

ACS 2022 Surgeons and Engineers: A Dialogue on Surgical Simulation Meeting

Promoting Technology and Collaboration

Augmented reality for Improving Operative Performance of Surgery Residents

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Background: Recent advances made in Augmented Reality (AR) technologies are offering many potential applications in medical education and, specifically, surgical training. AR will not only further the acquisition of knowledge, but also creativity and imagination by transforming the way educational content is delivered.

Technology Overview: There is evidence in support of the potential benefits of AR in surgical training by improving task performance of required surgical skills in an efficient way. However, the research done to improve the AR technology towards this use is limited as challenges have been faced with implementation of AR into surgical training. Several types of AR glasses have been tested, and due to a number of factors the AR Vuzix system was chosen as being best suited for our application.

Potential Application in Surgical Simulation and Education: In an operating room, surgeons may have to look at multiple separate screens to see visual information regarding the procedure, leading them to stop the procedure or turn away from the patient. AR technology can provide residents with an efficient tool that projects selected required or supplementary visual information for a procedure in line with task performance, with potential to help them focus and perform more efficiently.

Potential Opportunities to Collaborate: Currently, computer scientists from the School Of Electrical Engineering and Computer Science (SEECs) at the University of North Dakota (UND) in Grand Forks, ND are working with surgeons from Altru Hospital in Grand Forks, ND and Sanford Medical Center in Fargo, ND to implement an AR-distributed platform to employ the AR Vuzix technology in training facilities where UND surgery residents perform operative procedures in cadaveric and Fundamentals of Laparoscopic Surgery (FLS) models. With continued collaboration between engineers and surgeons, we intend to transition this work into the operative setting.