Smart And Effective Real-Time Management Of Street Parking Using CNN

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ABSTRACT

With the rapid development of society, travelers have become more popular in big cities, making it difficult to find a parking space. These stations are very expensive to manage and difficult in many cases, especially if there are many locations such as airports or commercial centres. Traffic congestion in the parking lot is a big problem that people face every day because while the number of vehicles is increasing, the parking space is not. The model takes all the available parking spaces in a place and based on the data obtained, it works to detect whether the parking space is empty or occupied by a car and provides the data sheet regarding the empty parking lot. In our system, we need to detect the station using CNN, RF and SVM. Here we need to draw boxes for full and empty boxes. Full parking areas are red, empty parking areas are green. The main problem of today's life is the increasing number of vehicles and the shortage of parking spaces. With the rapid development of the city, the number of vehicles in the city has also increased, and parking spaces in the city have become limited, which causes people to consume more fuel while looking for parking spaces. live and the engine continues to work until then. Traffic congestion in the parking lot is a big problem that people face every day because the number of vehicles increases while the parking space does not increase.

Keywords: CNN, Machine learning, Python, Smart street parking, signals

1.Introduction:

The research conducted here helps to solve the problem of traffic congestion in network bottlenecks (just parking) through sample segmentation algorithms and deep learning. The model takes all the available parking spaces in a place and works to detect whether the parking space is empty or occupied by a car based on the obtained data and provides the data sheet for the empty parking lot[1]. The model finds a suitable parking space for two wheels as well as finding free parking space for cars (less traffic). Transportation which can play a significant role in reducing fuel costs. The use of parking camera is quite effective as it does not require the installation of any separate equipment in the parking loT[2]. roads, commercial buildings and many vehicles. We use the parking system while parking these vehicles in the parking lot. Most of the events are unplanned and therefore there is no discipline and people can stop wherever they want which leads to chaos because most people do not follow the special reporting instructions[3]. As a result, there was a serious accident there. Due to poor road holding, an accident may occur due to lack of space in the vehicle while parking and picking up your vehicle. This leads to arguments, fights and sometimes serious car accidents between people. This is also a financial loss because we have to repair the damaged car and it consumes more fuel while getting in and out of the car. Traffic is a problem here because it wastes our valuable time[4]. Our valuable time is wasted due to parking chaos. It is very harmful to students, office workers and emergency patients. With the increase in

the speed of vehicles, the number of parking spaces has not increased. The research conducted here helps to solve the problem of traffic congestion in network bottlenecks (parking only) through sample segmentation algorithms and deep learning[5]. The model takes all the available parking spaces in a place and works to detect whether the parking space is empty or occupied by a car based on the obtained data and provides the data sheet regarding the empty parking lot. In addition to finding a free parking space for cars, this model also finds a suitable parking space for two wheels (less traffic).

2.1.1 Disadvantages:

- The efficiency of parking area identification is not high. br> In this system, the station dataset is collected from the dataset storage. After that, we need to use the image before doing the steps. In this step, we need to use image resizing. Then, we need to use deep learning techniques such as CNN, RF and SVM. After that[6], we need to mark the connected boxes and capture the stations. Then the address is shown in red and unavailable in green.

2.2.1 Advantages:

- It has very good performance for large files. Review:

2.3.1 Parking detection in environmental images based on deep learning

Methodology:

Due to different visual conditions such as lighting changes, shadows, and invisible restrictions, the reality of parking without parking of independent tour (AVMs) Parking Assistance (PAS) should be improved. To solve this problem, we propose VPS-Net, a deep learning-based empty parking space detection system[7]. VPS-Net transforms empty parking into a two-step problem, including parking space control and passenger allocation. We want to find the parking space path according to YOLOv3, which provides parking classification with the location of the marked points to find the parking space level, so that many stations can be found directly using geometric instructions. In the population classification stage, we build a customized network whose convolution kernel size and number of layers are adjusted according to the characteristics of the station. By offering multi-purpose network discovery and network distribution, VPS-Net can identify many existing stations[8]. The two combine the advantages of multi-purpose networks with distributed networks.

Disadvantages:

• The accuracy of our method decreases by 0.19%.
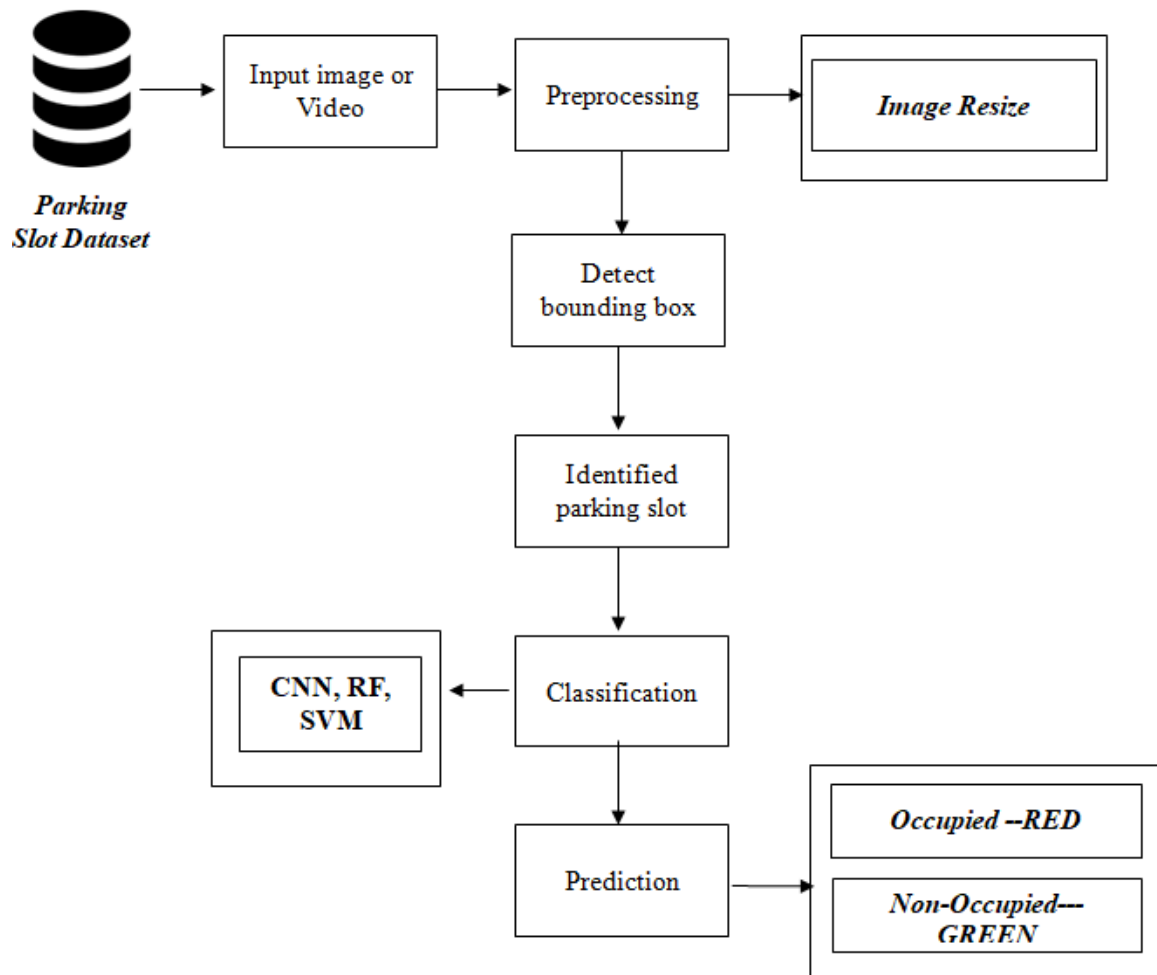
3.1 SYSTEM ARCHITECTURE:

FIGURE.1: SYSTEM ARCHITECTURE

4.IMPLEMENTATION

4.1 MODULES:

- Input image
- Preprocessing
- Detection bounding box
- Classification classification
- Prediction

4.2 module description:

1. Dataset is provided by dataset repository. The format of input file is ".png", ".jpg" or ".mp4". "In this step, we should read the input image or load it using: imread() do function. we use tkinter file dialog to select the input image. Resize the image and convert the image to grayscale . This function does not change the reference image, it returns behind another image with dimensions[9]; We can use OpenCV's borderRect(function) to find and add a rectangle or box around the image in the image.

2. Another way to use box representation is the combination of the center of the bounding box and the width and height of the bounding box, we need to use machine learning algorithms like CNN, RF, and SVM. These filters capture patterns like edges, textures, or higher-level features[10]. Pooling layers

reduce the spatial dimension of feature maps created by convolutional layers, help reduce computational complexity, and make the network more robust to small changes in the input.

3. Hyperplane: It is better to separate data points of various groups at a special place while completing the margin, i.e. the distance between the hyperplane of each group and its nearest data, called the support vector[11].

• A random forest is a collection of uniformly distributed or regression trees constructed using bootstrap samples from training data and random feature selection in the inductive tree. Predictions are made by aggregating the overall prediction (taking the majority votes or averaging). . Advantages of automatic parking:

5. Advantages of automatic parking are as follows:

1. **Reduce traffic:** Automatic vehicles reduce traffic congestion because here we pay by card, swipe the card at the payment desk and the pallet can drop the car off at the desired location

2. **Save time:** This is a time saver. Finding a parking space in manual parking is quite difficult and time-consuming. Sometimes it is late for meetings or other important work[12].

3. **Parking lot security:** To prevent situations such as theft and mugging, no one is allowed to enter the parking lot, and robberies can sometimes be harassed in quiet parking lots. This system prevents these problems.

4. **Fuel saving:** In this system, we use pallets that automatically place the cars in the parking lot and drop them off at the desired parking lot. This will reduce fuel costs. Here we don't need the whole station to light up[13]. It shines when moving anywhere on the road and is still very powerful.

5. **Saving on operating costs:** Over time, the cost of parking will decrease. Since the system does not require human interaction to perform financial transactions[14], man-hours need to be reduced.

6.Conclusion :

We concluded that the images or videos of the station are retrieved from the dataset repository. We are developing a deep learning algorithm using RCNN to detect or identify empty parking spaces.

7. Future Development:

In future work, we will combine hybrid transfer learning or two different machine learning or two different types of deep learning to make the work better or work better.

8.REFERENCES

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