

EYE SURGERY SIMULATOR



The HelpMeSee Eye Surgery Simulator is a highly realistic virtual reality trainer for Manual Small Incision Cataract Surgery (MSICS). The system provides a scalable approach for training cataract eye surgery specialists and ophthalmologists.

- Virtual reality with real touch and feel for fully immersive training
- Lifelike stereoscopic visuals as in surgical microscopes
- Physics based soft tissue modeling providing realistic interaction
- Realistic virtual eye models with numerous anatomical variations representing ethnicity and pathology
- Fully VR-based with no consumables required, allowing for unlimited attempts and comprehensive training

FEATURES

HARDWARE	
Both right and left hand interaction (Dual Haptics)	<ul style="list-style-type: none"> Simulation with usage of instruments in both hands of the operator. Both simulated instruments (left and right) can interact with each other and with the eye model. Realistic rendering of forces while operating on the virtual eye when interacting with the environment or during tool-tool collision.
All instruments	<ul style="list-style-type: none"> Left and right handpieces are multifunctional and represent all instruments needed for the MSICS procedure*.
Simcoe cannula	<ul style="list-style-type: none"> An additional hardware for simulating irrigation and aspiration using Simcoe cannula.
Virtual microscope	<ul style="list-style-type: none"> Simulates an actual microscope used during MSICS surgery. The interocular distance is adjustable by the user. <p>Key specs: SXGA, 85Hz, 40 degree field of view, stereoscopic display.</p>
Hand rest	<ul style="list-style-type: none"> Resembles a patient's head. The hand rest is adjustable for training surgery on either the right or the left eye. Force sensors measure the force applied on the patient's head by the surgeon. This force is used in the simulation to move the position of the eye in the microscope view*.
Audio cues	<ul style="list-style-type: none"> Audio sounds mimic patient's discomfort (e.g. there is too much force applied to the patient's head). Heart rate monitoring is also simulated during the operation.
Multiple computers	<ul style="list-style-type: none"> Simulation PC runs the eye physics and graphics model. Haptics PC runs the software that controls the two haptic devices. Courseware PC runs the courseware.

* Patents pending.

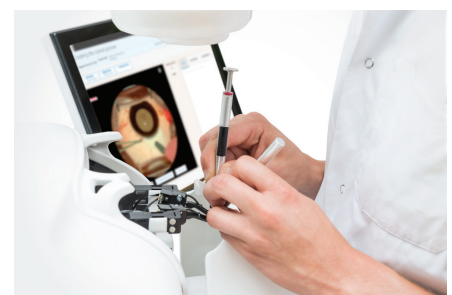
SOFTWARE	
Physics	<ul style="list-style-type: none"> Sofa framework installed and running on Simulation PC.
Visuals	<ul style="list-style-type: none"> H3D framework installed and running on Simulation PC.
Haptics	<ul style="list-style-type: none"> A unique admittance based control algorithm.
Training courseware	<ul style="list-style-type: none"> Comprehensive course and simulation based training program designed by surgical and training experts.
Maintenance tools	<ul style="list-style-type: none"> Calibration Tool optimizes the sensors performance in the haptics software. Diagnostics Tool provides information about the state of the simulator components.



Step by step direction



With stereoscopic microscope



Two hand procedures with realistic touch and feel

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