TECHNOLOGY FACT SHEET

Optical Testing

Adelaide Research & Innovation

Description of Technology

The new sensor belongs to the Hartmann 'family' of optical sensors, which determine the refractive or reflective properties of an optic by measuring its effect on an optical wavefront. Unlike conventional Hartmann-type wavefront sensors, however, the results of the new sensor have absolute accuracy. The new sensor is self-calibrating. The new sensor has been tested using a variety of optics. Advantages of the differential Hartmann sensor are:

» Each measurement used for map is more precise than for competing techniques

» Each measurement is accurate

» System performance is optimized by ensuring high precision and accuracy over a (slightly) reduced number of measurement points rather then using more low-precision measurements and averaging to try to recover precision (Note that averaging can't recover accuracy)

» dHs provides an array of measurements that can be used to characterize shape of optical surface (cornea) or refractive error.

Commercial Applications

Primarily for testing of ophthalmic lenses this invention enables characterisation of the optical properties of the whole lenses at once, rather than current single point fashion. Process is more accurate, simpler and more precise. Absolute sensitivity is the key advantage of the product. Base algorithm could form the basis for a variety of dedicated instruments – each adapted for a specific set of needs. Areas could include development, production, pre-surgical, quality control and identity ie it has a broad potential utility. Immediate applications include intraocular, contact and spectacle lenses, mass produced disposable lenses and eye surgery sculpting. Opportunities include optical and laser systems and defence systems and there are many other areas including

» Characterization of lenses for optometry

» Product development and QA in lens manufacture

» Characterization of safety visors

» Characterization of mirrors eg for cars

» Laser beam characterization and active control

» Corneal topography

» Measurement and correction of optical aberrations in the human eye

» Wavefront sensing (Cornea), applicable to Lensmeters, autofractors and autoaberrators. These could be either stand alone or in part integrated.

Patent Status

Pending in Canada, Europe, New Zealand, Japan and US

Partnership Opportunities

Development of two initial prototypes is planned. These ideally would comprise a dedicated low cost instrument, and a flexible, more versatile higher cost instrument. The project will require investment by a medical device company prepared to support algorithm and programming development and system integration to realise proof of concept.

Key People

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