Science-Hackathon on „Augmented reality in Surgery"

„Augmented Reality meets AI science assistant"– Division of Urotechnology, Department of Urology (Medical Center – University of Freiburg) in cooperation with Stryker hosts Science-hackathon on the topic of Augmented reality in surgery and surgical education

Augmented reality (AR) refers to a technology, which expands the perception of the real world by virtual aspects. By integrating cameras into mobile devices, information can be directly embedded into a captured image of the real world. This can be information of any kind (e.g. text information, images or virtual objects). Virtual reality however, refers to a completely computer-generated, virtual environment, which is perceived as reality. The possible applications of these two technologies are vast and they are already being used or tested in a wide range of areas. Recently, the game "Pokemon Go", which is based on AR technology, attracted some world-wide excitement.

In the field of medicine, the AR technology shows great potential for application in patient care as well as surgical education. The need for new training concepts is especially large, since the general shortage of physicians puts strain on the health care system, while especially in the surgical field the education of new certified surgeons using the established "apprentice concept" with training directly on the patient gets more and more difficult, due to the complexity and amount of existing surgical procedures. The vision of providing a virtual teacher to the doctor to be trained is therefore obvious and attractive. The Division of Urotechnology of the Department of Urology, under the leadership of Prof. Arkadiusz Miernik, MD, PhD, has been working on this subject for some time and been developing concepts for the use of this technology in medical teaching

In order to further investigate this topic, in cooperation with the company Stryker, a completely new format for the field of urology and medicine in general is applied: a hackathon. Originally developed in the IT sector, hackathons were created to solve programming problems in the context of a competition. Adapted for the field of science, this means participating scientists, familiar with the topic at hand, will perform a scientific literature search, to answer a scientific question on the base of current published data. Besides medical engineers of Stryker, the departments of neurosurgery, orthopedics, ENT and general surgery are involved. In addition, specialists for AR/VR technology of the German Research Center of Artificial Intelligence and engineers of the German Center of Aerospace Engineering announced their participation.

The hackathon is intended to investigate the current state of development of the AR and VR technology related to surgical education. The Division of Urotechnology plans to use the resulting data in order to develop new concepts for the application of AR in surgical education and to further the development of the technology. The Department of Urology is supported by the company IRIS.AI, which did not only develop the concept of the "Scithon" (science+hackathon=Scithon), but also provides the participants with a new software assistant for scientific literature research. This software, based on artificial intelligence and machine

learning technology, is intended to simplify scientific literature research in general and to optimize the result of conducting literature mapping studies. The evaluation of this software tool is also a main emphasis of this event.

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