

INTISARI

PERANCANGAN SISTEM DETEKSI DAN PENGENALAN RAMBU LALU LINTAS DENGAN METODE DEEP LEARNING

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Salah satu sistem yang penting dalam *Advanced Driver Assistant System (ADAS)* dalam langkah mengurangi angka kecelakaan adalah sistem pengenalan rambu lalu lintas. Salah satu metode pengenalan rambu lalu lintas yaitu metode R-CNN (Region-base Convolutional Neural Network), namun karena kompleksitas komputasinya, metodenya tidak dianggap layak untuk diterapkan dalam sistem deteksi rambu lalu lintas untuk waktu nyata meskipun telah mencapai tolak ukur mutakhir pada German Traffic Sign Recognition Dataset (GTSRD). Sementara itu, YOLO (You Only Look Once) memiliki komputasi dan arsitektur yang sederhana serta memiliki kecepatan FPS dan akurasi tinggi layak untuk dilakukan penelitian. Pada penelitian ini, digunakan 3 versi YOLO (3, 4 dan 5). Dataset yang digunakan berjumlah 11.111 citra, dengan total 12 kelas rambu-rambu lalu lintas yang sering ditemukan pada jalan raya Yogyakarta. Pengujian menunjukkan bahwa YOLO versi 5 (YOLOv5) memiliki akurasi tertinggi yaitu 90%, dengan *frame rate* 47,34 fps, diikuti oleh YOLOv3 (5 layer) dengan akurasi deteksi 86% dan *frame rate* 29,6 fps serta YOLOv4 (3 layer) dengan akurasi deteksi 79% dan *frame rate* 38,73 fps.

Kata kunci : *YOLO, frame rate, single-shot detector*



ABSTRACT

DESIGN OF A TRAFIC SIGNS DETECTION AND RECOGNITION SYSTEM WITH DEEP LEARNING

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One of the important systems in the Advanced Driver Assistant System (ADAS) in reducing the number of accidents is the traffic signs recognition system. One of the traffic sign recognition methods is the R-CNN (Region-base Convolutional Neural Network) method, but due to the complexity of the computation, the method is not feasible to be applied in a traffic sign detection system for real time even though it has reached the latest benchmarks on the German Traffic Sign. Recognition Dataset (GTSRD). Meanwhile, YOLO (You Only Look Once) has simple computation and architecture and has high FPS speed and accuracy is worthy to be researched. In this study, 3 versions of YOLO were used (3, 4 and 5). The dataset used is 11,111 images, with a total of 12 classes of traffic signs that are often found on Yogyakarta roads. Tests show that YOLO version 5 (YOLOv5) has the highest accuracy of 90%, with a frame rate of 47.34 fps, followed by YOLOv3 (5 layers) with detection accuracy of 86% and a frame rate of 29.6 fps and YOLOv4 (3 layers) with 79% detection and frame rate 38.73 fps.

Keywords : YOLO, frame rate, single-shot detector