Measurement of the Anterior Chamber Depth in the Eye With the Optical Polarimetry System

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The polarization of light, a fundamental property, finds extensive utility in various applications, notably in the realm of optical polarimetry. This project presents a novel approach utilizing optical polarimetry for non-invasive glucose monitoring and anterior chamber depth measurement, thus addressing crucial healthcare needs in a socially relevant manner. Leveraging the optical activity property, our study proposes two measurement systems designed to accurately determine glucose concentration in ocular fluid, thereby facilitating efficient management of ocular complications. Furthermore, the determination of anterior chamber depth is paramount in various ophthalmic surgical interventions for diagnosing myopia, hyperopia and glaucoma. Traditional methods for measuring anterior chamber depth are often invasive, expensive, and time-consuming. By harnessing optical polarimetry principles, our second measurement system offers a non-invasive alternative for precisely estimating anterior chamber depth. This not only enhances surgical precision but also minimizes patient discomfort and reduces healthcare costs associated with invasive procedures. In conclusion, our research underscores the societal importance of advancing non-invasive diagnostic techniques, particularly in the context of managing prevalent chronic conditions. Our work aims to improve patient outcomes, enhance healthcare accessibility, and alleviate the burden on healthcare systems.Through innovative approaches to glucose monitoring and anterior chamber depth measurement, we envision a future where non-invasive diagnostic techniques contribute to improved patient care, enhanced surgical outcomes, and greater healthcare equity.

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