

Dashcam for Traffic Object Detection

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Abstract—Dashcam is a camera stored in a vehicle. This tool serves to record all events in front of the vehicle. Security and safety have become a major concern in various sectors, including transportation and public security. On the highway, traffic accidents caused by the driver's ignorance of objects around the vehicle are still a serious problem. In this study, the development of a simple dashcam built from an edge computer was carried out by combining the number of cameras. Image stitching is applied to combine images that have been collected by each camera. Next, object detection is carried out on the images that have been collected. The object detection system approach is carried out using YOLOv8 which is the latest variant of the YOLO series. This research is expected to be one step in the development of an Intelligent Transportation System that is in accordance with traffic conditions in Indonesia. The results obtained in testing using the system created exist using the configuration of 78000 datasets, 3332 data validation with 8 epochs, batch size 32, linear learning rate and SGD optimization. Results are best in the morning and afternoon. The program can recognize predefined objects.

Index Terms—object detection, YOLOv8, dashcam

I. INTRODUCTION

Security and safety have become a major concern in various sectors, including transportation and public security. On the highway, traffic accidents caused by the driver's ignorance of objects around the vehicle are still a serious problem. Smart and effective object detection technology is becoming increasingly important for monitoring traffic [1].

Video captures from dashcams usually only show one side according to the camera position. However, this results in a lack of information about nearby objects. To overcome this problem, this study tried a solution by using two cameras or cameras placed at different positions in the vehicle. By using more than one camera, diverse viewing angles can provide more complete information about objects around the vehicle. For example, the camera on the left side helps detect objects

on the left, while the camera on the right side helps detect objects on the right. This approach is expected to provide more comprehensive results according to the actual situation in front of the vehicle. Therefore, the study of the application of dual cameras to detect objects becomes very relevant and interesting. By optimizing the use of dual cameras, it is hoped that this technology will be able to provide effective solutions in increasing driver awareness and safety on the road. The application of dual cameras for object detection has the potential to reduce accident incidents, reduce the risk of collisions, and improve the safety of all road users.

II. LITERATURE REVIEW

A. Object Detection

Object Detection is one of the important task in computer vision field, mainly dealing with detecting instances of visual object then categorize them into several classes [?]. With this kind of identification and localization, object detection can be used to count objects in a scene and determine and track their precise locations, all while accurately labeling them. Object detection has been widely used for face detection, vehicle detection, pedestrian counting, web images, security systems and driverless cars. Within the past twenty years, object detection have been going through a lot of changes and development. Although it is commonly divided into two periods: "traditional object detection" and "deep learning based". In 2012, Krizhevsky et al. [?] proposed a deep convolutional network trained on a subset ImageNet

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Keep your text and graphic files separate until after the text has been formatted and styled. Do not number text heads— \LaTeX will do that for you.

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Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Abbreviations such as IEEE, SI, MKS, CGS, ac, dc, and rms do not have to be defined. Do not use abbreviations in the title or heads unless they are unavoidable.

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$$a + b = \gamma \quad (1)$$

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- Be aware of the different meanings of the homophones “affect” and “effect”, “complement” and “compliment”, “discreet” and “discrete”, “principal” and “principle”.
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An excellent style manual for science writers is [?].

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TABLE I
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Table Head	Table Column Head		
	Table column subhead	Subhead	Subhead
copy	More table copy ^a		

^aSample of a Table footnote.

Figure Labels: Use 8 point Times New Roman for Figure labels. Use words rather than symbols or abbreviations when writing Figure axis labels to avoid confusing the reader. As an example, write the quantity “Magnetization”, or “Magnetization, M”, not just “M”. If including units in the label, present them within parentheses. Do not label axes only with units. In the example, write “Magnetization (A/m)” or “Magnetization {A[m(1)]}”, not just “A/m”. Do not label axes with a ratio of



Fig. 1. Example of a figure caption.

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ACKNOWLEDGMENT

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