

Project Design Phase-I
Solution Architecture

Date	18-05-2023
Team ID	NM2023TMID14621
Project Name	AI enabled car parking using openCV
Maximum Marks	4 Marks

Solution Architecture:

1. input Source: The system should have a camera or multiple cameras placed strategically to capture the parking lot. These cameras will act as the input source for the parking system.
2. Camera Interface: The camera(s) will be connected to a computer or a dedicated processing unit that interfaces with the OpenCV library. This interface should provide access to the video feed or individual frames from the cameras.
3. Object Detection and Tracking: OpenCV's computer vision capabilities can be utilized to perform object detection and tracking. The parking system should use these techniques to identify and track vehicles in the video feed. You can utilize pre-trained models like Haar cascades or more advanced deep learning models like YOLO or SSD for object detection.
4. Parking Space Mapping: The next step is to map the available parking spaces. This can be achieved by analyzing the video feed and identifying vacant and occupied spaces. Techniques like image segmentation and contour detection can be used to identify parking spaces and differentiate between empty and occupied spots.
5. Data Processing and Analysis: Once the parking spaces are mapped, the system needs to process and analyze the data to provide useful insights. This could include calculating parking occupancy, predicting available spaces, or generating real-time statistics on parking lot usage.

Example- Solution Architecture Diagram:

