ARAS HI-TECH ROBOTIC SOLUTIONS
ADVANCED ROBOTICS & AUTOMATED SYSTEMS

K.N.Toosi University of Technology

SERIES OF ARAS GENERAL PRESENTATION WEBINARS

ARAS EYE SURGERY TRAINING SYSTEM: A VR/AR APPROACH

ABSTRACT:

The virtual reality and augmented reality are getting more interest as a training technique in the medical fields unlocking significant benefits such as safety, repeatability and efficiency. Furthermore, VR/AR based simulators equipped with a haptic device can be used in medical surgery training in order to achieve skill improvement and training time reduction. With haptics as part of the training experience it is observed that a 30% increase in the speed of skills acquisition and up to a 95% increase in accuracy is achieved. Six out of nine studies showed that tactile feedback significantly improved surgical skill training.

Eye surgery training is considered for VR/AR based training in ARAS group as it is one of the most complex surgical procedures. The ARASH:ASiST haptic system is integrated into the eye surgery training system in conjunction with a physical simulation engine and the unity software to visualize the simulation results in Oculus VR headset. The hand motions of the expert surgeon is captured by a haptic system where later the motion data is used to train the hand motions of surgery students by force feedback. In the developed eye surgery training system, two types of eye surgeries are simulated, namely the cataract and vitrectomy. In each type of eye surgery, the haptic system is used to simulate the surgery tool motion. The interaction of the virtual surgery tool with the 3D modeled eye is computed through the SOFA framework. The simulation results are transformed to the unity game engine in order to visualize the results in an Oculus VR headset.

In addition, the eye surgery training system developed in the ARAS group, is able to learn the hand motions of expert surgeon by AI and correct the mistakes made by students during the simulated surgery. This system provides many options in the medical training and specially in the eye surgery training such as safety, repeatability, training speed and less cost in comparison to conventional training techniques.

Dr. Alireza Norouzzadeh
Director of ARAS
Mixed Reality in Surgery Group

Date:

MONDAY 3rd AUGUST 2020

13th Mordad 1399

Time :

18:00 - 19:30 (+4:30 GMT)

Tehran Local Time

TO REGISTER AND ENTER TO WEBINAR:

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