Pengenalan wajah 3d menggunakan fuzzy manifold dan jaringan saraf tiruan dengan lapis tersembunyi berstruktur hemisfer = 3d face recognition using fuzzy manifold and artificial neural network with hemispheric structured hidden layer

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Abstrak

[Dewasa ini, teknologi berkembang dengan sangat pesat, salah satu contoh teknologi yang sedang marak beberapa tahun belakangan ini adalah 3D face recognition. Teknologi ini menggabungkan data biometrik berupa wajah orang yang diambil dari beberapa sudut (horizontal dan vertikal) dan jaringan saraf tiruan. Untuk memperbaiki tingkat rekognisi yang rendah pada saat menggunakan data crisp, maka digunakanlah metode fuzzy. Percobaan akan dilakukan sebanyak tiga kali karena terdapat tiga cluster yang masing-masing cluster terdiri dari beberapa set orang. Pertama-tama, data akan diolah secara bertahap pada fase fuzzification dimulai dari parameter ekspresi, orang, dan sudut. Tahapan selanjutnya adalah membuat referensi pada fase fuzzy manifold untuk kemudian digunakan pada fase fuzzy nearest distance. Pada fase fuzzy nearest distance akan dicari jarak terpendek dari data testing dengan referensi yang sudah ada. Hasil keluaran dari sistem ini adalah kombinasi sudut horizontal dan vertikal dari tiap-tiap cluster yang nantinya akan dimasukkan kedalam Jaringan Saraf Tiruan (JST) dengan lapis tersembunyi berstruktur hemisfer untuk mendapatkan tingkat rekognisi. Secara keseluruhan rata-rata tingkat rekognisi setiap cluster sudah bisa mencapai 80%. Hal ini menunjukkan sistem sudah cukup optimal dalam mengenali pola wajah yang ada.
;The development of technology is growing rapidly, one of the examples of the technology that is emerging in recent years is 3D face recognition. This technology combines biometric data in form of faces which are taken from several angles (combination of horizontal and vertical angles) and artificial neural network. In order to improve the low recognition rate from crisp data, fuzzy method is used. The experiment will be performed three times because there are three cluster which are consist of several set of person. Firstly, the data will be processed step by step in fuzzification phase starting from the level of expression continued with the level of face and lastly is the level of person. With the use fuzzification, the crisp data can be converted into fuzzy. The next step is to make references in fuzzy manifold phase in order to be used in fuzzy nearest distance phase. In fuzzy nearest distance phase, the shortest distance between the testing data the references will be processed in artificial neural network with hemispheric structured hidden layer. Generally, the average of the all recognition rate can reach up to 80% which means that the system can recognize the face pattern quite good.
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