Problem Statement

PS - 13
Vehicle Movement Analysis and Insight
Generation in a College Campus using Edge AI

Unique Idea Brief (Solution)

➢ This solution utilizes Edge AI to deliver in-depth insights into the movement and parking behaviors of vehicles on college campuses.

➢ It provides with features like Vehicle movement analysis, parking occupancy monitoring, counting of incoming and outgoing vehicles, number plate detection, and vehicle validation to optimize campus management and enhance security.

➢ This solution utilizes easy ocr and several python libraries

Solution

➢ This solution counts the number of vehicles going in and going out and finds what type of vehicles they are and ensures efficient management of parking and security in the campus.

➢ Match the vehicle's number plate using number plate detection model and analyze the authorized and unauthorized vehicles.

➢ Solution uses a dataset to analyse the type of vehicle.

Features Offered

Count of vehicles in and out:
Counting the number of vehicles entering a particular lane and leaving the particular lane

Number Plate Detection:
Analyze the number plates of vehicles and flag the vehicles as authorized and unauthorized
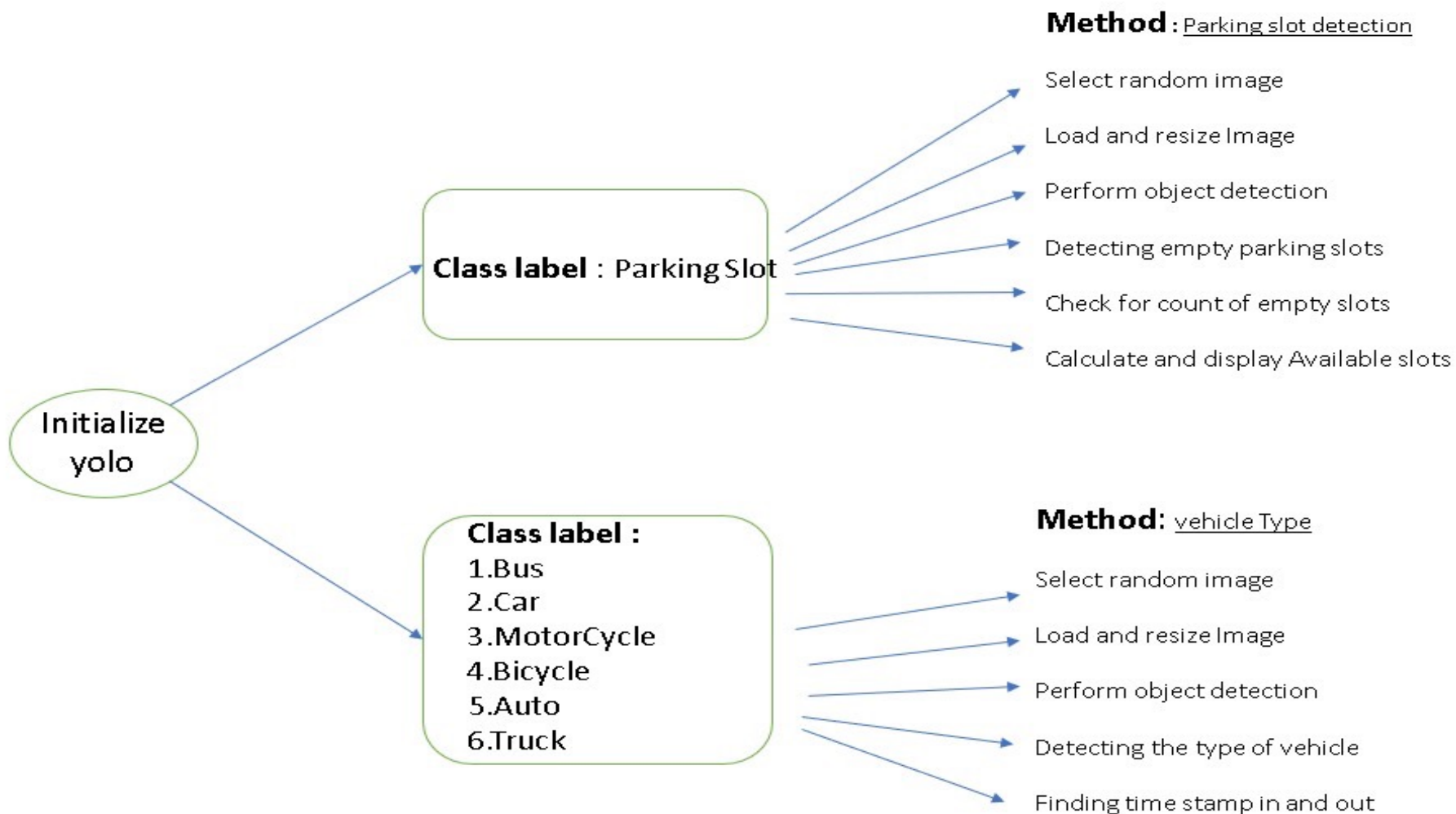
Parking Slot Detection:
Manage the parking slots available on the college campus by checking the vehicle occupancy
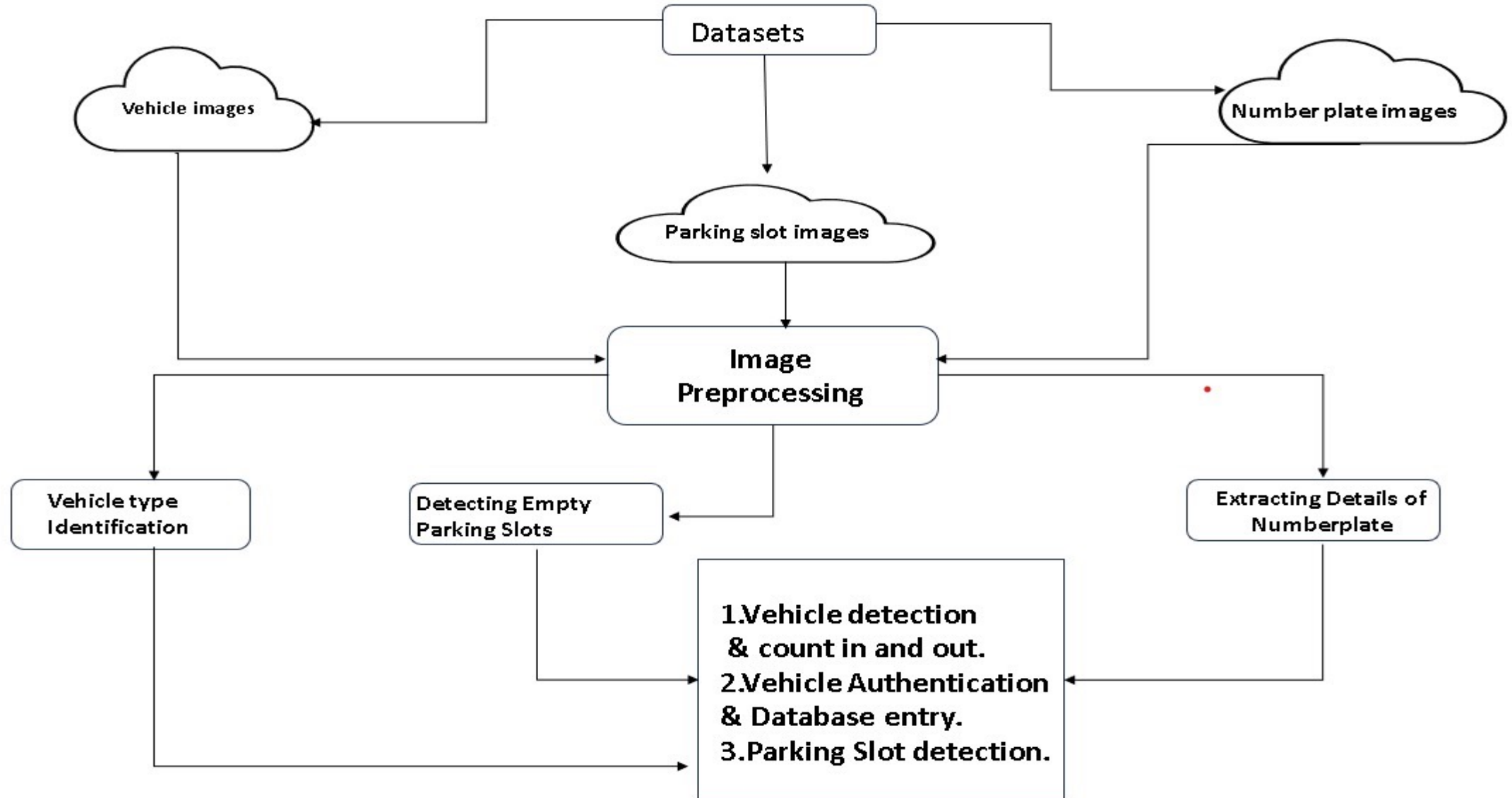
Vehicle Movement Analysis:
Analysing the movement of vehicles to manage the security

Process Flow

Initialize yolo

Class label : Parking Slot

Method : Parking slot detection

- Select random image
- Load and resize Image
- Perform object detection
- Detecting empty parking slots
- Check for count of empty slots
- Calculate and display Available slots

Class label :
1. Bus
2. Car
3. MotorCycle
4. Bicycle
5. Auto
6. Truck

Method: vehicle Type

- Select random image
- Load and resize Image
- Perform object detection
- Detecting the type of vehicle
- Finding time stamp in and out

Architecture Diagram

Technologies used

➢ Python
➢ Yolo – V5 And V8
➢ opencv
➢ Easy OCR
➢ numpy
➢ pandas
➢ matplotlib
➢ Database (MYSQL)
➢ Anaconda Environment
➢ VS Code

Team members and contributions:

Potharaju Sai Kishore (**Team Leader**)
Number Plate Detection using easy ocr
- Flagging authorized and unauthorized vehicles
- Security

MD ZAHEER PASHA
Parking slot allotment and analysis
- Analyzing the available and occupied parking slots

Challagundla Yamini
Counting of Vehicles in and out

Panav Kumar Sahu
Project documentation

Hrishikesh Reddy Papasani
Technical support

Conclusion

The solution for Vehicle Movement Analysis and insight Generation in a college campus using Edge AI
Includes various techniques to manage traffic in on college campuses. By exploring real – time image processing using opencv and data analytics
The solution shows the following:
- Number plate detection
- Counting the vehicles in and out
- Parking slot detection and analysis