Project Design Phase-I
Proposed Solution Template

Date	06 May 2023
Team ID	PNT2022TMID05926
Project Name	Project – AI Enabled Car Parking with open CV

Proposed Solution Template:

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	The problem addressed by the car parking system using OpenCV is the inefficiency and inconvenience associated with traditional parking methods. Traditional parking systems often suffer from limited parking space availability, inefficient allocation of parking spots, and time-consuming search for vacant spaces. This leads to increased traffic congestion, driver frustration, and decreased overall parking efficiency. The objective is to develop an automated parking system using OpenCV that can accurately detect and track vehicles, identify available parking spots, and streamline the parking process. The system aims to address these challenges by utilizing computer vision techniques to optimize parking space management, improve driver experience, reduce traffic congestion, and enhance overall operational efficiency for parking operators.

2.	Idea / Solution description	The car parking system using OpenCV is to utilize computer vision techniques to automate and optimize the parking process. The system will employ OpenCV's image processing and analysis capabilities to detect and track vehicles, identify vacant parking spaces, and manage parking occupancy. Using cameras or video streams, the system captures real-time images or video frames of the parking area. OpenCV algorithms are then applied to process the input and detect vehicles by analyzing features such as contours, motion, and object recognition. Once the vehicles are detected, OpenCV-based tracking algorithms are utilized to track their movement within the parking area. This allows for real-time monitoring of

		available parking spots and accurate assessment of parking occupancy. To guide drivers, the system employs techniques like image segmentation and contour detection to identify vacant parking spaces. Additionally, machine learning algorithms can be incorporated to classify parking spaces based on vehicle size or type. The system will provide a user-friendly interface, such as mobile apps or digital signage, to display real-time parking information to drivers, indicating available parking spots and guiding them to the nearest vacant space. By automating the parking process and providing accurate parking occupancy information, the car parking system using OpenCV improves parking efficiency, reduces search time for drivers, minimizes traffic congestion, and enhances the overall parking experience

3.	Novelty / Uniqueness	By utilizing OpenCV, car parking systems can employ advanced algorithms to detect, track, and analyze vehicles in real-time. This allows for efficient monitoring of parking spaces, automated vehicle counting, and accurate identification of available spots.
4.	Social Impact / Customer Satisfaction	Car parking systems utilizing OpenCV have a significant social impact and contribute to increased customer satisfaction. The integration of OpenCV in car parking systems brings forth various social benefits and positively impacts customer satisfaction. By leveraging advanced computer vision algorithms, OpenCV-based parking solutions offer the following advantages:
5.	Business Model (Revenue Model)	Car parking systems utilizing OpenCV can generate revenue through multiple streams. These include parking fees charged to customers based on usage duration, subscription models offering recurring access to parking spaces, premium services for added convenience, advertising and sponsorships on
		digital displays, data monetization by providing valuable insights, and partnerships with ridesharing or car-sharing companies. By employing these revenue models, OpenCV-based car parking systems can ensure a sustainable and profitable operation while delivering enhanced parking experiences to customers.
6.	Scalability of the Solution	The customer places the order on the client's website ,the order is processed by the web application and analyses the amount of raw