

Project Design Phase-II
Solution Requirements (Functional & Non-functional)

Date	09/MAY/2023
Team ID	IBM--18527-1682584903
Project Name	AI Enabled Car Parking Using OpenCv
Maximum Marks	4 Marks

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	License Plate Recognition	<ul style="list-style-type: none">As a driver, I want the system to recognize my car's license plate accurately and quickly when entering or leaving the parking lot.The system should capture the license plate image using a camera installed at the entrance or exit of the parking lot.The system should process the license plate image using OpenCV algorithms to extract the license plate number.The system should compare the extracted license plate number with the database of registered vehicles to determine if the car is authorized to enter or leave the parking lot.
FR-2	Parking Lot Occupancy Monitoring	<ul style="list-style-type: none">As a driver, I want the system to provide accurate information about available parking spaces in real-time.The system should use OpenCV algorithms to detect and track the occupancy of each parking space.The system should update the parking lot occupancy data in real-time and display it on a parking lot map or screen.The system should be able to differentiate between occupied and unoccupied parking spaces and detect any unauthorized parking.
FR-3	Parking Guidance	<ul style="list-style-type: none">As a driver, I want the system to guide me to an available parking space quickly and easily.The system should display the location of available parking spaces on a parking lot map or screen.The system should guide the driver to an available parking space using visual or audio cues.The guidance should be accurate and easy to follow, taking into account the location of the driver's car and the available parking spaces.

FR-4	Parking Lot Configuration	<ul style="list-style-type: none"> As an administrator, I want to be able to configure the parking lot layout and the number of parking spaces easily. The system should allow the administrator to input the parking lot layout and the number of parking spaces for each area. The system should be able to generate a parking lot map based on the configuration. The administrator should be able to update the parking lot configuration at any time.
FR-5	Reporting and Analytics	<ul style="list-style-type: none"> As an administrator, I want to be able to generate reports and analyze the parking lot usage easily. The system should allow the administrator to generate reports on the parking lot occupancy, usage, and revenue. The system should provide analytics on the parking lot usage and trends. The reports and analytics should be easy to understand and use.

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Performance	<ul style="list-style-type: none"> The system should be able to process license plate images and parking lot occupancy data in real-time, without significant delays or downtime. The system should be able to handle a high volume of traffic, including peak times, without affecting the performance. The system should have a response time of less than 2 seconds for license plate recognition and parking guidance.
NFR-2	Reliability	<ul style="list-style-type: none"> The system should be reliable and available 24/7 without significant downtime. The system should be able to recover from any errors or failures quickly and automatically without human intervention. The system should be able to handle unexpected events, such as power outages or hardware failures, without losing any data or affecting the performance.

NFR-3	Security	<ul style="list-style-type: none"> • The system should be secure and protect the privacy of the customers' data. • The system should be able to prevent unauthorized access to the parking lot or the system. • The system should be able to detect and alert in case of any security breaches, such as tampering with the cameras or the sensors.
NFR-4	Scalability	<ul style="list-style-type: none"> • The system should be scalable and able to handle an increasing number of parking spaces and users. • The system should be able to integrate with other parking management systems or technologies, such as payment gateways or mobile applications. • The system should be able to adapt to any changes in the parking lot configuration or the traffic patterns.
NFR-5	Usability	<ul style="list-style-type: none"> • The system should be user-friendly and easy to use for both drivers and administrators. • The system should have a clear and intuitive user interface for accessing the parking lot map and the reports. • The system should provide clear and concise instructions for the drivers to follow during parking guidance.

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