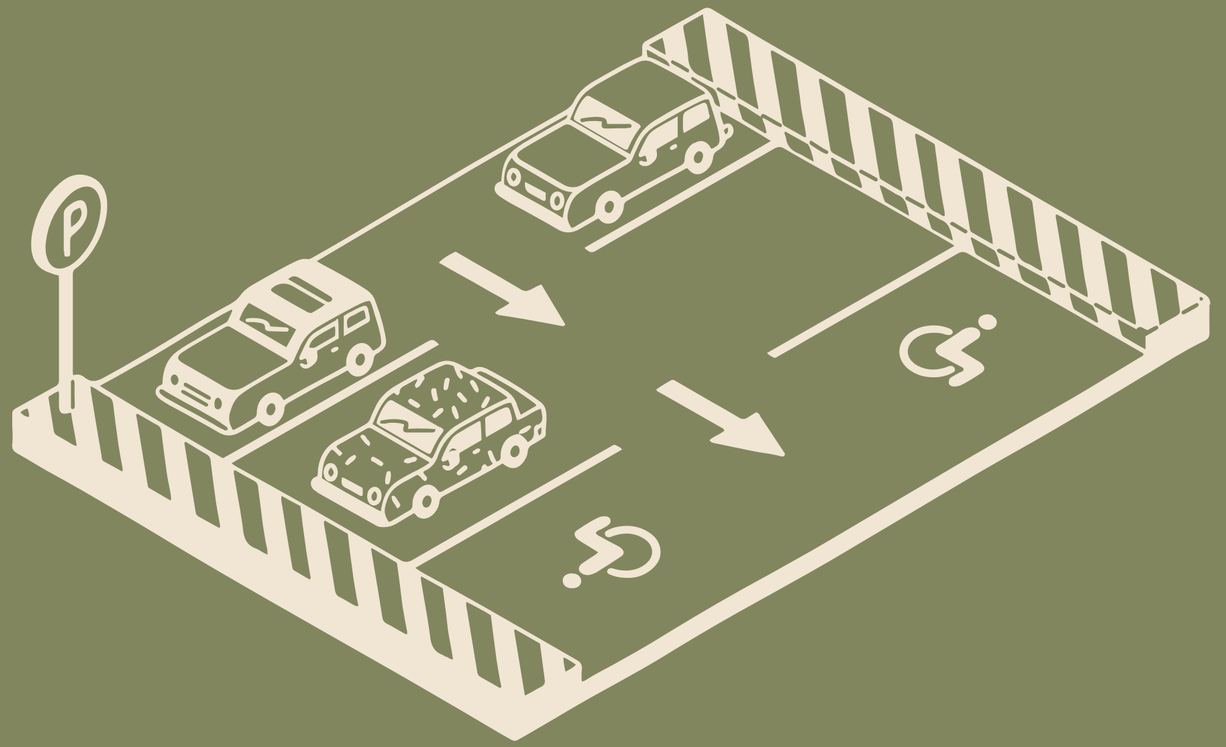
Smart Parking Management System



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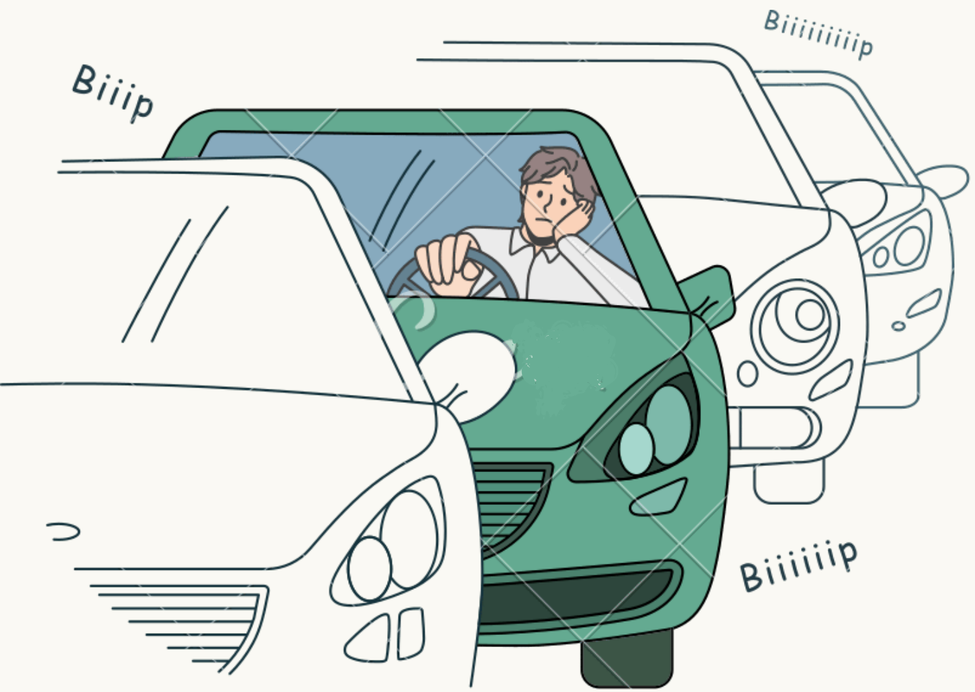
Problem statement:



Urban areas face increasing traffic congestion and pollution due to inefficient parking management. Drivers spend an average of 30% of their travel time searching for parking, leading to increased CO_2 emissions, fuel wastage, and unnecessary road congestion. Traditional parking systems lack real-time availability updates, causing frustration for drivers and inefficient space utilization.

SDG:11

This aligns with SDG 11, sustainable cities and communities, as we aim to reduce carbon emissions and fuel consumption by providing real time updates on parking spaces.

Proposed Solution

Our game plan is to capture images of parking lots and use an iot device to transmit data like total available spaces to the user along with the location of the parking space

- Camera images and IoT sensors detect parking occupancy in real-time.
- ML model(YOLO)finds locations of parking availability.
- Data from the IoT device is sent to a database.
- Navigation system directs drivers to the nearest vacant spot.
- Data analytics helps optimize parking lot management.

How it works?

1. Image Capture
    - A network of cameras is installed in parking lots.
    - These cameras take real-time images at regular intervals.
2. Processing & Location Mapping
    - GPS module on the IoT device transmits the coordinates of the empty spaces to the database
3. Database
    - The images and locations are stored in a database.
4. User Interface & Navigation
    - A script fetches data from the database.
    - Users can view available parking spots in real-time using our website.
    - When a user selects a parking lot, they are redirected to Google Maps, showing the location and available spaces.

A

IoT Sensors

- camera and a GPS module

B

Software used

CounterFit used to simulate IoT hardware

C

ML Model

YOLOv8

D

Website

Gives the user live updates about number of open parking spots and navigates user to the location

E

Database

Microsoft azure SQL database

F

IoT Hub

Device connects to Microsoft Azure IoT Hub using MQTT

THANK YOU