Pengenalan mata uang kertas rupiah menggunakan logika fuzzy

Hendra Heriawan, author

Abstrak

Skripsi ini dilakukan sebagai penelitian untuk menganalisa proses pengenalan jenis pecahan uang kertas rupiah dengan menggunakan metode Logika Fuzzy. Hal ini didasarkan pada teori bahwa setiap jenis pecahan uang kertas rupiah memiliki desain, warna serta ciri yang unik. Dalam skripsi ini tiap lembar uang kertas bagian depan dan bagian belakang di-scan menggunakan scanner. Kemudian image hasil scanning dilakukan proses graylevel. Selanjutnya dilakukan cropping pada region of interest. Hasil cropping yang berupa bagian kecil dari image kemudian diambil matriksmatriks sampelnya untuk ditentukan rata-rata nilai real FFT, rata-rata nilai DCT dan jumlah piksel hasil edge detection. Hasilnya kemudian dijadikan database. Pengenalan dilakukan dengan membandingkan nilai matriks sampel yang akan dianalisis terhadap database. Pengenalan dilakukan dengan tiga metode yaitu Fuzzy inference system<i> (FIS) dengan fungsi keanggotaan tipe segitiga, tipe Gaussian, dan tipe trapesium. Pengenalan dilakukan menggunakan enam jenis pecahan mata uang kertas rupiah yang terdiri dari Rp100.000,00; Rp50.000,00; Rp20.000,00; Rp10.000,00; Rp5000,00; and Rp1000,00. Simulasi mampu mengenali pecahan uang dengan tingkat ketepatan bervariasi mulai sebesar 78,95 % sampai 89,47 %. Akurasi tertinggi dicapai oleh metode FIS dengan fungsi keanggotaan Gaussian yaitu sebesar 89,47%.

.....This paper was made for studying Identification process of rupiah paper money using Fuzzy Logic. The study based on the theory that every kind of rupiah paper money were designed uniquely. In this paper, both side of rupiah paper money were scanned by a scanner. Then images obtained from the scanner were changed into graylevel images. A small part of graylevel images called region of interest then were cropped for obtaining sample matrices for determining three kind of image characteristic parameter. They were real average value of FFT, average value of DCT and number of pixel of edge detected images. The results then were mapped into membership function curve called database. Identification were held by evaluating the value of image characteristic parameter of the image being identified if their values were in database or not. Fuzzy Inference System with trapesium type, triangle type, and Gaussian type membership function provided by Matlab being used in this paper. Identification was held by using six different kind of rupiah paper money. They were Rp100.000,00; Rp50.000,00; Rp20.000,00; Rp10.000,00; Rp5000,00; and Rp1000,00. Data obtained from simulation told us if the money were succesfully identified or not. Simulation yielded percentage of accuracy from 78,95 % until 89,47 %. Fuzzy Inference System with Gaussian Type Membership function yielded best percentage of accuracy up to 89,47 %.