



CERTH
CENTRE FOR
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HELLAS

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**RESEARCH-TECHNOLOGY - INNOVATION
FOR SUSTAINABLE GROWTH**

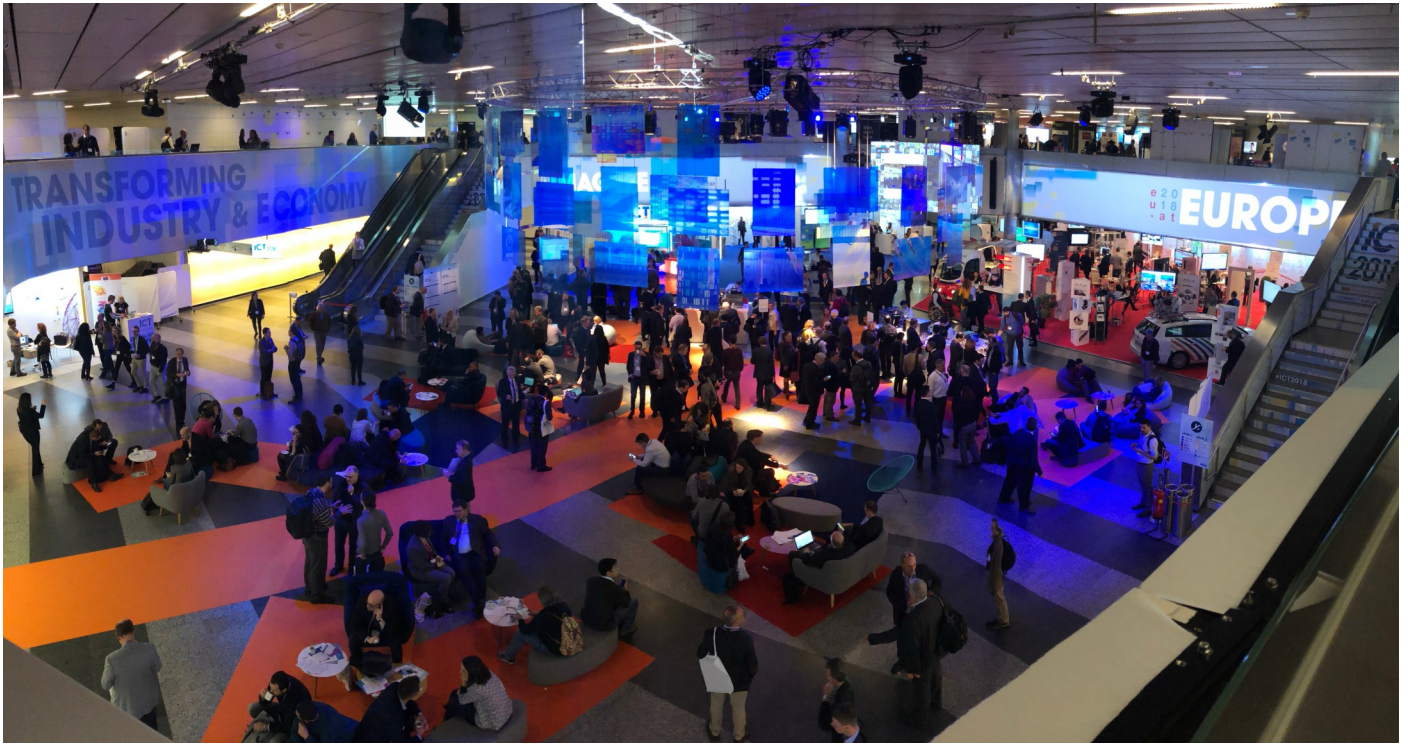
Integration of migrants in Europe

Innovative technologies at the service of the smooth and inclusive integration of migrants in Europe



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ITI in ICT 2018 Research and Innovation Event

Information Technologies Institute (ITI) participated with 19 researchers to the largest exhibition event of the European Union on the topic of Information and Communication Technologies. ICT is an open event, where citizens, policy makers, academics/researchers and industry visitors participate in order to discuss our vision of Europe in the digital age. This year it was co-organized by the European Commission and the Austrian Presidency of the Council of the European Union in Vienna, with 4800 people attending the event. The event consisted of four main sections: Conference, Exhibition, Networking opportunities and the Innovation & Startup Forum, all around the main theme of the event *Imagine Digital - Connect Europe*.

ITI presented results from projects it is either coordinating or participating, while its presence was also significant on the networking section by organizing thematic networking sessions on subjects related to its research interests. More specifically, ITI participated in the ICT 2018 exhibition with 6 exhibition stands to present results on the following projects: [MAMEM](#), [InVID](#), [ENVISAGE](#), [V4Design](#), [RAMCIP](#), [MyAirCoach](#) and organized 2 thematic networking sessions on smart cities and data-driven policy-making, and fake news on the Internet and social media.

The visitors of the stands were informed about the progress of the projects and the innovation they produced. In addition, they tested the applications developed in the projects, such as browse the web and play TETRIS with the eyes and mind (MAMEM), detect fake videos with the InVID Verification plugin, and visit a reconstructed virtual place at different times through artificially switching objects (V4Design). They also designed their own virtual chemistry or wind energy laboratory with the ENVISAGE design tool, interacted with the robotic home assistant RAMCIP, and explored the new smart inhaler for patients with asthma (MyAirCoach).



Inclusion of migrants in EU socio-economic structure (source: CGD)

Towards a better life

Innovative technologies at the service of the **smooth and inclusive integration of migrants in Europe**

Text Eleni Kamateri, Anastasios Karakostas, Stefanos Vrochidis

Editing Amalia Drosou



Today, migration is one of the most important issues affecting the European Union (EU). It is obvious that none of the EU countries is able or should face the enormous migratory pressures alone. The European Commission's agenda on migration provides common European response to the challenges involved, making the most of

the EU's organizations and tools and seeking the participation of all. The main objective is the global approach to this issue.

In particular, the integration of immigrants into society is a dynamic, complex and demanding process that requires great effort, time and patience on the part of all involved.



The main factors shaping its dynamics are autonomy, perception, culture, history, as well as institutional constraints that differ significantly between migrants and between countries.

The MIICT project aims to empower public authorities, public service providers, NGOs, interest groups and immigrants themselves, including refugees and asylum seekers, as part of a human-centered approach, through the design of innovative systems enabling the more inclusive integration of migrants into the social and economic

structures of the host countries. ITI / CERTH, and in particular MKLab, participates in the MIICT project, aiming at designing, developing and implementing tools that address the challenge of integrating immigrants through the co-creation of improved ICT-enabled services. In the MIICT project, public service providers, NGOs and other related social groups as consortium partners, as well as migrants and refugees themselves, are also actively involved.



Memoir photo from the kick-off meeting of MIICT

The MIICT project will design, develop and implement solutions based on the existing capabilities and tools of the consortium's partners concerning: managing the socio-economic integration of migrants, adaptation of services to the needs of migrants and the need for sustained and improved process of migrants inclusion by improving their access to labor markets.

Pilot use cases in Cyprus, Italy and Spain

The approach and tools of the project will be developed on the basis of their reusability, ensuring that they can be easily adapted to meet the diverse needs of the target users and make full use of the integration framework, which can easily be adopted by the EU public ser-

In order to achieve these goals, the project will place the migrant-related stakeholders in the center of designing and developing of the services and processes, making the most of their experience. They will work together through specific and new processes with the partners responsible for the development of the services.

vices. Taking into account that a generalized approach to addressing all the wishes and needs of migrants and refugees could not work effectively, the project will use specific case studies in Cyprus, Italy and Spain in order to test and demonstrate the operational utility of the proposed solutions across different Member States.

The kick-off meeting of the MIICT project took place on 14 and 15 November 2018 in Sheffield. Project coordinator is the CENTRIC research center (<https://research.shu.ac.uk/centric/>) of Sheffield Hallam University, which specializes in the fight against terrorism and organized crime.

The duration of the project is 3 years. More details are available on the project website: <http://miict.eu>



High level distinction at European level

Dr. Evangelos Bekiaris becomes the Head of the European ECTRI Association

On Wednesday, 12th of December, 2018, the Director of HIT/CERTH, Dr. Evangelos Bekiaris was elected as the new Chairman of the European association ECTRI (European Conference of Transport Research Institutes, <https://www.ectri.org>).

The European Association ECTRI includes 28 Transport Research Institutes from 21 EU Member States and has just celebrated its 15 years of existence.


The festive election of Dr. Bekiaris in his chairmanship is another validation of high excellence, professionalism and know-how, as well as the recognition of the work of the Hellenic Institute of Transport (HIT) of the Centre for Research & Technology Hellas (CERTH). HIT is the main research organization in the field of

Transport in Greece and one of the most important and most recognized technology and know-how nodes in Europe. It also is a member of the General Secretariat of Research and Technology of the Ministry of Education, Research and Religious Affairs. HIT's headquarters are located in Thessaloniki, while its branches are spread across Athens, Piraeus, Rhodes and more.

Dr. Bekiaris election is expected to contribute to the broader involvement of our country's research cluster in EU research initiatives and to the visibility of Greek positions and achievements in Transport Research, particularly regarding the upcoming European Research Framework 2021-2027 (Horizon Europe-HE).



Remote Assessment and Disease Relapse in Alzheimer's Disease (RADAR-AD Project)



Alzheimer's disease (AD) is a neurodegenerative condition with significant social, economic and psychological consequences. Cases worldwide are constantly increasing to impressive figures, tripling to 131.5 million worldwide by 2050. To date, **one major difficulty for its clinical care is the assessment of daily functionality problems** as it is based solely on subjective evidence and/or the recall of specific events by the caregivers. At the same time, the detection of biomarkers that will determine whether a patient will deteriorate, from the early stages of cognitive impairment to the later stage of AD, remains one of the most critical

INFOGRAPHIC

The global impact of dementia

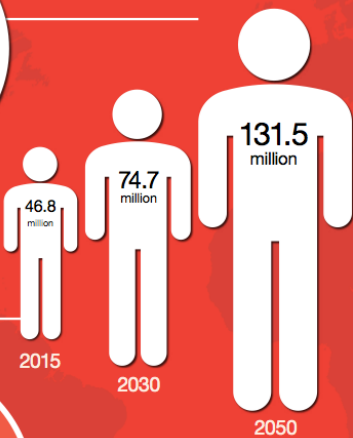


Around the world, there will be 9.9 million new cases of dementia in 2015,

one every 3 seconds

46.8 million people worldwide are living with dementia in 2015.

This number will almost double every 20 years.



Much of the increase will take place in low and middle income countries (LMICs): in 2015, 58% of all people with dementia live in LMICs, rising to 63% in 2030 and 68% in 2050.

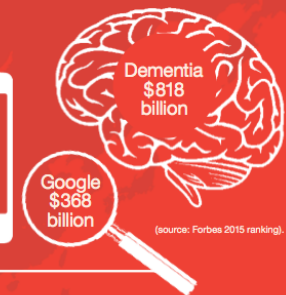


The total estimated worldwide cost of dementia in 2015 is US\$ 818 billion. By 2018, dementia will become a trillion dollar disease, rising to **US\$ 2 trillion by 2030**

If global dementia care were a country, it would be the

18th largest economy

in the world exceeding the market values of companies such as Apple and Google



(source: Forbes 2015 ranking).



This map shows the estimated number of people living with dementia in each world region in 2015.

We must now involve more countries and regions in the global action on dementia.

Global impact of Alzheimer's Disease. Resource: Alzheimer Disease International Report 2018

On the other hand, information communication technologies (ICT) have significantly evolved. The possibilities offered through the use of smartphones, wearables and remote monitoring devices promise to radically change the care and assessment of people with AD. In fact, objective and reliable monitoring by such devices gives much more rich information about the individual's condition than subjective observations. Thus, such technologies enable the evolution from a "diagnosis and treatment" to a "prediction" model of caring for the disease, which will allow individuals to live independently.

The RADAR-AD project, launched in January 2019 with three years duration, is expected to

bring such technologies closer to pharmaceutical practice. The aim of the RADAR-AD (Remote Assessment of Disease and Relapse in Alzheimer's Disease) is to develop and validate technologically advanced and sensitive measurements of the daily problems of people who are at the initial stage of AD (e.g., Mild Cognitive Impairment). To achieve this, RADAR-AD will work in close collaboration with patient organizations and regulatory authorities to select and integrate the most relevant devices available in order to measure daily function in a timely manner. Overall, the assessment of the proposed technology will be carried out across Europe, involving around 220 people from all stages of the AD continuum.

The project consortium consists of 17 European organizations: academic, such as King's College London, Oxford University and the Karolinska Institute, industrial, such as Lygature, The Hyve, Software AG, and the non-governmental organization Alzheimer Europe. Most notable, pharmaceutical companies, which include Janssen, Novartis, Johnson & Johnson, Takeda and Lilly, are also involved and co-finance the project, through the European Federation of Pharmaceutical Industries and Associations (EFPIA). Coordination has been undertaken by King's College London together with EFPIA Janssen and Novartis. The Information Technologies Institute (ITI) of the Center for Research and Technology Hellas (CERTH), and in particular the Multimedia Knowledge and Social Networks Laboratory (MKLab), will significantly contribute to RADAR-AD through its many years of experience in the field of e-health, diagnosis, remote monitoring,

assistive solutions and smart systems and the coordination of several health-related projects (such as www.demcare.eu).

Specifically, within RADAR-AD, CERTH-ITI will host 10 patients to stay at the "ITI-Smart Home", a real living environment with embedded sensors and smart devices. Through this pilot, we will have the opportunity to investigate various behavioral patterns, difficulties occurring within the AD spectrum, multiple biological functions, daily functionality problems and various aspects of deterioration in people with AD. This particular pilot is one of the three of the project and considered as a pioneering assessment of people with AD at a realistic home-like research environment. More specifically, it is expected to play a pivotal role in the final choice of the technology and equipment package of the project.

The RADAR-AD project started in January 2019, with duration of three years and is co-funded by the European Commission and EFPIA under the Innovative Medicines Initiative (IMI) public and private partnership.



Graphical representation of Smart Home

Art-driven adaptive outdoors and indoors design

Art has the capacity to transcend established theoretical and conceptual frames and act in cross-disciplinary ways, as it provides space for what is called as “lateral” thinking, that is to address issues with an ‘out of the box’ approach. In the MindSpaces project artists and technology experts will closely collaborate under a novel working model scheme to propose innovative designs to address societal challenges faced by cities as they expand, and the evolving needs in functionality and emotional resonance of modern day workplace and housing interiors.

Text Sotiris Diplaris, Kostas Avgerinakis, Stefanos Vrochidis

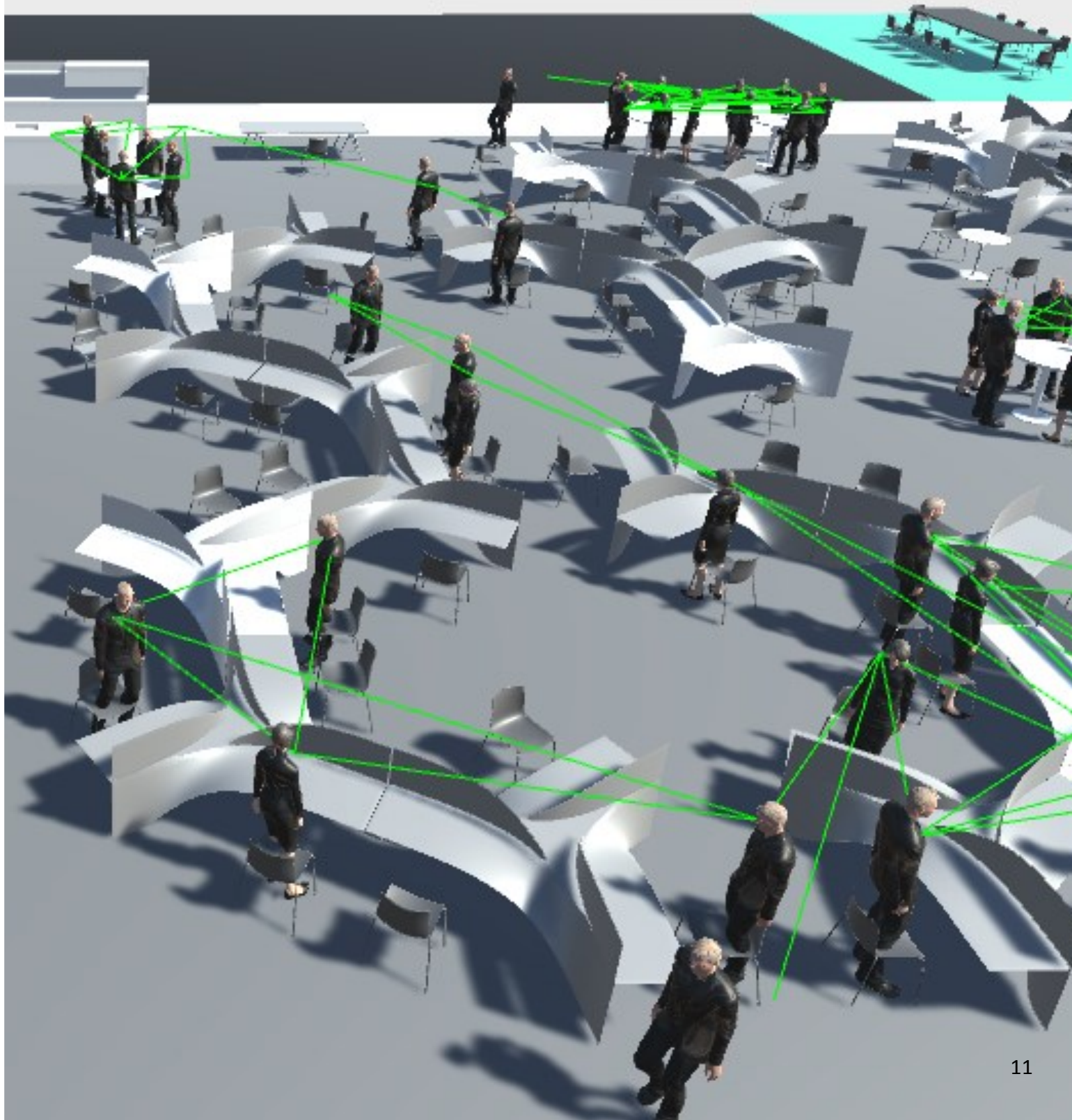
Editing Amalia Drosou



The Information Technologies Institute of the Centre for Research and Technology Hellas (ITI/CERTH) coordinates the project MindSpaces, which will bring together artists, creatives and technology experts in the realm of techno science art. The central objective of MindSpaces is to create the tools and develop the solutions for adaptive and inclusive spaces that dynamically adapt to emotional, aesthetical and societal responses of end users, creating functionally and emotionally appealing architectural design.

In this context, artists will help create AR/VR installations that will highlight the cul-

tural significance of cities and sustainability issues they are facing, as well as paradigm-shifting designs of indoors work and living environments. Their aim will be to ensure improved functionality, usability, but also emotional and cognitive wellbeing of end users. State-of-the-Art (SoA) multisensing technology, such as wearable EEG, physiological sensing, machine learning, visual analysis, social media inputs, will be integrated for the immediate assessment of innate user responses to the MindSpaces installations, and artistic adaptation of the designs accordingly.





Examples of interior space, urban space and workspace redesign

Attractive outdoors urban environment:

MindSpaces will use drone scans and 3d scanners to produce 2D and 3D documentation of the urban environment that architects and artists will work on and will produce an artistically and aesthetically rigorous, interactive public installation. It will engage city dwellers and tourists by appealing to their emotions and connection with the city, its history and its environment. Cognitive, emotional and environmental sensor measurements will be collected from the users and the data will be used to evaluate and generate improvements and alterations of the installation, with the goal to increase sensitivity and awareness towards the cultural significance and current issues of a city, related to the environment and mobility.

Inspiring workplaces: MindSpaces will build 3D models of the original workspaces, which will be re-designed by architects and artists,

and will be used to simulate and test social behavior within proposed workplace designs. These simulations coupled with direct user feedback data will be used as training data for a machine learning model to generate improved workplace designs, with the goal to increase opportunities for positive social interaction in work environments, and to allow for more dynamic and diverse social behavior.

Emotionally-sensitive functional interior design: The system will sense the behavior and reactions of habitants in 3D-reconstructed home environments, guiding architects and artists to adapt their architectural design and artistic exploration, realizing an aesthetically sensitive interior design that integrates the end users' responses and leverages specific aesthetic features that appeal to certain target groups (e.g. elderly etc).

The project MindSpaces has been characterised by the European Commission as a Lighthouse project in the STARTS (Innovation at the nexus of Science, Technology, and the ARTS) framework. Its kick-off meeting will take place in January 2019 in Thessaloniki. The project is coordinated by the Multimedia Knowledge and Social Media Analytics Laboratory (<http://mklab.iti.gr/>) of CERTH's Information Technologies Institute. Among other partners, project participants are the School of Architecture of Aristotle University of Thessaloniki, Zaha Hadid Architects, McNeel Europe SL, as well as distinguished digital artists like Maurice Benayoun and Refik Anadol. The project duration is 3 years. More information: stefanos@iti.gr.



Open Labs “Little Archeologists”

Co-operation of CERTH with the Public Library of Thermi for training school children in 3D technologies on the topic of culture and art



Text Dimitrios Ververidis

Photos CERTH

The Public Library of Thermi (DEPPATH) in co-operation with Centre for Research and Technology Hellas (CERTH) are organizing seminars – open labs with the name “Little Archaeologists” aiming into educating school children about 3D designing and printing around the topic of culture and art. The attempt was supported from the telecommunication company COSMOTE that

sponsored a 3D printer and a laptop to the library.

The school children of Thermi learned about archaeology and virtual labs through the technologies that the Multimedia, Knowledge, and Social Media Analytics Lab of CERTH-ITI [1] has developed during the research project DigiArt from 2015-2019 [2].



The first open-labs were contacted with children from 5th and 6th grade of the 1st Primary School of Thermi that visited the library on November 2018. The design of the lab has a) an informative character by providing information about CERTH and its projects through a promotional video [3]; b) a training character by presenting 3D models that occurred from 3D scanning of archaeological places with drones in Greece, Belgium and UK, and also by teaching children 3D designing and printing. The children had the opportunity to interact with virtual experiences that were created from CERTH using the scanned models, to design their own models, and compete for the best model that was selected for 3D printing. More information can be found in the blog of the Public Library of Thermi [4].

In January 2019, another open lab took place in the same place with the presence of the Mayor of Thermi, Mr. Theodoros Papadopoulos and the representor of COSMOTE Mrs. Eleni Tsamasirou that tried with enthusiasm a virtual reality experience through Oculus Rift glasses allowing to wander around in the cave of Scladina, Belgium, also developed by CERTH

during DigiArt project. The session was recorded by the TV channel 4E.

Organization:

CERTH: Dimitrios Ververidis, Lefteris Anastasovitis, Spiros Nikolopoulos, Yiannis Kompatsiaris (ikom@iti.gr)

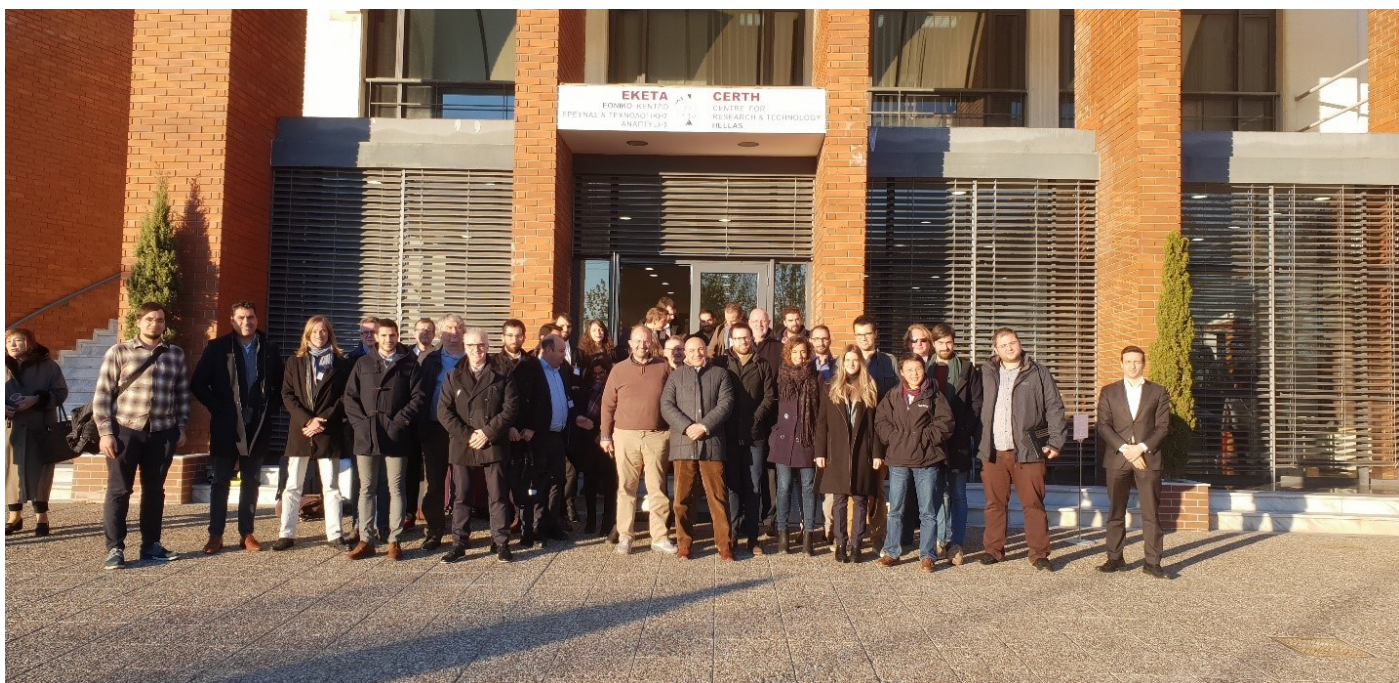
DEPPATH: Christos Vagionas, Athena Papadaki (President)

[1] Multimedia, Knowledge, and Social Media Analytics Lab, URL: <http://mklab.iti.gr>

[2] DigiArt EU H2020 project 2015-2018, URL: <http://digiart-project.eu>

[3] “DigiArt H2020 project overview”, Youtube video, URL: <https://youtu.be/oEGDztYrPpk>

[4] Public Library - Gallery of Thermi, “Open labs for 3D Designing-Printing cultural items.” URL: <https://bibliothermi.blogspot.com/2019/01/3d.html>



Safe and efficient road transport without casualties and serious injuries on European urban roads

Safe and efficient road transport without casualties and serious injuries on European urban roads, by deploying Cooperative Intelligent Transport System (C-ITS) services



The 4th General Assembly (GA) of the “C-Mobile (Accelerating C-ITS Mobility Innovation and deployment in Europe)” project took place at the Conference Centre of Centre for Research and Technology Hellas (CERTH), on December 11th and 12th, 2018. The C-Mobile project, funded under the EU Research and Innovation programme “Horizon 2020”, aims for a safe and efficient road transport without casualties and serious injuries on European urban roads, by deploying Cooperative Intelligent Transport System (C-ITS) services. The consortium C-Mobile, comprised of 37 partners from 9 European countries, is coordinated by the company IDIADA AUTOMOTIVE TECHNOLOGY SA. C-Mobile will demonstrate C-ITS services, engaging large numbers of end users, at large-

scale in the urban environments of 8 European cities, i.e. Deployment Sites: Barcelona, Bilbao, Bordeaux, Copenhagen, Newcastle, North Brabant, Thessaloniki, and Vigo. The objectives of the 4th GA comprised of the status of the 7 project Work Packages, the status overview of the 8 Deployment Sites, as well as issues related to data management, security, and interoperability of the C-ITS services. Moreover, 2 workshops were conducted, targeting at specific technical aspects of the C-ITS services implemented in the 8 Deployment Sites, as well as at the development of a C-ITS framework. The 4th GA was successfully completed with the commitment of all partners for a close collaboration towards the deployment of C-ITS services.



DigiArt project in the 34th PHILOXENIA

In the context of the 34th PHILOXENIA International Tourism Fair, DigiArt: [“The Internet of Historical Things and Building New 3D Cultural Worlds”](#) was hosted at the Central Macedonia Pavilion and tested by dozens of visitors of every age, gaining impressions and positive feedback.

Text Leyteris Anastasovitis, Dimitrios Ververidis, Spiros Nikolopoulos, Yiannis Kompatsiaris

The Multimedia Knowledge and Social Media Analytics Laboratory ([MK-Lab](#)) member of ITI/CERTH, in collaboration with the Ephorate of Antiquities of Imathia, designed and developed a 3D serious game, which concerns the Palace of Aigai as part of the European project H2020 DigiArt. In particular, using virtual reality devices, users have the ability to install the virtual exhibition for the façade of the emblematic build-

ing of antiquity through an educative and simultaneously, entertaining process. Interactions are easily achieved using the hands and fingers in a perfectly natural way, which maximizes the user's sense of presence in the virtual world and hence his/her satisfaction.



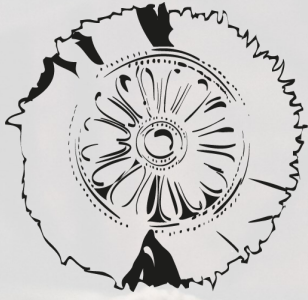
DigiArt test by Central Macedonia Regional Governor Apostolos Tzitzikostas and the guidance of Mr. Anastasovitis from MK-Lab, responsible for the development of VR experience.

Serious games are a constantly growing area, which helps to better communicate archaeological sites and museum exhibits to the public in the case of Culture. Combined with the technologies used to develop and implement them, they tend to become effective educational tools. Through the DigiArt virtual experience, the user is informed about the findings of the archaeological site, learns the building blocks of the Palace, matches their exact location on the façade and understands their architecture during the construction of the Palace.

Our virtual reality experience will be available to visitors of the New Polycentric Museum of Vergina in 2019, when it is expected to open its doors to the public. In the same project, MK-Lab developed a) the virtual tour of the Scladina cave (Belgium); b) the virtual Anthropology Museum for Liverpool John Moores University. Digiart was completed in November 2018, offering three-dimensional digitization of archaeological sites and artifacts, with low cost methods and high quality results, to create immersive virtual experiences in European Cultural [Heritage](#).



Retrieving information about the façade of the Palace of Aigai



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The **Centre for Research and Technology-Hellas (CERTH)** founded in 2000 is one of the leading research centres in Greece and listed among the TOP-20 E.U. institutions with the highest participation in competitive research grants.

Today CERTH includes the following five institutes with indicated major fields of research:

- **Chemical Process and Energy Resources Institute (CPERI)** Sustainable & Clean Energy, Environmental Technologies, Chemical & Biochemical Processes, New Functional Materials
- **Information Technologies Institute (ITI)** Informatics, Telematics and Telecommunication Technologies, Safety and Security
- **Hellenic Institute of Transport (HIT)** Smart Sustainable Mobility, Transport Safety
- **Institute of Applied Biosciences (INAB)** Agri-biotechnology, Health Translational Research, Informatics for big bio-data
- **Institute for Bio-economy and Agri-Technology (IBO)** Bio-economy, Agri-technology

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