

Highlights

iTEAM's Soundcool system for education using mobile devices, gets boost with two grants from European Erasmus+ and Generalitat Valenciana



Soundcool is a collaborative system for sound and music creation using mobile phones, tablets, Kinect and MAX / MSP / Jitter. Soundcool is being developed at iTEAM under the direction of Dr. Jorge Sastre. Recently, two grants were awarded, one by Generalitat Valenciana to continue its development and the other grant by the Erasmus+ European programme for the introduction of Soundcool into educational centers across Europe.

The European project Erasmus+ KA201 entitled "Technology to support learning and creativity: building European networks through collaborative music creation", 2015-2017, is led by Dr. Elizabeth Carras-cosa (Universitat de València), who is also a member of the Generalitat Valenciana project. The Erasmus+ project represents a key milestone for the international promotion of Soundcool, since the system is currently used in different European countries.

The partners of the project are seven cultural and educational institutions from Spain, Portugal, Italy and Romania. The ultimate goal is to develop the basic and transversal competencies of approximately 3000 students with ages between 6 and 16, who live in deprived environments, by means of collaborative music creation using Soundcool. Recently, the first transnational meeting took place in Valencia, and the partners had the opportunity to attend different training sessions. The focus was on the technical and pedagogic sides of Soundcool that will allow them to use the tool at their institutions. These sessions helped to identify pedagogical and technical needs that will be taken into account to improve the Soundcool system.

The technical improvements will be carried out within the framework of the Generalitat Valenciana project, led by Dr. Sastre. One of the main efforts is focused on the development of a number of apps for mobile devices. These applications will substitute the third-party non-free tools that Soundcool currently uses. By creating their own apps, Sastre's team will be able to offer the entire system free of any cost. Moreover, another line of developments are focused on technologies for disabled people.

The multidisciplinary team behind Soundcool combines artistic, technical, scientific and pedagogical backgrounds by bringing together members from the following institutions at the Universitat Politècnica de València: the Institute of Telecommunications and Multimedia Applications, the Department of Audio-visual Communication, Documentation and History of Art, the Master of Music, the Diploma of Electronic Music and Video Creation and the Department of Electronic Engineering, and also the Department of Didactics of Musical, Plastic and Corporal Expression from the Universitat de València. The team counts also on the external collaboration of Carnegie Mellon University (Pittsburgh, USA) through Prof. Roger Dannenberg, co-creator of Audacity, who is visiting the UPV to give a seminar, a workshop, and a concert in March 8-11, 2016 (More info: <http://musicaelectronica.blogs.upv.es>).

Dr. Jaime Serquera. Soundcool researcher
Dr. Jorge Sastre. Director Soundcool project
Institute of Telecommunications and Multimedia Applications. Universitat Politècnica de València.



MCG-iTEAM organized PIMRC 2016

The Mobile Communications Group of the iTEAM organized the 27th Annual IEEE International Symposium on personal, indoor and mobile radio communications (PIMRC 2016). More than 600 people attended to the event, being the 33% from Asia, 40% from Europe and the rest from other parts of the world. The central topic of the congress was the development of 5G technology and the evolution of mobile communications towards the internet of things, vehicle to vehicle communications and the development of new medical devices based on mobile technologies.

In addition to scientific presentations, plenary sessions were held with keynote speakers like the leader of 5G wireless system research in Huawei, Peiying Zhu; the leader of 5G

product marketing team at National Instruments, Erik Luther; the head of Strategy in Group Technology at Vodafone UK, Mabel Pous; the director of the Responsive Environments group at MIT Media Laboratory, Joseph Paradiso; the director of the UWICORE laboratory and professor at Universidad Miguel Hernández de Elche, Javier Gozávez; and the leader of academic urology at Guy's Hospital, King's College London, Prokar Dasgupta.

The program also included an exhibition area where the main international companies in the mobile communications industry, as National Instruments, Samsung, Huawei, Vodafone, Aire networks and Rhode&Schwarz, together with the publishers Springer and River and the project mmMagic participated.

iTEAM-UPV awarded at the IBC'2016 for its research on a new concept for DTT

Researchers from the Universitat Politècnica de València, Teracom (Sweden) and Panasonic (Germany) have designed a new system concept whose application would change the traditional way of transmitting and receiving Digital Terrestrial Television (DTT). It is presented as WiB –Wideband Reuse 1. Due to this work, the researchers have won the Best Conference Paper award at the International Broadcasting Convention (IBC 2016), held in Amsterdam.

WiB would enable the transmission of the DTT as a larger wideband signal in which, potentially, all transmitters in a network would use all the available frequencies in the UHF band. This way, a more efficient use of spectrum would be achieved as well as an important decrease in energy consumption and network operation costs. From the point of view of the users, WiB would increase the capacity for more TV services, even with enhanced quality (e.g. UHDTV or 4K), as well as high-speed vehicular reception. In addition, WiB would enable a future scenario in which broadcasters and mobile network operators use the UHF spectrum in a win-win approach.

Among the advantages are the possibility of substantially reducing operation and infrastructure costs due to a



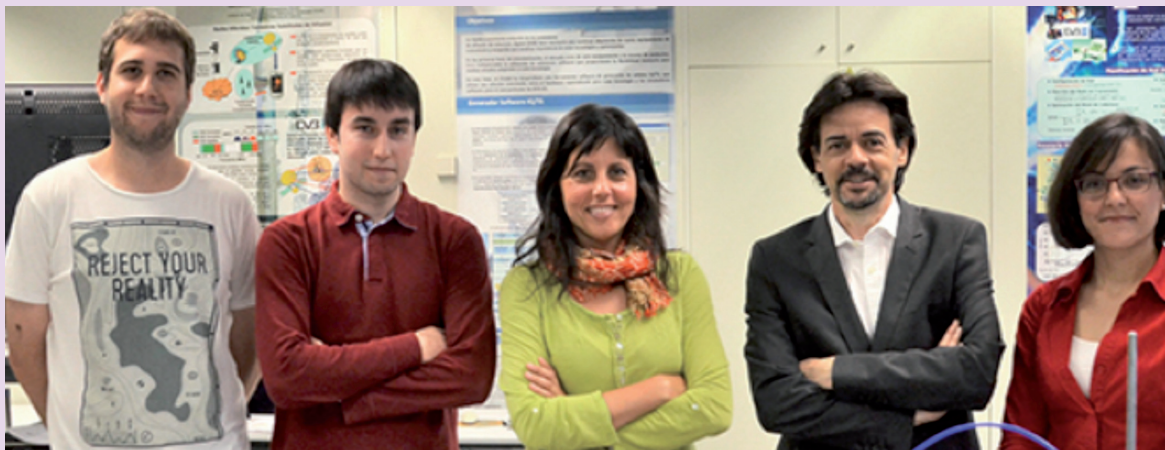
power reduction around 90% at the transmitters, what would also simplify broadcast equipment. This power reduction is also translated into saving in electricity bills and an increase in energy efficiency.



1st Workshop of ARCO5G collocated with PIMRC2016. 8th September 2016

The first workshop of ARCO5G Excellence Network took place in Valencia last 8th September 2016. This workshop was collocated with the 27th Annual IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC2016). During the workshop, ARCO5G partners presented their latest advances related with 5G communications networks. The session was opened by Prof. Narcis Cardona who explained the status of the project. After this introduction, the partners showed the latest results of their research lines.

New phantoms to explore the human body



Researchers at the Universitat Politècnica de València have developed new synthetic models (phantoms) that simulate the electromagnetic properties of several human tissues and organs, such as complex relative permittivity, dielectric constant, loss factor and conductivity. These models may be of interest for developing new technologies for medical screening, and in general, for testing 5G mobile communication devices. The researchers also devised the methodology to create the phantoms.

Recently, there has been a growing interest in the use of new telecommunication devices that facilitate clinical diagnosis when implanted in the organism. These units can be integrated inside capsules and taken orally. This is the case for sensors and medical monitoring systems that register biological information inside the body and later transmit it outside.

According to UPV researchers, these devices wirelessly communicate sending electromagnetic waves through the body, which acts as a transmission medium. In order to develop and test them before they are marketed, it is necessary to perform tests on animals and humans.

In fact, the models and methodology developed by the researchers and patented by the Universitat Politècnica de València will reduce testing on animals and humans. They will help to assess the transmission of electromagnetic waves in UWB (ultra-wide band) frequency, which is between 3.1 and 10.6 GHz; and will take part on future personal area networks, as well as other networks of narrower bands, such as ISM networks.

The phantom is a liquid mixture or a crosslinked polymer (hydrogel) that can be formed according to the shape and size of interest, in order to simulate a specific organ at an electromagnetic level that is able to hold those liquids or mixtures.

With the new methodology developed by the researchers, organs such as the liver, heart, pancreas, colon and cartilage can be simulated "on demand" from an electromagnetic point of view. For some of them, there are no phantoms on the market today, nor proposals for any in the future, not even for a specific frequency.

Researchers at the UPV involved in the publication of the international reference on the present and future of 5G technology



Researchers from the Universitat Politècnica de València have participated in the publication of 5G mobile and Wireless communications Technology the most comprehensive publication to date at international level on the present and future of 5G technology. Editors are Afif Osseiran, Ericsson,

Jose Francisco Monserrat, Institute of Telecommunications and Multimedia Applications UPV, and Patrick Marsch, Nokia.

The book, published by Cambridge University Press, is an indispensable tool for researchers and professionals related with mobile and wireless communications. It is written by leading experts worldwide on 5G; in total, 63 authors have participated, mainly from major international companies in the ICT sector, most of them in the METIS European project. From UPV, together with Jose Francisco Monserrat, also participates the iTEAM researcher David Martin-Sacristán.

In its 400 pages, the authors explain in detail the current state

of research, applications and future opportunities that the 5G provides, a technology that will bring the greatest revolution in the world of ICT for the last 15 years and that will intrinsically change the current paradigm in our communications.

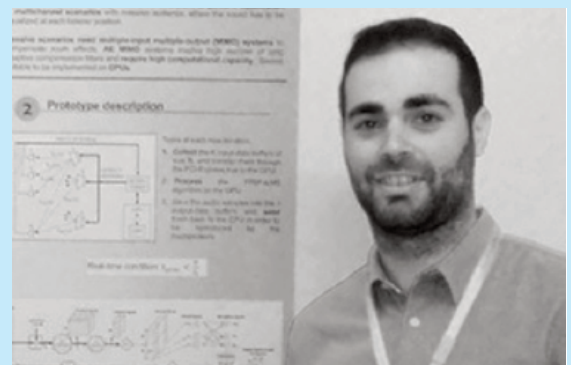
As pointed out by the researchers of the UPV, this book is intended as a guide and compendium of those technological advances that may constitute the foundations of the future standard for the implementation of the 5G.

Among other issues, the book discusses the technologies and key components of the 5G, as well as the latest developments and projects in communications over millimetric bands, radio access technologies, spectrum management, network wireless coding, and possible 5G system architectures, among others. In addition, it is important to stress the importance of 5G for the future of different sectors such as automotive, construction or energy, among others. This technology will not only affect communication between people, but also the wireless and on the move communication among machines enabling the exchange of information directly between devices without connecting to the cellular system.

Jorge Lorente, PhD from the Universitat Politècnica de València (UPV), has been granted the Ribera Young Researchers Award 2016 at the eleventh edition of Ciutat d'Algemesí Scientific and Technical Award

The 1500 euros prize recognizes the thesis of PhD Lorente, which has been led by Dr. Miguel Ferrer and Prof. Alberto González of the Institute of Telecommunications and Multimedia Applications (iTEAM-UPV).

Dr. Lorente's research proposes efficient algorithms for the massive parallel processing of acoustic signals when implemented on General Purpose Graphics Processing Units (GPGPU). Particularly he has used efficient adaptive algorithms for multichannel Active Noise Control (ANC) applications, which allows to reduce motor noise inside vehicles not only around the driver's ears, but in a wider listening area. These algorithms can also be used to improve the sound quality in teleconferencing applications.



UPV launches the new spin-off EPhoox Technology S.L.

The Universitat Politècnica de València (UPV) has founded a new spin-off, EPhoox Technology S.L. It is a technology based company set up by a group of researchers from the Instituto de Telecomunicaciones y Aplicaciones Multimedia (iTEAM): José Mora, José Capmany and Beatriz Ortega. Telnet Redes Inteligentes S.A., parent company of Grupo Telnet, also participates in the company.

EPhoox is the result of the technology transfer and results that have been generated in Optical Communication Group in the iTEAM as a result of its research activity over 25 years in this field. The knowledge resulting from the experience in cutting-edge research constitutes the main added value provided by the university to this business project.

EPhoox focuses its main activity on the development of solutions for the telecommunications sector. In the short term, the company will also transfer its technology to the

fields of defense and biotechnology. In particular, EPhoox works on the design and manufacture of advanced instrumentation based on Microwave Photonics Technology, the development of protocol monitorization as well as services for network management and maintenance.

Nowadays, the optical instrumentation that is developed is usually associated with a specific manufacturer of electronic instrumentation. The added value of EPhoox resides in developing and commercializing compatible products with any manufacturer and even improving the technical specifications in relation to its competitors. In this way, EPhoox offers advanced solutions which are not only competitive in specifications but also in costs which are related to adaptability. The immediate objective for EPhoox is to develop advanced optical instrumentation for metrology of present and future communication networks.