RV College of Engineering®
Mysore Road, RV Vidyaniketan Post,
Bengaluru - 560059, Karnataka, India

Department of Master of Computer Applications

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IV Semester - MCA491P Major Project

Intra Ocular Pressure measuring for Glaucoma diagnosis using digital image processing techniques

Goutam Narasimha Hegde (1RV22MC034)

The major purpose of this project is to develop a diagnostic tool that can detect and measure intra-ocular pressure of the human eye by analysing fundus images using image processing techniques. Increased intra-ocular pressure causes eye disease named glaucoma, which if not treated at the correct time, affects vision and can even lead to vision loss. The present diagnosis of glaucoma is based on clinical examination and imaging. These methods take more time and also are dependent on human judgement. In order to overcome these challenges, the project will be utilising automated image processing methods to analyse retinal fundus images and measures intra ocular pressure. The ability of the technology to make people lives better by contributing in the field of ophthalmology is the motivation for this project.

The image processing methodology will be employed in this project. Python will be used as programming language, OpenCV library will be used for image processing and feature extraction. Machine learning frameworks are used for classification of intra ocular pressure and detection of glaucoma. There are different modules in the project which include image acquisition, preprocessing, feature extraction and pressure prediction. In image acquisition module, gathering a dataset of fundus images takes place. Preprocessing module improves the quality of the images by applying noise reduction, contrast adjustment etc. In feature extraction module identification and selection of important indicators contributing to intra ocular pressure such as the position of optic disc and cup takes place. Finally, prediction module will utilize machine learning models to predict intra ocular pressure based on extracted features.

The expected result of this project is a diagnostic system that can effectively analyse fundus images and predicts the amount of intra ocular pressure and there by detect the condition of glaucoma. The system will be designed to reach better accuracy rate with optimal features and to reduce the time and effort needed in comparison to traditional manual techniques. The effectiveness and dependability of the tool will be evaluated using experimental data. This project will contribute in betterment of glaucoma diagnosis by predicting the intra ocular pressure, thus assisting in early identification and treatment of the disease to prevent vision loss.

Under the guidance of
Dr. Preethi N Patil
Assistant Professor
Dept of MCA