

# Multi Dashcam With Image Stitching 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 the test used a system made using a configuration of 78000 datasets, 3332 data validation with 8 epochs, batch size 32, linear learning rate, and SGD optimization. The best results with real testing were obtained in the morning with an accuracy of 72.8% of detectable objects. In addition, further research may involve an in-depth analysis of factors contributing to the accurate results found, such as the impact of lighting variations, camera position, as well as the characteristics of detected objects.

**Keywords:** dual camera; image stitching; object detection, YOLOv8 (List three to ten pertinent keywords specific to the article; yet reasonably common within the subject discipline.)

## 1. Introduction

Security and safety have become key issues in a variety of industries, including transportation and public safety. On roads, traffic accidents caused by drivers' lack of awareness of objects around them remain a severe problem. For traffic surveillance, intelligent and effective object detection technology is becoming increasingly important. According to the camera's position, if the dashcam camera is on one side, the final capture often only includes that side. By conducting research that identifies things with the aid of two cameras or cameras located at various points in the vehicle, this study seeks to provide a solution to the issue. You can gain various perspectives and more information about the surroundings of the car by using multiple cameras. To create more precise findings that correspond to the actual circumstances in front of the user's vehicle, for instance, the left camera can assist in detecting vehicles on the left and the right camera can assist in detecting vehicles on the right.

As a result, research into the use of dual cameras for object detection is very important and interesting. It is envisaged that by maximizing the usage of dual cameras, this technology will provide an effective solution for boosting driver awareness and road safety. The use of dual cameras for object detection has the potential to minimize the number of accidents, avoid collisions, and increase overall safety for all road users. Furthermore, the image stitching method is vital in the implementation of this technology. The act of integrating numerous photos from separate cameras into one larger, more comprehensive image is known as image stitching. When it comes to dual cameras for object detection, Image stitching can help create a more comprehensive and detailed view of the vehicle's surroundings.

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In this research, we used a system that combines image fusion techniques to merge data from several picture sources with YOLO technology for real-time object detection. This allows for a thorough awareness of the traffic conditions and the surrounding surroundings by precisely detecting several things along a route. This research is anticipated to significantly improve traffic efficiency and safety by fusing the speed and accuracy of YOLO detection with the capacity to blend photographs to produce panoramic views.

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3.1.1. Subsubsection

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All figures and tables should be cited in the main text as Figure 1, Table 1, etc.



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**Figure 2.** This is a wide figure.

**Table 2.** This is a wide table.

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	Data	Data	Data
	Data	Data	Data
Entry 2	Data	Data	Data
	Data	Data	Data
	Data	Data	Data
Entry 3	Data	Data	Data
	Data	Data	Data
	Data	Data	Data
Entry 4	Data	Data	Data
	Data	Data	Data
	Data	Data	Data

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Text.

Text.

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(1)

the text following an equation need not be a new paragraph. Please punctuate equations as regular text.

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(2)

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## Abbreviations

The following abbreviations are used in this manuscript:

MDPI   Multidisciplinary Digital Publishing Institute  
DOAJ   Directory of open access journals  
TLA   Three letter acronym  
LD   Linear dichroism

Appendix A

Appendix A.1

The appendix is an optional section that can contain details and data supplemental to the main text—for example, explanations of experimental details that would disrupt the flow of the main text but nonetheless remain crucial to understanding and reproducing the research shown; figures of replicates for experiments of which representative data are shown in the main text can be added here if brief, or as Supplementary Data. Mathematical proofs of results not central to the paper can be added as an appendix.

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- Author 1, A.B. (University, City, State, Country); Author 2, C. (Institute, City, State, Country). Personal communication, 2012.
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