ECSEL2017-2-783162

FitOptiVis

From the cloud to the edge - smart IntegraTion and OPtimisation Technologies for highly efficient Image and VIdeo processing Systems

Deliverable: D8.5 Update of the Dissemination and Communication Plan and Report

Due date of deliverable: (31-05-2020)

Actual submission date: (25-05-2020)

Start date of Project: 01 June 2018   Duration: 36 months

Responsible WP8

Revision: <outline, draft, **proposed**, accepted>

	Dissemination level	
PU	Public	✔
PP	Restricted to other programme participants (including the Commission Service	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (excluding the Commission Services)	

0 DOCUMENT INFO

Author

Author	Company	E-mail
Olli I. Heimo	UTU	olli.heimo@utu.fi
Tero Säntti	UTU	teansa@utu.fi

Documents history

Document version #	Date	Change
V0.1	31.5.2019	Starting version, D8.3
V0.2	28.4.2020	First complete draft of the update
V0.3	4.5.2020	Updated version (send to project internal reviewers)
V0.4	20.5.2020	Updates as per review
V1.0	25.5.2020	Approved Version to be submitted to ECSEL office

Document data

Keywords	
Editor Address data	Name: Tero Säntti, Olli Heimo Partner: UTU Address: teansa@utu.fi, olli.heimo@utu.fi Phone: +358505494720

Table of Contents

1 INTRODUCTION

Dissemination is an important element of the FitOptiVis project. It will be carefully planned and implemented in order to spread awareness about this ECSEL funded project to a wide audience, including its end-users. This will help guarantee an optimal exploitation of the project results and the long-term sustainability of the FitOptiVis pilots, demonstrators, and technology platforms. For this reason, the FitOptiVis participants have formulated an initial dissemination plan that describes the objectives and foreseen channels for the dissemination of the knowledge generated by the project. This plan is in compliance with the FitOptiVis Annex 1 (ECSEL-2017-1-737451), the FitOptiVis Consortium Agreement, and the Communication Guidelines for Projects/Studies published in 2018. This plan is constantly kept under scrutiny and revised, as the need arises, and in Month 36 of the project a final report on the dissemination activities will be published (D8.8 Final Dissemination & Communication Plan and Report).

Table 1 - List of FitOptiVis beneficiaries/participants:

Part. No.	Participant organisation name	Participant short name	Country
1	(Coordinator) Philips Healthcare	PHL	NL
2	Futura	FUT	NL
3	TU Delft	TUD	NL
4	TU Eindhoven	TUE	NL
5	CAMEA	CAMEA	CZ
6	Charles University	CUNI	CZ
7	Rex	REX	CZ
8	Brno University of Technology	BUT	CZ
9	University West Bohemia	UWB	CZ
10	Ustav teorie informace a automatizace AV CR, v.v.i.	UTIA	CZ
11	Hurja Solutions Oy	HURJA	FI
12	Nokia Technologies Oy	NOKIA	FI
13	Tampere University of Technology	TUT	FI
14	University of Turku	UTU	FI
15	Visidon Oy	VISI	FI
16	Hi Iberia	HIB	ES
17	Instituto Tecnológico de Informática	ITI	ES
18	RGB	RGB	ES
19	Seven Solutions	7SOLS	ES
20	Schneider Electric España S.A.	SCHN	ES
21	Thales Alenia Space	TASE	ES
22	University Cantabria	UC	ES
23	University Granada	UGR	ES
24	Abinsula	ABI	IT
25	Aitek	AITEK	IT
26	Società Acquedotti Tirreni	SAT	IT
28	Isarail	ISR	IT
29	Università degli Studi di Cagliari	UNICA	IT
30	Università degli Studi di Sassari	UNISS	IT
31	Università degli Studi dell'Aquila	UNIVAQ	IT

2 FITOPTIVIS DISSEMINATION STRATEGY

2.1 Means of communication

In order for dissemination to be effective, multiple communication channels are used in order to be able to effectively reach the desired target audiences. In this section an impression of the dissemination strategy over the M1-M36 period will be given, while in the remainder of this deliverable a more detailed account will be presented.

One focus of dissemination is on scientific publications and to address the academic research community. Publications within the area of interest of the project include both technology-oriented journals, to disseminate the FitOptiVis achievements on transversal methods, tools and components, as well as more application oriented ones, to vertically cover the different project assessment domains, and even journals covering innovation management. Project publishable results naturally tend to fall into one of the first two categories, with some overlap between the two.

In addition to journal publications, results are presented at conferences too, with a similar division between technology, application and innovation management-oriented venues, as in the case of journal publications.

Several conferences are accompanied by exhibitor presentations/booths and tutorials, where FitOptiVis partners originally planned to present and inform visitors about project product innovations and/or can push for FitOptiVis technologies usage by means of guided lectures on benefits and demo examples. The actions already done in this sense are intended to guarantee that FitOptiVis achieved results are presented here to complement the scientific communication and reach a larger visibility through direct point-to-point discussions and people engagement.

The communication and dissemination approach of FitOptiVis is implemented at different levels. It is based on solid project-level sharing of knowledge and communication patterns and it extends gradually to different target-user groups, from the FitOptiVis network to the general public. This approach is illustrated in Figure 1.
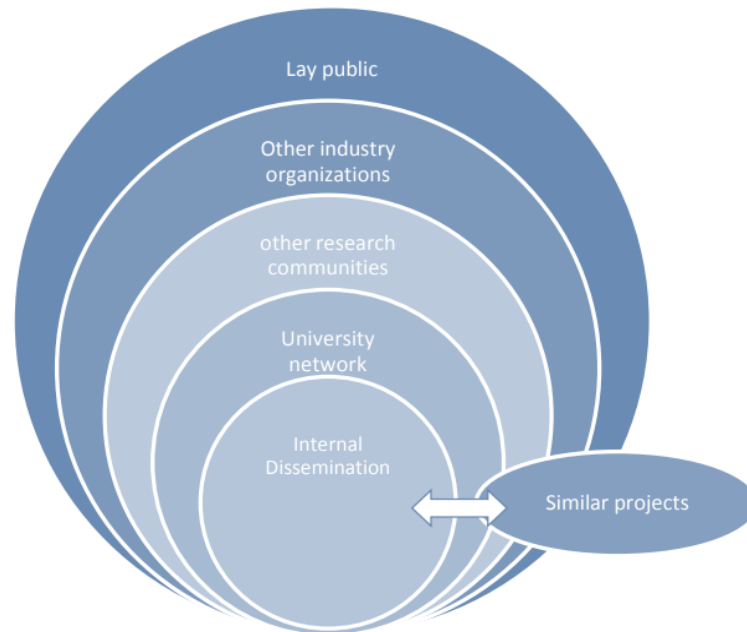
Figure 1, FitOptiVis Dissemination Strategy

2.2 Target Groups

Several important target audiences for dissemination activities have been identified. These include academic and industrial researchers, interested parties in the following fields: Image and Video Processing Community, Design and Technologies, Computer Aided Design, Cyber Physical and Embedded Systems, Verification and Formal Methods. Moreover, also stakeholders and general public are important FitOptiVis targets.

Different dissemination products are expected to appeal differently to each of these categories. Therefore it is necessary to be aware of what the focus of dissemination is expected to be during the different stages of the project, and how the results to be disseminated are to be best tailored to their target audience. Due to the end user boards every partner has directed their actions towards the new goals.

As the project progresses, it is expected that the focus of the dissemination will - next to the pilots and demonstrators – increasingly also include the pilot products that demonstrate the technologies in practice.

2.3 Timing

The expected shift in focus of dissemination activities described in the previous section leads to a different focus of the various dissemination products during the different stages of the project.

Concerning the timing of our dissemination strategy, three distinct phases of implementation can be identified, going from project overview to the dissemination of the final outcomes. These phases are listed in Figure 2.
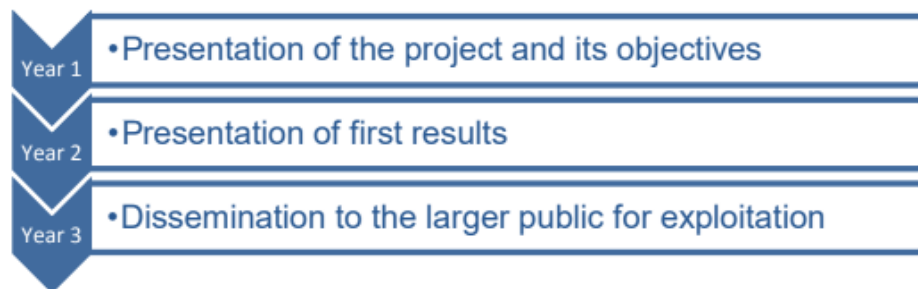
Figure 2, Timing of FitOptiVis dissemination

2.4 Internal Dissemination Strategy

Continuous and effective internal communication is key to the success of large international projects such as FitOptiVis. For this reason, internal dissemination must be considered as an essential part of the dissemination strategy as a whole. Internal communication should allow to:

- Keep track of project-related decisions and action points;
- Clearly communicate the role and responsibility of each project participant;
- Communicate on WP and demonstrator progress;
- Disseminate the right level of information to project participants;
- Identify problems and provide solutions.
- The database and is updated regularly
- Workshops are arranged every 4 months (during COVID-19 outbreak a teleworkshop) where each meeting individual partners present and demonstrate on relevant mature results
- A board meeting each month (mostly teleconference) and relevant decisions/actions are promptly forwarded to the rest of the consortium

2.5 External Dissemination Strategy

Much of the effort is aimed at 'external communication' to promote the project, and disseminate results. The major external dissemination objectives are to:

- Identify the different external user's groups that could benefit from the FitOptiVis pilots and demonstrators and project's results and the best channels of communication to reach them;
- Effectively use these communication channels to present the FitOptiVis project's results;
- Establish links and encourage synergies with similar projects and initiatives;
- Provide the foundation of a comprehensive exploitation strategy.

Details of each dissemination activity/tool are provided in Section 4 ("Dissemination Tools and activities")

2.6 COVID-19 Outbreak

During M21 – M24 the project has been struggling with COVID-19 outbreak along with the rest of the world. Most of the dissemination activities, e.g. seminars, exhibitions and

conferences, are dependent on personal contact and therefore have been cancelled. We have encouraged the project participants to focus on academic journals and other publishing not requiring physical presence.

The workshop 9.–11.6.2020 planned to be held in Turku, Finland, is converted to a virtual workshop to be held in MS Teams. Regular WP specific meetings and the project board have been using teleconferencing during the whole project, so the technologies and practices are not new.

3 GENERAL DISSEMINATION RULES

3.1 Presentation and publication guidelines

Any publication related to work done under FitOptiVis shall be sent to the Coordinator, Philips, and then by the Coordinator to the FitOptiVis Consortium participants at the earliest time possible, but at least 45 days before publication, together with sufficient information on the results it will disseminate. The latter will have 30 days to comment/object to the publication. Both can be waived by mutual agreement. For more details about publications, please refer to the FitOptiVis Grant Agreement (Article 29).

Open access, which can be either green or gold, publishing is to be preferred, actually the Grant Agreement states: "Each beneficiary must ensure open access (free of charge online access for any user) to all peer-reviewed scientific publications relating to its results." This needs to be considered while planning publications.

Any project presentation will be made using the project templates provided by Philips and will have to be circulated for comments to the consortium participants at the earliest time possible and prior to the meeting.

Presentations and publications must also comply with the clauses presented in chapter 3.3 about graphic identity and compulsory acknowledgements.

3.2 Graphic Identity

This section describes the features that contribute to giving a common graphic identity to all dissemination activities allowing for a better visibility and recognition of the project.

3.2.1 Layouts and Templates

Common/similar layouts are used for FitOptiVis dissemination materials. The project colour theme is blue. Templates for project meeting minutes and PowerPoint presentations (see Figure 3) were made available by the project coordinator, Philips. The files can be found in the project repository.
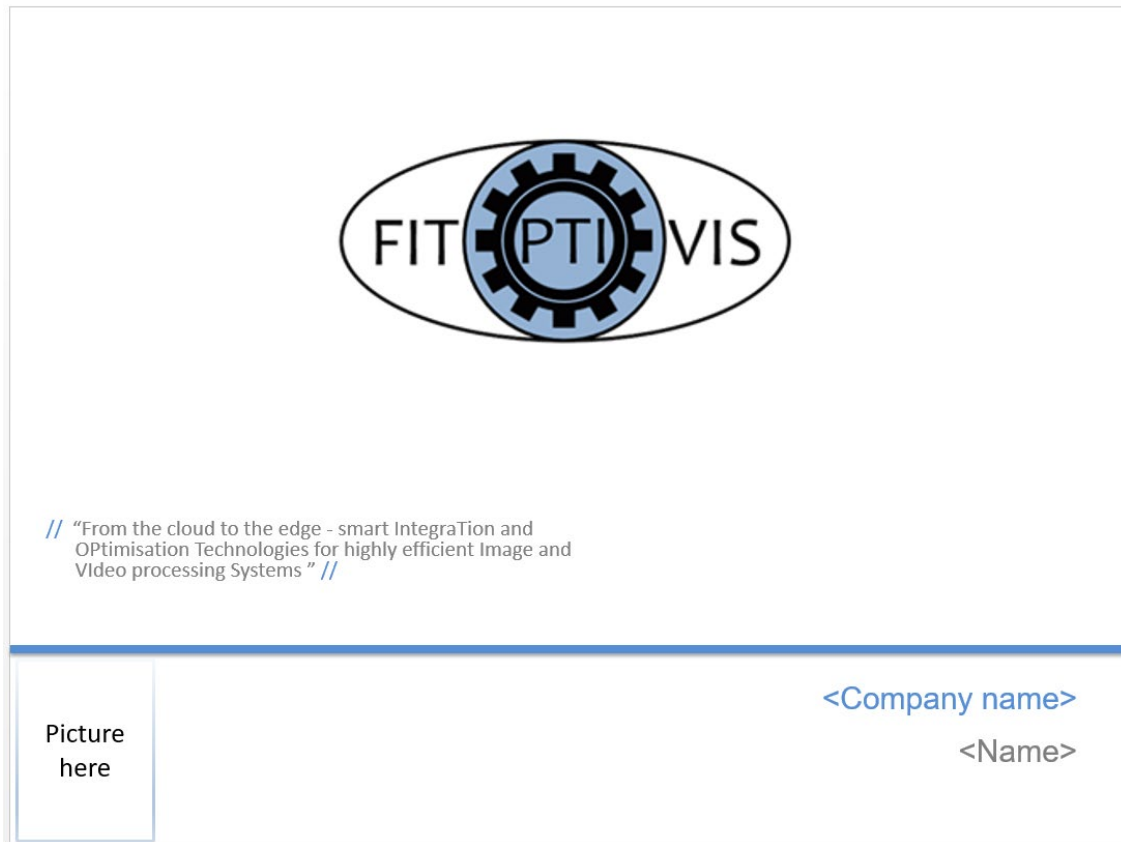
Figure 3, FitOptiVis slide design

3.2.2 Logos

The project logo, depicted in Figure 4, has been created. The project logo represents the connection between vision (eye) and technology (cogwheel). In addition to the project logo, the ECSEL-JU requires that the logo of ECSEL is used on any project publication and promotional material, as well as on the project's website (see also "3.3 Compulsory Acknowledgements" section).

Figure 4 - FitOptiVis logo.

3.3 Compulsory Acknowledgements

Any partner in the FitOptiVis project will in their dissemination activities clearly acknowledge the ECSEL with reference to the project "FitOptiVis" and the grant number ECSEL 2017-1-737451.

Preferred Reference

"This project/study is partially funded by the European Commission under the EU Joint Undertaking program "ECSEL" +include link to ECSEL website (http://www.ecsel-ju.eu/web/index.php) Project "FitOptiVis" grant no: 2017-1-737451+ include link to the project website (https://www.ecsel.eu/projects/fitoptivis)

4 DISSEMINATION TOOLS

4.1 Internal Dissemination Tools

The project coordinator, Philips, and the participant in charge of the communication and dissemination work package (WP8, UTU), have put in place a variety of mechanisms to optimize the communication workflow.

4.1.1 Project Meetings

As detailed in the FitOptiVis Description of Work, there are several types of project meetings:

- Management Board meetings taking place monthly (mostly remote teleconference calls);
- Project face-to-face workshops 3-4 per year;
- Work Package meetings and email lists as needed.

At the moment of submitting this document so far 20 Management Board and 7 face-to-face Workshops (see Figure 5) have been organized. The Management Board meetings and Workshops serve to update each other on project results, and to align the activities for the next period. Apart from that the workshops are a great opportunity to build Pan-European networks and advertise the demonstrators.

Figure 5, Images from FitOptiVis workshops

4.1.2 Information sharing

FitOptiVis consortium members have access to a project private database that is shielded by a user code and password, to share project information, presentations and even photos. The user-friendly file transfer environment is structured around the different work packages (WPs), and can be easily developed and modified by any identified/authorized FitOptiVis project participant. The files are stored in a version-controlled fashion (SVN), and the descriptions of the files are stored in the database. As all partners have access to both tools, they can update all required information in a distributed manner. The database also has section for partner descriptions and also personnel. This allows a personnel listing with contact information, kept away from the general public, so that the partners can reach each other.

4.1.3 Other Tools

Other internal communication tools include mailing lists (participant, WP and at the consortium levels), internal staff meeting and meeting minutes, web conferencing etc.

4.2 External Dissemination Tools

External dissemination designates actions aiming at ensuring the visibility and awareness of the results outside the Consortium borders, i.e., in the scientific community, in academic institutions, in other research organizations, or among the lay public.

For example UGR presented FitOptiVis objectives and activities during the Workshop on Industrial Robotics and Computer Vision between the Univ. of Granada and the Korean Association of Robot Industry (KAR). This workshop was held at the Research Centre for Information and Communications Technologies (CITIC-UGR), in Granada (Spain) last March 1, 2019. UGR presented its low-latency solutions for computer vision processing and their application to robotics. During the workshop, collaboration activities between the Univ. of Granada and the Korean Association of Robot Industry were also discussed with KAR Team Leader Mr. Gyeong-jun Lee and KAR Strategy and Planning Team Leader Ms. Han-Byeol kim. More examples can be found from *D7.2 – Update of the Innovation, Standardization and Exploitation plan and report.*

4.2.1 Project Public Website

The FitOptiVis public website presents general project information, participant information, downloadable publications and deliverables. Furthermore, it informs

viewers about previous and forthcoming events and activities of the project as well as of other relevant projects and collaborations. Additional features can be added as needed.

BUT initially designed the website of FitOptiVis (Figure 6) and will host it for the required period. The website will be updated on a continual basis by BUT who as the D8.1 Lead beneficiary is responsible for the website content until end of the project. Other FitOptiVis participants' contributions will be requested throughout the project.

Figure 6, FitOptiVis public website: https://www.ecsel.eu/projects/fitoptivis

Statistics about FitOptiVis website during the period 15/5/2019 -- 15/5/2020:
- unique users: 935
- unique visits: 1 304
- page views: 3 554
- avg. session duration: 2 min. 35 secs
- language: 57% English, 8% Italian, 6% Spanish, ...
- country: 17% Unites States, 12% Italy, 10% Netherlands
- operating system: 52% Windows, 15% Android, 10% Linux

The project is also promoted by Schneider Electric:
https://www.se.com/ww/en/work/products/medium-voltage-switchgear-and-energy-automation/r-and-d-projects/fitoptivis.jsp

4.2.2 Publications and Presentations

To end of M23 FitOptiVis has been promoted in following locations:

- US west-coast tour
  - Workshop, Aug 19-22, 2019, California, US
  - The TUDelft was invited on a tour to the US west coast to present their work on the Fletcher open source FPGA interface, one of the main communication components of the FitOptiVis project. The tour included talks at University of Southern California, UC Riverside and Xilinx. Plans were made for future collaboration activities.
- OpenPOWER EU summit 2019
  - Workshop, Oct 30-31, 2019, Lyon, France
  - The TUDelft presented their FitOptiVis FPGA integration toolchain in the OpenPOWER summit in Lyon, France. The presentation attracted various participants from industry and academia, such as Xilinx, IBM, Molex, AlphaData, etc. The talk presented a number of next generation accelerated solutions for big data analytics and discussed the growing community effort to integrate these technologies into high performance computing systems. The talk was given during the OpenPOWER summit, where computing industry heavy-weights are collaborating to create new innovative systems to address the challenges we face with big data analytics at scale.
- EFECS event 2019
  - Workshop, Nov 19-21, 2019, Helsinki, Finland
  - The FitOptiVis project had a booth during the EFECS technology event in Helsinki, Finland. At the booth, the TUDelft presented a demonstrator of the hardware integration toolchain technology being developed in FitOptiVis. The toolchain allowed integration of a high-performance decompression and search pipeline on FPGA within days. The demo is able to search through the whole of a compressed version of wikipedia in under 1 second. The event was attended by dozens of companies and academia interested in collaboration.
- Demo FitOptiVis Fletcher technology
  - Conference, Mar 9-13, 2020, Grenoble, France
  - Considered as the premier EDA event in Europe, DATE conference brings together major technology players together to present new inno-vations and discuss developments. TUDelft presented the FitOptiVis Fletcher demo in the exhibition of the conference. A video of the demo will be available on line on the website of the conference. The demo shows how Fletcher can be used to significantly reduce design time of complex FPGA HW systems.
- Demo FitOptiVis Jointer technology
  - Conference, Mar 9-13, 2020, Grenoble, France
  - Considered as the premier EDA event in Europe, DATE conference brings together major technology players together to present new inno-vations and discuss developments. UNISS, UNICA and UNIVAQ pre-sented the FitOptiVis Jointer demo in the exhibition of the conference. A short video of the demo will be available on line on the website of the

conference, but you can access the complete video at the following link: https://www.youtube.com/watch?v=w7EoDlxgzI0&t=107s. The video presents the demo and tutorial of JOINTER, a framework that allows to develop complex heterogeneous architectures composed of programmable processors and dedicated reconfigurable accelerators on FPGA, together with customizable monitoring systems, keeping under control the introduced overhead.

- The European anaesthesiology congress
  - o Fair / Trade show, 1-3 June 2019, VIENNA, AUSTRIA
- American Society of Anesthesiologists (ASA)
  - o Fair / Trade show, October 19, 2019 - October 23, 2019, Orlando, USA
- MEDICA
  - o Fair / Trade show, 18-21 November 2019, Düsseldorf Germany

There are also **53 educational events** more detailed in *D7.2 – Update of the Innovation, Standardization and Exploitation plan and report*, pp. 63-82.

According to the Communication and Dissemination strategy we are following, FitOptiVis project results are submitted for publication in scientific journals, conferences, and workshops. The submission of papers jointly written by project participants has been encouraged. All other partners have started on the dissemination, with 44 entries in the publications list, 8 entries in the media list, and 1 entry in the events list.

Given the diversity of the topics and demonstrators being addressed in FitOptiVis, a wide variety of national and international journals, conferences and workshops have been targeted to disseminate FitOptiVis results. The selection of a certain dissemination platforms will, apart from the topic, also depend on the timing. Not all conferences are held every year, and also the timing within the year may vary. A preliminary list of targeted journals and conferences was also included in Table 20 of the original proposal. In the list below we highlight those successfully targeted as means of dissemination in this first two years of the project.

Journals targeted by FitOptiVis include:

- ACM Transactions on Cyberphysical Systems (TCPS)
- ACM Transactions on Design Automation of Electronic Systems (TODAES)
- ACM Transactions on Embedded Computing Systems (TECS)
- ACM Transactions on Reconfigurable Technology and Systems (ACM)
- Discrete Event Dynamic Systems: Theory and Applications (DEDS)
- IEEE/ACM Transactions and Letters (Computer, Industrial Informatics, Embedded Systems, CAD, etc.)
- ACM Transactions on Reconfigurable Technology and Systems (TRETS)
- IEEE Transactions on Circuits and Systems for Video Technology
- IEEE Transactions on Control Systems Technology (TCST)
- IEEE Transactions on Industrial Electronics (TIE)
- IEEE Transactions on Industrial Informatics
- IEEE Transactions on Parallel and Distributed Systems
- IEEE Transactions on Services Computing
- IEEE Journal of Selected Topics in Signal Processing
- IEEE Transactions on Signal and Information Processing over Networks
- IET Image Processing
- IET Signal Processing
- International Journal of Parallel Programming (Springer)
- Journal of Parallel and Distributed Computing (Elsevier)
- Journal of Real-Time Image Processing
- Journal of Signal Processing Systems (Springer)
- Transactions on Image Processing

Conferences targeted by FitOptiVis include (Some alterations possible due COVID-19 outbreak):

- AAL-IoT: EAI International Conference on Ambient Assisted Living Technologies based on Internet of Things.
- ACM/SIGDA International Symposium on Field-Programmable Gate Arrays (FPGA)
- Computational Color Imaging Workshop (CCIW)
- Cyber-Physical Systems week (CPS week)
- Design Automation Conference (DAC)
- **Design and Automation and Test in Europe (DATE)**
- Embedded Systems Week (ESWEEK)
- **Euromicro Conference on Digital System Design (DSD)**
- European Conference on Computer Vision Edinburgh, England, United Kingdom Aug 23 - Aug 28, 2020 (ECCV 2020).
- EUVIP 2019
- Field-Programmable Logic and Applications Conference
- Future Security Secure Research Conference.
- High Performance Computing (HPC)
- ICCASA: EAI International Conference on Context-Aware Systems and Applications.
- ICSP 2019: Industry Case Studies Program 2019 – Industry Day (ICSP 2019)
- ICT4AWE ICT for Ageing Well.

- IEEE Conference on Decision and Control (CDC)
- IEEE Conference on Emerging Technologies and Factory Automation (EFTA)
- IEEE International Conference on Image Processing
- IEEE Global Communications Conference
- IEEE International Symposium on Personal, Indoor and Mobile Radio Communications
- IEEE International Conference on Communications
- IFAC Conference on Programmable Devices and Embedded Systems (PDeS)
- IFAC Workshop on Discrete Event Systems (WODES)
- International Conference on Computer Vision 2020 (ICCVG 2020)
- **International Conference on Field-Programmable Logic and Applications (FPL)**
- International Conference on Hardware/Software Codesign and System Synthesis (CODES+ISSS)
- International Conference on Control, Decision and Information Technologies (CODIT)
- International Conference on Distributed Smart Cameras (ICDSC)
- International Conference on Signal and Image Processing (ICSIP)
- International Symposium on Low Power Electronics and Design (ISLPED)
- Mediterranean Conference on Control and Automation (MED)

With respect to the original plan we have also chosen the following additional targets, which have entered the preferred list of targets.

- 6th International Workshop on Requirements Engineering and Testing
- The 8th Mediterranean Conference on Embedded Computing - MECO'2019
- 12th European Conference on Software Architecture: Companion Proceedings (ECSA '18)
- 12th IEEE Conference on Software Testing, Validation and Verification (ICST)
- 16th ACM International Conference on Computing Frontiers
- 27th International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS)
- ACACES 2019 - Fifteenth International Summer School on Advanced Computer Architecture and Compilation for High-Performance and Embedded Systems
- ACM/IEEE International Symposium on Low Power Electronics and Design
- ACM International Conference on Computing Frontiers
- ACM Transactions on Graphics
- Applied Reconfigurable Computing (ARC 2019)
- Eurographics Symposium on Rendering
- IEEE Access
- IEEE Nordic Circuits and Systems Conference
- International Conference on Computer Graphics Theory and Applications
- International Conference on Field Programmable Logic and Applications (FPL)
- Intl. Conf. on Performance Engineering
- International Workshop on OpenCL, SYCL, Vulkan and SPIR-V

- International Workshop on OpenMP
- International Workshop on Software and Compilers for Embedded Systems
- Journal of Systems Architecture
- Sixth International Workshop on FPGAs for Software Programmers

4.2.3 Press Releases

Press releases will be organized on an ad hoc base to disseminate special milestones and/or project results. Very often media coverage cannot be orchestrated, but rather "happens" as a result related dissemination activities.

4.2.4 Alignment with other European Projects

FitOptiVis project is aligned with other European projects to produce synergic advantages. Sharing of knowledge with other researchers is itself a value, but the efficiency gained by joint publishing, co-operation in research, and communication between the experts when solving complex problems is paramount when pursuing success in science and technology.

The use of virtual reality or augmented reality tools for safety applications is currently investigated in several EU-funded projects. In more details, *Immersafe* - Immersive Visual Technologies for Safety-Critical Applications is a four-year (2018-2021) H2020 Marie Sklodowska-Curie Innovative Training Network that brings together 9 beneficiaries and 5 partner organizations from Finland, Sweden, Norway, Croatia, Italy, and Switzerland. The aim of the project is the training of a new generation of multi-disciplinary experts, who understand the core imaging technologies, the requirements set to them by the safety-critical applications and who can account for the human user in the design of such systems. In fact, in many contexts – heavy work machines, emergency response, control centres – human operators face complex and demanding situations where their decisions can have far-reaching consequences on productivity, environment, and even human lives. To provide to the operator situational awareness, which can be achieved by sensing relevant visual data about the operating environment, Immersive Visual Technologies can be used for providing ultra-realistic and interactive visual experience.

Elements of the monitoring solution using video analytics in use case UC3 Habit Tracking are being co-designed with similar results in ECSEL project *AFarCloud* in their use case for animal grazing monitoring[1]. Despite the different target (in AFarCloud we're targeting the monitoring of animals in farms where in FitOptiVis it is humans at their homes) the rough set-up is similar: fixed cameras capture and stream video that is analysed upstream at edge or cloud nodes to extract behaviour of the subjects and understand their actions (e.g., patterns, outliers, etc.). Thus, some elements can be shared among the projects. Specifically we're at the time of writing of this report sharing the capture hardware (FOSCAM FI9900EP infrared cameras[2]) for limited experiments in the baseline deployment for UC3 Habit Tracking. Since the timeline of AFarCloud and FitOptiVis is very aligned (both correspond to the same ECSEL call) and there are a number of shared partners (e.g., HIB for UC3, but also UNIVAQ) it is expected that joint

---

[1] http://www.afarcloud.eu/spain-local/ - AFarCloud Grazing Monitoring local demonstrator
[2] https://www.foscam.com/FI9900EP.html - FOSCAM FI9900EP IR camera website.

work may be done together in terms of dissemination and that FitOptiVis technology approaches can be tested there.

EMC² – 'Embedded Multi-Core systems for Mixed Criticality applications in dynamic and changeable real-time environments' is an ARTEMIS Joint Undertaking project in the Innovation Pilot Programme 'Computing platforms for embedded systems' (AIPP5). Embedded systems are the key innovation driver to improve almost all mechatronic products with cheaper and even new functionalities. They support today's information society as inter-system communication enabler. A major industrial challenge arises from the need to face cost efficient integration of different applications with different levels of safety and security on a single computing platform in an open context. ITI participated in this recently finished project by developing enhanced 3D Industrial inspection system features and applying them in an innovative pilot. All these developments have influenced the work carried out in FitOptiVis.

H2020 *ZDMP* (Zero Defect Manufacturing Platform) is a European project which main aim is to establish a digital platform for connected smart factories for achieving excellence in manufacturing through zero-defect processes and products. The project started in January 2019 and it will last a total of four years. ITI forms part of the consortium as technical manager and plans to integrate its 3D Industrial Inspection system in the project portfolio solutions, it will count on the enhancements achieved within FitOptiVis project.

CERBERO (https://www.cerbero-h2020.eu/): CERBERO is a completed (Feb. 2020) H2020 project. It aimed at providing a model-based methodology and toolset for design, incremental prototyping, verification and continuous developments of adaptive CPS. Run-time CPS management has been enabled leveraging on strategies for system-in-the loop co-simulation, continuous monitoring, optimization and system reconfiguration to provide high (optimal) performance, while being reactive to users' needs and changed environmental conditions. UNISS, UNICA, and ABI were involved in CERBERO. The cross-connections that have been established with CERBERO were quite strong. Indeed, both MDC and the SAGE suite that are in use also within FitOptiVis have been originally used and developed there. Numerous, tutorials on this technologies have already been organized (CPS Summer School 2017, 2018 and 2019 editions, CPS&IoT Summer School 2019, DATE U-Booth 2019) and were planned also in 2020 (CPS Summer School 2020, CPS&IoT Summer School 2020, DATE U-Booth 2020) involving FitOptiVis extensions to those tools and project partners (i.e. UNIVAQ).

4.2.5 Education and Innovation

Educating young scientists and involving them in innovation is an important aspect of the FitOptiVis project. Young scientists are invited to apply for positions at various levels and to learn about the concept while at the same time, in so far it is possible, the demonstrator products will be presented. Also in university courses the concepts of the project are discussed while the platform technologies are explained.

For example, University of Granada has already included FitOptiVis methodology and objectives as part of their Master´s degree curriculum. Master students have already studied the consortium work during the classes for our course on Advanced Architectures for Vision Processing (3 ECTS), within our Master in Big Data and

Computer Engineering (https://masteres.ugr.es/datcom/). Additionally, it is right now the topic for two master´s final project on video-surveillance applications and for the monitoring of the elderly at home.

We have created the following training activities:

Educational Activity Topic	Activity Summary
Internal events	3 Events
External events	7 Events
Bachelor Thesis	2 Thesis
Master Thesis	4 Thesis
PhD Students	6 Students
Professional Doctorate Students	1 Student
Usage of FitOptiVis results within Courses	9 Courses
Exchange Periods	3 Visiting Periods

Figure 7, Educational activities

More information on educational activities is available in *D7.2 – Update of the Innovation, Standardization and Exploitation plan and report,* pp. 63-82.

A consortium level action related to Innovation regards FitOptiVis End User Board (EUB).The First End-User Workshop is to provide an overview of the feedback given by the EUB members during the workshop organised in Eindhoven on 10 September 2019. This workshop is the first one of a series of three that will take place during the project lifetime, if COVID-19 situation allows. During the workshop, discussions took place among the EUB members and FitOptiVis' participants. The discussions were guided in accordance with the points included in a questionnaire that was created by the FitOptiVis management board and the use case leaders and that was distributed to the EUB members beforehand. In general, all the EUB members agree to the importance of FitOptiVis technologies and you may find details about the feedback in DXXX.

Currently all other education and innovation projects are on hold due COVID-19 outbreak.
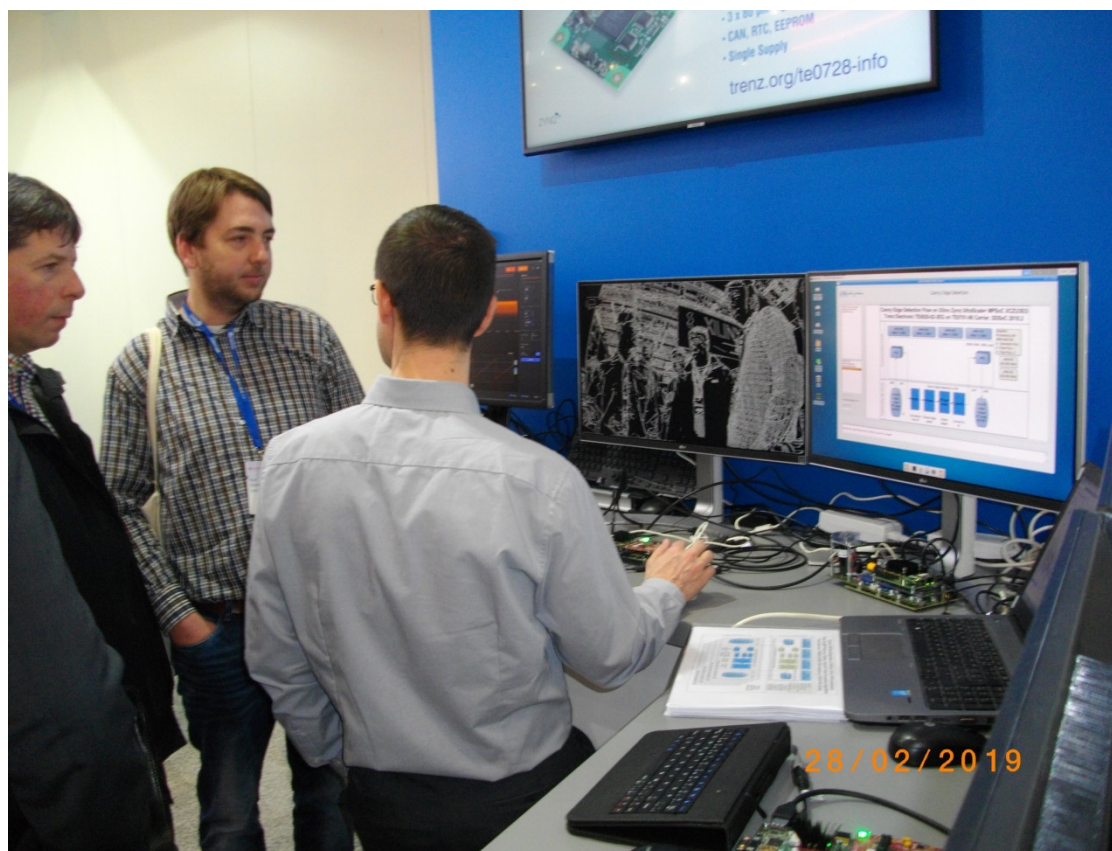
Figure 8 - UTIA Presentation at Embedded World 2019

UTIA presented FitOptiVis design time resources at the EW 2019 exhibition held in Nuremberg from 26 to 28 February 2019 at the TRENZ Electronics company booth.

5 EXECUTIVE SUMMARY

This Initial Dissemination Plan outlines the general principles applicable to the project communication as well as the different methods that have or will be put in place to:

- Facilitate the sharing of knowledge within the project consortium for optimal project management and to
- Promote the project's research and outcomes to the identified target groups to guarantee the long-term success and sustainability of the project.

The sharing of knowledge within the consortium is mainly done through the Management Board meetings and Workshops. During these meetings partners tell about their results and align the activities for the next period. So far 20 Management Board meetings and 7 Workshops have been held. The Workshops were hosted by different partners in different countries (2 in Netherlands, 1 in Italy, 1 in Finland, 2 in Czech Republic and 1 in Spain). Next the rotation would have gone to Finland, in June 2020. However, this will be held as a telepresence meeting, due to restrictions caused by the COVID-19 outbreak.

FitOptiVis has 14 academic and research partners, all of them with strong background and curricula. We address 22 publications per year, more than our goal of 20, including project level and individual partners' ones. Project website has reached 935 unique users, 1304 unique visits and 3554 page views during the period from 15th of May 2019 to 15th of May 2020.

Finally, an efficient file sharing system is in place to exchange documents, files, presentations etc. The system has version control for safety and ease of operation. The system is hosted by BUT. The details of publications and other presentations generated by the project will be collected in the database, which is hosted by UTU. The same system is used to collect partner descriptions and personnel information.

The communication to the target groups outside the consortium is, and will be mainly done through conferences, scientific journals, symposia, press releases and educational activities. At the project level so far one publication (see Annex 6.2, paper 12) gives wider audience an overview of the project. Also, contributions to (virtual) summer schools are planned for the coming summer.

6 ANNEXES

6.1 Annex I: Project poster

6.2 Annex II: Papers/Conferences/Workshops/etc.

Article in Journal:

1. "An integrated hardware/software design methodology for signal processing systems", Lin Li, Carlo Sau, Tiziana Fanni, Jingui Li, Timo Viitanen, François Christophe, Francesca Palumbo, Luigi Raffo, Heikki Huttunen, Jarmo Takala, Shuvra S.Bhattacharyya, In: Journal of Systems Architecture, 2019

2. "Blockwise Multi-Order Feature Regression for Real-Time Path Tracing Reconstruction", Matias Koskela, Kalle Immonen, Markku Mäkitalo, Alessandro Foi, Timo Viitanen, Pekka Jääskeläinen, Heikki Kultala, Jarmo Takala, In: ACM Transactions on Graphics, 2019

3. "Reconfigurable Adaptive Multiple Transform Hardware Solutions for Versatile Video Coding", Sau, C., Ligas, D., Fanni, T., Raffo, L., & Palumbo, F. (2019). IEEE Access, 7, 153258-153268.

Publication in Conference proceedings/Workshop:

4. "Self-adaptive loop for CPSs: is the Dynamic Partial Reconfiguration profitable?", Gabriella D'Andrea, Tania Di Mascio and Giacomo Valente, In: The 8th Mediterranean Conference on Embedded Computing - MECO'2019, 2019

5. "SHRIMP: Efficient Instruction Delivery with Domain Wall Memory", Joonas Multanen, Pekka Jääskeläinen, Asif Ali Khan, Fazal Hameed, Jeronimo Gastrillon, In: ACM/IEEE International Symposium on Low Power Electronics and Design , 2019

6. "Towards Efficient Code Generation for Exposed Datapath Architectures", Kanishkan Vadivel, Pekka Jääskeläinen, Roel Jordans, Heikki Kultala, Sander Stuijk, Henk Corporaal, In: International Workshop on Software and Compilers for Embedded Systems, 2019

7. "J4CS: An Early-Stage Statement-Level Metric for Energy Consumption of Embedded SW", Vittoriano Muttillo, In: The 8th Mediterranean Conference on Embedded Computing - MECO'2019, 0

8. "Guaranteed Latency Applications in Edge-Cloud Environment", Petr Hnetynka, Petr Kubat, Rima Al Ali, Ilias Gerostathopoulos, Danylo Khalyeyev, In: 12th European Conference on Software Architecture: Companion Proceedings (ECSA '18), , 2018

9. "Supporting Columnar In-memory Formats on FPGA: The Hardware Design of Fletcher for Apache Arrow", Johan Peltenburg, Jeroen van Straten, Matthijs Brobbel, H. Peter Hofstee, Zaid Al-Ars, In: Applied Reconfigurable Computing (ARC 2019), 2019

10. "Energy-Delay Trade-Offs in Instruction Register File Design", Joonas Multanen, Heikki Kultala, Pekka Jääskeläinen, In: IEEE Nordic Circuits and Systems Conference, 2018

11. "Reducing Computational Complexity of Real-Time Stereoscopic Ray Tracing with Spatiotemporal Sample Reprojection", Markku Mäkitalo, Petrus Kivi, Matias Koskela and Pekka Jääskeläinen, In: International Conference on Computer Graphics Theory and Applications, 2019

12. "The FitOptiVis ECSEL project: highly efficient distributed embedded image/video processing in cyber-physical systems." Al-Ars, Z., Basten, T., de Beer, A., Geilen, M., Goswami, D., Jääskeläinen, P., ... & Pomante, L. (2019,

April). In Proceedings of the 16th ACM International Conference on Computing Frontiers (pp. 333-338).

13. "OpenMP Dynamic Device Offloading in Heterogeneous Platforms." Álvarez, Á., Ugarte, Í., Fernández, V., & Sánchez, P. (2019, September). In International Workshop on OpenMP (pp. 109-122). Springer, Cham.

14. "Demo extended abstract - MECO: an innovative run-time manager to evaluate the Dynamic Partial Reconfiguration profitability", Gabriella D'Andrea, Tania Di Mascio, Luigi Pomante and Giacomo Valente, In: ACACES 2019 - Fifteenth International Summer School on Advanced Computer Architecture and Compilation for High-Performance and Embedded Systems. (2019)

15. "Poster: Automatic Consistency Checking of Requirements with ReqV", Vuotto, Simone and Narizzano, Massimo and Pulina, Luca and Tacchella, Armando, In: 12th IEEE Conference on Software Testing, Validation and Verification (ICST) (2019)

16. "Automata based test generation with SpecPro", Vuotto, Simone and Narizzano, Massimo and Pulina, Luca and Tacchella, Armando, In: 6th International Workshop on Requirements Engineering and Testing.(2019)

17. "HW/SW Co-Design Framework for Mixed-Criticality Embedded Systems Considering Xtratum-Based SW Partitions", V. Muttillo, L. Pomante, P. Balbastre, J. Simò and A. Crespo, In: 22nd Euromicro Conference on Digital System Design (DSD) (2019)

18. "Foveated Real-Time Path Tracing in Visual-Polar Space", Matias Koskela, Atro Lotvonen, Markku Mäkitalo, Petrus Kivi, Pekka Jääskeläinen, In: Eurographics Symposium on Rendering

19. "AEx: Automated Customization of Exposed Datapath Soft-Cores", Alex Hirvonen, Kati Tervo, Heikki Kultala, Pekka Jääskeläinen, In: Euromicro Conference on Digital System Design

20. "Machine Learning Is the Solution Also for Foveated Path Tracing Reconstruction", Atro Lotvonen, Matias Koskela, Pekka Jääskeläinen, In: International Conference on Computer Graphics Theory and Applications.

21. "HIPCL: Tool for porting CUDA applications to advanced OpenCL platforms through HIP", Michal Babej, Pekka Jääskeläinen, In: International Workshop on OpenCL, SYCL, Vulkan and SPIR-V

22. "POCL-R: Distributed OpenCL runtime for low latency remote offloading", Jan Solanti, Michal Babej, Julius Ikkala, Pekka Jääskeläinen, In: International Workshop on OpenCL, SYCL, Vulkan and SPIR-V

23. "Run-time Performance Monitoring of Heterogenous Hw/Sw Platforms Using PAP", Tiziana Fanni, Daniel Madroñal, Claudio Rubattu, Carlo Sau, Francesca Palumbo, Eduardo Juárez, Maxime Pelcat, César Sanz, Luigi Raffo, In: FSP Workshop 2019; Sixth International Workshop on FPGAs for Software Programmers.

24. "Fletcher: A Framework to Efficiently Integrate FPGA Accelerators with Apache Arrow", Johan Peltenburg, Jeroen van Straten, Lars Wijtemans, Lars van Leeuwen, Zaid Al-Ars and Peter Hofstee, In: International Conference on Field Programmable Logic and Applications (FPL)

25. "Initial Experiments with Duet Benchmarking: Performance Testing Interference in the Cloud", Lubomír Bulej, Vojtěch Horký, Petr Tůma, In: 27th International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS)

26. "Duet Benchmarking: Improving Measurement Accuracy in the Cloud", Lubomír Bulej, Vojtěch Horký, Petr Tůma, François Farquet, Aleksandar Prokopec, In: Intl. Conf. on Performance Engineering.

Other:

27. "Demo poster paper - AN AUTONOMIC MANAGER FOR EDGE-COMPUTING PLATFORMS", Gabriella D'Andrea, Tania Di Mascio, Luigi Pomante and Giacomo Valente, In: Conference on Design and Test Automation in Europe (DATE) – University Booth, 2019

28. "Design Time and Run Time Resources for the ZynqBerry Board TE0726-03M with SDSoC 2018.2 Support ", Jiři Kadlec, Zdeněk Pohl, Lukáš Kohout, In: UTIA in FitOptiVis, 2019

29. "Design Time and Run Time Resources for Zynq Ultrascale+ TE0808-04-15EG-1EE with SDSoC 2018.2 Support", Jiři Kadlec, Zdeněk Pohl, Lukáš Kohout, In: UTIA in FitOptiVis, 2019

30. "Demo poster Paper - HEPSYCODE-MC: ELECTRONIC SYSTEM-LEVEL METHODOLOGY FOR HW/SW CO-DESIGN OF MIXED-CRITICALITY EMBEDDED SYSTEMS", Luigi Pomante, Vittoriano Muttillo, Marco Santic and Emilio Incerto, In: Conference on Design and Test Automation in Europe (DATE) – University Booth, 2019

31. "Ph.D. forum paper - ESL HW/SW Co-Design Methodology for Mixed-Criticality and Real-Time Embedded Systems", Vittoriano Muttillo, In: Conference on Design and Test Automation in Europe (DATE) – Ph.D. Forum, 2019

32. "Design Time and Run Time Resources for Zynq Ultrascale+ TE0820-03-4EV-1E with SDSoC 2018.2 Support", Jiři Kadlec, Zdeněk Pohl, Lukáš Kohout, In: UTIA in FitOptiVis, 2019

33. "Video Input/Output IP Cores for TE0820 SoM with TE0701 Carrier and and Avnet HDMI Input/Output FMC Module", Lukas Kohout, Jiri Kadlec, Zdenek Pohl, In: UTIA in FitOptiVis, 2019

34. "Video Input/Output IP Cores for Xilinx ZCU102 with Avnet HDMI Input/Output FMC Module", Lukas Kohout, Jiri Kadlec, Zdenek Pohl, In: UTIA in FitOptiVis, 2019

35. "Stereo Demo", Zdenek Pohl, Lukas Kohout, Jiri Kadlec, In: UTIA in FitOptiVis, 2018

36. "Live Canny Edge Detection Demo for TE0808+TEBF0808 Trenz Board", Zdenek Pohl, Lukas Kohout, Jiri Kadlec, In: UTIA in FitOptiVis, 2018

37. "HDR Tonemapping demo", Martin Musil, Svetozar Nosko, In: , 2019

38. "HDR deghosting demo", Martin Musil, Petr Musil, In: , 2019

39. "FPGA object detection demo", Petr Musil, Roman Juranek, In: , 2019

40. "Demo Presentation - Tutorial HEPSYCODE PhD Course", Vittoriano Muttillo, Luigi Pomante, Seminar at Università degli Studi dell'Aquila

41. "Demo poster paper - MECO AN INNOVATIVE RUN-TIME MANAGER TO EVALUATE THE DYNAMIC PARTIAL RECONFIGURATION PROFITABILITY" Gabriella D'Andrea, Tania Di Mascio, Luigi Pomante and Giacomo Valente, In: ACACES 2019 - Fifteenth International Summer School on Advanced Computer Architecture and Compilation for High-Performance and Embedded Systems.

42. "Demo poster paper - MECO AN INNOVATIVE RUN-TIME MANAGER TO EVALUATE THE DYNAMIC PARTIAL RECONFIGURATION PROFITABILITY", Gabriella D'Andrea, In: CWWMCA19 - Career Workshop for Women & Minorities in Computer Architecture.

43. "Demo Presentation - Design space exploration for hypervisor-based mixed-criticality systems", V. Muttillo, L. Pomante, In: CPS&IoT'2019 Summer School on Cyber-Physical Systems and Internet-of-Things.
44. "Demo poster paper - JOINTER JOining flexIble moNitors wiTh hEterogeneous architectuRes", G. Valente, T. Fanni, C. Sau, C. Rubattu, F. Palumbo, L. Pomante, In: DATE2020 Design, Automation and Test in Europe Conference.

6.3 Annex III: Press Releases and Public Announcements

None so far.