FACE PRESENTATION ATTACK DETECTION MENGGUNAKAN METODE LOCAL BINARY PATTERN DAN RESTRICTED BOLTZMANN MACHINES

SKRIPSI

diajukan untuk memenuhi sebagian syarat untuk memperoleh gelar Sarjana Komputer Program Studi Ilmu Komputer

oleh

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UNIVERSITAS PENDIDIKAN INDONESIA

2021

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Sebuah skripsi yang diajukan untuk memenuhi sebagian syarat untuk memperoleh gelar Sarjana Komputer Program Studi Ilmu Komputer

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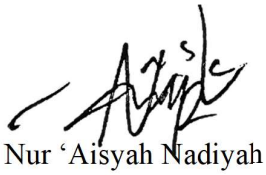
PERNYATAAN

Dengan ini penulis menyatakan bahwa skripsi dengan judul "*Face Presentation Attack Detection* Menggunakan Metode *Local Binary Pattern* dan *Restricted Boltzmann Machines*" ini beserta seluruh isinya adalah benar-benar karya penulis sendiri. Penulis tidak melakukan penjiplakan atau pengutipan dengan cara-cara yang tidak sesuai dengan etika ilmu yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, penulis siap menanggung risiko/sanksi apabila di kemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keaslian karya penulis ini.

Bandung, Juni 2021

Yang membuat pernyataan,



Nur 'Aisyah Nadiyah

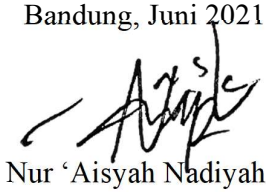
UCAPAN TERIMA KASIH

Pada proses penelitian penulis tentu tidak dapat menyelesaikan tanpa bantuan dan bimbingan dari berbagai pihak baik secara langsung maupun tidak langsung. Oleh karena itu penulis mengucapkan terimakasih yang sebesar-besarnya kepada:

1. Orang tua serta kakak dan adik penulis yang sudah membantu dan memberikan dorongan serta doa kepada penulis.
2. Bapak Lala Septem Riza, M.T., Ph.D. selaku pembimbing I, yang telah meluangkan waktu untuk membimbing penelitian dan penulisan skripsi ini.
3. Bapak Dr. Anto Satriyo Nugroho, B.Eng., M.Eng. selaku pembimbing II, yang telah meluangkan waktu untuk membimbing penelitian dan juga penulisan skripsi ini.
4. Ibu Dr. Rani Megasari, S.Kom., M.T. selaku Ketua Program Studi Ilmu Komputer.
5. Bapak dan Ibu Dosen Prodi Pendidikan Ilmu Komputer dan Ilmu Komputer yang telah memberikan ilmu yang bermanfaat kepada penulis selama masa perkuliahan.
6. Pihak *OULU University*, Finland dan *Northwestern Polytechnical University*, China yang telah menyediakan dan bersedia mengizinkan penggunaan data penelitian.
7. Teman-teman yang telah membantu proses penelitian dan mendukung penulis dalam melakukan penelitian.
8. Seluruh pihak lainnya yang tidak dapat penulis sebutkan satu persatu yang telah membantu dalam proses penelitian.

Semoga segala perbuatan, dukungan, dan doa yang telah diberikan mendapatkan balasan yang berlipat dari Allah SWT. Aamiin.

Bandung, Juni 2021



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FACE PRESENTATION ATTACK DETECTION MENGGUNAKAN METODE *LOCAL BINARY PATTERN* DAN *RESTRICTED BOLTZMANN MACHINES*

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ABSTRAK

Sistem pengenalan wajah saat ini sudah sangat banyak digunakan untuk pengamanan sistem, namun sistem ini merupakan biometrik yang rentan karena paling mudah dimanipulasi. Dari masalah ini, penelitian tentang *face presentation attack detection* dilakukan dengan harapan model yang dibangun dapat digunakan pada sistem pengenalan wajah sebagai alat pendeteksi serangan pemalsuan wajah dengan fokus penelitian pada jenis serangan *photo-attack* dan *video-attack*. Model ini dibangun menggunakan data yang berasal dari *database* OULU-NPU yang diproses *frame* per *frame* sebagai data yang independen. Algoritma *Local Binary Pattern* (LBP) dan *Restricted Boltzmann Machines* (RBM) digunakan sebagai metode ekstraksi fitur dari citra wajah. LBP digunakan untuk mengekstraksi fitur tekstur dari citra wajah, sedangkan RBM digunakan untuk mencari pola hubungan dari citra. Hasil evaluasi model menunjukkan model dengan ekstraksi fitur LBP-RBM berhasil mencapai akurasi sebesar 90% dan model dengan ekstraksi fitur RBM mencapai akurasi sebesar 95%. Sedangkan model terbaik diperoleh saat metode ekstraksi fitur dilakukan dengan mengimplementasikan algoritma LBP dengan tingkat akurasi yang dihasilkan mencapai 98%.

Kata Kunci: *Presentation Attack Detection*, LBP, RBM.

FACE PRESENTATION ATTACK DETECTION USING LOCAL BINARY PATTERN AND RESTRICTED BOLTZMANN MACHINES METHOD

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ABSTRACT

Face recognition systems are currently used widely for system security, but this system is a vulnerable biometric because it is the easiest to manipulate. Based on this problem, research on face presentation attack detection is carried out with the hope that the built model can be used in face recognition systems as a tool for detecting face forgery attacks with research focus on photo-attack and video-attack types. This model is built using data from the OULU-NPU database which is processed frame by frame as independent data. Local Binary Pattern (LBP) and Restricted Boltzmann Machines (RBM) algorithms are used as methods for extracting feature of face images. LBP is used to extract texture features of face images, while RBM is used to find relationship patterns of images. The results of model evaluation show that the model with LBP-RBM feature extraction achieves an accuracy of 90% and the model with RBM feature extraction achieves an accuracy of 95%. The best model is obtained when feature extraction method is carried out by implementing the LBP algorithm with an accuracy rate of 98%.

Keywords: *Presentation Attack Detection*, LBP, RBM.

DAFTAR ISI

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LAMPIRAN

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