INTISARI

METODE *YOU ONLY LOOK ONCE* (YOLO) UNTUK SISTEM PENGENALAN RAMBU LALU LINTAS

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Advanced System Driving Assistance (ADAS) yang disematkan kepada mobil-mobil cerdas yang mampu memperhatikan lingkungan di sekitarnya dan mengambil keputusan tidak dapat dilepaskan dari kemampuan mobil tersebut mengidentifikasi rambu lalu lintas di jalan raya dan mengartikan makna dari rambu yang terpampang di beragam sudut di jalan raya. Sistem ini dibangun dengan harapan mengurangi resiko kecelakaan dari pelanggaran lalu lintas yang disebabkan oleh faktor emosional manusia.

Penelitian ini dilakukan menggunakan salah satu metode *deep convolutional neural network* metode YOLO (*You Only Look Once*), dengan menggunakan dua versi YOLO (3 dan 5). Dataset yang digunakan berjumlah 1769 data citra dengan total tujuh kelas rambu-rambu lalu lintas yang sering ditemukan pada jalan-jalan kota besar di Indonesia seperti Jakarta, Bogor, dan Yogyakarta.

Dengan data uji yang telah disediakan, penelitian ini menghasilkan nilai uji YOLOv3 dengan presisi sebesar 97,78%, nilai akurasi sebesar 90,91%, nilai sensitifitas sebesar 92,63%, dan nilai F1 sebesar 95,13% serta kecepatan komputasi sebesar 8,1 milidetik per-*frame*; sedangkan untuk pengujian dengan YOLOv5 menghasilkan nilai presisi sebesar 93,81% dan nilai akurasi sebesar 85,19%, nilai sensitifitas sebesar 90,01%, dan nilai F1 sebesar 91,87% serta kecepatan komputasi sebesar 40,226 milidetik per-*frame*.

Kata kunci: YOLO, *single-shot detector*, *artificial intelligence*

ABSTRACT

YOU ONLY LOOK ONCE (YOLO) METHOD FOR TRAFFIC SIGNS RECOGNITION SYSTEM

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Advanced Driving Assistance Systems (ADAS) that were attributed to what known as smart cars which able to pay attention to its surrounding environments cannot be separated from the ability of that car to identifies traffic signs on the street and boulevards and be able to understand what it means. This system were build in the hope of minimizing the risk of traffic accidents that often caused by human emotional factors.

This research were done using one of the deep convolutional neural network method which is YOLO (You Only Look Once) method, and by using two versions of YOLO (3 and 5). Dataset that were used consists of 1769 choosen images with the total of seven classes of traffic signs listed that is often be seen on the major road across Indonesia such as Jakarta, Bogor, and Yogyakarta.

By using the prepared test data, this research were able to get the YOLOv3 precision rate of 97,83%, accuracy rate of 90,91%, sensitivity rate of 92,63%, and F1-Score of 95,133% with the computational speed rate of 8,1 milisecond per-frame; therefore for YOLOv5 were able to reach the precision rate of 93,18%, accuracy rate of 85,19%, sensitivity rate of 90,01%, and F1-Score of 91,87% with the computational speed rate of 40,226 miliseconds per-frame.

Keyword: YOLO, single-shot detector, artificial intelligence