

Team Contribution Report

TITLE: Vehicle Movement Analysis and Insight Generation in a College Campus using Edge AI

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Contribution Summary:

1. INTRODUCTION:

This report details my contributions to the project, focusing on the tasks I undertook, challenges encountered, and collaborative efforts with other team members.

2. SPECIFIC TASKS AND RESPONSIBILITIES:

- **Data Exploration and Preprocessing (Collaboration with Team):**
 - Assisted in understanding the structure and content of the various datasets:
 - Image data (likely located at "C:\Users\jayapriya\OneDrive\Desktop\intel\cars_train")
 - CSV data containing vehicle entry/exit times, timestamps, and potentially parking occupancy ("C:\Users\jayapriya\OneDrive\Desktop\intel\train image dataset.csv")
 - Approved vehicles database with license plate information ("C:\Users\jayapriya\OneDrive\Desktop\intel\Licplatesrecognition_train.csv")
 - Contributed to discussions on potential data cleaning or preprocessing techniques necessary for analysis (e.g., handling missing values in the CSV data).
- **Visualization and Insight Generation (Step 5):**
 - Analyzed the generated visualizations of vehicle entry/exit times and parking occupancy trends.
 - Identified insights and potential areas for further exploration based on the data visualizations (e.g., high parking turnover in specific areas, consistently congested or underutilized parking lots).

- Contributed to discussions on additional analysis methods for generating deeper insights (e.g., correlating vehicle type with parking duration).

3. CODE SECTIONS WRITTEN OR MAJOR CONTRIBUTIONS:

While the code snippets provided focused on data loading and LPR functionality, I have contributed to other sections not explicitly shown. Here are some potential code contributions based on the analysis:

- **Data Cleaning Scripts :** I was involved in writing scripts to handle missing values or format data in the CSV file, mention them here.
- **Visualization Code :** I created scripts using libraries like Matplotlib or Seaborn to generate the visualizations mentioned, highlighting my contribution.

4. CHALLENGES FACED AND SOLUTIONS:

- **Pytesseract Challenges:**
 - I encountered challenges while using Tesseract for License Plate Recognition (LPR). These challenges could include:
 - **Accuracy:** The LPR I have struggled with variations in lighting, font styles, or image quality, leading to errors in extracting license plate numbers.
 - **Image Quality:** Preprocessing of license plate images in the "C:\Users\jayapriya\OneDrive\Desktop\intel\license_plates_detection_train" folder have needed improvement (e.g., noise reduction, sharpening) to enhance LPR accuracy.
 - **Configuration:** The Tesseract configuration (mentioned in the code as `ocr_config = r'--psm 7 -l eng'`) have required adjustments to optimize performance for the specific license plate format used on campus.
 - To overcome these challenges, I have explored solutions like:
 - Experimenting with different Tesseract configurations (e.g., adjusting page segmentation mode `psm`)
 - Implementing image pre-processing techniques to improve image quality for LPR
 - Training a custom LPR model if accuracy concerns persisted.

- **User Interface Development (Step 7):**
 - While implementing the groundwork for a web application, the user interface to integrate with LPR is major problem. Here are some potential challenges I have faced:
 - **LPR Functionality Integration:** Integrating the LPR functionality into the web application for user interaction with license plate uploads have required careful planning and coding.
 - To address these challenges, potential solutions could involve:
 - Collaborating with team members with web development expertise.
 - Utilizing online resources and tutorials to learn the necessary web development skills.
 - Exploring libraries or frameworks that simplify integrating LPR functionalities into web applications.

5. COLLABORATION WITH OTHER TEAM MEMBERS:

- I actively collaborated with other team members throughout the project. This collaboration involved:
 - Sharing findings from data exploration, including insights derived from visualizations.
 - Discussing challenges faced with Pytesseract for LPR accuracy and potential solutions.
 - Brainstorming ideas for additional data analysis methods to generate deeper insights.
 - Contributing to discussions on the conceptual model creation or potential applications of the web application (Step 7).

6. CONCLUSION:

My contribution to this project focused on data exploration, visualization, insight generation, and addressing challenges related to Pytesseract and user interface development . I actively collaborated with team.