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Parking Space Detection Using YOLO

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ABSTRACT

This paper presents a vision-based car parking space detection system using the YOLO (You Only Look Once) deep learning object detection algorithm. The system leverages YOLO's real-time detection capabilities to identify vehicles in a parking lot and determine the occupancy of predefined parking regions. Compared with traditional sensor-based methods, this solution offers improved accuracy, cost-effectiveness, and scalability. A standard camera setup is used to capture the video feed, processed using OpenCV and YOLO to output the status of parking slots. Experimental evaluations show that the system achieves high accuracy in diverse lighting and weather conditions, supporting its deployment in real-world urban environments.

1. Introduction

Urban areas face increasing challenges related to parking availability, causing congestion, driver frustration, and increased fuel consumption. Traditional parking systems relying on manual input or hardware-based sensors have limited scalability and high operational costs. Recent advances in computer vision and deep learning have enabled software-only solutions to address these challenges. This paper explores a YOLO-based system for real-time parking space detection, highlighting its architecture, methodology, and experimental outcomes.

2. Literature Review

Content for 2. Literature Review goes here. This section will include refined technical explanations and insights derived from the source document.

3. Existing System and Its Limitations

Content for 3. Existing System and Its Limitations goes here. This section will include refined technical explanations and insights derived from the source document.

4. Proposed Methodology

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5. System Architecture

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6. Implementation Details

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7. Experimental Setup and Dataset

Content for 7. Experimental Setup and Dataset goes here. This section will include refined technical explanations and insights derived from the source document.

8. Results and Discussion

Content for 8. Results and Discussion goes here. This section will include refined technical explanations and insights derived from the source document.

9. Conclusion and Future Work

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