

ADAS: DESIGN AND DEVELOPMENT OF A DRIVER DROWSINESS AND ALCOHOL DETECTION SYSTEM

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ABSTRACT

Traffic accidents remain a major issue in many countries, including Indonesia. These accidents are often caused by human error, such as driver fatigue or excessive alcohol consumption. Therefore, a system to detect drowsiness and alcohol in drivers is urgently needed. In this study, a drowsiness detection system is developed using the YOLOv5 (You Only Look Once version 5) algorithm to analyze the driver's facial expressions and identify signs of drowsiness based on eye blinking patterns, head position, and mouth movements. Meanwhile, alcohol detection is conducted using the MQ-3 sensor. Both systems are controlled by a Raspberry Pi, which acts as the data processing center. The average success rate for detecting alert faces is 87.6%, while the detection rate for drowsy faces reaches 85.3%. The optimal detection distance is 50–70 cm, with ideal lighting intensity above 30 lux. The alcohol detection system achieved a 100% success rate, demonstrating the high sensitivity of the MQ-3 sensor in detecting alcohol presence

Keywords: Drowsiness detection, YOLOv5, MQ-3 sensor, Raspberry Pi 5