

INTISARI

SISTEM KLASIFIKASI JENIS KENDARAAN BERBASIS PENGOLAHAN CITRA DIGITAL DENGAN METODE *MULTILAYER PERCEPTRON*

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Perkembangan video sensor dan hardware dapat digunakan dalam pengembangan sistem pemantauan lalu lintas berbasis vision. Karena dapat menyediakan informasi seputar kendaraan yang melintas agar pemantauan dengan memanfaatkan kamera dapat dilakukan secara otomatis. Dibutuhkan sistem pengolahan yang dapat memberikan beberapa informasi terkait kondisi lalu lintas. Salah satu pendekatannya adalah memanfaatkan pengolahan citra digital.

Penelitian ini terdiri dari 2 tahapan pengolahan citra digital yaitu proses deteksi dan klasifikasi. Proses deteksi menggunakan *Haar Cascade classifier* dengan data training berupa citra kendaraan dan data uji berupa citra keadaan di jalan tol yang diambil secara acak. Sementara, proses klasifikasi menggunakan *Multilayer Perceptron* dengan memanfaatkan hasil dari deteksi yang diproses. Klasifikasi kendaraannya di bagi menjadi 3 tipe kendaraan yaitu Mobil, Bus, dan Truk. Lalu klasifikasi dievaluasi dengan parameter *accuracy*, *sensitifity* dan *specificity*.

Hasil pengujian dalam proses deteksi kendaraan menunjukkan *accuracy* data uji pertama sebesar 92,67%, *accuracy* data uji kedua sebesar 87,60%, *accuracy* data uji ketiga sebesar 91,62%. Sementara itu, proses klasifikasi dilakukan dengan tahap *trial and error* untuk mengevaluasi parameter yang telah ditentukan. Hasil penelitian menunjukkan sistem klasifikasi memiliki rata-rata nilai *accuracy* data uji pertama sebesar 87,60%, nilai *accuracy* data uji kedua sebesar 88,29%, nilai *accuracy* data uji ketiga sebesar 87,33%, kemudian nilai *sensitifity* data uji pertama sebesar 59,91%, nilai *sensitifity* data uji kedua sebesar 66,63%, dan nilai *sensitifity* data uji ketiga sebesar 67,43%, sedangkan nilai *specificity* data uji pertama sebesar 79,13%, nilai *specificity* data uji kedua sebesar 82,78%, dan nilai *specificity* data uji ketiga sebesar 83,83%.

Kata kunci : *Kendaraan, Deteksi, Haar, Cascade, Klasifikasi, MLP*

ABSTRACT

VEHICLE TYPE CLASSIFICATION SYSTEM BASED DIGITAL IMAGE PROCESSING WITH METHODS OF MULTILAYER PERCEPTRON

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The evolution of video sensors and hardware can be used for developing traffic monitoring system vision. It can provide information about vehicle passing by utilizing the camera, so that monitoring can be done automatically. It is needed for the processing systems to provide some information regarding traffic conditions. One such approach is to utilize digital image processing.

This research consisted of two phases image processing, namely the process of detection and classification. The process of detection using Haar Cascade Classifier with the *training* data image form the vehicle and data test form the image state of toll road drawn at random from three different video. While, Multilayer Perceptron classification process uses by utilizing the result of the detection process. Vehicle classification is divided into three types, namely car, bus and truck. Then the classification parameters were evaluated by accuracy and sensitivity.

The test results indicated vehicle detection which the first test accuracy data is 92.67%, second test accuracy data is 87.60%, and third test accuracy data is 91.62%. Meanwhile, the classification process is done with phase trial and *error* to evaluate the parameters that have been determined. Results of the study show the classification system has an average value of the first test data accuracy value is 87.60%, the value of the second test data accuracy is 88.29%, and the value of the third test data accuracy is 87.33%, then the value sensitivity first test data is 59.91%, the value sensitivity second test data is 66.63%, and the value sensitivity third test data is 67.43%. While the value specificity first test data is 82.78%, the value specificity second test data is 79.13%, and the value specificity third test data is 83.83%.

Keyword : *Vehicle, Detection, Haar, Cascade, Classification, MLP*