SISTEM PENDETEKSI SEPEDA MOTOR PELANGGAR MARKA JALAN MENGGUNAKAN METODE *CONVOLUTIONAL NEURAL NETWORKS* (CNNs)

SKRIPSI

Diajukan untuk Memenuhi Bagian dari Syarat Memperoleh Gelar Sarjana Komputer Pada Departemen Pendidikan Ilmu Komputer Program Studi Ilmu Komputer

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Sistem Pendeteksi Sepeda Motor Pelanggar Marka Jalan Menggunakan Metode *Convolutional Neural Networks* (CNNs)

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Abstrak

Banyaknya pelanggaran lalu lintas yang terjadi saat ini baik yang dilakukan oleh pengendara mobil atau sepeda motor merupakan cerminan dari kepribadian suatu bangsa. Pelanggaran terjadi karena kurangnya kedisiplinan pengendara dalam mematuhi rambu lalu lintas dan marka jalan yang ada. Pelanggaran lalu lintas menjadi masalah yang serius karena dari pelanggaran ini dapat berpotensi menjadi kecelakaan lalu lintas. Tidak mampunya petugas untuk mengawasi pengendara selama 24 jam membuat pelanggaran terus saja terjadi. Oleh karena itu untuk membantu mengatasi masalah tersebut dibuatlah sistem pendeteksi sepeda motor pelanggar marka jalan menggunakan metode *Convolutional Neural Networks* (CNNs). Pelanggaran yang dideteksi merupakan sepeda motor yang berhenti melewati *stop line* pada saat lampu merah menyala. Data yang digunakan merupakan video dari rekaman CCTV milik Dinas Perhubungan Kota Bandung yang diambil selama 10 hari agar video yang diperoleh bervariasi. Data yang diperoleh merupakan video dengan format .mp4 sehingga harus dilakukan transformasi citra terlebih dahulu agar bisa diproses ke tahap selanjutnya. Sistem menggunakan metode *deep learning* yaitu CNNs dengan 5 *layer* yang terdiri dari 2 *layer* konvolusi dan 3 layer *fully connected*. Untuk memudahkan proses klasifikasi, data melakukan praproses terlebih dahulu yang terdiri dari pelabelan data, *scalling*, konversi citra, dan normalisasi. Hasil dari percobaan dengan menggunakan 3000 data yang terdiri dari 2 kelas data yaitu motor dan non motor menunjukkan akurasi sebesar 95,94%. Hasil akurasi tersebut menunjukkan bahwa sistem sudah cukup baik dalam mendeteksi sepeda motor pelanggar marka jalan.

Kata Kunci: Deteksi Sepeda Motor, Deteksi Pelanggar, *Convolutional Neural Networks, Deep Learning*

Abstract

The large amount traffic of that happens now a day, whether by motorist or car driver is reflection of the personality of a nation. This violation happen due to lack of discipline of drivers in obeying traffic sign and road marking that exist. Traffic violations is a serious problem because it can occur traffic accident. The officers cannot supervise drivers for 24 hours, therefore the author makes motorcycle detection system that violated road markings using Convolutional Neural Networks (CNNs). The detected violation system is when a motorcycle stops passing through the stop line when the red light is activated. The data that used in this research is a video that author got from Departement of Transportation Bandung wich was taken for 10 days, so the videos that obtained have a lot of variety. The obtained data is .mp4 video so we must transformed the video to image first. The system uses the deep learning method, that is CNNs with 5 layers consisting of 2 convolution layers and 3 layers fully connected. Before make classification, we must make the data praprocesses. The data praprocesses consist of data labeling, scalling, image conversion, and normalization. The results of the experiment using 3000 data consisting of 2 class data that is motorcycle and non motorcycle showed accuracy 95.94%. The results of this accuracy indicate that the system is quite good at detecting motorbike off road markers.

Key Words: Vehicle detection, Violator Detection, Convolutional Neural Networks, Deep Learning

Daftar Isi

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