

**A PROJECT REPORT ON**  
**AUTOMATED DETECTION OF GLAUCOMA STAGES**  
**FROM RETINAL FUNDUS IMAGES USING SVM**  
**CLASSIFIER**

**Submitted in partial fulfilment of the Requirement for the award of  
the degree of**

**BACHELOR OF TECHNOLOGY**  
**IN**  
**ELECTRONICS AND COMMUNICATION ENGINEERING**

*Submitted by*

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**DEPARTMENT OF ELECTRONICS AND COMMUNICATION  
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**RAJEEV GANDHI MEMORIAL COLLEGE OF  
ENGINEERING AND TECHONOLOGY**  
**Autonomous**

Affiliated to J.N.T.U.A- Anantapuramu, Approved by A.I.C.T.E., New Delhi,

Accredited By N.B.A & NAAC with 'A+' Grade, New Delhi,

NANDYAL – 518501, Kurnool (Dt), A.P.

**YEAR: 2018-2022**

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**CERTIFICATE**

This is to certify that the desertion entitled **“AUTOMATED DETECTION OF GLAUCOMA STAGES FROM RETINAL FUNDUS IMAGES USING SVM CLASSIFIER”** that is being submitted by **V.THARUN KUMAR REDDY (18091A04M8), K.ANIL KUMAR (18091A0409), G. RAHUL (18091A04E8), M. MEGHANATH REDDY (18091A04A4)** Under the guidance of **Dr.N.RAMANJANEYULU** for Project of the award of B.Tech Degree in **ELECTRONICS COMMUNICATIONS AND ENGINEERING** in the **RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING & TECHNOLOGY, Nandyal Affiliated to J.N.T. University Anantapur** is a record of bonafied work carried out by them under our guidance and supervision.

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## **CANDIDATE'S DECLARATION**

We hereby declare that the work done in this major project titled "AUTOMATED DETECTION OF GLAUCOMA STAGES FROM RETINAL FUNDUS IMAGES USING SVM CLASSIFIER" submitted towards completion of major project in IV-year second semester of B. Tech (ECE) at the Rajeev Gandhi Memorial College of Engineering and Technology, Nandyal. It is an authentic record of our original work done under the guidance of Dr.N.RAMANJANEYULU, Assoc. Professor, Dept. of ECE, RGM CET, Nandyal. We have not submitted the matter embodied in this major project for the award of any other degree in any other institution.

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## ACKNOWLEDGEMENT

We manifest our heartier thankfulness pertaining to your contentment over our project guide **Dr. N. RAMANJANEYULU GARU**, Assistant Professor of Electronics and Communication Engineering department, with whose adroit concomitance the excellence has been exemplified in bringing out this project to work with artistry.

We express our gratitude to **Dr. K. MALLIKARJUNA GARU**, Head of the Department of Electronics and communication Engineering department, all teaching and nonteaching staff of the Electronic and communication engineering department of Rajeev Gandhi memorial College of Engineering and Technology for providing continuous encouragement and cooperation at various steps of our project.

Involuntarily, we are perspicuous to divulge our sincere gratefulness to our Principal, **Dr. T. JAYACHANDRA PRASAD GARU**, who has been observed posing valiance in abundance towards our individuality to acknowledge our project work tangentially.

At the outset we thank our honourable Chairman **Dr. M. SANTHI RAMUDU GARU**, for providing us with exceptional faculty and moral support throughout the course.

Finally, we extend our sincere thanks to all the **Staff Members** of ECE Department who have co-operated and encouraged us in making our project successful.

Whatever one does, whatever one achieves, the first credit goes to the **Parents** be it not for their love and affection, nothing would have been responsible. We see in every good that happens to us their love and blessings.

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## **ABSTRACT**

Glaucoma is one of the leading causes of irreversible vision loss, it progresses gradually without easily noticeable symptoms. The detection of glaucoma in the early stage is crucial as it may help to decelerate the progress. The traditional instrument methods are manual, time-consuming and less accurate. Hence, the automated diagnosis of glaucoma is needed for detection of glaucoma in the early stage with high accuracy. The flexible analytic wavelet transforms (FAWT) based novel method has been proposed for the classification of glaucoma stages. In the proposed method, FAWT has been used to decompose the pre-processed images into various sub-band images. Then, Relief and sequential box-counting (SBC) algorithms are applied to extract the various entropies and fractal dimension (FD) based features, respectively.

Further, the extracted feature values are ranked using Fisher's linear discriminant analysis (LDA) dimensionally reduction. Finally, the higher rank features have been used for the classification of glaucoma stages using least squares-support vector machine (LS-SVM) classifier. The proposed method has been evaluated on publicly available large and diverse glaucoma database. The classification accuracy of the proposed method is 93.40% using tenfold cross validation. The proposed method has demonstrated better performance for glaucoma classification as compared to the existing methods. The proposed method is ready to help the ophthalmologist in their daily screening for glaucoma detection