



CONNECT

Virtual Reality in surgery

Background

HoloMed is a technology system developed at the Karlsruhe Institute of Technology. In collaboration with UID, mbits imaging GmbH and the University Hospital Ulm, it won the Neo Innovation Award of the best future projects. The project was funded by the German Federal Ministry of Research and Education. Using augmented reality and AI, HoloMed aims to make brain surgery safer and more efficient. HoloMed promises to reduce errors in complex procedures that leave little room for neurosurgeons to maneuver in the traditional, manual way. In addition to precision and novelty, the technology promises a cost-effective solution for sustainable quality optimization.

Merging different realities - virtual or real?

Many are familiar with the blending of the virtual and real worlds from the gaming sector. The real world that happens around you is enhanced with vivid, digital content through the use of VR glasses and other hardware tools. 90% of Germans are familiar with the term „virtual reality“. For some years now, this technology has also been making its way into medical application areas. But is it serious?

Market researchers expect the global VR market to grow by 18% per year until 2028. In 2023, the forecast market volume in Germany is around 280 million euros. Market researchers go even further and assume that the use of VR and AR in Germany will affect every hundredth person in their job by 2030.

Field reports demonstrate that an experienced surgeon needs to perform a simple operation an average of 10 to 20 times to master the technique. For complicated procedures, this requires even up to 100 repetitions. These repetitions on the human body involve not inconsiderable risks that can make the difference between life and death. Does VR offer an efficient and safe alternative in this regard? A study from the David Geffen School of Medicine found that VR training for surgery preparation improved surgeons' overall performance by 230% and execution speed by 20%.

Young medical professionals who have just completed their studies or are still in the final stages of them can now gain their practical experience without endangering a human life. VR makes it possible to virtually display 3D models of skeletons, blood vessels and complex organs and to simulate operations. This is possible through the use of VR goggles and two motion controllers, allowing the subject to perform a virtual surgery on a virtual patient.



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VR also finds appeal in various therapeutic areas. Phobias, addictions, ADHD, dementia, but also chronic pain treatments can be supported and successfully treated using VR technologies.

However, VR can not only be used as a therapeutic or training tool, but is also used in real operations. Holomed, which has already won an innovation award, is working on AR glasses and punctures on the brain. The glasses enable the visualization of deep-seated body structures with millimeter precision. The integration of artificial intelligence simultaneously processes CT and MRI data from the electronic patient record and transmits it to the surgeon. Main fields of application are fluid removal and pressure reduction on the brain after brain hemorrhages or strokes. These procedures require precision and give little anatomical room to maneuver. Machine learning assists by providing a segmented 3D model of the head and enhances the quality of the surgical procedure. The neurosurgeon wears the AR glasses and receives surgery-relevant information directly superimposed on his field of vision. The optimal puncture point and angle of the puncture needle on the skull can be determined. Until now, only 60% of this procedure without AR glasses reached the correct puncture site.

The use of virtual or augmented reality in medicine represents a revolution of various fields of application. Whether training simulation, diagnostic support, therapeutic measures or operations - all areas are optimized in their application, quality and sustainability.

Virtual or augmented reality is your field of interest? The revolution of technology in the medical field won't let you go? Then you should contact us and we will be happy to establish a dialog between the company and you. arcoro CONNECT links innovative ideas, companies and interested parties - personally and directly!



COMPANY	LOCATION	WEBSITE	FIELD OF EXPERTISE
UID Labs / HoloMed	Germany	https://uidlabs.de/projekt/augmented-reality-im-op/	Medical VR training platform
FundamentalVR	England	https://fundamentalsurgery.com/de/	Medical VR training platform
Osso VR Inc	USA (CA)	https://www.ossovr.com/	Medical VR training platform
ImmersiveTouch Inc	USA (IL)	https://www.immersivetouch.com/	Medical VR training platform
Surgical Theater Inc	USA (CA)	https://surgicaltheater.net/	Medical VR training platform
Touch Surgery Labs	England	https://www.touchsurgery.com/	Medical VR training platform
Augmedics Ltd	USA (IL)	https://augmedics.com/	Medical AR training simulator
Surgical Science Sweden AB	Sweden	https://surgicalscience.com/	Medical VR training simulator
PrecisionOS Technology Inc	Canada	https://www.precisionostech.com/de/	Medical VR training simulator
UKE Arbeitsgruppe VOXEL-MAN	Germany	https://www.voxel-man.de/	Medical VR training simulator

We are also happy to connect you directly and personally with industry experts in the field of VR training simulation. Interesting, medical research approaches, exciting start-ups and stirring visions - discover some international opinion leaders below:

INDUSTRY EXPERTS	JOB POSITION	FIELD OF EXPERTISE
Prof. Dr. Thomas Hirth	VP for Innovation and International Affairs at KIT	Technological innovations
Prof. Dr. Ing. habil. Björn Hein	Professor for Intelligent Production and Cloud Robotics	Cloud computing, robotics, AI & sensor technologies
Richard Vincent	CEO & CO-Founder of FundamentalVR	Medical VR training simulation

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