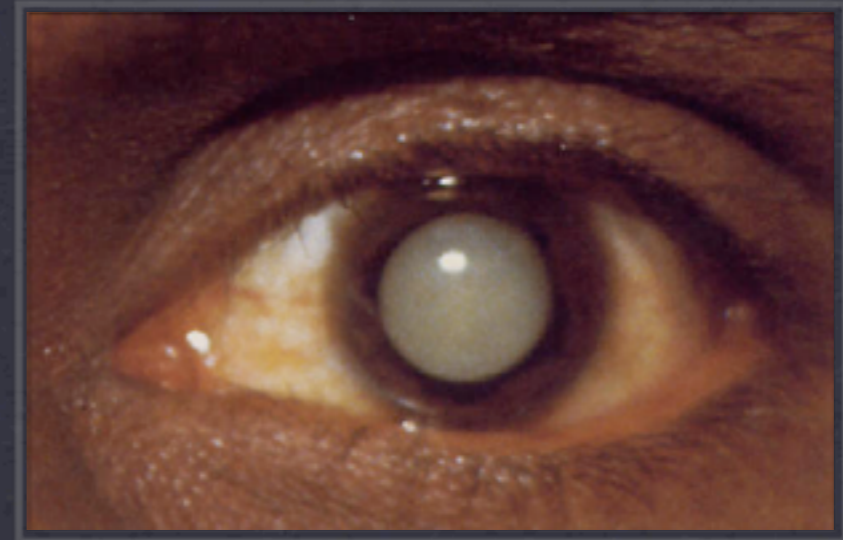




Simulation de la chirurgie de la cataracte

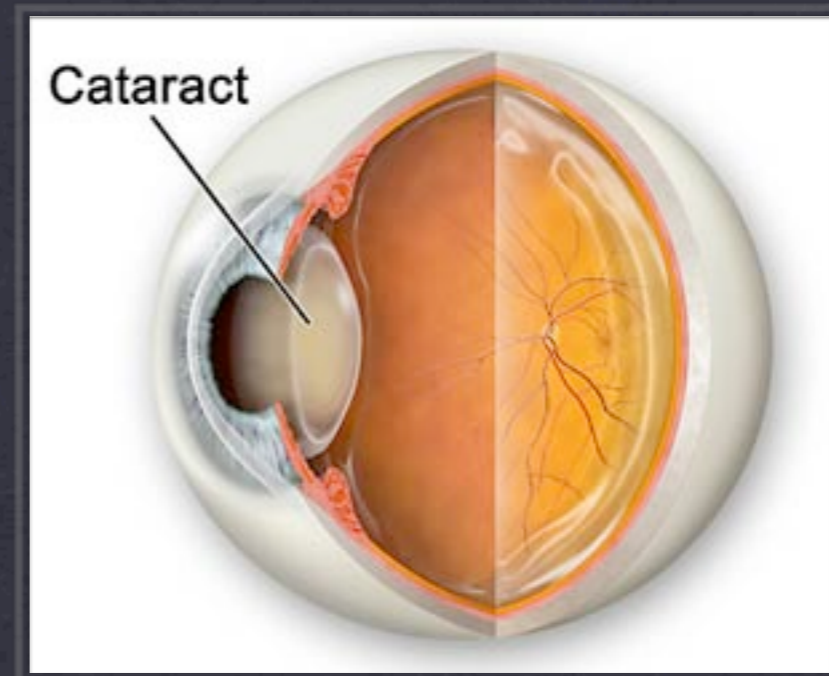
Cataracte:

Opacification du cristalin



Epidémiologie:

- + première cause de cécité dans les pays en voie de développement
- + age mais aussi formes congénitales
- + facteurs aggravants: dénutrition, déshydratation, tabagisme, diabète...

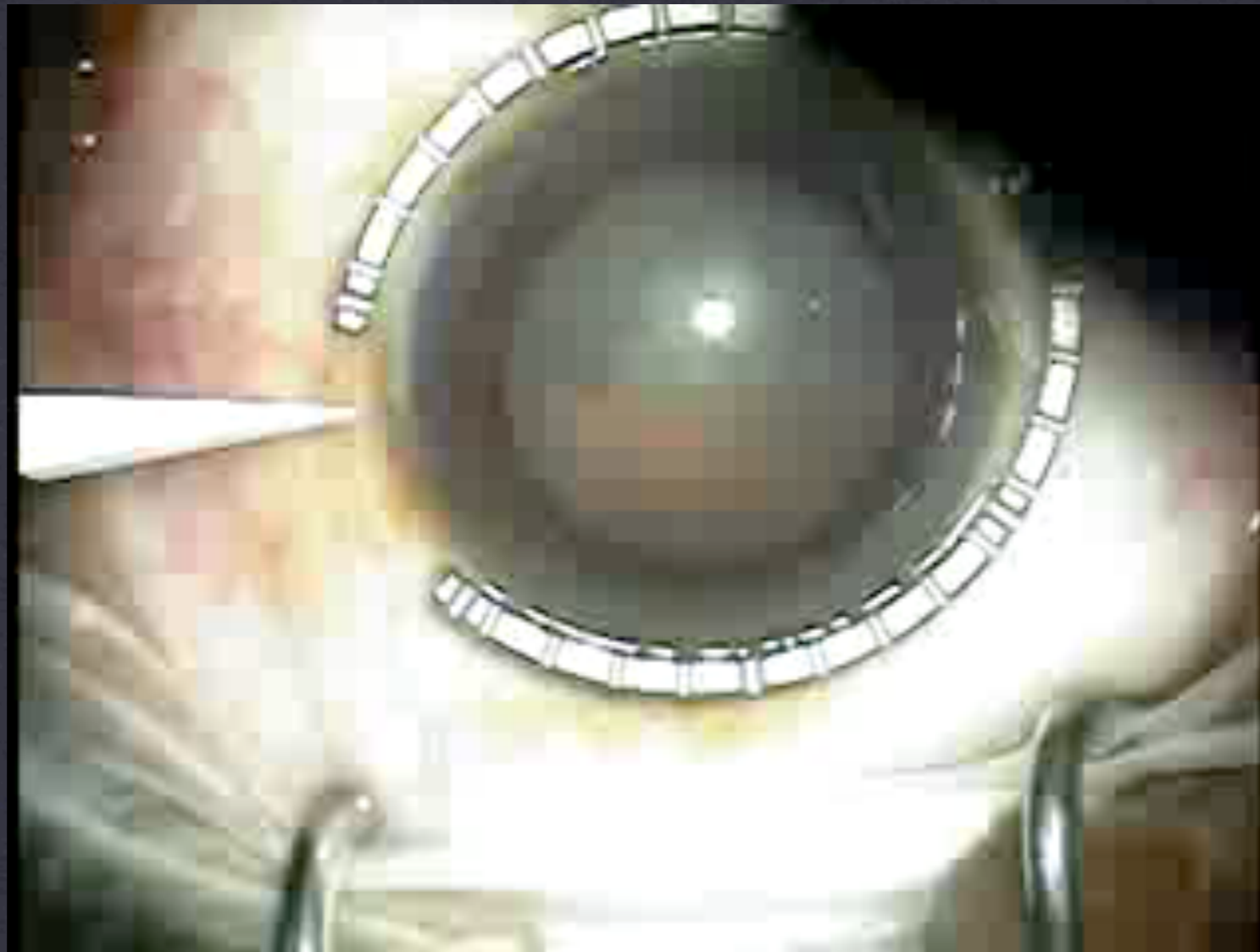


2 types d'intervention

Phacoemulsification

MSISC

Phacoemulsification



- Sclerocorneal section
- Capsulotomy
- Hydrodissection and hydrodelineation
- Motion of nucleus
- Phacoemulsification of the nucleus
- Epinucleus and cortex aspiration
- Implant

KEY STEPS OF PHACOEMULSIFICATION PROCEDURE

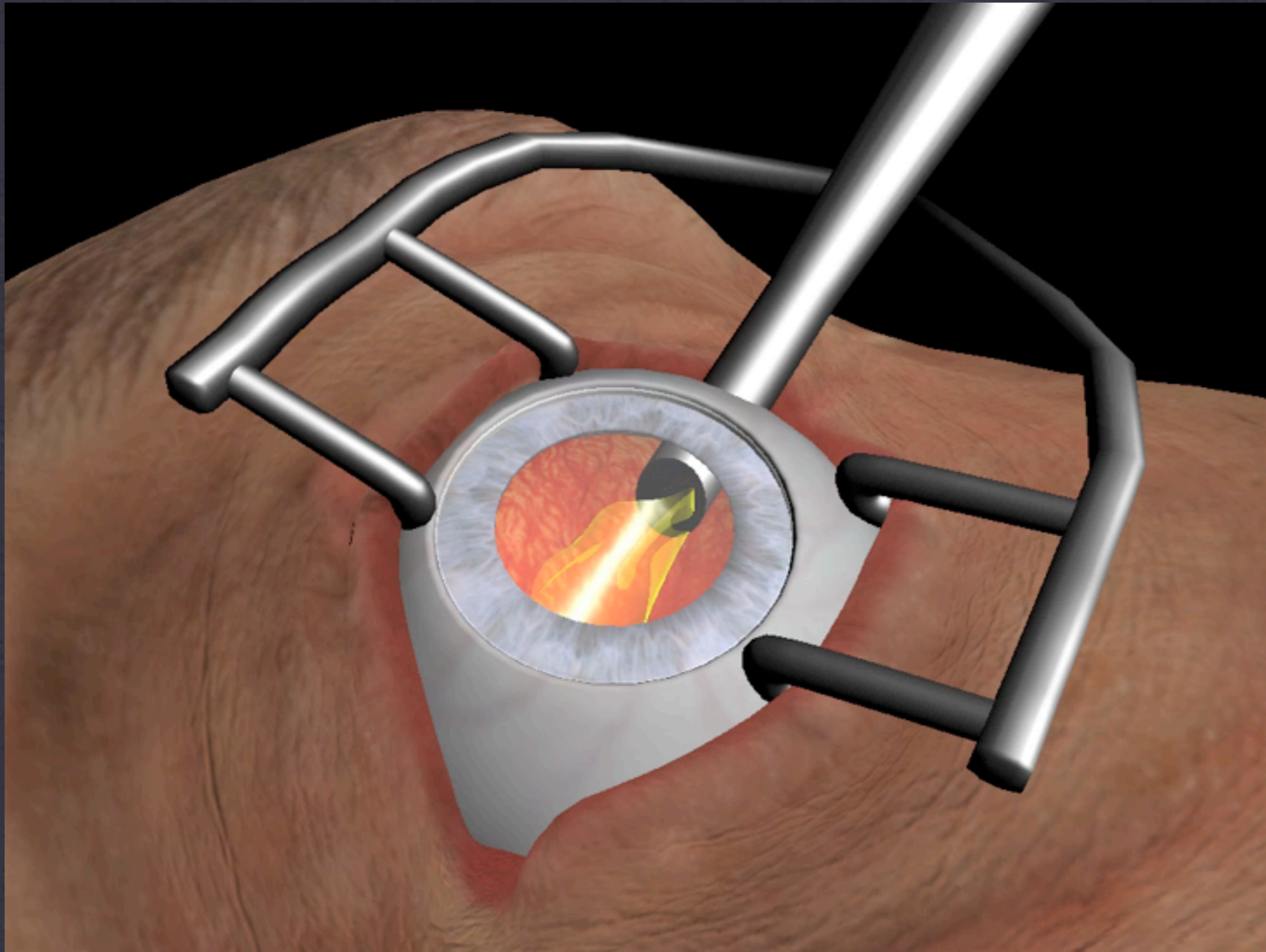


Computer-Based Training System For Cataract Surgery

a joint work between
Shaman - INRIA Lille North-Europe &
Department of Ophthalmology University Hospital Lille

FIRST SIMULATOR

PHACOEMULSIFICATION



FIRST SIMULATOR

PHACOEMULSIFICATION

**A 15-MINUTE
SURGERY COULD
GIVE THIS GIRL
HER EYESIGHT
BACK**

CLOSE

YES, I WANT TO GIVE A BLIND CHILD OR ADULT A CHANCE TO SEE.

\$300 Full Surgery \$150 Half Surgery
 \$75 Anesthesia Other

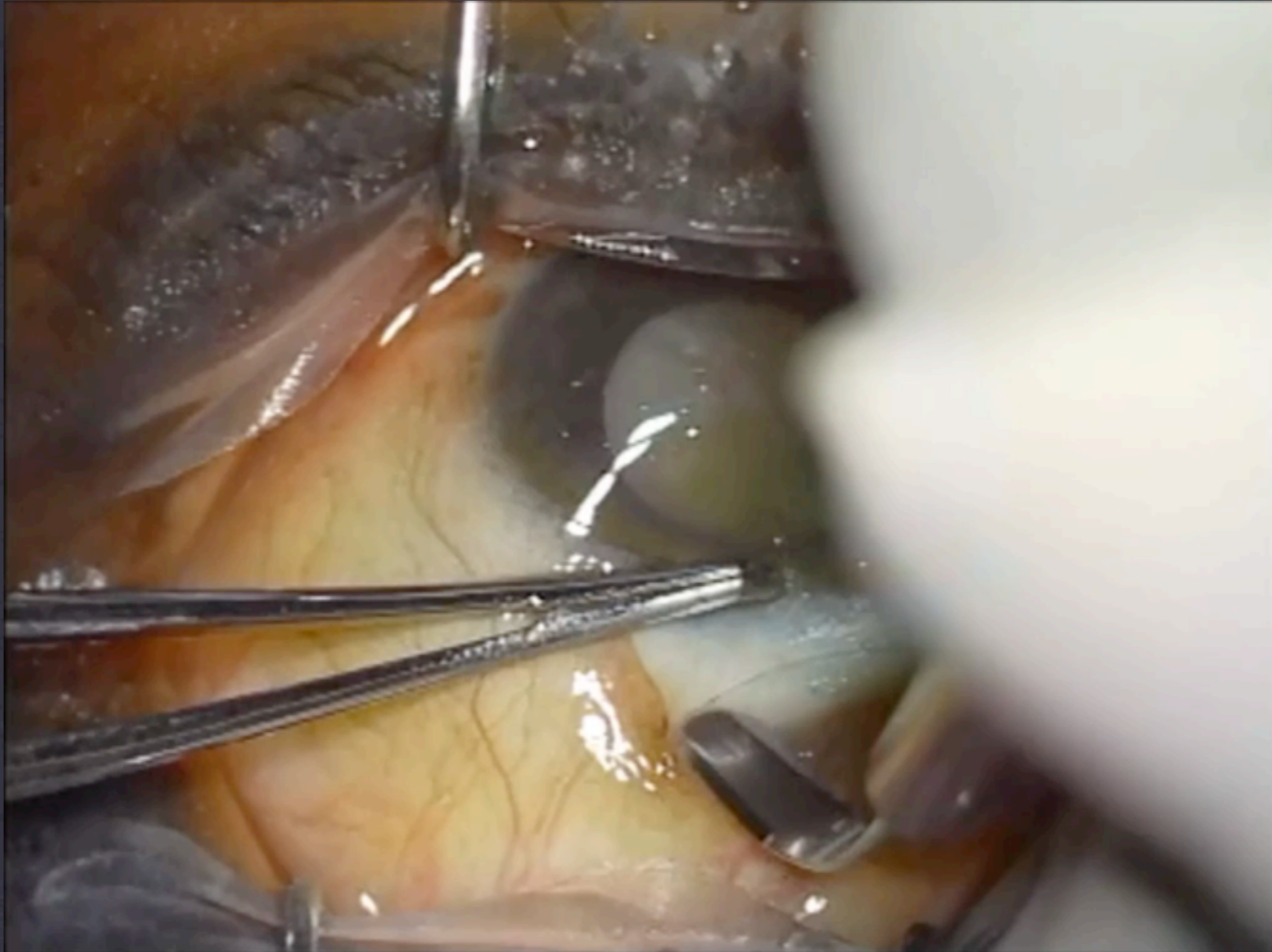
HelpMeSee is a registered 501c3. 100% of this gift is tax-deductible. © 2011 HelpMeSee.

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Other ways to donate	

PROJET

HELP ME SEE

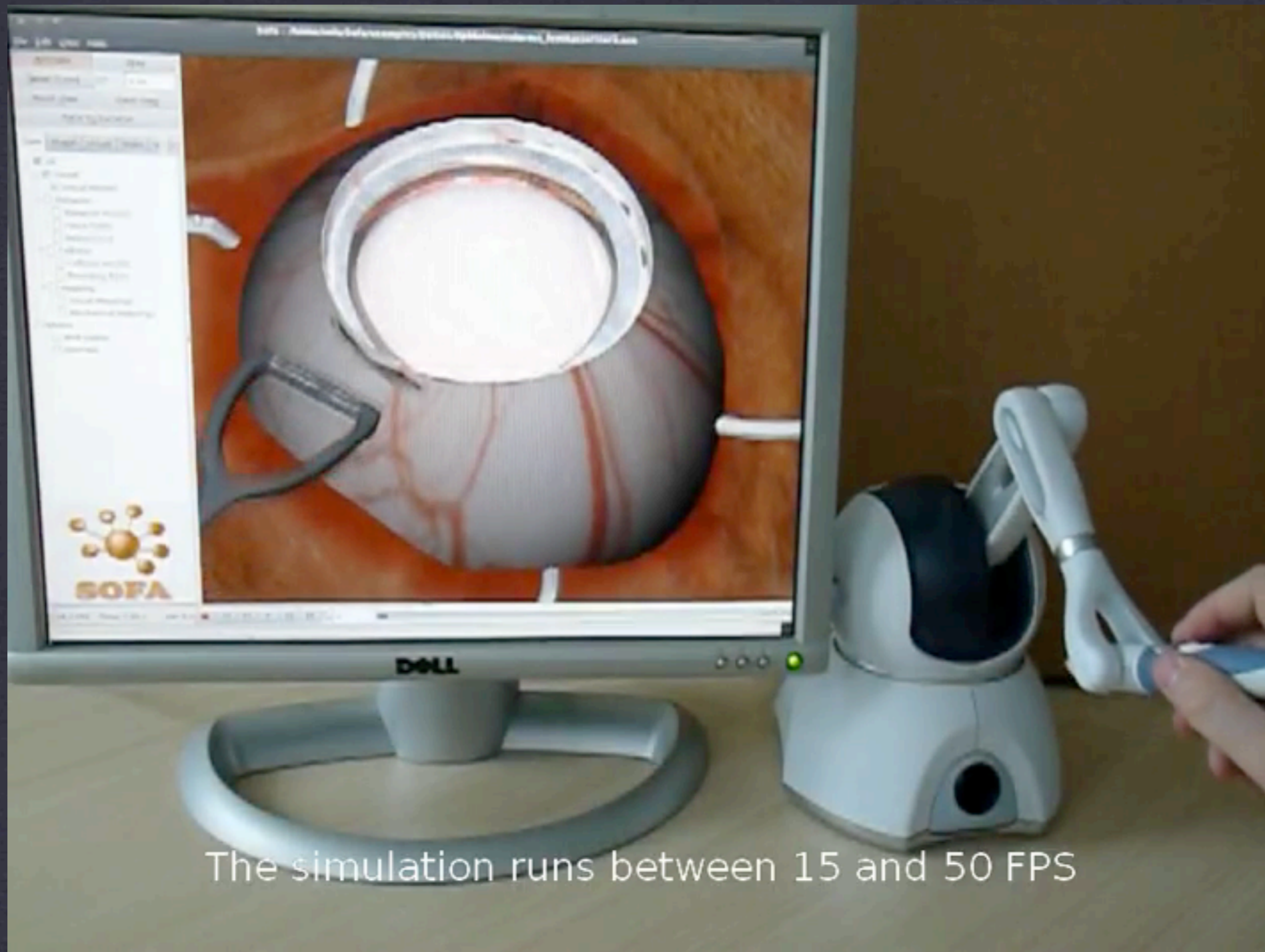
MSICS



[VOIR VIDEO](#) [TECH MANUAL...](#)

- Bridle suture and conjunctival section
- Sclerocorneal tunnel construction
- Capsulotomy
- Hydrodissection and hydrodelineation
- Prolapse of nucleus into anterior chamber
- Nucleus removal from anterior chamber
- Epinucleus and cortex aspiration
- IOL implantation
- Wound Closure

KEY STEPS OF MSICS PROCEDURE



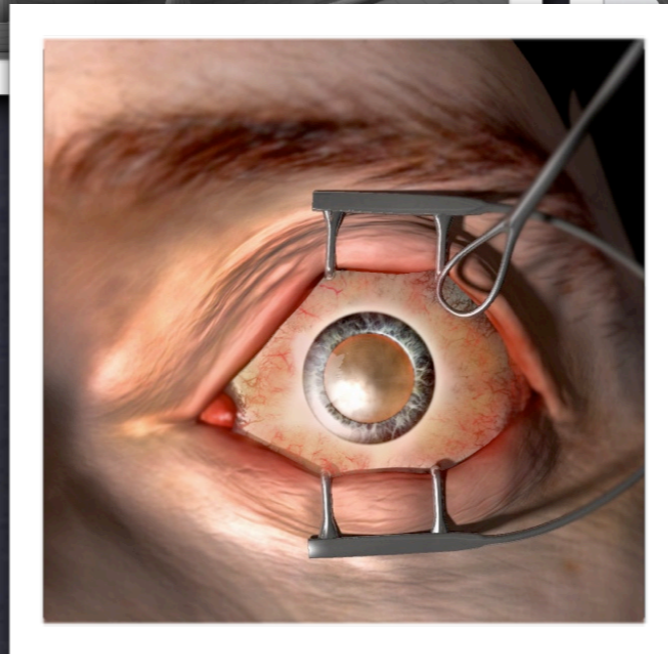
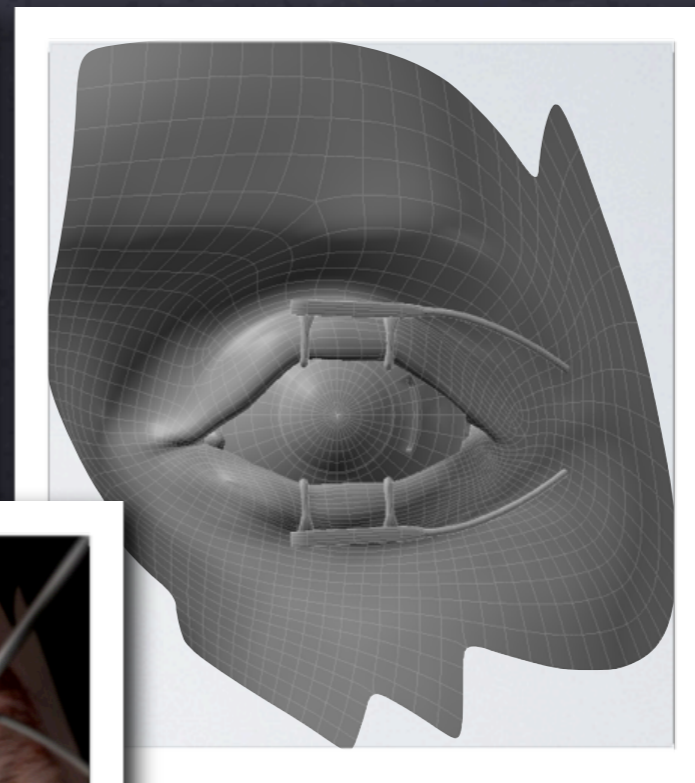
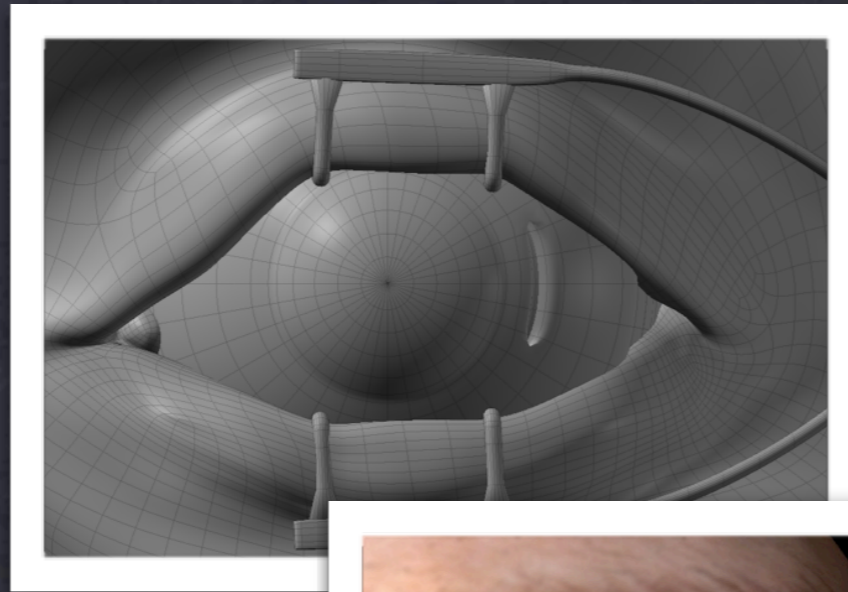
The simulation runs between 15 and 50 FPS

NUCLEUS REMOVAL

EYE MODEL 0.0

Geometry for visualization

- Large polygon count for details
- Include texture coordinates
- Compatible with advanced rendering techniques and shaders



GEOMETRICAL MODELING

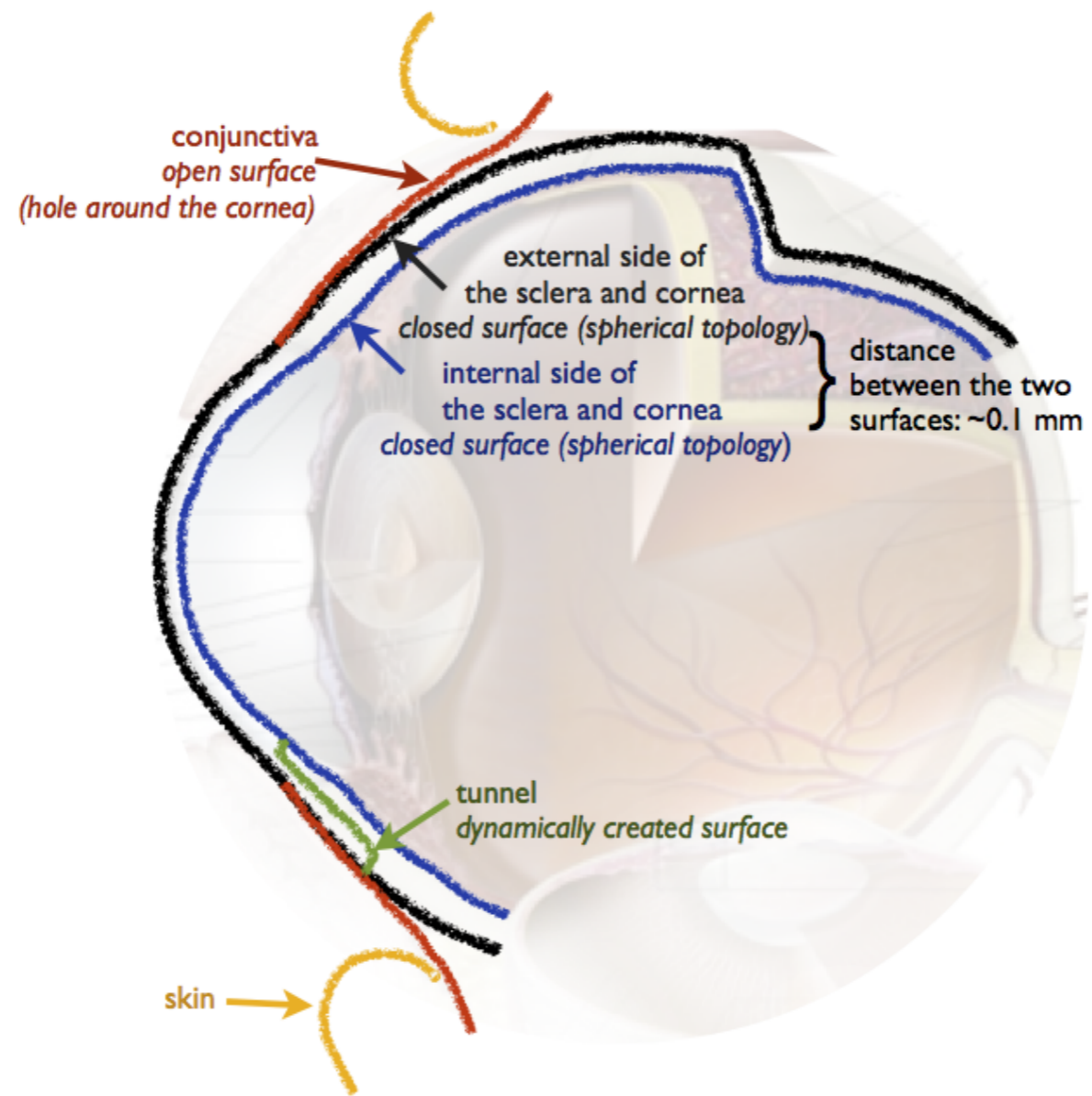
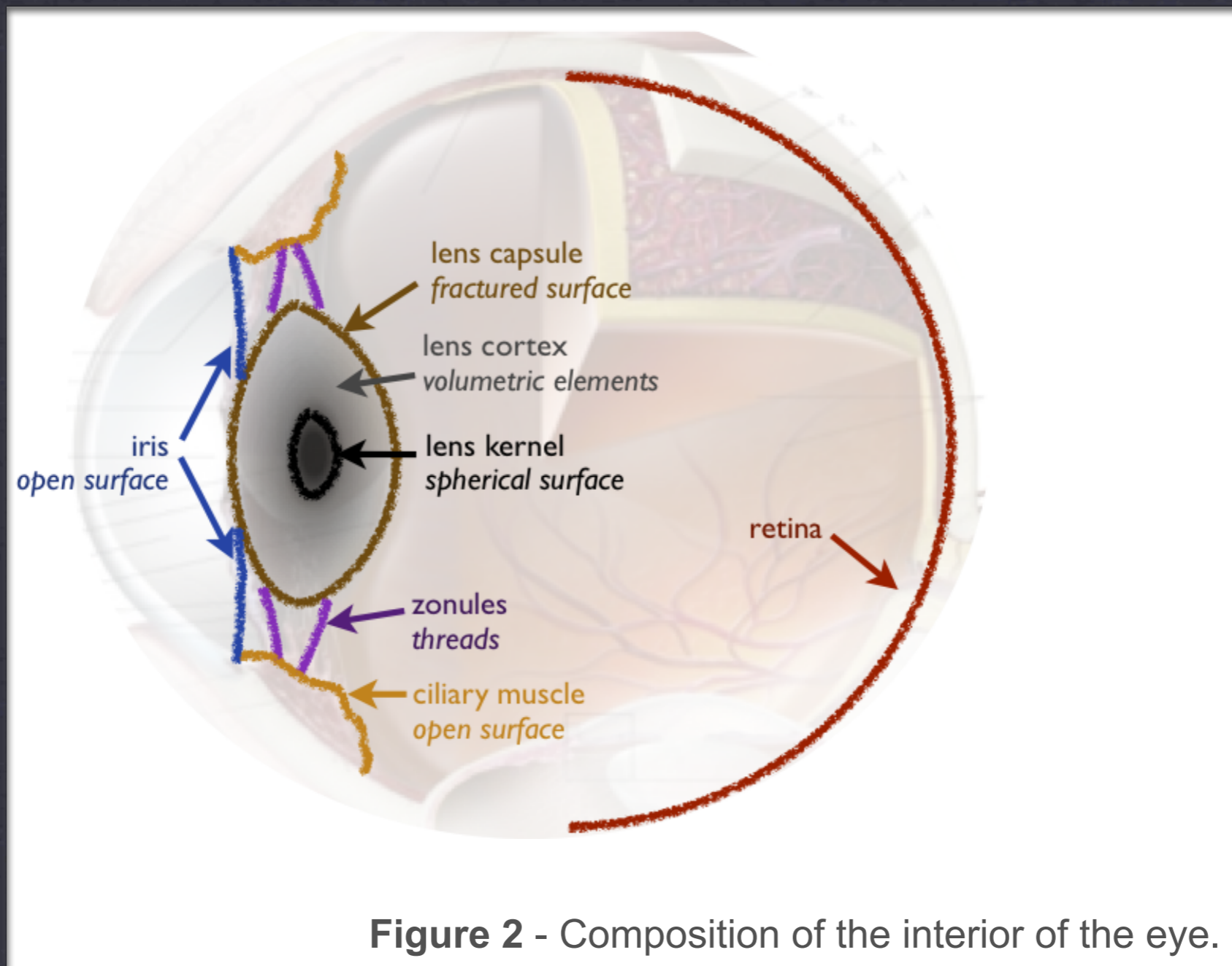


Figure 1 - Composition of the exterior of the eye.

EYE MODEL



EYE MODEL

MSICS Tunnel Incision

MSICS Tunnel Incision

EYE MODEL

VERSION 1.0

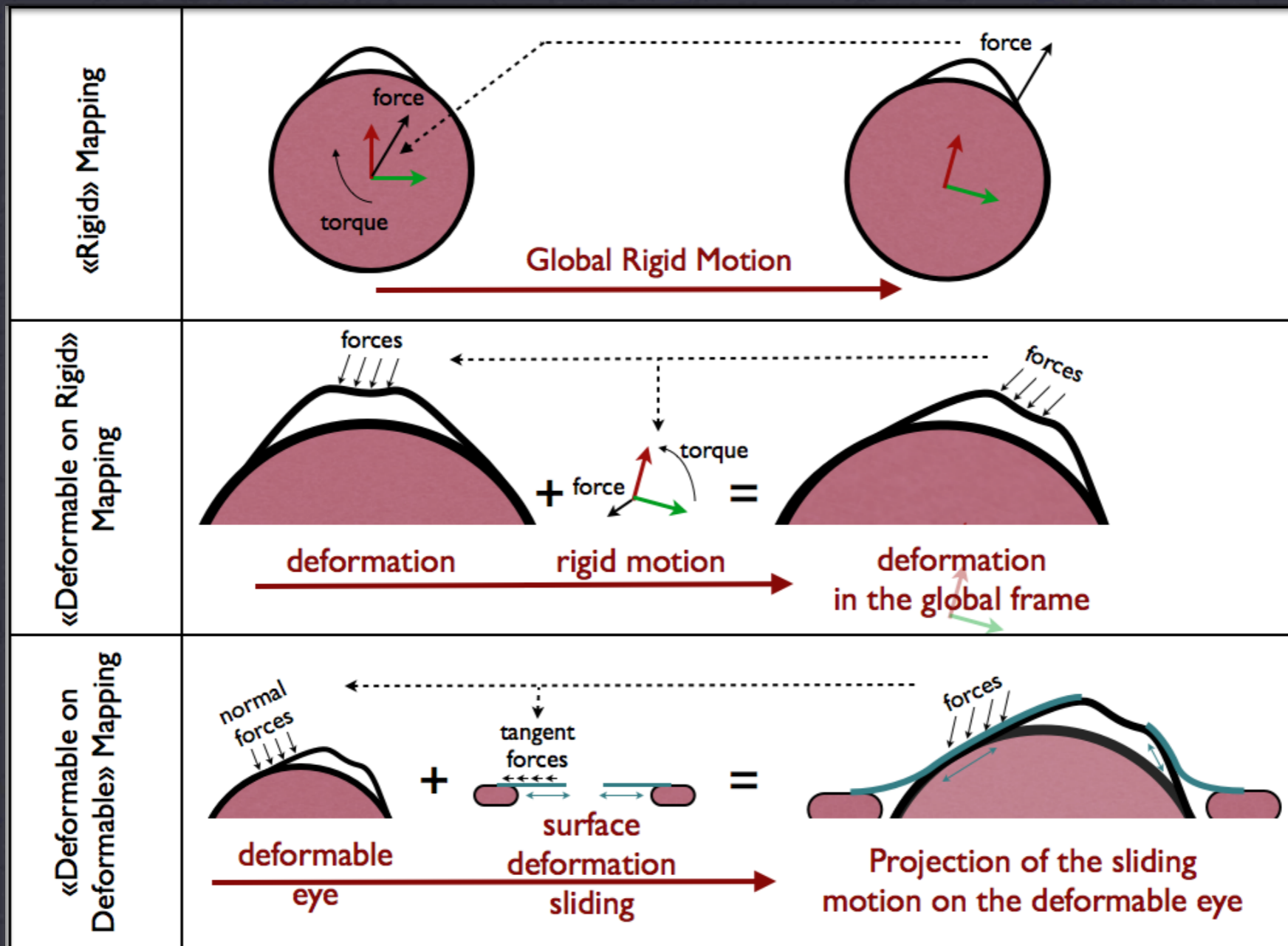
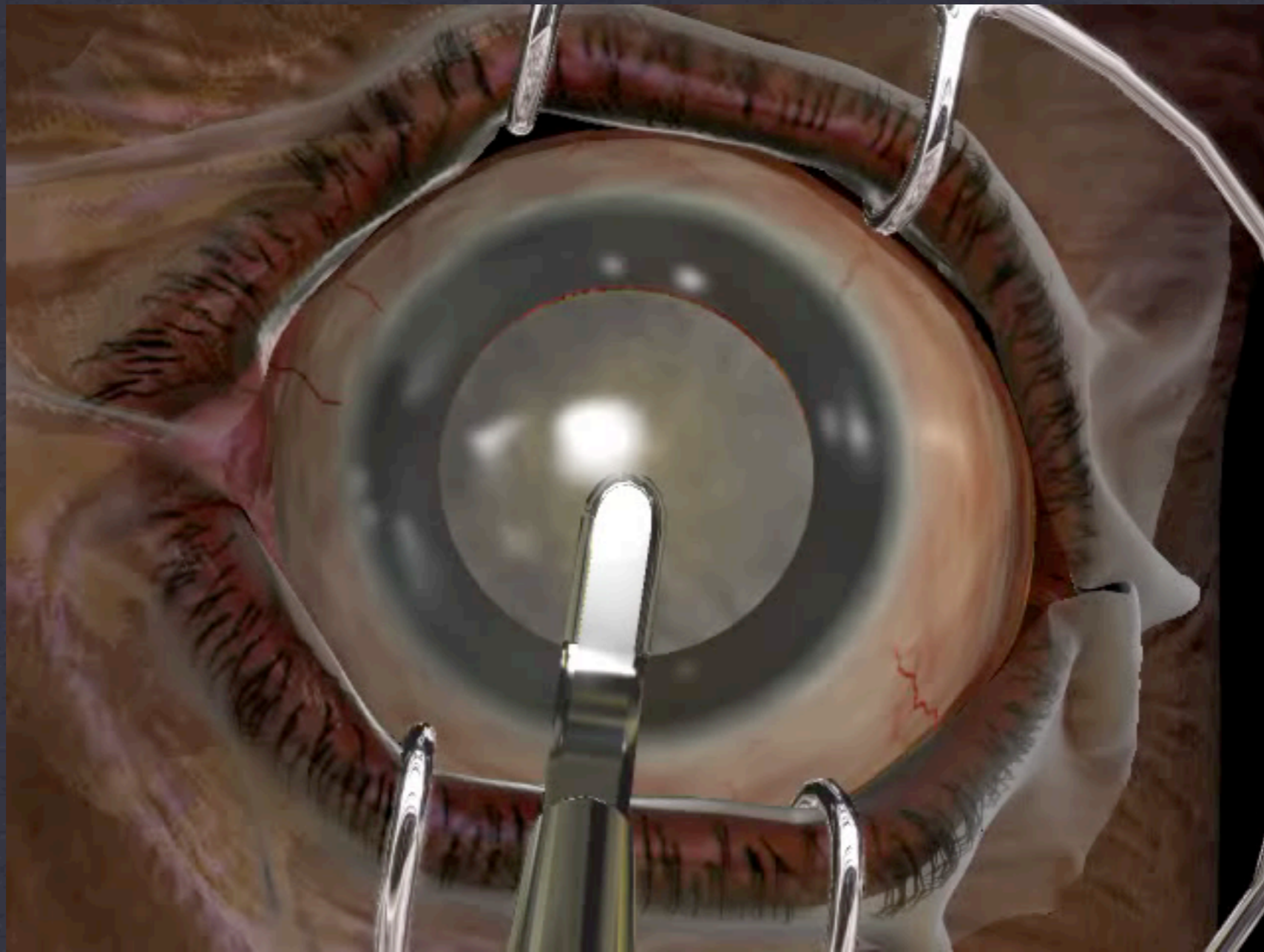


Figure 3 - Layered modeling approach using SOFA mechanical mappings

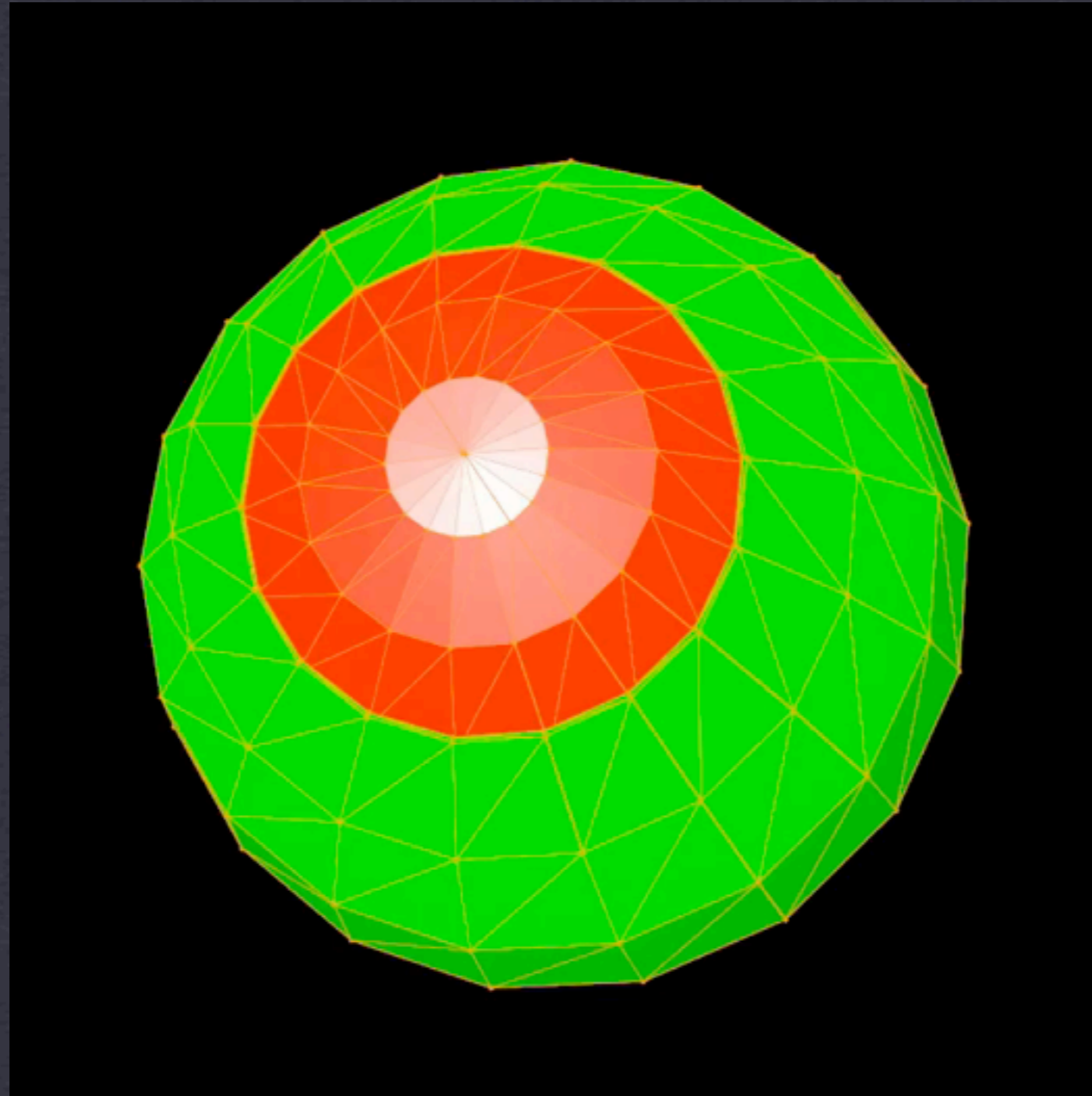
EYE MODEL

VERSION 2.0



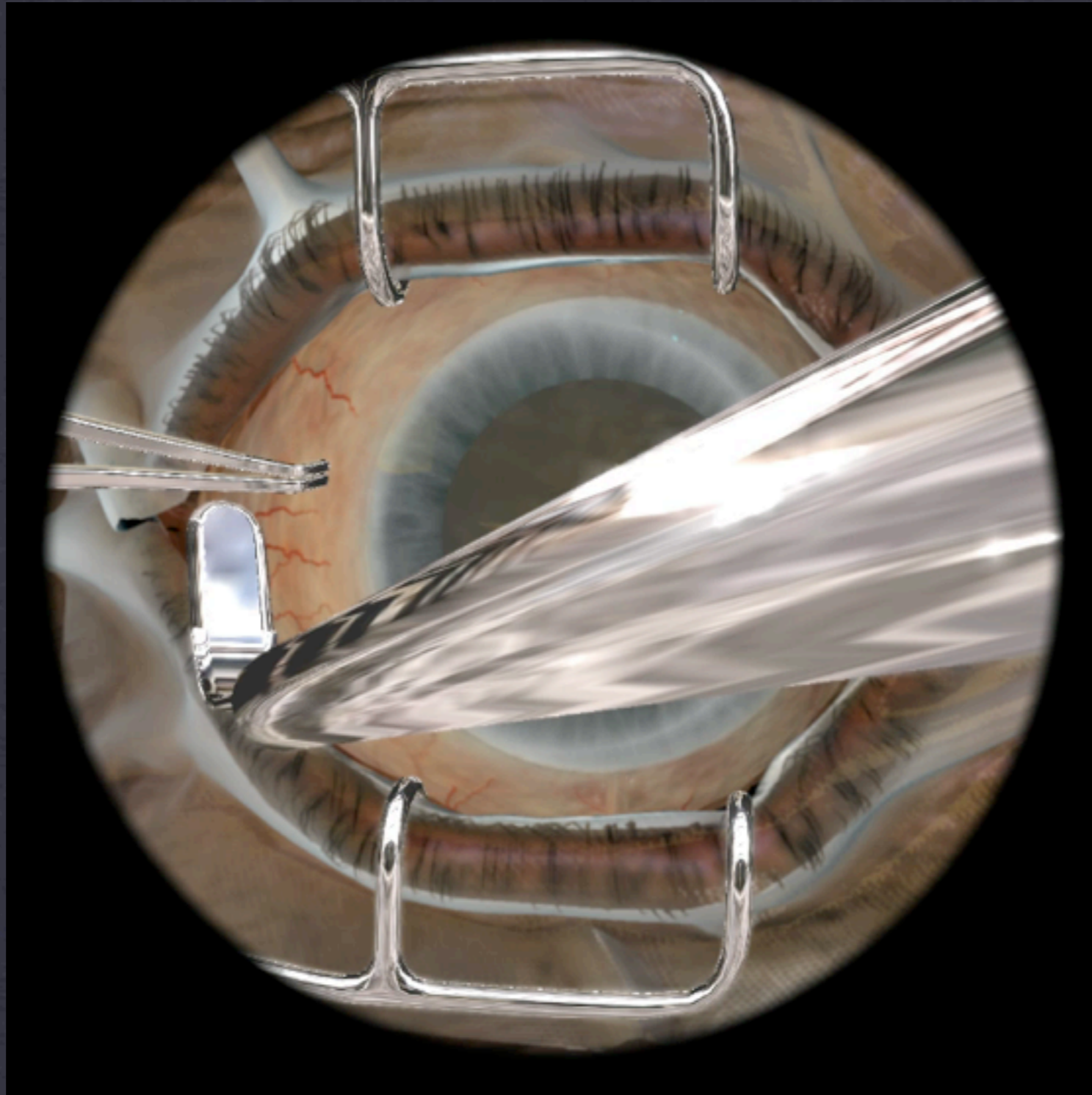
MULTI-MAPPING APPROACH

VERSION 2.0



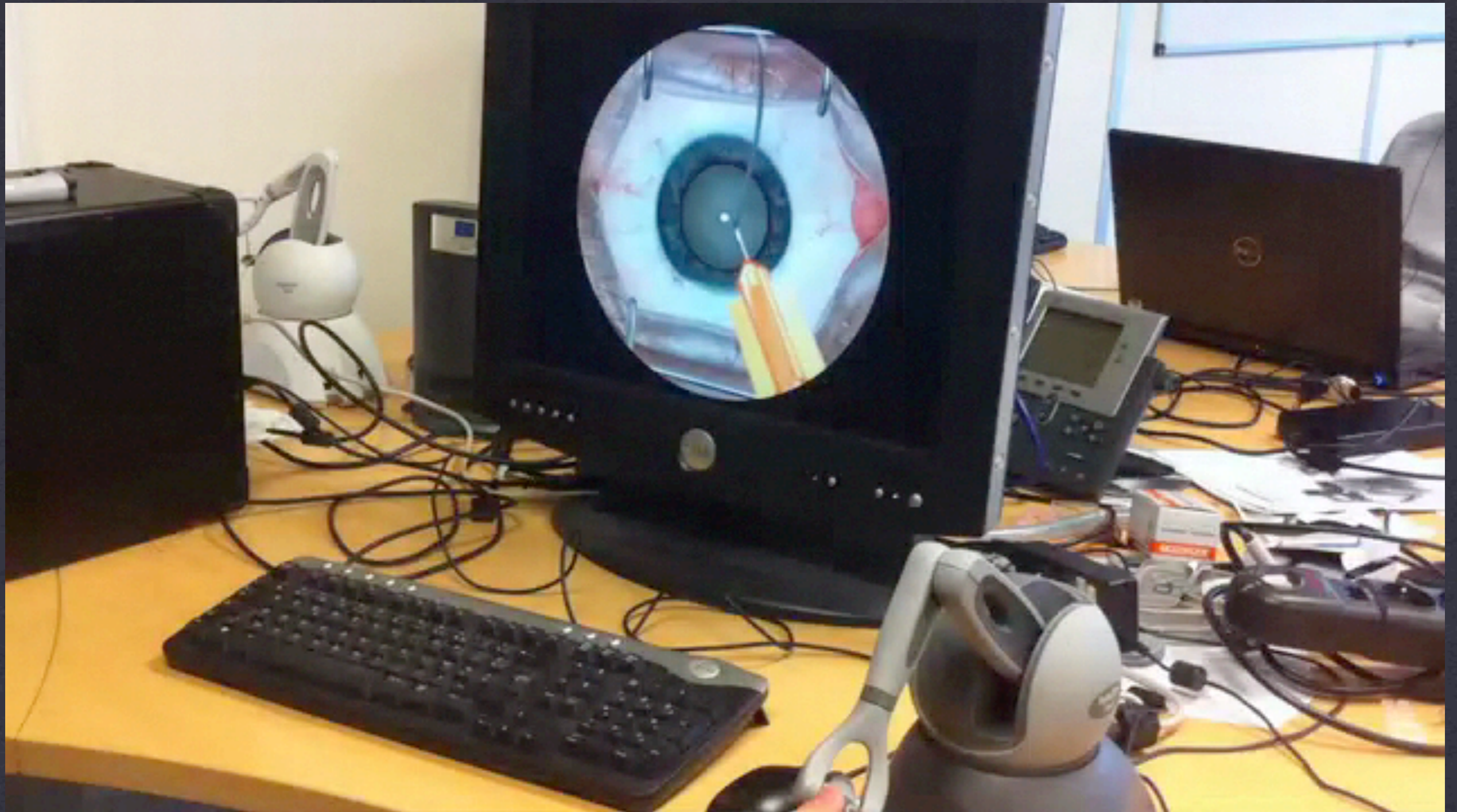
CONJONCTIVA CUTTING

VERSION 2.0



CONJONCTIVA CUTTING

VERSION 2.0



EYE MODEL

VERSION 3.0 (SHACRA - SENSEGRAPHIX)



MSICS Simulator Prototype
HelpMeSee Project - Moog/SenseGraphics/InSimo

EYE MODEL

VERSION 3.0 (SHACRA - SENSEGRAPHIX - MOOG)