New Indra-Adecco Foundation Accessible Technologies Chair

THE UNIVERSIDAD CARLOS III DE MADRID WILL DEVELOP A SYSTEM TO PROVIDE ACCESSIBILITY SERVICES THROUGH LIGHT TO PEOPLE WITH DISABILITIES

- **The project aims to develop an innovative communication system based on a visible LED light capable of incorporating an audio description or subtitled information to help to integrate people with disabilities into the workplace**

- **The project is being carried out under the Indra-Adecco Foundation Accessible Technologies Chair at UC3M; the agreement for which was signed today.**

Researchers from the Universidad Carlos III de Madrid (UC3M) are working on an R&D+i project to develop a pioneering communication system through visible light that is able to incorporate audio description and subtitled information for people with disabilities. The ultimate goal is to make it possible to aid learning or performing tasks to help improve the employability and quality of life of these individuals.

The project is part of the Indra-Adecco Foundation Accessible Technologies Chair at UC3M. The agreement of which was signed today by the Rector of the university, Daniel Peña, the Director of Innovation and Partnerships at Indra, José Luis Angoso, and the President of Adecco Foundation, José María Echevarría y Arteche.

Light-Access, Transmission of audiovisual accessibility services through light, is the first project being addressed by researchers from the Department of Electronics Technology and RoboticsLab affiliated with the chair. The aim is to develop a communication system based on visible light from the LEDs (VLC) of the ambient light that is capable of carrying embedded audio information and/or text through which the user can be given instructions. Consequently, the system improves efficiency in the learning period and daily performance of professionals with physical or mental disabilities or learning difficulties and, therefore, enhances their integration into the workplace and quality of life.

This leverages the signal of invisible data associated with photons that the human eye perceives as light by incorporating accessibility services to ambient lighting in buildings. The user can receive the information transmitted by this system through a small optical receiver that collects visible light and decodes the data, information sent from the transmitter, transmitting it through devices such as loudspeakers, headphones, glasses with a built-in viewer, cell phones, tablets and laptops. This system can be incorporated into the workstations of people with

Madrid, December 2, 2014

sensory and/or mental disabilities, whereby these accessibility services are transmitted to them in a customized and discreet manner.

LED lighting has been chosen because of its unique ability to turn on and off millions of times per second. This rate is much higher than what can be detected by the human eye, which senses light as if it were constant even if it has additional information associated with it (voice, images or video). The signals are emitted in the form of binary code and the technology can transmit a signal even when it appears to be turned off.

An example of use of the Light-Access system would be the case of a blind person who, via a small box connected to a headset, may be receiving instructions on how to perform certain work-related tasks through the light signal concealed by his or her desk. It could also provide text information via a mobile device for people with hearing impairments. The benefit of the solution could be extended to other potential users, such as people who have recently started their job or immigrants with language difficulties.

In addition, the system has other potential applications beyond the workplace such as facilitating access to leisure and cultural events by offering, for example, information on museums. It could also be used in airports, railroad stations, hospitals, etc.

Innovative technology with many advantages

The advantages of this type of communication compared to other wireless technologies such as Wi-Fi, Bluetooth or RFID is that the system is safe from the standpoint of the user's health and it is inexpensive as it uses the basic infrastructure of the building's lighting and economical optical and electrical components that are easy to acquire and replace. The system is confined to the area the LED light illuminates, which does not interfere with other wireless communications as mentioned above and does not require prior authorization for installation as it uses part of the free electromagnetic spectrum.

The project is innovative in its design and implementation, but the technology developed will also add value to the lighting infrastructure of public buildings and infrastructures, which has barely been explored so far. This technology can serve as a completely free base infrastructure to build communications networks in *indoor* environments.

Accessible Technologies Research Chair

Light-Access is the first R&D+i project to be carried out by the new Indra-Adecco Foundation Accessible Technologies Chair at UC3M. The Professor of Electronic Technology, José Manuel Sanchez Pena, holds the Chair, who carries out his activities in the university's science park.

The purpose of the chair is to conduct research, development and technology transfer in this area as well as training and dissemination. It is also important to raise awareness in society about the role that new technologies can offer to create appropriate working environments that facilitate access to employment for people with disabilities.

With this included, Indra has now established eleven Research Chairs for Accessible Technologies, as part of its corporate responsibility and commitment to innovation, in

collaboration with the Adecco Foundation and different Spanish universities. Three more chairs have also been created in Latin America. The purpose of these chairs is to research and develop new solutions and services that facilitate access to technology and the social and labor market integration of people with disabilities.

The new chair also reinforces Indra's relationship with the UC3M, which it signed a framework agreement with in 2013 and created a Cybersecurity Chair this year. Both institutions have been collaborating on various R&D+i projects for over ten years. Moreover, Indra maintains close relationships with governing bodies of the UC3M, such as its Social Council.

About Indra

Indra, chaired by Javier Monzón, is the leading consulting and technology multinational in Spain and one of the most prominent in Europe and Latin America. Innovation represents the cornerstone of its business and sustainability. In the last three years it has spent more than €570 million on R&D&i, making it one of the biggest European investors in the industry. With a revenue of approximately €3 billion, 61% of its income is generated by the international market. It employs more than 42,000 staff and has clients in over 138 countries.

About the Universidad Carlos III de Madrid

The Universidad Carlos III de Madrid (UC3M) is a public university that is innovative and committed to the betterment of society through the highest-quality education and cutting-edge research, according to the strictest international guidelines. The UC3M has three Undergraduate Schools, in addition to a School of Graduate Studies, which manages and coordinates the university's master's degree courses, and a Doctorate School. Founded in 1989, it operates over four campuses and has 18,000 students, 18% of which are foreign. Furthermore, it is the first university in Spain and third in Europe in terms of undergraduate students taking part in the Erasmus student exchange programs. In addition, the UC3M is included in the QS ranking of the top 50 universities under 50 years old.