Drugged Eye Detection Using Image Processing

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Abstract- *The project has entitled as "DRUGGED EYE DETECTION USING IMAGE PROCESSING", and developed by using Python as front end. Drugs are a major problem in economic and many losses in worldwide. In this project, introduces an innovative approach utilizing image processing techniques to detect drug consumption through analysis of eye images. Traditional methods relying on manual observation by experts are often costly and time-consuming, especially in remote areas. By leveraging deep learning, particularly convolutional neural networks (CNNs), the system aims to automate the detection process, overcoming challenges such as variability in eye appearance and the presence of red areas. The methodology involves preprocessing and segmentation of eye images, followed by feature extraction and classification using CNNs. By accurately identifying features indicative of drug consumption, the system aims to provide a reliable and efficient solution for detecting drugged eyes, potentially mitigating losses across various industries impacted by drug abuse. In addressing the limitations of current detection methods, the proposed project offers a promising solution that could significantly enhance the efficiency and accuracy of drugged eye detection. Through comprehensive data preprocessing, feature extraction, and classification utilizing CNNs, the system aims to provide rapid and precise identification of drug consumption symptoms in eye images. By automating the detection process, the system not only reduces reliance on expensive expert consultations but also enables timely intervention to prevent potential losses in industrial sectors. With future enhancements focusing on web integration and further refinement of machine learning algorithms, the proposed system holds substantial potential in advancing the field of drug consumption detection, ultimately contributing to public health and safety initiatives.*

Keywords- CNN, Image Processing, Automatic identification, Colour models.

I. INTRODUCTION

The classical approach for detection and identification of drugged eyes is based on the naked eye observation by the experts. In some developing countries, consulting experts are expensive and time consuming due to the distant locations of their availability. Automatic detection of drugged eye is essential to automatically detect the symptoms of drug consumers. Drugs can cause major losses in many industrial fields. To know what control factors to take next year to avoid losses, it is crucial to recognize what is being observed. However, detection of defects is still problematic due to natural variability of white area of eye in different types of eyes, high variance of defect types, and presence of red area. The studies of eye can be determined by apparent patterns of specific types and it is critical to monitor reddish area within an eye. Deep learning, also called neural networks, is a subset of machine learning that uses a model of computing that's very much inspired by the structure of the eye. Deep learning is already working in Google search and in image search; it allows you to image-search a term like 'hug.' It's used to getting you Smart Replies to your Gmail. It's in speech and vision. It will soon be used in machine translation, I believe." said Geoffrey Hinton, considered the Godfather of neural networks. Deep Learning models, with their multi-level structures, as shown above, are very helpful in extracting complicated information from input images. Convolutional neural networks are also able to drastically reduce computation time by taking advantage of GPU for computation which many networks fail to utilize. Image classification using CNN is most effective. First and foremost, we need a set of images. In this case, we take images of eyes, as our initial training data set. The most common image data input parameters are the number of images, image dimensions, number of channels, and number of levels per pixel.

1.1 Objectives

- To give eye image input as well as with drug consuming can be given for finding the name of disease.
- To initiate the given input image for image processing.
- To convert the RGB image into binary format to make sure it is drugged.
- To highlight the reddish area of eye.
- To apply the training image set to find the drug consumed eye.
- To provide accurate result about the given input image.

II. LITERATURE SURVEY

Gür Emre Güraksın et.al., [1] Proposed an eye state recognition system, spanning fatigue detection, gaze recognition, liveness detection, and eye fatigue assessment. It emphasizes the reliance on computer vision systems for assessing eye movement, gaze, and blink status, favouring behavior-based approaches for their reliability and non-invasiveness. Advancements in face and eye recognition, artificial intelligence, feature extraction, and deep learning significantly influence system development. Early literature is categorized into feature-based, motion-based, and appearance-based methods, with a preference for view-based techniques due to superior performance. Challenges such as variability in defining eye conditions and computational demands lead to the exploration of vision-based classification techniques. The text addresses the importance of evaluating vision-based algorithms across domains, considering accuracy and computational complexity trade-offs. Speed performance is highlighted, particularly for real-time applications, and the Pop-EYE dataset is introduced for evaluation. Overall, the text underscores the significance of eye state recognition, identifies challenges, outlines study objectives, and stresses the importance of evaluating classification algorithms for accuracy and efficiency.

Giovanni Gibertoni et.al., [2] explores the importance of driver fatigue detection for road safety, favouring behavior-based methods, particularly those leveraging computer vision systems. Recent advancements in face and eye recognition, artificial intelligence, and deep learning have significantly advanced eye state recognition. Challenges such as environmental factors led to the adoption of AI techniques like AdaBoost and support vector machines, initially requiring manual feature extraction. However, deep learning has emerged as a transformative development, eliminating the need for manual feature extraction and achieving superior performance. Various studies have utilized AI algorithms like SVM and AdaBoost with features such as HOG, Gabor wavelets, and LBP for drowsiness detection and driver safety, achieving high accuracy. Overall, eye state recognition plays a critical role in ensuring user well-being and road safety, evolving from traditional feature-based methods to deep learning approaches, enhancing system accuracy and efficiency.

In this paper, Anil K et.al., [3] proposed a widespread adoption of biometric recognition due to its high accuracy and user convenience. However, concerns remain regarding privacy, security, bias, and the transparency of decision-making in recognition systems. Developers have outlined efforts to address these concerns, highlighting the need for continued attention. They emphasize the importance of resolving configuration issues within biometric systems to enhance security, fairness, and trust. Biometric recognition is increasingly crucial for various applications such as public ID cards, access control, and payments. The technology has advanced to the point where it can surpass human recognition accuracy in certain situations, indicating its significance in modern identity verification systems.

Andrea Rodenbeck et.al., [4] explaining the significant impact of shift work on physical and mental health, particularly sleep issues and alcohol consumption as a coping mechanism. A comprehensive review examined 14 articles, revealing a link between shift work and alcohol use, especially among healthcare professionals. However, conflicting or negative results were also found, indicating the complexity of this relationship. The review highlights the prevalence of sleep problems, fatigue, and psychosocial stress among shift workers, leading to an investigation of alcohol abuse as a potential outcome. Regional variations in alcohol consumption rates are noted, suggesting a need for better understanding in countries with widespread acceptance of alcohol. Newer studies show higher odds of alcohol use among shift workers, especially among certain professions and older female workers. Despite limitations in existing research, evidence suggests a likely association between shift work and alcohol consumption, particularly as a form of self-medication for sleep problems. Recommendations include incorporating sleep education into health promotion programs for shift workers to address potential health risks associated with alcohol abuse and sleep problems. These findings underscore the importance of implementing preventive measures and coping strategies for sleep disorders and fatigue in industries and healthcare settings with shift labor.

In this work, Akanksha Joshi et.al., [5] discusses the preliminary temperature changes observed on the eyes of drunk and sober individuals, indicating a contrast in temperature between the iris and sclera after alcohol consumption. Biometrics, including facial and iris recognition, is crucial in various applications such as medicine, finance, and security. While visible light face recognition faces challenges due to lighting conditions, emphasis is now placed on gathering data from faces in the thermal infrared spectrum. Results show that alcohol consumption leads to sclera warming while the iris remains relatively unchanged in temperature, resulting in darker iris appearance in thermal images. Iris recognition algorithms are highlighted for their accuracy and security, with a low false match rate. The importance of high-resolution iris images and monochrome CCD cameras in the near-infrared range is emphasized for accurate iris recognition. The technical aspects of capturing

and processing iris images for recognition purposes are discussed, highlighting the reliability and uniqueness of iris recognition as a method for individual identification.

In this study, Ajay Kumar et.al., [6] The paragraph discusses a comparative study of iris verification methods, focusing on Log Gabor, Haar wavelet, DCT, and FFT-based features. Results suggest that the combination of Haar wavelet and Log Gabor channel-based phase encoding shows the most promising performance among the four approaches considered. Combining these two methods leads to significant performance improvement and lower computational complexity. Experimental findings from datasets such as IITD v1 and CASIA v3 demonstrate enhanced performance, particularly with Log Gabor and Haar wavelet methods. Additionally, the study explores the potential performance enhancement through score-level fusion, highlighting the effectiveness of combining Log Gabor and Haar wavelet matching scores using a weighted sum rule. Overall, the research contributes to advancing iris identification methods and optimizing performance through feature combination and fusion techniques.

In this research, Adam Czajka [7] claim that novel method for eye liveness detection based on pupil dynamics, enhancing iris recognition system security by detecting presentation attacks. Utilizing a proprietary iris capture device, 204 observations for 26 subjects were obtained, capturing spontaneous pupil movements and reactions to light changes. Employing the Kohn and Clynes pupil dynamics model, each observation is transformed into a feature space defined by model parameters. Linear and non-linear Support Vector Machines are used for classification, showing optimal performance in distinguishing normal reactions from spontaneous movements with a minimum observation time of 3 seconds. However, limitations include potential time constraints and inadequate exploration of pupil dynamics variability across populations, impacting real-world applicability. Despite constraints, the method's sensitivity to dynamic features presents opportunities for enhancing Presentation Attack Detection (PAD) systems.

In this study, Ali Farhadi et.al., [8] The discussing the YOLO object detection framework, highlighting its efficient localization approach by treating object detection as a regression problem. YOLO directly predicts class probabilities and bounding box coordinates from image pixels, ensuring real-time predictions with high speed and accuracy. Its rapid processing capabilities make it suitable for tasks like autonomous driving and real-time video analysis. YOLO's global reasoning ability enables comprehensive image analysis during both training and testing, reducing errors associated with background patches. It demonstrates strong generalizability across diverse domains, excelling in various image types, including artwork and natural scenes. Despite potential accuracy trade-offs, YOLO's speed and adaptability make it valuable for applications requiring prompt object detection. Additionally, its provision of open-source resources facilitates widespread adoption and development within the computer vision community.

Peter Corke, [9] In this study, The Robotics, Vision & Control: Fundamental Algorithms in MATLAB" centers around giving a complete outline of fundamental ideas and calculations in the field of advanced mechanics and PC vision utilizing the MATLAB programming climate. Composed by Peter Corke, a main master in advanced mechanics, this book fills in as an amazing asset for the two amateurs and experienced experts hoping to figure out the basic standards and commonsense uses of advanced mechanics and PC vision. It covers visual perception, image processing, and machine vision, in addition to kinematics, dynamics, and control of robots. It offers an involved methodology, stressing the execution of calculations and ideas in MATLAB, making it a useful aide for pursuers to explore and learn. The blend of hypothesis and commonsense models permits pursuers to acquire a profound comprehension of the topic while likewise fostering the fundamental abilities to apply these standards in certifiable mechanical technology and vision projects. With its broad inclusion and MATLABbased approach, "Advanced mechanics, Vision and Control “is an important asset for understudies, specialists, and experts trying to investigate the center calculations and methods that support the fields of mechanical technology also, PC vision.

John Daugman, [10] has proposed a significance of automated person recognition and presents iris patterns as a viable approach to address this challenge. It highlights the key issue in pattern recognition, such as face recognition, which involves managing both intra-class and inter-class variations. Iris patterns are identified as promising due to their unique characteristics: they can be captured at short distances, remain stable over time, are relatively unaffected by lighting and viewing angle changes, and contain rich and distinctive features. The paragraph also mentions algorithms for encoding and recognizing iris patterns, emphasizing their high accuracy rates. The process of iris recognition involves various steps, including image focusing, iris and pupil boundary detection, and the use of specialized operators for precise boundary estimation. Additionally, the paragraph discusses limitations related to eyelid boundaries and underscores the advantages of iris recognition as a robust method for individual identification, thanks to the iris's unique properties. Overall, it

provides insights into the technical aspects of capturing and processing iris images for recognition purposes.

The graphical representation below in Figure.1 presents the accuracy of different methods in the detection of drugged eye based on the study.

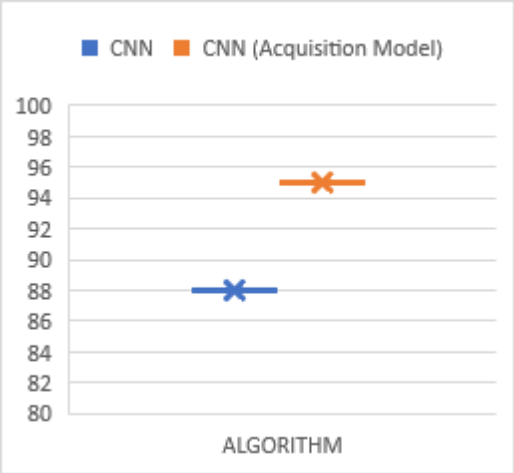

Figure 1. Comparison Graph

III. PROPOSED SYSTEM

In tackling the drugged eye detection problem, achieving precise image segmentation is crucial. Without accurate segmentation, the features of non-infected regions can overshadow the features of the reddish, infected region. It utilizes Convolutional Neural Networks (CNN) in image processing to effectively detect and delineate the region of red, which corresponds to the infected part of the eye. By focusing on this segmentation process, the system can better isolate and analyze the areas of interest. Once the image is processed, features are extracted from the segmented eye region. These features contain vital information about the infected area, which is then used for training and classification. Leveraging the capabilities of CNNs for image analysis and feature extraction ensures that the system can provide precise and accurate results when identifying the drugged eyes, aiding in effective diagnosis and treatment.

3.1 Advantages of Proposed System

- Accuracy is high.
- Enhancing the value of drugged eye detection.
- It takes few seconds to provide exact result.
- Result is provided with high accuracy rate.
- Applicable for both low and high pixel images.

IV. DISCUSSION

The research presented in this study addresses the detection of drugged eyes using image processing methodologies, leveraging techniques such as image acquisition, preprocessing, segmentation, applying training datasets, and analyzing experimental results. The methodology begins with image acquisition, where sample images of eyes exhibiting signs of drug consumption are collected. These images undergo preprocessing, including resizing and noise reduction, to improve quality and enhance the accuracy of subsequent analysis. Image segmentation techniques are then applied to isolate relevant features of the eyes, such as reddish discoloration associated with drug consumption. Applying training datasets involves categorizing the segmented images and creating sets for experimentation, ensuring randomness in the selection process. The experimental results focus on identifying drugged eyes accurately, considering parameters such as the presence of reddish areas and the stage of drug consumption. The shuffling of training files and multiple verification tests are conducted to validate the accuracy of the detection model. This comprehensive approach highlights the effectiveness of image processing methodologies in detecting signs of drug consumption in eye images. Furthermore, the adaptability of these techniques allows for potential applications across various imaging modalities and scenarios, emphasizing their importance in addressing public health concerns related to drug abuse detection.

V. FUTURE WORK

Future of this project can be easily updated. To achieve the benefits that expected from the user must understand the overall system and they must be able to carry out their specific tasks effectively. The successful implementation depends upon the right people at the right time.

- The application become useful if the below enhancements are made in future.
  1. If the application is designed as web service, it can be integrated in many web sites.
  2. More accuracy can be detected using various machine learning algorithms
- The application is developed such that above said enhancements can be integrated with current modules.

VI. CONCLUSION

An image processing-based arrangement is proposed and assessed in this task for the discovery of Drug consumed eye. The suggested method consists mostly of three steps. In

the initial step picture division is performed utilizing convolutional brain network method. There are rose patches in the second stage. The third step involves ordering and preparation. It would likewise elevate to ensure the approved people were sedated or not and decrease loss of modern misfortunes because of medication shoppers. The main goal of our effort is to make drugged eye detection more valuable.

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