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An alternative mathematical algorithm for the photo- and videokeratoscope. (English)

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Nonlinear Anal., Real World Appl. 7, No. 5, 1223-1232 (2006).

Summary: Due to the resolution of current laser technology, the accuracy of corneal topography as measured by the videokeratoscope is no longer adequate to provide precise enough data for refractive surgery or for the fitting of customized contact lenses. We present an algorithm for recovering corneal topography that makes use of modern differential geometric techniques and numerical descent in Sobolev spaces. We believe this algorithm may be used with the photo- and videokeratoscope to increase the accuracy of the recovered corneal topography.

MSC:

34C60 Qualitative investigation and simulation of ordinary differential equation models
92C55 Biomedical imaging and signal processing

Keywords:

ophthalmology; photokeratoscope; videokeratoscope; corneal; modeling; topography; algorithm; Sobolev; steepest; descent; numerical; differential; geometry

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