DEVELOPMENT OF DIGITAL IMAGE ACQUISITION SYSTEM FOR QUANTIFYING THE FORMATION OF CORNEAL ARCUS

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Abstract

The human eye is an organ which is composed of several parts with specific characteristics and function. One of those parts is Cornea. Cornea is a surface of the human eye that can be seen clearly. Cornea can be used for identify sign of an illness. In older people’s cornea may form a circular white ring around it, in medical term it is known as corneal arcus. Many studies mentioned that formation of corneal arcus is due to lipid deposition in human blood. Some diseases are directly related to corneal arcus like diabetes mellitus, and atherosclerosis. This research talk about development of optical metrology is performed by design of digital image acquisition system for the quantifying of cornea or formation of corneal arcus. This system may be used for study or further purpose research of development criteria diagnostic based on quantifying corneal arcus images. The system made of from webcam, google welding as housing and led for lightning. To obtain a good result an accurately quantify image this system is calibrated by many pattern like line and circular pattern. The data generated by the image acquisition system are uniform and calibrated to facilitate the process of identification and quantification. it was obtained that the average distance between the eye and the webcam is $4.607 \pm 0.103$ cm, with %RSD (relative standard deviation) of 2.242%. Around this average distance, the magnification will be $M = 0.105$. Using this magnification factor, the measurements
of test persons' corneal-ring diameter will produce very good accuracy, i.e. with error of 0 - 5 %.

**Keywords**: Cornea, magnification, optical metrology, webcam.