contrib. M33382, 108th MPEG mtg., Valencia, ES, March 2014.

[12] **Karol Wnukowicz, Stavros Paschalakis (VA)**, "MPEG-7 eXperimentation Model Update and Testing", MPEG contrib. M33434, 108th MPEG mtg., Valencia, ES, March 2014.

C. Proposals submitted to MPEG for their consideration at the 109th MPEG meeting held in Sapporo, JP, during 7–11 July 2014

[13] **Sergio García, Pablo Carballeira, Francisco Morán (UPM)**, Gauthier Lafruit, "EE1 and EE2 results on Bee", MPEG contrib. M34079, 109th MPEG mtg., Sapporo, JP, July 2014.

[14] **Marius Preda (IMT)**, Gerard Kim, Christine Perey, "Contributions to MAR RM", MPEG contrib. M34338, 109th MPEG mtg., Sapporo, JP, July 2014.

[15] **Adrian Gabrielli, Yassine Lehiani, Traian Lavric, Marius Preda (IMT)**, "ARAF: remote recognition – analysis and preliminary results", MPEG contrib. M34360, 109th MPEG mtg., Sapporo, JP, July 2014.

[16] **Massimo Balestri (TI), Davide Bertola (CED), Diego Gibellino (TI), Giuseppe Vavalà (CED)**, "Compact Descriptors Engine API", MPEG contrib. M34466, 109th MPEG mtg., Sapporo, JP, July 2014.

[17] **Miroslaw Bober (UNIS), Stavros Paschalakis (VA), "**Proposal on evaluation protocol for responses to Compact Descriptors for Video Analysis CfP**",** MPEG contrib. M34478, 109th MPEG mtg., Sapporo, JP, July 2014.

[18] **Alex Freestone, Miroslaw Bober (UNIS)**, "Development of GUI for MPEG-7 XM software", MPEG contrib. M34479, 109th MPEG mtg., Sapporo, JP, July 2014.

[19] **Miroslaw Bober, Alex Freestone, Stephanie Stoll (UNIS)**, "Compact Descriptors for Video Analysis CfP - Example annotations for the test material and comments on the annotation tools", MPEG contrib. M34480, 109th MPEG mtg., Sapporo, JP, July 2014.

[20] **Stavros Paschalakis (VA), Miroslaw Bober (UNIS)**, "Refined Requirements for the Compact Descriptors for Visual Analysis in Media and Entertainment for Video Search Scenarios", MPEG contrib. M34481, 109th MPEG mtg., Sapporo, JP, July 2014.

[21] **Karol Wnukowicz, Stavros Paschalakis (VA)**, "Further Development Work on MPEG-7 eXperimentation Model", MPEG contrib. M34507, 109th MPEG mtg., Sapporo, JP, July 2014.

[22] **Diego Gibellino (TI)**, "Comments on Metadata support in ISOBMFF", MPEG contrib. M34573, 109th MPEG mtg., Sapporo, JP, July 2014.

[23] **Miroslaw Bober, Mark Barnard (UNIS), Stavros Paschalakis (VA)**, "Proposal for the evaluation framework of MPEG-7 visual descriptors in scene classification task", MPEG contrib. M34582, 109th MPEG mtg., Sapporo, JP, July 2014.

D. Proposals submitted to MPEG for their consideration at the 110th MPEG meeting held in Strasbourg, FR, during 20–24 October 2014

[24] Attilio Fiandrotti, Massimo Matteliano, **Massimo Balestri, Gianluca Francini, Skjalg Lepsoy (TI)**, "A CDVS library with minimal dependencies", MPEG contrib. M35072, 110th MPEG mtg., Strasbourg, FR, October 2014.

[25] **Sergio García, Pablo Carballeira, Francisco Morán (UPM)**, Gauthier Lafruit, "EE1 and EE2: Bee results", MPEG contrib. M35079, 110th MPEG mtg., Strasbourg, FR, October 2014.

[26] Patrik Goorts, **Pablo Carballeira, Sergio García (UPM)**, Krzysztof Wegner, **Francisco Morán (UPM)**, Gauthier Lafruit, "EE2: San Miguel results", MPEG contrib. M35111, 110th MPEG mtg., Strasbourg, FR, October 2014.

[27] Patrik Goorts, **Pablo Carballeira, Sergio García (UPM)**, Krzysztof Wegner, **Francisco Morán (UPM)**, Gauthier Lafruit, "EE3B: Soccer-corner results", MPEG contrib. M35112, 110th MPEG mtg., Strasbourg, FR, October 2014.

[28] **Leonardo Chiariglione, Davide Bertola (CED), Alberto Messina (RAI), Marius Preda, Traian Lavric (IMT)**, "Proposal for a Media Linking Application Format (MLAF)", MPEG contrib. M35117, 110th MPEG mtg., Strasbourg, FR, October 2014.

[29] **Miroslaw Bober, Mark Barnard (UNIS), Stavros Paschalakis (VA)**, "Evaluation of MPEG-7 visual descriptors in scene classification tasks", MPEG contrib. M35129, 110th MPEG mtg., Strasbourg, FR, October 2014.

[30] **Karol Wnukowicz, Stavros Paschalakis (VA)**, "Further Development Work on MPEG-7 eXperimentation Model", MPEG contrib. M35132, 110th MPEG mtg., Strasbourg, FR, October 2014.

[31] **Traian Lavric, Marius Preda (IMT)**, "ARAF: remote audio recognition", MPEG contrib. M35222, 110th MPEG mtg., Strasbourg, FR, October 2014.

[32] **Gianluca Francini, Massimo Balestri, Skjalg Lepsoy (TI)**, "CDVS: Removal of the orientation parameter from feature selection", MPEG contrib. M35391, 110th MPEG mtg., Strasbourg, FR, October 2014.

E. Output documents agreed upon at the end of the 106th MPEG meeting held in Genève, CH, during 28 October – 1 November 2013

[33] **Christian Tulvan (IMT), Francisco Morán (UPM)**, Seung Wook Lee, Khaled Mammou, Minsu Ahn, Mary-Luc Champel (eds.), "Description of 3DG Core Experiments", MPEG output doc. N14031, 106th MPEG mtg., Genève, CH, November 2013. The following four successive versions of this output doc., co-edited by slightly different lists of people (always including the two BRIDGET researchers highlighted above, and in some cases others), were also produced during this reporting period: N14195, 107th MPEG mtg., San Jose, CA, US, January 2014; N14476, 108th MPEG mtg., Valencia, ES, April 2014; N14764, 109th MPEG mtg., Sapporo, JP, July 2014; N15001, 110th MPEG mtg., Strasbourg, FR, October 2014.

F. Output documents agreed upon at the end of the 107th MPEG meeting held in San Jose, CA, US, during 13–17 January 2014

[34] Jean Le Feuvre, David Singer (eds.), "Proposed Exploration of 'Uniform Signaling for Timeline Alignment'", 107th MPEG mtg., San Jose, CA, US, January 2014.

[35] **Stavros Paschalakis (VA), Gianluca Francini (TI), Giovanni Cordara (HUA), Miroslaw Bober (UNIS)**, Lingyu Duan, Kota Iwamoto, Vijay Chandrasekhar (eds.), "Study Text of ISO/IEC CD 15938-13 Compact Descriptors for Visual Search", MPEG output doc. N14220, 107th MPEG mtg., San Jose, CA, US, January 2014. The following three successive versions of this output doc., co-edited by the same list of people, were also produced during this reporting period: N14392, 108th MPEG mtg., Valencia, ES, April 2014; N14681, 109th MPEG mtg., Sapporo, JP, July 2014; N14956, 110th MPEG mtg., Strasbourg, FR, October 2014.

G. Output documents agreed upon at the end of the 108th MPEG meeting held in Valencia, ES, during 31 March – 4 April 2014

[36] **Stavros Paschalakis (VA), Gianluca Francini (TI), Giovanni Cordara (HUA), Miroslaw Bober (UNIS)**, Lingyu Duan, Kota Iwamoto, Vijay Chandrasekhar (eds.), "Test Model 10: Compact Descriptors for Visual Search", MPEG output doc. N14393, 108th MPEG meeting, Valencia, Spain, March 2014. The following two successive versions of this output doc., co-edited by the same list of people, were also produced during this reporting period: N14682, 109th MPEG mtg., Sapporo, JP, July 2014; N14961, 110th MPEG mtg., Strasbourg, FR, October 2014.

H. Output documents agreed upon at the end of the 109th MPEG meeting held in Sapporo, JP, during 7–11 July 2014

[37] **Stavros Paschalakis (VA), Gianluca Francini (TI), Miroslaw Bober (UNIS)**, Werner Bailer (eds.), "Compact Descriptors for Video Analysis: Requirements for Search Applications", MPEG output doc. N14558, 109th MPEG mtg., Sapporo, JP, July 2014.

[38] **Stavros Paschalakis (VA), Gianluca Francini (TI), Miroslaw Bober (UNIS)**, Werner Bailer (eds.), "Compact Descriptors for Video Analysis: Draft Evaluation Scenarios for Search Applications", MPEG output doc. N14559, 109th MPEG mtg., Sapporo, JP, July 2014.

[39] **Massimo Balestri (TI), Davide Bertola (CED), Diego Gibellino (TI), Giuseppe Vavalà (CED)**, "WD of MXM APIs for CDVS", MPEG output doc. N14659, 109th MPEG mtg., Sapporo, JP, July 2014

I. Output documents agreed upon at the end of the 110th MPEG meeting held in Strasbourg, FR, during 20–24 October 2014

[40] **Leonardo Chiariglione, Davide Bertola (CED), Alberto Messina (RAI), Marius Preda, Traian Lavric (IMT)** (eds.), "Draft Requirements for Media Linking Application Format (MLAF)", MPEG output doc. N15049, 110th MPEG mtg., Strasbourg, FR, October 2014.

[41] **Leonardo Chiariglione, Davide Bertola (CED), Alberto Messina (RAI), Marius Preda, Traian Lavric (IMT)** (eds.), "WD of ISO/IEC 23000-18 Media Linking Application Format (MLAF)", MPEG output doc. N15061, 110th MPEG mtg., Strasbourg, FR, October 2014.

[42] **Stavros Paschalakis (VA), Karol Wnukowicz (VA)** (eds.), "Text of ISO/IEC 15938-6:201X Reference software (2nd edition)", MPEG output doc. N14954, 110th MPEG mtg., Strasbourg, FR, October 2014.

6 Collaboration

6.1 Collaboration between Consortium Members

The members of the partners have known each other for a long time, they have cooperated for many years in common standardisation bodies, such as MPEG. In addition they have variously teamed up with some of these and other partners in successful European projects, and effected experts' exchanges.

Currently members of the BRIDGET consortium are collaborating within the following projects and standardisation groups: MPEG-CVDS, MPEG-CDVA, MPEG-Requirements, EBU-Automated Metadata Extraction (SCAIE).

6.2 Clustering Activities

BRIDGET is involved in several activities which encourage knowledge sharing within their domains of expertise:

- Miroslaw Bober, University of Surrey, on behalf of the BRIDGET consortium joined the 2nd TV-RING Workshop @NEM Summit 2014 to present BRIDGET's vision on future of Connected TV.
- Gianluca Franchini, Telecom Italia, represented BRIDGET at the Visual Research workshop, he covered the MPEG Compact Descriptors for Visual Search (CDVS) work and discussed the project's aims and projected outcomes.
- Miroslaw Bober, University of Surrey, and Stavros Paschalakis, Visual Atoms, attended IBC 2014 and during the exhibition formed links with related projects; Link-TV, SAM and MediaScape. It has been agreed that they will share a booth at IBC 2015.
- BRIDGET formed a mini-cluster with the projects Link-TV, SAM and MediaScape to exchange technical results, implementation and commercialisation ideas. Miroslaw Bober, University of Surrey, and Stavros Paschalakis, Visual Atoms attended a concertation meeting in Breukelen, The Netherlands in August 2014.
- Leonardo Chiariglione, Multimedia technologies for improved 3D user experience, Invited speech at National Chengkung University, Tainan, 2014/11/24

7 Useful Links

BRIDGET Project main site: http://ict-bridget.eu

Centre For Vision Speech and Signal Processing
University of Surrey
www.surrey.ac.uk/CVSSP

CEDEO SAS di Chiariglione Leonardo e C.
www.cedeo.net/

Heinrich Hertz Institute
Fraunhofer Gesellschaft zur
Foerderung der Angewandten Forschung E.V.
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