



UNIVERSITÄT
BERN

FAST, PATIENT-SPECIFIC PLANNING OF CORNEAL SURGERY

Problem – Challenge

Every day, about 75'000 cataract operations take place worldwide; more than 90% of people over the age of 65, sooner or later, suffer from this condition. New technologies enable surgeons to go beyond simple visual rehabilitation by replacing the turbid lens: Refractive enhance-means in the course of surgery allow for correction of astigmatism, giving the patient a spectacle-free, clear vision.

Correction of astigmatism depends on the accuracy of the surgery, considering the individual properties of the cornea. Unfortunately, currently used planning methods of refractive cataract surgery are based on assuming a statistically averaged eye, which doesn't exist. Starting from a CTI funded project with the University of Bern, Optimo Medical AG decided to assume the challenge of personalized eye surgery planning.

Solution

Optimeyes™ is a highly innovative planning software for cataract surgery based on state-of-the-art finite element modelling of the cornea. Based on uploaded patient derived CT-data, the software readily generates a "digital twin" of the patient's eye.

The surgeon then conducts a virtual surgery on the digital twin before the actual operation. This allows him/her to know the optimal surgery parameters for astigmatism management to give the best post-cataract surgery result and eliminate blurred or reduced vision. This method enables patients to regain clear vision by not only get rid of cataract but also the ability to see clear again to e.g. read TV subtitles or drive a car at night.

Optimeyes™ is based on years of research performed at the University of Bern. The software kernel and a patent application on efficient computing of eye models were licensed in from the University of Bern (<http://www.optimo-medical.com>).

