ABSTRAK

PERBANDINGAN ALGORITMA *PRINCIPAL COMPONENT ANALYSIS* DAN *LOCAL BINARY PATTERN* UNTUK EKSTRAKSI CIRI PADA SISTEM PENGENALAN WAJAH

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Sistem pengenalan wajah telah banyak dimanfaatkan pada bidang keamanan. *library* OpenCV dapat dimanfaatkan untuk pembangunan sistem ini, seperti dilakukan penelitian sebelumnya tentang penggunaan dan perbandingan algoritma pengenalan wajah terhadap perancangan aplikasi dan skenario yang didapat kurang sesuai dengan pengujian yang dilakukan. Oleh karena itu peneliti akan membandingkan algoritma ekstraksi ciri pengenalan wajah menggunakan bahasa pemrograman java. Analisis ini menggunakan algoritma *Principal Component Analysis* dan *Local Binary Pattern*, algoritma diuji terhadap beberapa skenario perbedaan cahaya matahari dan lampu, objek menghadap kamera dan tidak menghadap kamera. Sampel data pengujian dilakukan terhadap 4 orang dengan menggunakan *video file* atau *frame* berjumlah 70 untuk dikenali wajah, kemudian dilakukan perbandingan algoritma dan hasil yang lebih efisien akan diimplementasikan menggunakan video *real-time.* Hasil penelitian menunjukkan bahwa algoritma *Local Binary Pattern* pada skenario objek menghadap kamera dengan pencahayaan matahari di ruangan memiliki nilai akurasi 98,59 %, waktu pengenalan 812,817 milidetik, FAR 1,41 % dan FRR 0 %, sedangkan pada *Principal Component Analysis* akurasi 98,59 %, waktu pengenalan 1275,761 milidetik, FAR 1,41 % dan FRR 0 %. Berdasarkan hasil perbandingan tersebut maka metode *Local Binary Pattern* lebih efisien dibandingkan *Principal Component Analysis* untuk pengenalan wajah terhadap skenario tersebut.

Kata Kunci : Pengenalan Wajah, OpenCV, *Principal Component Analysis, Local Binary Pattern, Frame, Video File,* Video *Real-time,* FAR dan FRR.

ABSTRACT

A COMPARISON BETWEEN PRINCIPAL COMPONENT ANALYSIS AND LOCAL BINARY PATTERN ALGORITHMS TO FEATURE EXTRACTION IN FACE RECOGNITION SYSTEM

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Face recognition system has been utilized in security sector. Library OpenCV could be used to develop this system, as the previous research related to the utilizing and the comparison of face recognition algorithms toward the application design and scenario which has been conducted was less suitable with the test perfomed. Therefore, the researcher would compare the feature extraction on face recognition algorithms by using java language programming. Feature extraction used the Principal Component Analysis and Local Binary Pattern. The algorithms was assessed toward some scenario difference between sunshine and light. The object faced the camera and also againsts the camera. The sample of data have done by 4 participants by using video file or about 70 frame to be recognized by the face and then, the comparison of algorithms was done and more effisien result would be implemented using real-time video. The result of the research indicated that Local Binary Pattern algorithms on the object scenario faced the camera with the natural sunlight in the room has accuracy value 98,58%, time recognition 812,817 miliseconds, FAR 1,14% and FRR 0%. Meanwhile, the result for the Principal Component Analysis was 98,59% accuracy, time recognition 1275,761 miliseconds, FAR 1,14% and FRR 0%. According to the comparison result, Local Binary Pattern method was more effisien than Principal Component Analysis in terms of recognizing the scenario.

Keywords : *Face Recognition, OpenCV, Principal Component Analysis, Local Binary Pattern, Frame, Video File, Real-time Video, FAR and FRR.*