EAI Endorsed Transactions
on Energy Web
Research Article EAI.EU

Pedestrian Perception Tracking in Complex Environment of Unmanned Vehicles Based on Deep Neural Networks

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Abstract

INTRODUCTION: In recent years, machine learning and deep learning have emerged as pivotal technologies with transformative potential across various industries. Among these, the automobile industry stands out as a significant arena for the application of these technologies, particularly in the development of smart cars with unmanned driving systems. This article delves into the extensive research conducted on the detection technology employed by autonomous vehicles to navigate road conditions, a critical aspect of driverless car technology.
OBJECTIVES: The primary aim of this research is to explore and highlight the intricacies of road condition detection for autonomous vehicles. Emphasizing the importance of this key component in the development of driverless cars, we aim to provide insights into cutting-edge algorithms that enhance the capabilities of these vehicles, ultimately contributing to their widespread adoption.
METHODS: In addressing the challenge of road condition detection, we introduce the TidyYOLOv4 algorithm. This algorithm, deemed more advantageous than YOLOv4, particularly excels in pedestrian recognition within urban traffic environments. Its real-time capabilities make it a suitable choice for detecting pedestrians on the road under dynamic conditions.
RESULTS: The application of the TidyYOLOv4 algorithm in autonomous vehicles has yielded promising results, especially in enhancing pedestrian recognition in urban traffic settings. The algorithm's real-time functionality proves crucial in ensuring the timely detection of pedestrians on the road, thereby improving the overall safety and efficiency of autonomous vehicles.
CONCLUSION: In conclusion, the detection of road conditions is a critical aspect of autonomous vehicle technology, with implications for safety and efficiency. The TidyYOLOv4 algorithm emerges as a noteworthy advancement, outperforming its predecessor YOLOv4 in pedestrian recognition within urban traffic environments. As companies continue to invest in driverless technology, leveraging such advanced algorithms becomes imperative for the successful deployment of autonomous vehicles in real-world scenarios.

Keywords: YOLOv4, Driverless Vehicles, Complex scene perception

Received on 27 December 2023, accepted on 09 April 2024, published on 15 April 2024

doi: 10.4108/ew.5793

1. Introduction

With the development of AI profound learning technology, in a variety of disciplines, including medical diagnostics [1-4], natural language processing [5-8], unmanned driving [9-12], and others, it has demonstrated substantial application benefits. With the continued expansion of the automotive business, driverless cars have came to the fore as one of the key areas of research and advancement. The driver was less car adopts the integration of multiple technologies, including front-end environment perception,

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