SISTEM PENGENALAN WAJAH MENGGUNAKAN ALGORITMA VIOLA-JONES DAN *MACHINE LEARNING* BERBASIS APLIKASI *DESKTOP*

SKRIPSI

Diajukan untuk memenuhi syarat untuk memperoleh gelar Sarjana Teknik Elektro

Program Studi Teknik Elektro

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Sebuah skripsi yang diajukan untuk memenuhi salah satu syarat memperoleh gelar
Sarjana Teknik Elektro pada Program Studi S1 Teknik Elektro

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ABSTRAK

Sistem pengenalan wajah merupakan sebuah sistem yang memiliki peran penting untuk kemanan dengan tingkat biometrik, selain itu penggunaan sistem pengenalan wajah sangat berperan penting dalam masa pandemi dan endemi untuk mengurangi penularan, karena memiliki prinsip *contactless*. Tujuan dari penelitian ini adalah membuat sebuah sistem pengenalan wajah menggunakan algoritma Viola-Jones dan *Machine Learning* berbasis aplikasi *desktop*. Deteksi wajah menggunakan algoritma Viola-Jones telah banyak diteliti dan memiliki tingkat akurasi yang tinggi, sehingga dengan digabungkannya dengan sistem pengenalan wajah menggunakan *Machine Learning* dengan metode *Neural Network* akan menghasilkan sistem pengenalan wajah dengan tingkat akurasi yang tinggi, cepat dan berbasis aplikasi *desktop* agar dapat digunakan di area yang belum terjangkau dengan internet. Metode yang digunakan yaitu *Iterative Waterfall* Model yang bertujuan untuk menyelesaikan masalah dalam pembuatan sistem pengenalan wajah. Program sistem pengenalan wajah menggunakan algoritma Viola-Jones dan *Machine Learning* berbasis aplikasi *desktop* berhasil dibuat dengan tingkat keakuratan sistem sebesar 92% dan waktu proses untuk mengenali 1 wajah yaitu 400 milidetik. Program juga mampu mengenali wajah dari jarak sejauh 4 meter dengan kondisi cahaya yang cukup baik dan menggunakan kacamata dengan syarat tampak depan wajah tidak tertutupi.

Kata Kunci : Pengenalan wajah; Algoritma Viola-Jones; *Machine Learning*; *Neural Network*.

ABSTRACT

The facial recognition system is a system that has an important role for biometric-level security, besides the use of a facial recognition system plays an important role in pandemic and endemic times to reduce transmission, because it has a contactless principle. The purpose of this research is to create a face recognition system using the Viola-Jones algorithm and machine learning based on a desktop application. Face detection using the Viola-Jones algorithm has been widely researched and has a high level of accuracy, so that by combining it with a facial recognition system using Machine Learning with the Neural Network method, it will produce a face recognition system with a high level of accuracy, fast and based on desktop applications so that it can be used. in areas not yet reached by the internet. The method used is the Iterative Waterfall Model which aims to solve problems in making facial recognition systems. The face recognition system program using the Viola-Jones algorithm and Machine Learning based on a desktop application was successfully created with a system accuracy rate of 92% and the processing time for recognizing 1 face is 400 milliseconds. The program is also able to recognize faces from a distance of 4 meters with good light conditions and use glasses provided that the front view of the face is not covered.

Keyword : Face Recognition; Viola-Jones Algorithm; Machine Learning; Neural Network.

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