A FACIAL RECOGNITION SYSTEM USING A COMBINATION OF YOLOV8, ARCFACE, AND SVM FOR NON-CONTACT EMPLOYEE ATTENDANCE

(Case Study: GKST Sinar Kasih Hospital, Tentena)

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ABSTRACT

This research develops an automatic attendance system based on facial recognition to address the limitations of manual systems, which are prone to manipulation and time-consuming. The primary focus is to optimise the system for surveillance cameras installed at 3 meters, integrating YOLOv8m as the face detector, ArcFace for 512-dimensional feature extraction, and a polynomial kernel SVM for identification. The dataset comprises five individuals and is augmented 20-fold per image, then split into training (70%) and test (30%) sets. The preprocessing stage includes CLAHE, denoising, and sharpening to enhance image quality. Evaluation results demonstrate competitive performance, with an accuracy of 93.7%, precision of 0.938, recall of 0.937, and an F1 score of 0.935. PCA and confusion matrix analyses reveal that the primary misclassification occurs between two classes with high feature similarity: E005_employee5 and E002_employee2. Regarding efficiency, the system achieves 7.2 FPS on the test device. These results indicate that the system is both accurate and practical for real-world applications, although real-time performance depends heavily on the hardware used.

Keywords: Deep Learning; Facial Recognition; YOLOv8; ArcFace; Support Vector Machine.