

ABSTRAK

AC (*Air Conditioner*) merupakan sistem pendingin ruangan yang digunakan dimanapun salah satunya pada kereta api. AC juga merupakan faktor utama tingkat kenyamanan dari penumpang kereta. Namun, AC kereta saat ini hanya dapat dikontrol manual dari kabin masinis sehingga banyak sedikitnya penumpang tidak memengaruhi suhu AC. Terlebih lagi, AC menyerap 30% daya dari total daya di kereta. Maka dari itu, penelitian ini disusun dengan tujuan dapat menghitung jumlah penumpang melalui konsep *people counting* menggunakan metode *You Only Look Once* (YOLO) guna sistem kontrol suhu kereta. Penelitian ini dibangun menggunakan 1 kelas objek yaitu *person* dan algoritma YOLOv5, dimana metode tersebut merupakan metode deteksi objek dengan tingkat akurasi yang tinggi. Penelitian ini dirancang dengan bahasa pemrograman Python dengan platform Google Colaboratory dan MQTT untuk protokol penyimpanan data hasil deteksi penumpang. Dataset yang digunakan adalah penumpang dalam kereta sebanyak 1300 gambar. Model hasil *training* dan validasi memperoleh mAP 99.63%, presisi 95%, *recall* 100%, F1 *score* 97.5%, dan average IoU 79.96%. Kemudian, model diujikan dan memperoleh mAP 99.35%, presisi 95%, *recall* 99%, dan F1 *score* 97%. Penelitian ini menghasilkan performa sistem yang cukup baik dalam mendeteksi dan menghitung penumpang pada kereta.

Kata Kunci: *AC (Air Conditioner), People Counting, You Only Look Once (YOLO) v5, Sarana Perkeretaapian*

ABSTRACT

AC (Air Conditioner) is an air conditioning system that is used anywhere, one of them on the train. Air conditioning is also a major factor in the comfort level of train passengers. However, train air conditioning currently can only be controlled manually from the driver's cabin so that the number of passengers does not affect the air conditioning temperature. What's more, the air conditioner absorbs 30% of the total power in the train. Therefore, this research was compiled with the aim of being able to calculate the number of passengers through the concept of people counting using the You Only Look Once (YOLO) method for the train's temperature control system. This research was built using 1 object class, namely person and the YOLOv5 algorithm, where this method is an object detection method with a high degree of accuracy. This research was designed using the Python programming language with the Google Colaboratory platform and MQTT for the data storage protocol for passenger detection results. The dataset used is passengers in the train as many as 1300 images. The training and validation results model obtained a 99.63% mAP, 95% precision, 100% recall, 97.5% F1 score, and 79.96% average IoU. Then, the model was tested and obtained 99.35% mAP, 95% precision, 99% recall, and 97% F1 score. This research resulted in a fairly good system performance in detecting and counting passengers on trains.

Keywords: *AC (Air Conditioner), People Counting, You Only Look Once (YOLO) v5, Railways Facilities*