

## **Virtual reality simulator for phacoemulsification cataract surgery education and training**

### **Abstract**

Computer systems are taking an important role in the field of medicine with the introduction of electronic biomedical devices in diagnosis and treatment, where medical records obtained from the devices are documented and processed as reference to medical panels. The capability of latest computed tomography technology in generating three-dimensional patient model for graphical representation is very informative for surgeons to plan and make decision before the operation. This initiates the idea of implementing the model into computer-generated simulator for surgical education and training. This paper presents the development of virtual reality cataract surgery simulator. Three-dimensional eye model and surgical instruments are generated as the virtual surgical environment. The system is equipped with a pair of haptic devices to provide actual sensation. The results show that the simulator is capable of providing interactive training on the main procedures of cataract surgery. It has the potential to be incorporated as part of the curriculum of medical program when the proposed future work in the end of the paper is completed.

**Keywords** — Cataract surgery, phacoemulsification, surgical simulator, virtual reality