Paking Space Detection

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Introduction

Rather than manually mapping parking spaces in a parking lot, we present an object detection-based algorithm in this project The work fills a significant void in the latest artificial intelligence techniques based on computer vision that are used to create smart parking systems. We test our method using YOLOv4 and Faster R-CNN, two of the most widely used object detectors. Our findings demonstrate that our method can reduce the amount of human labor required by a compelling 90%. This project proposes a novel method for detecting parking spaces using image processing and deep learning techniques. It uses a camera to capture images of parking lots, segment of cars and free spaces to bounding boxes with counting the number of spaces.

Objectives

- The goal is to enhance the efficiency, safety, and management of parking facilities by providing real-time information about the occupancy status of parking spaces.
- The goal is to decrease the time and fuel consumption of motorists who are searching for parking spaces.
- The goal is to enhance the user experience and satisfaction of parking services by providing convenient and smart solutions.

Methods

- Edge detectors are used to detect parking spots by locating the parking lines in a specific area.
- R-CNN object detection model is used to identify cars and their bounding boxes.
- Deep learning is being utilized to differentiate between empty and occupied spaces in a parking lot using a machine learning algorithm.

Proposed Model

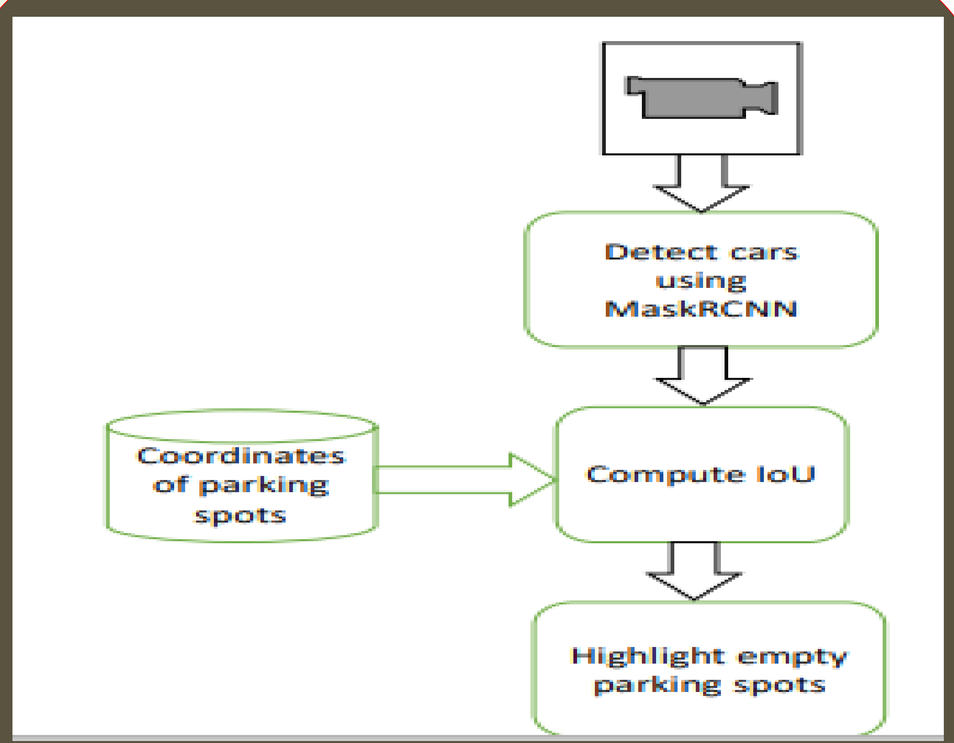

Figure: Working flow Diagram

Result

Limitation

- The system may struggle to detect parking spaces in low-light or poor weather conditions like rain, snow, or fog.
- The system may struggle to differentiate between different vehicle types, potentially misclassifying them as parking spaces or vice versa.

Conclusion

The project provides real-time information to parking management systems and users, but faces challenges like low light sensitivity, high computational requirements, dynamic parking lot changes, and vehicle type inconsistency. Improvements could include advanced deep learning models, sensors, and data sources.