

INTISARI

SISTEM PENCATATAN KEHADIRAN OTOMATIS BERDASARKAN CITRA WAJAH SECARA *REAL-TIME* MENGGUNAKAN *FACENET* DAN *SUPPORT VECTOR MACHINE*

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Metode pengenalan wajah sudah banyak diterapkan ke dalam sistem kehadiran otomatis namun pada kenyataannya masih mempunyai kekurangan yaitu terbatasnya pose wajah, jarak penangkapan kamera terhadap objek serta terdapat adanya atribut penghalang wajah mengakibatkan kesalahan dalam proses pengenalan sehingga dibutuhkan sistem dengan metode yang *robust* terhadap kondisi tersebut. Pada penelitian ini merancang dan membuat sistem kehadiran otomatis secara *real-time* dibuat dengan *User Interface* berbasis web yang terintegrasi dengan sistem pengenalan wajah. Metode yang digunakan pada penelitian ini yaitu *Multi-Task Cascaded Convolutional Neural Network* digunakan untuk mendeteksi wajah dan untuk mencari fitur wajah dengan metode *FaceNet* kemudian diklasifikasikan dengan menggunakan *Support Vector Machine*. Digunakan dataset sebanyak 30 wajah setiap individu dengan variasi pose wajah dan dataset sebanyak 40 wajah setiap individu dengan variasi penghalang wajah berupa kacamata, masker, dan tangan. Hasil pengujian deteksi dan pengenalan wajah dengan menggunakan variasi jarak didapatkan akurasi terbaik 100% pada jarak 1 meter hingga 3 meter. Pengujian performa sistem pengenalan wajah dengan variasi atribut halangan wajah didapatkan akurasi 95%. Sistem ini dapat dilakukan secara *realtime* karena proses waktu eksekusi tiap wajah yang berhasil dikenali dapat memenuhi *deadline* dengan waktu kurang dari 1 detik.

Kata kunci: Pengenalan wajah, deteksi wajah, *Multi-Task Cascaded Convolutional Neural Network*, *FaceNet*, *Support Vector Machine*, Sistem kehadiran otomatis

ABSTRACT

AUTOMATIC ATTENDANCE SYSTEM BASED ON FACE IMAGES IN REAL-TIME USING FACENET AND SUPPORT VECTOR MACHINE

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The face recognition method has been widely applied to the automatic presence system but in fact it still has shortcomings, namely limited facial pose, camera capture distance to the object and the presence of facial barrier attributes resulting in errors in the recognition process so a system with a robust method is needed for these conditions. In this research, designing and creating a real-time automatic attendance system is made with a web-based user interface that is integrated with the facial recognition system. The method used in this study is the Multi-Task Cascaded Convolutional Neural Network, which is used to detect faces and to search for facial features using the FaceNet method and then classified using the Support Vector Machine. A dataset of 30 faces for each individual with a variety of facial poses was used and a dataset of 40 faces for each individual with a variety of face barriers in the form of glasses, masks, and hands. The results of detection and face recognition testing using distance variations obtained the best accuracy of 100% at a distance of 1 meter to 3 meters. Testing the performance of the facial recognition system with a variety of facial barrier attributes obtained 95% accuracy. This system can be done in real time because the process of execution time for each face that is successfully recognized can meet the deadline in less than 1 second.

Keywords: *Face recognition, Face detection, Multi-Task Cascaded Convolutional Neural Network, FaceNet, Support Vector Machine, Automatic attendance system*