



Computational and Mathematical Methods in Medicine

Special Issue on

Simulation and Analysis Methods in Ophthalmology

CALL FOR PAPERS

The eye is our most fascinating sensory organ providing us with visual impressions of our environment, allowing us to navigate or grasp emotions of our fellows. Disorders of the optical apparatus and the sensory structures of the eye often require sophisticated mathematical strategies. Typical applications are mathematical approaches for representing optical surfaces such as the human cornea, especially after surgical alterations such as keratoplasty. But also other fields require intelligent algorithms allowing automatic and objective screening, such as methods detecting retinal layers allowing automatic calculation of progression in glaucoma. Faster computers and cheaper camera systems have evolved into new technologies allowing digital marking and registration of ocular structures making manual marking obsolete in the future.

This special issue aims at the publication of high-quality research papers and review articles addressing current advancements in computational or mathematical methods in ophthalmology, ophthalmic optics, and vision research.

Potential topics include, but are not limited to:

- ▶ Methods representing optically refractive surfaces and their disorders
- ▶ Reconstruction of ocular structures in tomographic images
- ▶ Modelling of accommodation processes
- ▶ Modelling of aqueous fluid transport in vessels or implants or glaucoma valves
- ▶ Modelling of ocular tissue changes induced by surgical technique
- ▶ Image processing of retinal structures, such as segmentation of retinal layers or calculation of the retinal nerve fiber layer
- ▶ Descriptors and simulation methods for contact lenses, spectacle lenses, or intraocular implants
- ▶ Modelling of biomechanical properties of ocular tissue
- ▶ Modelling of drug/tissue interaction
- ▶ Algorithms for intraoperative eye-tracking and marking of ocular structures and implants

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