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## **5TONIC laboratory presents, together with SAMUR-PC and the UC3M, a revolutionary system for health emergencies based on 5G**

**The demonstration shows a personalized 5G 100% automatic system that allows to reduce the time of action in case of an emergency, minimizing errors**

**5TONIC, the open research and innovation laboratory on 5G technologies, founded by Telefónica and IMDEA Networks, has presented, together with SAMUR-PC and the Carlos III University of Madrid (UC3M), a new system for situations 5G-based emergency plan, developed under the European innovation project 5G-TRANSFORMER.**

The demo shows a 5G 100% automatic system that allows to reduce the time of action and minimize errors, which implies a higher percentage of survival in emergency situations. The system allows personalized attention to have the patient's medical data such as, among others, the pulse and blood test values. These values are shown in real time to the doctor in 5G augmented reality glasses to facilitate their flow of decisions when attending to the patient. This allows a personalized diagnosis and emergency treatment to be fully customized, since conceptually the system could even have the patient's medical history at that time.

The application of 5G augmented reality assists the medical personnel attending the emergency in three aspects: on the one hand, it shows you how to get to the geographical position where the patient is, from the place where you can reach with emergency vehicles; second, it shows the patient's clinical parameters in real time and at the moment when they are necessary to facilitate medical decisions; and finally, it allows sending a video stream taken in situ at the emergency site to remote medical centers to facilitate assistance from other centers or doctors who can help in the specific case. All this is achieved using intelligence on the edge of the network (also known as 5G Edge computing), one of the technologies that will allow 5G to have the precise characteristics to offer services that require a minimum delay and a great transfer of data, as in this case with the augmented reality.

As for technological elements, the system is composed by the smartwatch mobile device that monitors the patient's constants and connects to a 5G mobile; by a 5G evolved patient monitoring and emergency monitoring center from which the status of patients in whom an alarm has been activated is checked, as well as the status and location of SAMUR-PC emergency equipment and firefighters and from where it is carried out all coordination of the emergency device. Additionally, the ambulances and fire fighters are equipped with technology that allows real-time monitoring of the case and the sanitary professionals to obtain additional valuable information thanks to the augmented reality glasses.

The technology and proof of concept of this 5G-based emergency system has been developed within the European project H2020 5G-TRANSFORMER, coordinated by UC3M, in which Telefonica, SAMUR-PC and Ericsson also participate (together with 14 other institutions of first level). The

technology developed includes very relevant aspects for the advancement of 5G, such as the dynamic orchestration of resources, including the automatic deployment of functions in the "edge" and the multi-domain federation between operators.

"Solutions like this decrease response times. We currently need almost three minutes to handle an emergency call. In the first place, it must be located, codified and prioritized. Then, we select the best resource, mobilize and confirm that it is directed towards the patient. Sometimes, if it is a complicated place of access, additional time is needed to locate it. This technology could save us these three minutes of the process. 23 percent of SAMUR-PC patients who have suffered a cardiorespiratory arrest recover without sequelae. We would like this technology to allow us to increase at least ten percentage points these figures.

5G technology would allow us to have a lot of information before our arrival, such as the patient's location and clinical data. In addition, we could explore other possibilities such as automatic alerts in certain pathologies such as hypoglycemia, hypoxia situations in respiratory patients, loss of consciousness, etc. All this in relation to the possibilities that 5G offers us to monitor a large number of chronic patients such as heart, hypertensive, respiratory or diabetic patients," says Javier Quiroga, Head of the Organization Support Division of SAMUR-PC.

"Testing this type of advanced 5G emergency response systems at 5TONIC is essential to validate and demonstrate the advantages that these systems will provide. In the immediate future in which monitoring and health applications for people in mobile phones and smart watches It is increasingly common and advanced, integration with 5G mobile networks and health care systems, enables automation scenarios and emergency coverage never seen before," explains 5TONIC Vice President Arturo Azcorra, Director of the IMDEA Networks Institute and Professor of the Department of Telematic Engineering of the UC3M.

"5G technology, thanks to its ability to dynamically adapt the network to meet demanding latency and capacity requirements (both in terms of bandwidth and computing), will be able to have a direct impact on society, improving response times to health emergencies. The use of these 5G technologies also makes possible the integration of augmented reality mechanisms, which have a direct and extremely useful application in the case of medicine" affirms the 5G-TRANSFORMER project coordinator, Carlos J. Bernardos, Professor of the Department of Telematic Engineering at UC3M.

**Source(s):** IMDEA Networks Institute

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***Some keywords that define us:** 5G, Big Data, blockchains and distributed ledgers, cloud computing, content-delivery networks, data analytics, energy-efficient networks, fog and edge computing, indoor positioning, Internet of Things (IoT), machine learning, millimeter-wave communication, mobile computing, network economics, network measurements, network security, networked systems, network protocols and algorithms, network virtualization (software defined networks – SDN and network function virtualization – NFV), privacy, social networks, underwater networks, vehicular networks, wireless networks and more...*

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