

ABSTRACT

The increasing use of digital devices has caused significant impacts on eye health, particularly the emergence of Computer Vision Syndrome (CVS). Reports indicate that 97% of computer users in Indonesia experience CVS symptoms, including eye fatigue, tension, and visual disturbances resulting from prolonged digital screen exposure. This condition requires serious attention to prevent potential long-term eye health damage.

The research aims to develop an early detection system for CVS symptoms using computer vision technology by implementing a Convolutional Neural Network (CNN) integrated with Eye Aspect Ratio (EAR) and Percentage of Eye Closure (PERCLOS) methods. Through this innovative approach, the research seeks to create a real-time solution for detecting eye fatigue and providing early warnings to users. The research methodology includes image and video data collection, eye blink pattern analysis, and system evaluation using accuracy, precision, and F1-score metrics. The developed model demonstrates an impressive 99.61% accuracy, indicating significant potential for implementation in web-based applications for continuous eye health monitoring.

Keywords -- Computer Vision Syndrome, Convolutional Neural Network , Eye Aspect Ratio, PERCLOS, System Detection Development.