Abstract:
This paper presents a novel augmented reality assistance platform for eye laser surgery. The aims of the proposed system are for the application of assisting eye doctors in pre-planning as well as providing guidance and protection during laser surgery. We developed algorithms to automatically register multi-modal images, detect macula and optic disc regions, and demarcate these as protected areas from laser surgery. The doctor will then be able to plan the laser treatment pre-surgery using the registered images and segmented regions. Thereafter, during live surgery, the system will automatically register and track the slit lamp video frames on the registered retina images, send appropriate warning when the laser is near protected areas, and disable the laser function when it points into the protected areas. The proposed system prototype can help doctors to speed up laser surgery with confidence without fearing that they may unintentionally fire laser in the protected areas.