OpSim

Eye Cataract Surgery Simulator
Powered by Virtual Reality

SiMedix
Simulated Medical Experiences

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Ayandenegari Hamafarinan Ofogh is a creative pioneer in design and production of advanced technologies and high-tech equipment in Iran. The company has been founded and directed by educated people with high academic degrees and done more than 40 projects proudly. For more information about us, visit our website.

SiMedix is a hi-tech pioneer leader in the business of providing VR (Virtual Reality) medical surgery simulators in the healthcare industry in Asia. We pride ourselves of getting 100 percent of the VR eye surgery simulators market share in Iran. Our clients are among the biggest and largest corporations in the healthcare industry.

OpSim is our first developed ophthalmic surgical simulator designed and manufactured in order to help medical residents to operate in a realistic environment and also keeping patients out of operating rooms.

SiMedix
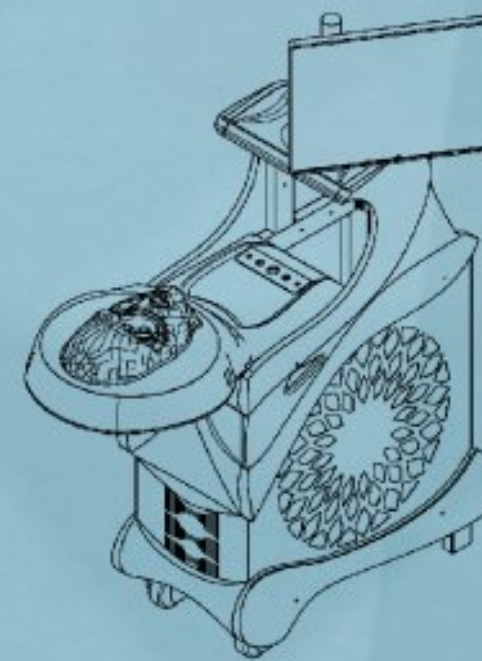
OpSim

OpSim
Eye Surgery Simulator

Department of Virtual Reality

Virtual reality (VR) refers to computer technologies that use software to generate realistic images, sounds and other sensations that replicate a real environment and simulate a user's physical presence in this environment, by enabling the user to interact with this space and any objects depicted therein. Virtual reality is used to provide trainees with a virtual environment where they can develop their skills without the real-world complications. In other words, Simulation Education is a bridge between classroom learning and real-life experience.

VR Department of has three domains of activity: Medical training simulators, custom operations training simulators and VR hardware developments and integrations. SiMedix is the a brand in medical training simulators, which has focused on ophthalmic surgeries. Medical simulators rely on computerized mannequins that perform several functions of human realistically.
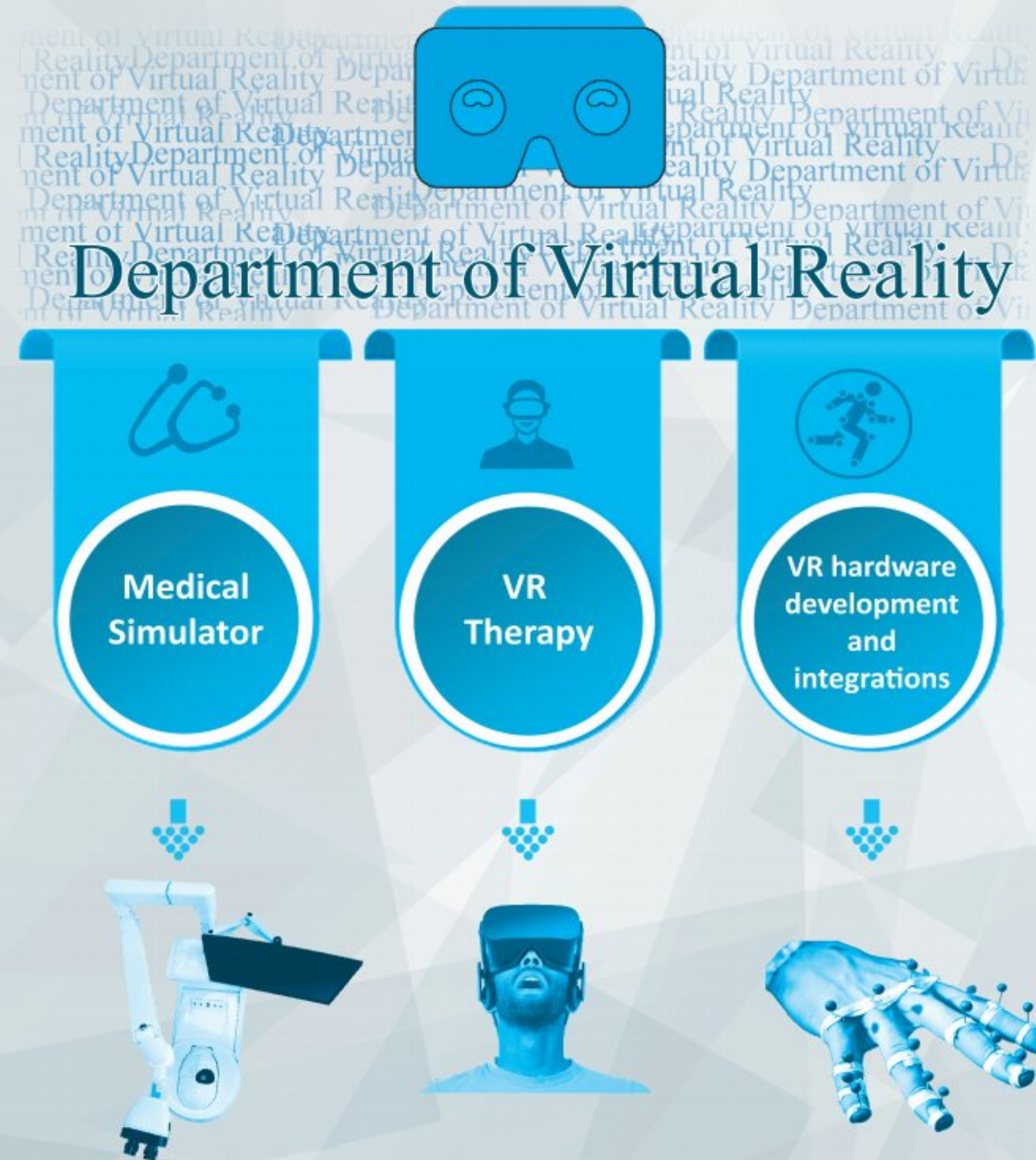
Why Simulator?

Medical simulators allow trainess to practice what to do in different situations and give them the best possible chance of enhancing skills and reducing medical malpractices. Only by the help of simulators, residents can experience dangerous situations without putting the patient in danger.

Also, simulators have proven far more effectiveness in the amount and retention of knowledge versus conventional classroom teaching:

- Ability to practice potentially risky scenarios in a safe environment
- Increased knowledge retention by more exercising
- reporting in a more complete, consistent and objective form
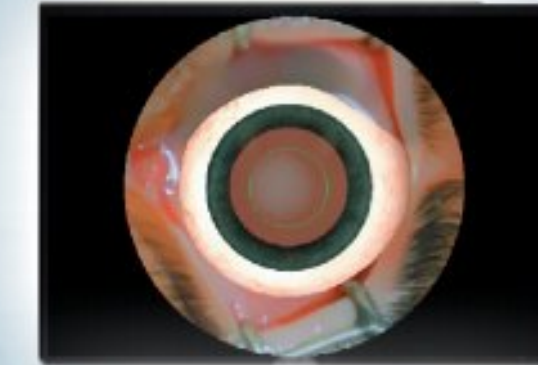- demonstration of what Students have learned

Medical Simulator

VR Therapy

VR hardware development and integrations

OpSim Subsystem

Adjustable stereo vision system

Ergonomic design for microscope to achieve comfortable feeling during surgery

Control Touch Screen

Control monitor for observing surgical process by supervisor

Stereo Microscope Unit

To create 3D view sense and depth of view

Surgery Interface Head

The patients' head maquette for learning doctors' hands during surgery

Height Adjustable Base

Surgical instruments

Simulator handpieces look like surgical instruments

Instrument Foot Pedal

Instrument foot pedal for ultrasonic injection control and forceps control

Microscope Foot Switch

Microscope foot switch for preparing best view

Simulated Cataract Surgery

Taking the patient out of training procedure

- Reducing the risk of malpractice for patients
- High reliability for training of eye surgeries
- Performing cataract surgeries individually or under supervision of a mentor
- Repeatable training

Expertise as a consequence of experience

- Training primary skills to beginners, such as utilizing microscope, hand-pieces and space constraints
- Training basic surgical methods, such as capsulorhexis, divide and conquer
- Training special surgical techniques
- Enhancement of residents' skills
- Progress evaluation
- Learning complex surgical techniques step-by-step

Life-like environment for optimum learning

- Preparing life-like simulation in order to perform cataract surgery
- learning different styles to approach the eye by a human head model
- High fidelity simulation of the eye interior environment
- High fidelity modeling of Stereo Microscope

Realistic modeling of OR machine and instruments

- Availability of cataract surgery hand-pieces such as forceps, cystotome and phaco instrument
- Realistic modeling of surgical fluids, eye pressure and red reflex
- Life-like OR machine interface and functions
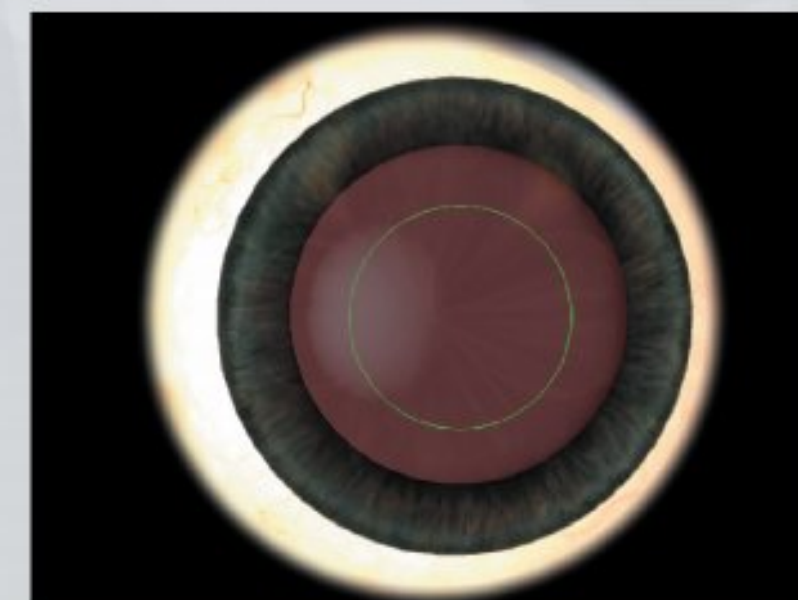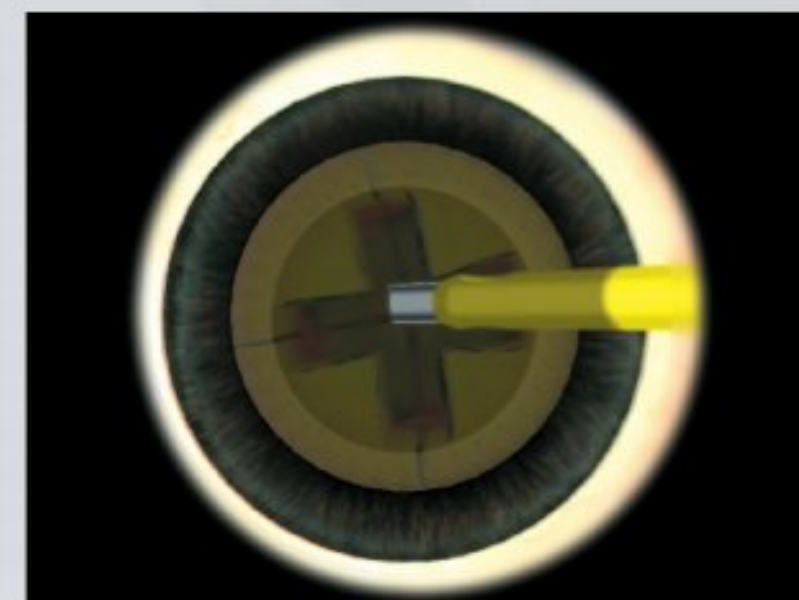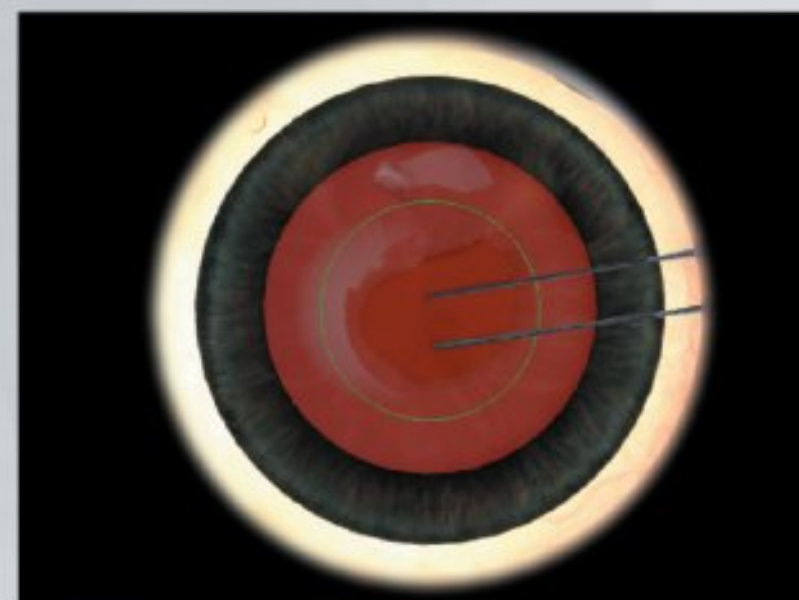
Residents are able to perform all cataract surgery steps by OpSim. For example: capsulorhexis and phacoemulsification

The interface of surgery simulator allows resident to learn necessary skills. For example, residents learn how to handle the hand-piece to keep red-reflex while performing virtual surgery.

Objective Evaluation

- Providing brief description of the residents' performance after completing each part of training
- Recording different information such as microscope handling, surgery effectiveness and interacting tissues
- Monitoring residents' performance
- Providing documented reports for mentor to evaluate residents' development

Importance of Using Simulators

- Evidence has shown that trainees have the highest complication rates at the start of their training, which emphasizes the importance of adequate and appropriate surgical training and supervision.
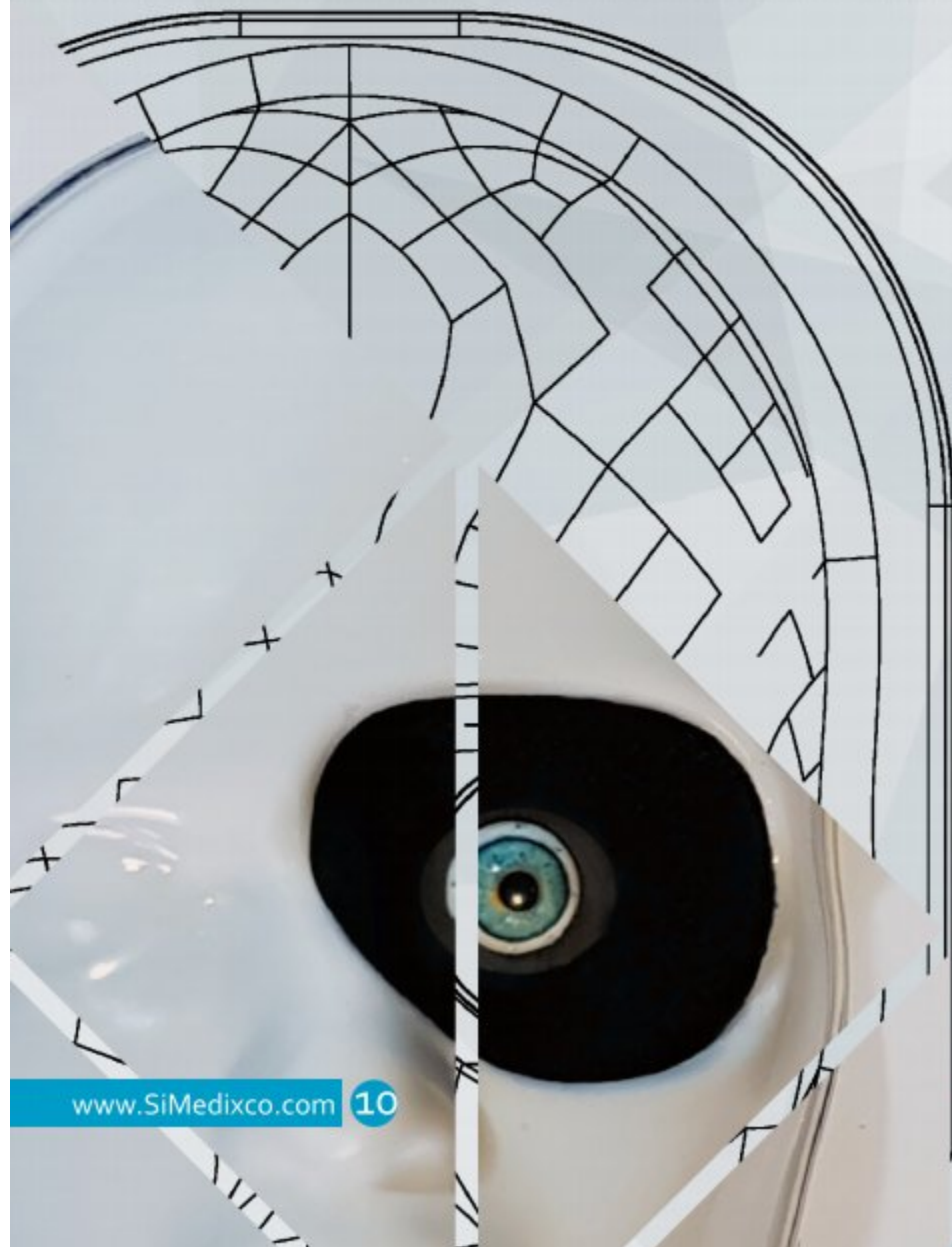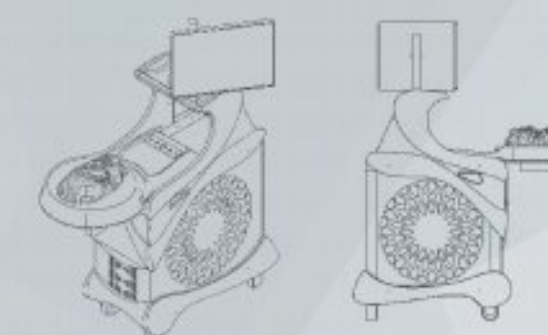
OpSim Cataract Models

There are three models for OpSim cataract simulator:

- The PS model simulates primary skills which residents can use to get ready for operations. In these modules, residents learn manipulating of objects in eye interior environment, grasping objects and reducing hand tremor.

- The BT model simulates basic techniques in a cataract surgery. The model consists of these modules: Forceps and Cyctotome Capsulorhexis, Gel Injection and Phaco divide and conquer (D&C). In this model residents train whole surgery procedure with regular tissue behavior and they can improve their skills in a regular situation devoid of complications.

- The ST model simulates special techniques in surgery. For example, tendency to escape in capsulorhexis, shallow/deep anterior chamber cases and etc.

Model	Description	Software	Options	Hardware
OS-cat-PS	Primary skills	OS-cat-01	Hand tremor, forceps skills, phaco training	OS-cat-hw
OS-cat-BT	Basic techniques	OS-cat-02	+ capsulorhexis, D&C	
OS-cat-ST	Special techniques	OS-cat-03	+ advance capsulorhexis, advance D&C	

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