COST
Domain Committee ICT

COST Action IC1105
Start Date 1st August 2012

3D Content Creation, Coding and Transmission over Future Media Networks

MONITORING PROGRESS REPORT

Reporting Period: *from 1st August 2012 to 30th April 2013*

This Report is presented to the relevant Domain Committee.
It contains three parts:

I. Management Report *prepared by the COST Office/Grant Holder*
II. Scientific Report *prepared by the Chair of the Management Committee of the Action*
III. Previous versions of the Scientific Report*; i.e., part II of past reporting periods*

The report is a "cumulative" report, i.e. it is updated annually and covers the entire period of the Action.

Confidentiality: the documents will be made available to the public via the COST Action web page except for chapter *II.D. Self evaluation*.

Based on the monitoring results, the COST Office will decide on the following year's budget allocation.

Executive summary (max.250 words):

The reporting period of this Action corresponds to the first 9 months of its activity. This initial period brought the Action at the stage of knowledge sharing, interaction and interdisciplinary discussion. A successful Training School was organized Tampere, addressing different topics in the field of 3D Media in its various forms combined with its human perception and user experience and emphasizing the corresponding computational approaches and architectures. The WG meetings held in Cagliari (September/2012) and Poznan (April/2013) provided a thorough overview of the research fields and problems where the Action participants are actively involved. These meetings were important events for networking and also for interaction with other European research programmes with objectives in the field of 3D networked media, such as several FP7 projects and Cost Action Qualinet. Further networking and interaction with other European research programmes was accomplished with a workshop organized at the NEM Summit in Istanbul (October/2012). The Industry Forum organized in Poznan provided an excellent opportunity for the Action participants to get familiar with the innovative technology of the first Full-angle 3D Light Field Display and also with recent research activities in 3DTV broadcasting industry. In the reporting period 3 STSM were approved and in addition to these at least 4 other STSM are planned or under evaluation until the end of first year. Still in the first year, a second Training School focused on plenoptic video is planned for June, in Sandsvall, and a workshop on Immersive Interactive Multimedia Communications will be organized at the IEEE International Conference on Communications in Budapest. Overall, in this initial period of 9 months, the Action launched relevant seeds for future coordinated activities and accomplished several objectives as defined in the MoU.

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I.A. COST Action Fact Sheet

• **COST Action** *IC1105 – 3D Content Creation, Coding and Transmission over Future Media Networks*
• **Domain** *Information and Communication Technologies*

• **Action details:**

CSO Approval: *(01/11/2011)*	**End date:** *(21/05/2016)*
Entry into force: *(13/01/2012)*	**Extension:** *N/A*

• **Objectives** *This Action undertakes coordinated research collaboration, at European level, in 3D multimedia creation, encoding, delivery and reception of services and applications over future networking technologies. A scientific framework is envisaged to integrate the main elements of the delivery chain, such as 3D content creation and encoding evolution, transmission across heterogeneous networks and user consumption, taking perceived quality as an overall key performance factor.*

• **Parties:** *list of countries and date of acceptance*

Croatia *(13/09/2012)*	Malta *(28/12/2011)*	
Cyprus *(18/05/2012)*	Netherlands *(22/03/2012)*	
Denmark *(02/04/2012)*	Norway *(21/05/2012)*	
Finland *(20/01/2012)*	Poland *(09/02/2012)*	
FYR of Macedonia *(23/03/2012)*	Portugal *(06/01/2012)*	
France *(16/05/2012)*	Romania *(05/04/2012)*	
Germany *(28/03/2012)*	Serbia *(25/10/2012)*	
Greece *(13/03/2012)*	Slovenia *(23/06/2012)*	
Hungary *(07/03/2012)*	Spain *(03/01/2012)*	
Ireland *(17/01/2012)*	Sweden *(11/05/2012)*	
Israel *(25/06/2012)*	Turkey *(16/04/2012)*	
Italy *(13/01/2012)*	United Kingdom *(06/12/2011)*	

• **Intentions to accept:** *N/A*

• **Other participants:**
  • *Universidade Federal do rio de Janeiro, Programa de Engenharia Eletrica/COPPE, Brazil, Rio de Janeiro*
  • *University of Southern Queensland, Faculty of Engineering and Surveying, Australia, Toowoomba*

Chair: *Pedro Assuncao, Instituto de Telecomunicacoes, Polo-II, FCTUC, DEEC, 3030-290 Coimbra, Portugal, amado@co.it.pt*

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Administrative Officer: *Philippe Callens, Philippe.Callens@cost.eu*

Action Web site: *http://www.3d-contournet.eu/*

Grant Holder Representative: *Henrique Silva, hjas@ci.uc.pt*

I.B. Management Committee member list

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I.C. Overview activities and expenditure

(year) Budget

Total Action Budget:
Remaining Action Commitment:

Meetings

Meeting Type	Date	Place	Cost	Total
Working Group Meetings Management Committee Meeting	13/09/2012 to 14/09/2012	Cagliari (Italy)	29 777.00 EUR	29 777.00 EUR
Industry Forum Working Group Meetings Management Committee Meeting	10/04/2013 to 12/04/2013	Poznan (Poland)	35 480.00 EUR	35 480.00 EUR
				65 257.00 EUR

STSM

Beneficiary	Date	Place	Cost	Total
Klemen Peternel	01-03-2013	Finland	2500,00 EUR	2 500.00 EUR
Nelson Francisco	08-01-2013	Poland	2500,00 EUR	2 500.00 EUR
Emilie Bosc	02-06-2013	Italy	850,00 EUR	850.00 EUR
				5 850.00 EUR

Workshops

Title	Date	Place	Cost	Total
Immersive and Interactive Content Creation, Coding and Transmission Workshop @ NEM Summit	15-10-2012	Istanbul (Turkey)	4 760.00 EUR	**7 235.00 EUR**

General Support Grants

Beneficiary	Date		Cost	Total
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Schools

Title	Date	Place	Cost	Total
Training School on *3D Media, User Experience and Computational Architectures*	12/08/2012 to 16/08/2012	Tampere (Finland)	25 046.73 EUR	**25 047.00 EUR**

Dissemination

Title	Date	Place	Cost	Total
Development, setup and maintenance of the web site	22-04-2013	Tampere	2 500.00 EUR	**2 500.00 EUR**

Action Total: **105 889.00 EUR**

II. Scientific Report *prepared by the Chair of the Management Committee of the Action, describing results achieved during the Action operation in this period, in no more than 3 pages (the report is "cumulative"). All items listed in Sections A, B, and C, below, must be addressed.*

Additional documentation such as extended scientific reports, proceedings of workshops, seminars or conferences may be provided separately as an annex to this report, and should be referenced in the report.

II.A. Innovative networking

- *Innovative knowledge resulting from COST networking through the Action. (Specific examples of Results vs. Objectives)*

  Networking of scientific activities started in September/2012 in the first meeting of all Working Groups (WG) and also in April/2013. Within the scope of each WG, these meetings achieved their objectives of knowledge sharing and exchange as necessary in the initial stage of networking.

  The Action's web site has been set up to be the key element in dissemination and information sharing among participants. The site provides access to different resources and promotes the involvement of researchers and institutions in the Action activities. Outdoor 3D multiview video sequences created at Poznan University and used worldwide in MPEG standard tests were made available to the Action participants for scientific purposes.

  The Management Committee decided to establish formal links with Cost Action IC1103 (Qualinet) through WG4. A Joint Task Force was launched with a leadership team comprising participants from both Cost Actions. The Joint Task Force is mandated to exchange on status and progress of respective activities which are of common interest to both Actions participants, in particular about QoE matters in 3D, exchange of general and specific information and news on 3D and QoE, exchange of 3D test data used in respective Actions, Coordination of 3D subjective test methodologies, coordination of 3D metrics validation and use, adoption, and if relevant update, of definitions, concepts and models of QoE, in particular in 3D.

  More innovative knowledge output, as a direct result of the Action activities, is expected to appear in later stages of networking after a longer period of networking and scientific activity through the Action.

- *Significant scientific breakthroughs as part of the COST Action. (Specific examples)*

  The Action deals with the whole communication chain of 3D media, including new forms of content representation, coding and networking aspects addressing multiple levels and inter-disciplinary research. At this early stage of the Action, the participants were gathering and exchanging relevant information. Significant scientific breakthroughs are mostly still to emerge. The Action is currently establishing the foundations for the integration of different disciplinary knowledge, pursuing significant scientific breakthroughs in the field of 3D.

- *Tangible medium term socio-economic impacts achieved or expected. (Specific examples)*

  Training Schools and STSM, are contributing to enrich the international experience of participants at European level, with potential impact in professional activities outside the Action. One ESR started his professional career after completing an

STSM. Two participants [Poznan University (PL) and IT (PT)] are active contributors to the MPEG group. Cooperation with the ITU-T VQEG group was also discussed in the last MC meeting in April/2013. In the long term there will be potential socio-economic impact resulting from these activities.

- *Spin off of new EC RTD Framework Programme proposals/projects. (List)*
  - FP7-PEOPLE, (IAPP), PROLIGHT - Modern Signal Processing Methods for Ultra-realistic Light-Field Displays (approved)
  - SINEMAS: Chist-ERA project (submitted)
  - FIRE : FET X-Track project (submitted)
  - FP7-PEOPLE (ITN) QoE-Net - Quality Of Experience maNagement in Emerging mulTimedia services (submitted)
  - FP7 Call 10, Project EUMSSI (approved)

- Spin off of new *National* Programme proposals/projects. (List*)*
  - WOW : submitted ANR-blanc international project, France
  - NINIVE : submitted French ANR-CONTINT, France
  - UDICMI: Approved QREN, Portugal

II.B. Inter-disciplinary networking

- *Additional knowledge obtained from working with other disciplines within the COST framework. (Specific examples)*

  The technical presentations and discussions during the meetings of the September/2012 and April/2013 addressed a wide range of subjects across all fields of 3D media within the scope of the Action. Since the Action itself has already an interdisciplinary nature, these activities actually launched this type of networking and gave the opportunity to researchers from different fields to start establishing coordinating research links in cross-disciplinary fields.

  Industry feedback during Industry Forum gave an insight into different display technologies. Furthermore, insight from a service provider showed relevant evidence about the requirements and current customer satisfaction.

  The workshop "3D Immersive and Interactive Content Creation, Coding and Transmission" co-organised with the *3D Interactive, Immersive Media Cluster* at the NEM Summit in October 2012 was also a relevant event for interdisciplinary networking with European projects dealing with related research issues.

- *Evaluation of whether the level of inter-disciplinarity is sufficient to potentially provide scientific impacts. (Specific examples)*

  This Action is inherently inter-disciplinary, since all the chain from representation, transmission, applications and display is required to achieve effective 3D Media delivery. For example, for efficient and robust coding, the characteristics of the captured data and its representation format must be taken into account by network protocols, applications and end-user devices (e.g. 3D displays). Such high level of inter-disciplinarity is seen as providing the necessary grounds for achieving relevant scientific impacts.

- *Evaluation of whether the level of inter-disciplinarity is sufficient to potentially provide socio-economic impacts. (Specific examples)*

  Through the White Papers being developed within the Action, the needs and future directions will be opened up for debate. This is expected to allow the research

community and industry to focus more on the issues by the Action with potential socio-economic impact.

Barcelona Media has started business development relationships with UPM. As a result of the meeting opportunities generated by the project, Iris Galloso (UPM, Spain) Santi Fort (Barcelona media, Spain) found interesting complementarities in their knowhow and industry contacts and are planning to offer joint commercial proposals.

II.C. New networking

- *Additional new members joining the Action during its life.*

  The Action started with 19 COST countries and then 5 more countries joined. Two non-COST Countries joined the Action: University of Southern Queensland from Australia and University of Rio de Janeiro from Brazil.

- *Total number of individual participants involved in the Action work. (Number of participants. Give % of female and of Early Stage Researcher participants)*

  There are 100 individual participants involved in the Action, 15% female and 41%ESR

- *Involvement of Early Stage Researchers in the Action, in particular with respect to STSMs, networking activities, and Training Schools. In addition, justification should be provided if less than 4 STSMs were carried out during the year.*

  In the reporting period there are 3 STSM approved, 2 STSM currently under evaluation and 2 STSM being planned to finish before the end of the first year. Therefore, a total of 7 STSM are expected to be accomplished within the first year. Most of these STSM are involving ESR. Only one is to be assigned to a PhD student.

- *Involvement of researchers from outside of COST Countries. (Number of participants from non-COST Countries approved by the CSO. Give % of such participants from countries with reciprocal agreements. Specify their contribution)*

  There are two non-COST institutions formally approved by the CSO, participating in the Action. One of them is accepting an ESR for an STSM in the field of 3D video coding using advanced MDC. Joint efforts are planned to define research directions where both parties are able to collaborate.

- *Advancement and promotion of scientific knowledge through publications and other outreach activities. (Number of publications and other outreach activities that resulted from COST networking through the Action. Complete list should be given in an annex)*

  Several technical/scientific papers and books were published by members of the Action.

- *Activities and projects with COST network colleagues.*

  The WG meetings and the STSMs are the main instruments for generating activities and promoting projects among COST network colleagues. During the course of the Action it is foreseen that such instruments and activities will trigger joint research, achieving relevant results and *leading* to joint publications.

  The Action is preparing one white paper in each WG, which will be accomplished as a

joint work of all members. In the reporting period a Book to be published by Springer, entitled "3D Future Internet Media" has been started with contributions from several Action members.

Organization of several special sessions on relevant topics for the COST Action, with invitations to colleagues:
- Asilomar2013 Pacific Groove, CA, USA, 4-7 November 2013, with Frédéric Dufaux and Marco Cagnazzo, on "3D content processing".
- WIAMIS 2013 Paris, France, 3-5 July 2013, with Marco Cagnazzo and Frédéric Dufaux, on "Content Enhancement for Improved Multimedia Applications"
- IEEE 19th Int. Conf. on Digital Signal Processing (DSP2013) Santorini, Greece, 1-3 July 2013, with Frédéric Dufaux and Oliver Scherer, on "Emerging Ultra-High Resolution Formats and Applications"

Researchers from Barcelona Media and Holografika are preparing a demonstrator using multiview generation capabilities from scenes captured with camera arrays by Barcelona Media to be used as a source material for the new depth enabled displays developed by Holografika.

- *The capacity of the Action members to raise research funds.*
  A EU FP7 Marie-Curie action was approved between two Cost institutions (Tampere University of technology and Holografika).
  A PhD grant from the Portuguese Foundation for Science and Technology was awarded, after a national competition, for a collaborative PhD in two Cost institutions (University of Surrey and Instituto de Telecomunicacoes).

II.D. Self evaluation

III. Previous scientific report(s)

Not Applicable.