# Hands on with Surveillance Camera

**(Micro-project report)**

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## Abstract

Smart Parking System using Image Processing is a real-time parking management solution that leverages the power of computer vision and image processing technology to solve the problem of parking space utilization. The system uses cameras placed at strategic locations to capture images of parking spaces, which are then processed by computer vision algorithms to detect the presence or absence of a vehicle in a parking space. The processed information is then communicated to a central database, which updates the availability of parking spaces in real-time. This information can be accessed by drivers through a mobile app or a web portal, helping them find available parking spaces quickly and efficiently.

## 1 Camera specifications

- High quality imaging with 4 MP resolution compatible with NVR
- Efficient H.265+ compression technology
- Clear imaging even with strong back lighting due to 120 dB WDR
- Water and dust resistant (IP67)
- EXIR 2.0: advanced infrared technology with long IR range



**Fig 1: SURVEILLANCE CAMERA**

## 2 Objectives identified

- Our aim to display the number of free slots available to park the Car in parking area.
- We also aim is to Assist the driver to park their vehicle in the place allotted specifically for the vehicle.

## 3 Applications of camera

- A surveillance camera can be used in a smart parking system for monitoring and tracking the movement of vehicles in a designated parking area.
- This can aid in managing and optimizing the use of parking spaces, ensuring efficient use of the available space and reducing the time it takes for a vehicle to find an available spot.
- The camera can be used to detect the presence of a vehicle in a parking space and automatically update the availability status of that space in real-time. Additionally, the camera's footage can be used for security purposes and to track any suspicious activity in the parking area.

## 4 Experimentation carried out

- First, we need to a image of empty parking slot so that we make our **Region of Interest** so that we will be focus only on those region for object detection
- After masking the ROI, we can will get the Mask image ->
- Now we will take the image which is having some cars parked in the parking are and convert it to a binary Image.
- When we apply the mask on the binary Image then we will get only the ROI parts in the result.
- After this we can set a threshold (let's take 60% of area) If the black is not continuous then we'll increase out count to 1 in object detection list;

### 5   Learning Outcomes.

At the end of this microproject, we learnt

- Specifying the Region of interest.
- Masking of the image.
- Object detection using block detection
- Applying the algorithm frame by frame to get the number of free slots in real time

**References**

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