DTU Announces a new Virtual Reality System for Cardiopulmonary Resuscitation Simulation Training

On November 13, Duy Tan University announced its new Virtual Reality Cardiopulmonary Resuscitation Simulation system for first-aid training. The system was developed by the DTU Center for Visualization & Simulation (CVS), combining 3D virtual reality with IoT (Internet of Things) technologies, using a model of the human body with built-in sensors.

Attendees

Participants included Mr. Nguyen Minh Son, from the Danang Department of Health, Doctor Nguyen Van Cong, Chairman of the Wellbeing Service Company; representatives from the Danang C Hospital, the Binh Dan General Hospital and the Hoan My Hospital; Danang district health-center staff; Dr. Le Nguyen Bao, DTU Provost; Associate Professor Nguyen Ngoc Minh, DTU Vice-Provost; CVS Director Le Van Chung and staff; DTU lecturers and Health Sciences students.

The objective of eCPR is to teach first-aid and cardiopulmonary resuscitation skills to all age groups, to learn how to deal with sudden and dangerous accidents that can lead to cardiac or pulmonary arrest, like a

stroke, circulatory shutdown or drowning, all of which necessitate emergency first-aid treatment on the spot, before going to a hospital.

The eCPR model integrates a variety of features. The hardware consists of a stand-alone CPR experimental booth, a plastic model of the human body, electronic circuitry, a personal computer and an appropriately designed multi-touch screen. The software includes a virtual reality 3D simulator, designed to process events in real-time and simulate the CPR sensations in the human hand and mouth, through IoT sensors. eCPR offers three screen options, external chest compression only, external chest compression with mouth-to-mouth resuscitation and mouth-to-mouth resuscitation alone.

CVS staff at practice

"Cardiopulmonary resuscitation can save victims in emergency situations," explained Director Le Van Chung, from the Center of Visualization & Simulation and leader of the eCPR research group. *"However, without real-time feedback, current CPR training methods cannot gather enough information to detect the accuracy of user movements well enough to achieve the best results. The current devices require the user to already be skilled in first-aid or to be a certified doctor. However, the eCPR sensors can now accurately measure compression depth and speed, determine the correct neck positioning and monitor mouth-to-mouth exhalation pressure. Actually, the eCPR system is so simple that users can even practice and refine their movements on it independently."*

Doctor Nguyen Van Cong carefully followed the experimental process that led to the development of the eCPR device and understands it well. *"The first time I visited DTU, I was thoroughly impressed with the university's achievements in education and research,"* he said. *"It is remarkable that, in just one year, DTU has developed and announced their new eCPR device, which has great potential in measuring the efficiency of cardiopulmonary resuscitation. This will assist us significantly in lecturing and grading our students and I hope the device will become even more effective when linked with an automated external defibrillator at a reasonable price. If so, it will be widely adopted by first-aid professionals."*

Associate Professor Nguyen Ngoc Minh, the leader of Health Sciences at DTU, remarked: *"The development of the eCPR device is an important addition to the well-being of our community. The Center of Visualization & Simulation has also created other useful Health Sciences education products, such as Anatomy, a virtual reality and augmented reality application to simulate and interact with the human body in 3D. Also 3D Dental, a virtual reality application integrated with IoT to simulate dental surgery, including the insertion of implants. In future, DTU plans to expand eCPR to help everyone live healthier lives and give workers more peace-of-mind on the job by creating a safer community where anyone, in an emergency, can play the role of a real doctor and save the lives of themselves, their families and colleagues."*

(Media Center)