SALENTO AVR 2018

5th International Conference on Augmented Reality, Virtual Reality and Computer Graphics

Computer Graphics and Animation – Augmented Reality

Virtual Reality – Games and Serious Games

Human-Computer Interaction

June 24-27, 2018

Hotel Basiliani, Otranto (Lecce) - Italy

Provincia di Lecce

Comune di Otranto

Salento AVR 2018 - www.salentoavr.it

SALENTO AVR 2018 intended to bring together researchers, scientists, and practitioners to discuss key issues, approaches, ideas, open problems, innovative applications and trends on virtual and augmented reality, 3D visualization and computer graphics in the areas of medicine, cultural heritage, arts, education, entertainment, industrial and military sectors.

We are very grateful to the Program Committee and Local Organizing Committee members for their support and for the time spent to review and discuss the submitted papers and doing so in a timely and professional manner. We would like to sincerely thank the keynote and tutorial speakers who willingly accepted our invitation and shared their expertise through illuminating talks, helping us to fully meet the conference objectives.

We extend our thanks to the University of Salento for the enthusiastic acceptance to sponsor the conference and to provide support in the organization of the event. We would like to thanks also the EuroVR Association, which supports the conference from its first issue, by contributing each year to the design of the International Program Committee, to propose the Invited Keynote Speakers, and to spread internationally the announcements of the event.

SALENTO AVR 2018 attracted high-quality paper submissions from many countries. We would like to thank the authors of all accepted papers for submitting and presenting their works at the conference and all the conference attendees for making SALENTO AVR an excellent forum on virtual and augmented reality, facilitating the exchange of ideas, fostering new collaborations, and shaping the future of this exciting research field.

Accepted papers will be included in the conference proceedings and published in Lecture Notes in Computer Science (LNCS) edited by Springer.

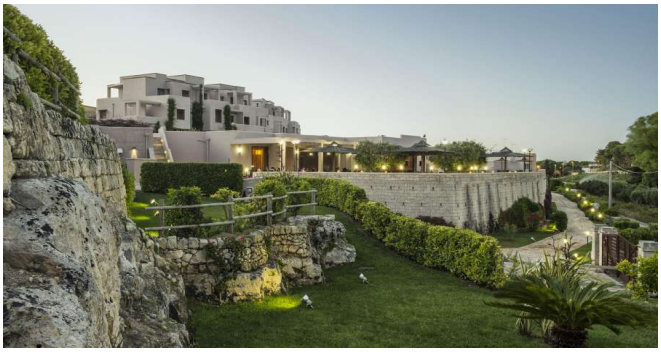
Our thanks go to Springer for sponsoring the ***best paper awards***. The best papers of three young researchers and one researcher will be selected by the Scientific Committee.

Springer

Lecture Notes in Computer Science
LNCS LNAI LNBI

Venue

The SALENTO AVR 2018 will take place at “Hotel Basiliani” in Otranto (Lecce), a town on the east coast of Salento 50 km away from Lecce.



Hotel Basiliani
Via Renis – 73028 Otranto (Lecce)
Phone: +39 0832 351321
www.basilianiresort.com

Committees

Conference Chair
Lucio Tommaso De Paolis, University of Salento, Italy

Conference Co-chair
Patrick Bourdot, CNRS/LIMSI, University Paris-Sud, France
Marco Sacco, ITIA-CNR, Italy
Paolo Proietti, MIMOS, Italy

Honorary Chair
Giovanni Aloisio, University of Salento, Italy

Scientific Program Committee
Andrea Abate, University of Salerno, Italy
Giuseppe Anastasi, University of Pisa, Italy
Selim Balcisoy, Sabancı University, Turkey
Vitoantonio Bevilacqua, Polytechnic of Bari, Italy
Monica Bordegoni, Politecnico di Milano, Italy
Davide Borra, NoReal.it, Torino, Italy
Andrea Bottino, Politecnico di Torino, Italy
Pierre Boulanger, University of Alberta, Canada
Andres Bustillo, University of Burgos, Spain
Massimo Cafaro, University of Salento, Italy
Sergio Casciaro, IFC-CNR, Italy
Marcello Carrozzino, Scuola Superiore Sant'Anna, Italy
Mario Ciampi, ICAR/CNR, Italy
Pietro Cipresso, IRCCS Istituto Auxologico Italiano, Italy
Arnis Cirulis, Vidzeme University of Applied Sciences, Latvia
Lucio Colizzi, CETMA, Italy
Mario Covarrubias, Politecnico di Milano, Italy
Rita Cucchiara, University of Modena, Italy
Yuri Dekhtyar, Riga Technical University, Latvia
Matteo Dellepiane, National Research Council (CNR), Italy
Giorgio De Nunzio, University of Salento, Italy
Francisco José Domínguez Mayo, University of Seville, Spain
Aldo Franco Dragoni, Università Politecnica delle Marche, Italy
Italo Epicoco, University of Salento, Italy
María José Escalona Cuaresma, University of Seville, Spain
Vincenzo Ferrari, EndoCAS Center, Italy
Francesco Ferrise, Politecnico di Milano, Italy
Dimitrios Fotiadis, University of Ioannina, Greece
Emanuele Frontoni, Università Politecnica delle Marche, Italy
Francesco Gabellone, IBAM ITLab, CNR, Italy
Damianos Gavalas, University of the Aegean, Greece
Osvaldo Gervasi, University of Perugia, Italy
Luigi Gallo, ICAR/CNR, Italy
Viktors Gopejenko, ISMA University, Latvia
Mirko Grimaldi, University of Salento, Italy
Heiko Herrmann, Tallinn University of Technology, Estonia
Sara Invitto, University of Salento, Italy

Local Organizing Committee

Program at a Glance

<table>
<tr><th>Sunday 24th</th><th>Monday 25th</th><th>Tuesday 26th</th><th>Wednesday 27th</th></tr>
<tr><td rowspan="4">11,00 – 17,00
Registration</td><td colspan="2">9,00 – 9,30
Opening Ceremony</td><td>9,00 – 10,00
Keynote Speaker:
Marcello Carrozzino</td><td>9,00 – 10,00
Keynote Speaker:
Marco Sacco</td></tr>
<tr><td colspan="2">9,30 – 10,30
Keynote Speaker:
Arcadio Reyes-Lecuona</td><td>10,00 – 11,00
Session 5
VR/AR in Medicine</td><td>10,00 – 11,00
Session 8
VR/AR in Industry</td></tr>
<tr><td colspan="2">10,30 – 11,00
Coffee break</td><td>11,00 - 11,30
Coffee break</td><td>11,00 - 11,30
Coffee break</td></tr>
<tr><td>11,00 – 13,00
Session 1
Virtual Reality</td><td>11,00 – 13,00
Session 2
Human-Computer Interaction</td><td rowspan="2">11,30 – 13,15
Session 6
VR/AR in Medicine</td><td>11,30 – 12,00
Session 9
VR/AR in Industry</td></tr>
<tr><td></td><td colspan="2">13,00 – 14,30
Lunch</td><td>13,15 – 14,45
Lunch</td><td>12,00 – 13,00
Poster Session 1</td></tr>
<tr><td rowspan="3">15,00 – 17,00
Tutorial</td><td rowspan="2">14,30 – 15,30
Session 3
Virtual Reality</td><td rowspan="2">14,30 – 15,30
Session 4
Augmented and Mixed Reality</td><td>14,45 – 15,45
Keynote Speaker:
Roberto Pierdicca</td><td>14,30 – 15,30
Session 10
Computer Graphics</td></tr>
<tr><td rowspan="2">15,45 – 17,00
Session 7
VR/AR in Cultural Heritage</td><td>15,30 – 16,45
Poster Session 2</td></tr>
<tr><td colspan="2">15,30 – 17,00
Company space</td><td>16,45 – 17,00
Closing Ceremony</td></tr>
<tr><td rowspan="2"></td><td colspan="2"></td><td></td><td rowspan="2"></td></tr>
<tr><td colspan="2">18,00 – 20,00
Social event:
Guided tour of Otranto</td><td>18,30 – 23,00
Social event:
Gala dinner</td></tr>
</table>

Scientific Programme

Sunday 24th June
11,00 – 17,00 ***Registration***
15,00 – 17,00 **Tutorial** *Spatial Augmented Reality: a Way to Increase Content in Cultural Heritage Context* **DONATO MANIELLO,** *Studio Glowarp, Italy*

Monday 25th June	
9,00 – 9,30 ***Opening Ceremony***	
9,30 – 10,30 ***Keynote Speaker*** ***Arcadio Reyes-Lecuona****, Universidad de Malaga, Spain* ***3D Audio for VR Applications: Fundamentals and Practicalities***	
10,30 – 11,00 *Coffee break*	
11,00 – 13,00 **Session 1 - Virtual Reality** *Chair: Arcadio Reyes-Lecuona*	
Marta Mondellini, Sara Arlati, Luca Greci, Giancarlo Ferrigno, Marco Sacco	Sense of Presence and Cybersickness while Cycling in Virtual Environments: their Contribution to Subjective Experience
Matteo Palieri, Cataldo Guaragnella, Giovanni Attolico	Omero 2.0
Christian Hirt, Markus Zank, Andreas Kunz	Geometry Extraction for ad Hoc Redirected Walking Using a SLAM Device
Abassin Sourou Fangbemi, Yanxiang Zhang	Wrist-Worn Sensor-Based Tangible Interface for Virtual Percussion Instruments
Danny F. Herrera, Bolivar Acosta S., Washington X. Quevedo, Jhon A. Balseca, Victor H. Andaluz	Training for Bus Bodywork in Virtual Reality Environments
Washington X. Quevedo, Olga J. Benavides, Verónica A. Rocha, Cristian M. Gallardo, Aldrin Acosta, Julio C. Tapia, Víctor H. Andaluz	Market Study of Durable Consumer Products in Multi-User Virtual Environments
Sylvia Rothe, Heinrich Hußmann	Guiding the Viewer in Cinematic Virtual Reality by Diegetic Cues
Marco Pilatásig, Emily Tobar, Lissette Paredes, Franklin Silva, Andrés Acurio, Edwin Pruna, Ivón Escobar, Zulia Sanchez	Virtual System for Teaching-Learning of Initial Education Using a Haptic Device

11,00 – 13,00 **Session 2 - Human-Computer Interaction** *Chair: Jakub Flotyński*	
Jakub Flotyński, Adrian Nowak, Krzysztof Walczak	Explorable Representation of Interaction in VR/AR Environments
Carlo Luongo, Paolo Leoncini	An UE4 Plugin to Develop CVE Applications Leveraging Participant's Full Body Tracking Data
Nicola Capece, Ugo Erra, Giuseppe Romaniello	A Low-Cost Full Body Tracking System in Virtual Reality Based on Microsoft Kinect
Spyros Vosinakis	Mid-Air Interaction vs Smartphone Control for First-Person Navigation on Large Displays: a Comparative Study
Mirko Pani, Fabio Poiesi	Distributed Data Exchange with Leap Motion
Vlasios Kasapakis, Elena Dzardanova, Charalabos Paschalidis	Conceptual and Technical Aspects of Full-Body Motion Support in Virtual and Mixed Reality
Edwin Pruna, Gabriel Corrales, Catherine Gálvez, Ivón Escobar, Luis Mena	Proposal for Muscle Rehabilitation of Lower Limbs Using an Interactive Virtual System Controlled Through Gestures
Christian Mai, Christian Valenta, Heinrich Hußmann	Defining Size Parameters for Touch Interaction in Substitutional Reality Environments
14,30 – 15,30 **Session 3 - Virtual Reality** *Chair: Ahmet Kose*	
Ahmet Kose, Aleksei Tepljakov, Eduard Petlenkov	Towards Assisting Interactive Reality for Education. Interactive Reality, Data Analysis and Industry
Sara Arlati, Daniele Spoladore, Davide Baldassini, Marco Sacco, Luca Greci	VirtualCruiseTour: an AR/VR Application to Promote Shore Excursions on Cruise Ships
Mihalache Ghinea, Dinu Frunza, Jean-Rémy Chardonnet, Frédéric Merienne, Andras Kemeny	Perception of Absolute Distances within Different Visualization Systems: HMD and CAVE
Fabrizio Bazzurri, Massimo A. Picardello	Optimization Techniques for Photogrammetry Applied to Cultural Heritage and the Action of Transformation Groups
14,30 – 15,30 **Session 4 - Augmented and Mixed Reality** *Chair: Patrick Bourdot*	
Dariusz Rumiński, Mikołaj Maik, Krzysztof Walczak	Mixed Reality Stock Trading Visualization System
Pedro Girão, João Paulo, Luís Garrote, Paulo Peixoto	Real-Time Multi-View Grid Map-based Spatial Representation For Mixed Reality Applications

Donato Maniello	Improvements and Implementations of the Spatial Augmented Reality Applied on Scale Models of Cultural Goods for Visual and Communicative Purpose
Jorge Ierache, Nahuel Adiel Mangiarua, Martín Ezequiel Becerra, Santiago Igarza	Framework for the Development of Augmented Reality Applications Applied to Education Games
15,30 – 17,00 ***Company Space***	

Tuesday 26th June

9,00 – 10,00
Keynote Speaker
Marcello Carrozzino, *Scuola Superiore Sant'Anna, Italy*
Opportunities of the use of Embodied Agents in Virtual Reality for Cultural Heritage

10,00 – 11,00
Session 5 – Applications of AR/VR in Medicine
Chair: Vincenzo Ferrari

Rok Oblak, Ciril Bohak, Matija Marolt	Web-Based Vascular Flow Simulation Visualization with Lossy Data Compression for Fast Transmission
Victoria M. López, Pablo A. Zambrano, Marco Pilatasig, Franklin M. Silva. M.	Interactive System Using Myoelectric Muscle Sensors for the Strengthening Upper Limbs in Children
Edwin Pruna, Jenny Tigse, Alexandra Chuquitarco, Ivón Escobar, Marco Pilatásig, Eddie Daniel Galarza	Immersive Virtual System Based on Games for Children's Fine Motor Rehabilitation
Maria Sisto, Mohsen Zare, Nabil Ouerhani, Christophe Bolinhas, Margaux Divernois, Bernard Mignot, Jean-Claude Sagot, Stéphane Gobron	Virtual Reality Serious Game for Musculoskeletal Disorder Prevention
11,00 – 11,30 *Coffee break*	

11,30 – 13,15
Session 6 – Applications of AR/VR in Medicine
Chair: Marcello Carrozzino

Manuel A. León, Paul A. Romero, Washington X. Quevedo, Oscar Arteaga, Cochise Terán, Marco E. Benalcázar, Víctor H. Andaluz	Virtual Rehabilitation System for Fine Motor Skills Using a Functional Hand Orthosis
Marina Carbone, Sara Condino, Fabrizio Cutolo, Rosanna Viglialoro, Oliver Kaschke, Ulrich W. Thomale, Vincenzo Ferrari	Proof of Concept: Wearable Augmented Reality Video See-Through Display for Neuro-Endoscopy
Patricio D. Cartagena, Jose E. Naranjo, Carlos A. Garcia, Carmen Beltran, Maritza Castro, Marcelo V. Garcia	Virtual Reality-Based System for Hand Rehabilitation Using an Exoskeletal Orthosis

Ivón Escobar, Catherine Gálvez, Gabriel Corrales, Edwin Pruna, Marco Pilatásig, Javier Montaluisa	Virtual System Using Haptic Device for Real-Time Tele-Rehabilitation of Upper Limbs
Giuseppe Turini, Sara Condino, Paolo Domenico Parchi, Rosanna Maria Viglialoro, Nicola Piolanti, Marco Gesi, Mauro Ferrari, Vincenzo Ferrari	A Microsoft HoloLens Mixed Reality Surgical Simulator for Patient-Specific Hip Arthroplasty Training
Mauricio Tamayo, Pablo J. Salazar, Carlos Bustamante D., Marcelo Silva S., Miguel Escudero V., Victor H. Andaluz	Virtual Rehabilitation of Carpal Tunnel Syndrome through Force Feedback
César A. Naranjo, Paola M. Velasco, Washington X. Quevedo, Grace R. Naranjo, David Rivas-Lalaleo, Franklin M. Silva, Víctor H. Andaluz	Virtual Reality System for Assistance in Treating Respiratory Disorders
15,45 - 15,45 **Keynote Speaker** **Roberto Pierdicca,** *Università Politecnica della Marche, Italy* *Sensing Cultural Heritage: User-Centered Approaches towards Senseable Spaces*	
15,45 - 17,00 **Session 7– Applications of AR/VR in Cultural Heritage** *Chair: Roberto Pierdicca*	
Marcello Carrozzino, Marianna Colombo, Franco Tecchia, Chiara Evangelista, Massimo Bergamasco	Comparing Different Storytelling Approaches for Virtual Guides in Digital Immersive Museums
Chen Qiang, Zhenyu Ouyang, Chaoying Luo, Jielong Liu	Digital-Assisted Repairing of the Six Steeds in Zhao Mausoleum
Sebastián Mirasol-Menacho, Ana Planells-Pérez, Jaume Segura Garcia, Santiago Felici-Castell, Máximo Cobos-Serrano, Rosa Cibrián, Alicia Giménez-Pérez, Joan Oleza-Simó	Virtual Acoustic Renderization in Old Spaces: Application to an Early-Modern Theatre in València, "L'Olivera"
Andrea Schönhofer, Sabine Hubner, Perihan Rashed, Wolfgang Aigner, Peter Judmaier, Markus Seidl	ViennAR: User-Centered-Design of a Bring Your Own Device Mobile Application with Augmented Reality
Ramy Hammady, Minhua Ma, Anna Powell	User Experience of Markerless Augmented Reality Applications in Cultural Heritage Museums: 'MuseumEye' as a Case study

Wednesday 27th June	
9,00 – 10,00 **Keynote Speaker** **Marco Sacco**, *ITIA-CNR, Italy* ***Augmented & Virtual Reality Enabler for the "Factory 4.0"***	
10,00 – 11,00 **Session 8 – AR/VR in Industry** *Chair: Marco Sacco*	
Emanuele Frontoni, Jelena Loncarski, Roberto Pierdicca, Michele Bernardini, Michele Sasso	CybPhysical Syster ems for Industry 4.0: Towards Real Time Virtual Reality in Smart Manufacturing
Francesco De Pace, Federico Manuri, Andrea Sanna, Davide Zappia	An Augmented Interface to Display Industrial Robot Faults
Claudio Pascarelli, Mariangela Lazoi, Gabriele Papadia, Valerio Galli, Luigi Piarulli	CAD-VR Integration as a Tool for Industrial Assembly Processes Validation: a Practical Application
Mauricio Rosero, Rai Pogo, Edwin Pruna, Víctor H. Andaluz, Ivón Escobar	Immersive Environment for Training on Industrial Emergencies
11,00 – 11,30 *Coffee break*	
11,30 – 12,00 **Session 9 – AR/VR in Industry** *Chair: Giovanni D'Errico*	
José E. Naranjo, Paulina Ayala, Santiago Altamirano, Geovanni Brito, Marcelo V. Garcia	Intelligent Oil Field Approach Using Virtual Reality and Mobile Anthropomorphic Robots
Fernando A. Chicaiza, Cristian G. Gallardo, Christian P. Carvajal, Washington X. Quevedo, Jaime Santana, Vicente Morales, Víctor H. Andaluz	Real–Time Virtual Reality Visualizer for Unmanned Aerial Vehicles
12,00 – 13,00 **Poster Session 1**	
Aldrin G. Acosta, Víctor H. Andaluz, Jessica S. Ortiz, Franklin M. Silva, Julio C. Tapia, Christian P. Carvajal, Washington X. Quevedo	e-TOURISM: Governmental Planning and Management Mechanism
Antonella Maselli, Benedetta Cesqui, Paolo Tommasino, Aishwar Dhawan, Francesco Lacquaniti, Andrea d'Avella	Catching Virtual Throws: an Immersive Virtual Reality Setup to Evaluate Human Predictive Skills
Edwin Pruna, Mauricio Rosero, Rai Pogo, Ivón Escobar, Julio Acosta	Virtual Reality as a Tool for the Cascade Control Learning

Fernando A. Chicaiza, Luis Lema-Cerda, Marcelo Álvarez V., Víctor H. Andaluz, José Varela-Aldás, Guillermo Palacios-Navarro, Iván García-Magariño	Virtual Reality-Based Memory Assistant for the Elderly
Jorge S. Sánchez, Jessica S. Ortiz, Paola M. Velasco, Washington X. Quevedo, Cesar A. Naranjo, Paulina X. Ayala, Carlos X. Gordon, Víctor H. Andaluz	Virtual Environments to Stimulate Skills in the Early Childhood Education Stage
Yanxiang Zhang, Ziqiang Zhu	Live Mixed Reality Video Production for Educational Presentation
Yanxiang Zhang, Weiwei Zhang	A Study on Narrative Design of Augmented Reality Publications
Yevgeniya Daineko, Madina Ipalakova, Dana Tsoy, Akmedi Shaipiten, Zhiger Bolatov, Tolganay Chinibayeva	Development of Practical Tasks in Physics with Elements of Augmented Reality for Secondary Educational Institutions
Juan Garzón, Juan Acevedo, Juan Pavón, Silvia Baldiris	ARtour: Augmented Reality-Based Game to Promote Agritourism
Vlasios Kasapakis, Damianos Gavalas, Elena Dzardanova	Robust Outdoors Marker-Based Augmented Reality Applications: Mitigating the Effect of Lighting Sensitivity
Primož Lavrič, Ciril Bohak, Matija Marolt	Vulkan Abstraction Layer for Large Data Remote Rendering System
Alex Guamán, Marcelo Álvarez V., Jorge S. Sánchez , Víctor H. Andaluz	SLT-Game: Support System for Therapies of Children with Communication Disorders
Washington X. Quevedo, Paulina F. Venegas, Viviana B. López, Cristian M. Gallardo, Aldrin G. Acosta, Julio C. Tapia, Víctor H. Andaluz	Sales Maximization Based on Neuro-Marketing Techniques in Virtual Environments
Francesco Carrino, Omar Abou Khaled, Elena Mugellini	IMPACT - Immersive Mirror for Pain Control and Treatment
Edgar F. Borja, Daniel A. Lara, Washington X. Quevedo, Víctor H. Andaluz	Haptic Stimulation Glove for Fine Motor Rehabilitation in Virtual Reality Environments
Sergio Teodoro Vite, César Domínguez Velasco, Aldo Francisco Hernàndez Valencia, Juan Salvador Pérez Lomeli, Miguel Ángel Padilla Castañeda	Virtual Simulation of Brain Sylvian Fissure Exploration and Aneurysm Clipping with Haptic Feedback for Neurosurgical Training
Edwin Pruna, Ivón Escobar, Andrés Acurio, Henry Cocha, José Bucheli, Luis MenaJ	Augmented Reality System for the Complement of Cognitive Therapeutic Exercise in Children: Preliminary Tests
Doriana Cisternino, Carola Gatto, Lucio T. De Paolis	Augmented Reality for the Enhancement of Apulian Archaeological Areas
Saverio Iacono, Daniele Zolezzi, Gianni Vercelli	Virtual Reality Arcade Game in Game-Based Learning for Cultural Heritage
Lucio T. De Paolis, Valerio De Luca, Giovanni D'Errico	Augmented Reality to Understand the Leonardo's Machines
Francesco Settembrini, M. G. Angelini, D. Costantino	Virtual Museum, the Exploration of Cultural Heritage with Virtual Reality Techniques

14,30 – 15,30 **Session 10 – Computer Graphics** ***Chair: Fabrizio Nunnari***	
Fabrizio Nunnari, Alexis Heloir	Write-Once, Transpile-Everywhere: Re-Using Motion Controllers of Virtual Humans across Multiple Game Engines
Bruno Ježek, David Horáček, Jan Vaněk, Antonín Slabý	Non-photorealistic Rendering and Sketching Supported by GPU
Santi P. Badathala, Nicoletta Adamo, Nicholas J. Villani, Hazar N. Dib	The Effect of Gait Parameters on the Perception of Animated Agents' Personality
Jan Vaněk, Jan Tobola, Karel Petránek, Bruno Ježek, Miloslava Černá	Trivial Algorithm for Interactive Water Simulation
15,30 – 16,30 **Poster Session 2**	
Víctor H. Andaluz, Jorge S. Sánchez, Carlos R. Sanchez, Washington X. Quevedo Josè Varela, Josè L. Morales, Giovanny Cuzco	Multi-User Industrial Training and Education Environment
Cristian G. Gallardo, Sandy P. Rodríguez, Irma E. Chango, Washington X. Quevedo, Aldrin Acosta, Julio C. Tapia, Víctor H. Andaluz	Augmented Reality as a New Marketing Strategy
Mohammad Fadly Syahputra, Muhammad Iqbal Rizki Siregar, Romi Fadillah Rahmat	Realistic Shadow Augmented Reality of Rare Animals from Indonesia
Wilbert G. Aguilar, Fabricio Amaguaña, Jonathan Tituaña, Brayan Collaguazo	Simulation System Based on Augmented Reality for Optimization of Training Tactics on Military Operations
Christian P. Carvajal, María G. Méndez, Diana C. Torres, Cochise Terán, Oscar B. Arteaga, Víctor H. Andaluz	Autonomous and Tele-Operated Navigation of Aerial Manipulator Robots in Digitalized Virtual Environments
Jessica S. Ortiz, Jorge S. Sánchez, Paola M. Velasco, Washington X. Quevedo, Christian P. Carvajal, Vicente Morales, Paulina Ayala, Víctor H. Andaluz	Virtual Training for Industrial Automation Processes Through Pneumatic Controls
José F. Manosalvas, Joan A. Guillén, Wilbert G. Aguilar, Bryan Collaguazo	Robust Motion Estimation based on Multiple Monocular Camera for Indoor Autonomous Navigation of Micro Aerial Vehicle
Juan Galarza, Esteban Pérez, Esteban Serrano, Andrés Tapia, Wilbert G. Aguilar	Pose Estimation based on Monocular Visual Odometry and Lane Detection for Intelligent Vehicles

Mohammad Fadly Syah Putra, Siti Fatimah, Romi Fadillah Rahmat	Interaction on Augmented Reality with Finger Detection and Hand Movement Recognition
Córdova C. Andrea, Jiménez Q. Byron , Pardo I. Jorge , Toalombo CH. Inti , Wilbert G. Aguilar	Geolocation and Counting of People with Aerial Thermal Imaging for Rescue Purposes
Anh Nguyen, Marc Inhelder, Andreas Kunz	Discrete Rotation during Eye-Blink
Yanxiang Zhang, ZhongBei Wang	Towards Visual Comfort: Disciplines on the Scene Structure Design for VR Contents
Edoardo Bellanti, Alice Corsi, Andrea De Sotgiu, Gianni Vercelli	“Changes”: an Immersive Spatial Audio Project Based on Low-Cost Open Tools
Viktors Gopejenko, Aleksejs Gopejenko	Using Applications and Tools to Visualize ab Initio Calculations Performed in VASP
Bruno Carpentieri, Francesco Palmieri, Raffaele Pizzolante	Secure Lossy Image Compression via Adaptive Vector Quantization
Joakim Vindenes, Angelica Ortiz de Gortari, Barbara Wasson	Mnemosyne: Adapting the Method of Loci to Immersive Virtual Reality
Ciril Bohak, Byeong Hak Kim, Min Young Kim	Web-based Real-time LADAR Data Visualization with Multi-user Collaboration Support
YanXiang Zhang, Pengfei Ma	Design of a Kind of Optimized Time-lapse Macro VR Movie Recording System
Abassin Sourou Fangbemi, Bin Liu, Neng Hai Yu, Yanxiang Zhang	Efficient Human Action Recognition Interface for Augmented and Virtual Reality Applications Based on Binary Descriptor
Edwin Pruna, Andrés Acurio, Ivón Escobar, Henry Cocha, Silvia Alpúsig, José Bucheli	Virtual Training System for Crawling Skill in Infants Using Mapping 2D: Preliminary Test
Bryan Cobeña, Vinicio S. Salcedo, Guillermo Rodriguez, Wilbert G. Aguilar	SVM and RGB-D Sensor Based Gesture Recognition for UAV Control
15,45 – 16,00 ***Closing Ceremony***	

Tutorial

DONATO MANIELLO – Studio Glowarp, Italy

Spatial Augmented Reality: a way to increase content in cultural heritage context

The technique called Spatial Augmented Reality – better known as video mapping – is constantly growing. Several fields of application have tested the potential and particularity of use. This contribution aims to discuss the well-known potential of this medium in the urban redevelopment through forms of "augmented architecture" and enhancement in the museum in the case of "augmented archeology" and to expose some of the techniques used to map generic surfaces in relation to their complexity and size. This allows the construction of a workflow that transforms this raw data into useful contents to enhance the asset itself through multimedia installation and digital storytelling, taking care not to replace the asset itself. In this way the user is not placed in front of the object in a detached manner, but is catapulted and projected into it, as if he were in a parallel reality. In this case video mapping becomes a medium through which the museum experience is integrated and completed, without going beyond the real world but simply making discernment easier and emphatic.

Keynote Speakers

MARCO SACCO – ITIA-CNR, Italy

Augmented & Virtual Reality Enabler for the "Factory 4.0"

Manufacturing sector transformation (the so call Factory 4.0) requires the introduction of advanced tools for both the knowledge representation and simulation. For over 10 years, Virtual Reality and Augmented Reality have generated benefits in several sectors thanks to the potentialities offered by these visualisation technologies able to provide an added value to the contents and data enrichment.
Manufacturing companies, thanks to the reduction of cost and a widespread of devices, could now take advantage integrating AR/VR to simulation and emerging AI. The result is a Virtual Factory, a full digital twin of the real plant, that could be used for several purposes, from design to monitoring and logistics, from reconfiguration to training. Some industrial applications will be presented.

MARCELLO CARROZZINO – Scuola Superiore Sant'Anna, Italy

Opportunities of the use of Embodied Agents in Virtual Reality for Cultural Heritage

Virtual Reality is becoming an increasingly important tool for the research, the communication and the popularization of cultural heritage. However most of the available 3D interactive reconstructions of artefacts, monuments and sites often miss an important factor: human presence. Thanks to the advancements in the technology, in latest years Virtual Humans have started being used in a variety of cultural-related VR applications. From simple 2D characters to complex 3D avatars, technology continues to evolve and so is the adoption of virtual assistants in digital heritage. The acceptance of such tools deserves a greater attention from the scientific community.
This talk will explore the state-of-the-art on this subject, underlining the technological challenges and also analysing the effects of avatar interaction on user engagement, sense of immersion and learning effectiveness.

ARCADIO REYES-LECUONA – Universidad de Malaga, Spain

3D Audio for VR Applications: Fundamentals and Practicalities

Immersive Virtual Reality has been experimenting a constant development and has become more and more popular in the last times. This development has been mainly focused in the visual modality. However, auditory stimuli can also be very powerful in creating immersive perceptions. In this context, three-dimensional localization of sound sources plays an important role in these systems.

3D audio techniques allow to produce the perception in the listener that a sound source is virtually located anywhere in the 3D space, including behind or above the listener. They are not new, but, with the advancements in computational power, it is now possible to perform the required processing in real time using affordable equipment. Therefore, the interest for 3D sound has been increasing. Additionally, sound is modified by the environment and this is especially relevant when simulating spatial sound. The perception of sound includes a combination of the original sound emitted by the source, modifications due to the environment and modifications produced by the listener's head. All those modifications can be characterized and applied in a simulation in order to virtually locate a source in a specific place within a given environment.

In this talk, the fundamentals of several techniques of 3D audio will be presented, with special attention to those more suitable for affordable Virtual Reality systems. More specifically, the potential of binaural audio and virtual Ambisonics will be presented. In addition to this, the role of the environment and how it can be considered will also be discussed. Finally, using 3D audio in a Virtual Reality system requires to know some basic concepts of real time audio, which will be addressed as well. Moreover, the main decisions and trade-off to be taken when implementing a 3D sound renderer will be discussed, presenting the practical implications of each of them.

ROBERTO PIERDICCA – Università Politecnica della Marche, Italy

Sensing Cultural Heritage: User-Centered Approaches towards Senseable Spaces

Cultural Heritage domain (both tangible and intangible) has witnessed, in the last decade, to a tremendous improvement on the way in which the users can be in contact with cultural goods. The reasons are many, but one can summarize all of them: ICT are everywhere, pervasive like never in the past, and at the same time more and more cheaper and available in the market. Following this wave, 3D reconstructions, new advanced interfaces, wireless connections and interactions are becoming the backbone for AR/VR experiences, which can be definitively defined as the mainstream for communicating and valorising the priceless values of cultural goods in a more efficient way. State of art solutions for the development of such experiences are mature enough to allow an effective storytelling and are designed to be exploited by heterogeneous users.

However, several limitations still prevent the adoption of a real and efficient digital agenda for the management of Cultural Heritage. One of them, and probably the most urgent, is that digital experiences are developed by experts or insiders, without taking into account the real needs of the users. There is thus the necessity of adopting strategies to understand the users' behaviours by analysing and studying their habits, preferences and knowledge. Nowadays this process is made possible by the increasing miniaturization of new technologies, which allows to provide contextual information to the users and, at the same time, to infer information from the digital footprints they leave (the so-called Users' Generated Data).

The talk, besides providing a complete overview of the latest achievements in the field of DCH, will provide prospective visions about a new paradigm of spaces (both indoor and outdoor) where a bidirectional exchange of information from the space to the user and vice versa is possible. These Spaces can be defined *Senseable Spaces*, which can be both indoor and outdoor scenario where the service to the users are designed following their behaviours and need, in a seamless way. To show the feasibility of such approach, some research projects (developed by a multi-disciplinary group) will be broadly discussed.

Social Events

Guided tour of Otranto

Monday 25th June

18,00 - 20,00

Gala dinner with Pizzica dance show

Masseria Le Stanzie - Supersano (Lecce)

(event included in the full registration fee)

Tuesday 26th June

18,00 - 23,00

Accompanying persons and students are welcome; the cost of the gala dinner is € 50

Pizzica is a popular Italian folk dance, originally from the Salento peninsula and later spreading throughout all the Puglia and Calabria regions and eastern Basilicata. The traditional Pizzica is danced while embracing a partner.