

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY  
BELGAUM, KARNATAKA- 590014**



**A PROJECT REPORT ON  
VISITOR FACE AUTHENTICATION USING OPEN-CV**

**Submitted in partial fulfillment for the award of Degree of,**

**BACHELOR OF ENGINEERING  
IN  
INFORMATION SCIENCE AND ENGINEERING**

**By**

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# ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

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## CERTIFICATE

This is to certify that the project entitled **"VISITOR FACE AUTHENTICATION USING OPEN-CV"** has been successfully completed by

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the bonafide students OF DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING, Alva's Institute of Engineering and Technology, Moodbidri affiliated to VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI during the academic year 2023-24. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed in partial fulfillment of awarding Bachelor of Engineering degree.

  
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## ABSTRACT

In today's security landscape, the need for efficient and reliable visitor face authentication systems is paramount. The research introduces an innovative methodology for visitor face authentication using OpenCV (Open Source Computer Vision Library) in conjunction with Histogram of Oriented Gradients (HOG) features. Face authentication serves as a critical component of security protocols, ensuring that only authorized individuals gain access to restricted areas or sensitive information. The proposed system capitalizes on the strengths of OpenCV, a versatile and widely used computer vision library, to detect faces accurately and efficiently in input images or video streams. Upon face detection, the system employs HOG features to encode the distinctive characteristics of each detected face. HOG features capture the local gradient information within facial regions, enabling robust representation of facial structures irrespective of variations in lighting conditions, facial expressions, or pose. These features serve as the foundation for visitor authentication, facilitating the recognition of authorized individuals within the captured data. To achieve visitor authentication, a supervised learning approach is employed, wherein a classifier, such as Support Vector Machines (SVM), is trained on a labeled dataset of facial images. During the training phase, the classifier learns to distinguish between faces of authorized visitors and those of unauthorized individuals based on their HOG feature representations. Once trained, the classifier can effectively categorize new facial inputs and determine whether the visitor should be granted access. Experimental evaluations demonstrate the efficacy and efficiency of the proposed visitor face authentication system. Real-time scenarios are simulated to assess the system's performance in practical settings, considering factors such as computational speed, accuracy, and robustness against variations in environmental conditions. The results showcase the system's ability to accurately authenticate visitors while maintaining low processing overhead, making it suitable for deployment in a variety of security-sensitive applications. Overall, the integration of OpenCV and HOG features offers a promising solution for enhancing visitor authentication systems. By leveraging the capabilities of these technologies, organizations can bolster their security measures while ensuring seamless and efficient access control for authorized visitors.