Stay Ahead

Academic Year 2025 - 26

S6 MINI PROJECT - II

First Review

PROJECT TITLE

Traffic Sign Prediction

BIP PROJECT ID

26S6MIN400

CATERGORY

INTERNAL

BATCH MEMBERS

SUBALEKA K R-7376222AD208

HARINI M- 7376222AD143

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GUIDE

MANJU M

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AIM & OBJECTIVES OF THE PROJECT
(Problem Statement)

The aim of this project is to develop a **Traffic Sign Recognition System** using **Deep Learning** techniques. The system will classify traffic signs from images using a **Convolutional Neural Network (CNN)** model. The trained model will be deployed in a web application using **Flask**, allowing users to upload an image of a traffic sign and receive its classification as output. This can assist autonomous vehicles and intelligent traffic management systems in recognizing and responding to traffic signs effectively.

LITERATURE SURVEY

| Sl.No.	Journal Paper Title with Author	Works carried out (with details of Methods/ Materials/ Software/ Algorithms / fabrication / techniques/ components used)	Information gathered relevant to your project
1	H. Wu, J. Zhang, and Y. Chen, "A Deep Learning-Based Traffic Sign Recognition System Using Vision Transformers," *IEEE Transactions on Intelligent Vehicles*, vol. 8, no. 1, pp. 45-58, 2023.	The authors implemented a Vision Transformer (ViT) model for traffic sign recognition, achieving higher accuracy than traditional CNN-based models. The model was trained on GTSRB and BelgiumTS datasets, using data augmentation and transfer learning techniques.	Vision Transformers improve classification accuracy by capturing global dependencies. Transfer learning enhances model generalization for unseen traffic signs.
2	M. Patel and A. Gupta, "Enhancing Traffic Sign Recognition Using Lightweight CNN Models," *Journal of Machine Vision and Applications*, vol. 35, no. 4, pp. 233-249, 2022.	Explored MobileNet and EfficientNet for traffic sign recognition, focusing on reducing computational complexity while maintaining accuracy.	Explored MobileNet and EfficientNet for traffic sign recognition, optimizing model efficiency while preserving high accuracy.

SCOPE OF THE PROJECT

This project focuses on developing a **web-based application** where users can upload an image of a traffic sign, and the system will predict the sign label and display its description. Using **Deep Learning (CNNs) and Flask**, the backend processes the image, classifies the traffic sign, and returns the results to the frontend for display. This system provides an easy-to-use interface for traffic sign identification, making it useful for educational purposes, driver awareness, and research.

NEED FOR THE CURRENT STUDY

- **Improving Road Safety and Awareness** – A web-based traffic sign recognition system helps individuals easily identify traffic signs, reducing confusion and enhancing road safety.
- **User-Friendly Traffic Sign Identification** – Providing an accessible platform where users can upload images and get instant sign recognition improves learning and awareness for drivers and learners.
- **Advancements in AI-Based Recognition Systems** – Leveraging deep learning and computer vision enhances the accuracy and reliability of automated traffic sign identification.
- **Overcoming Manual Identification Challenges** – Automated recognition eliminates human errors in sign interpretation, ensuring precise and consistent results.
- **Simplified Traffic Sign Learning for Public Use** – This system can be used for educational purposes, helping students, new drivers, and researchers understand traffic rules more effectively.

PROPOSED METHODOLOGY (Flow Chart)

Flow Chart
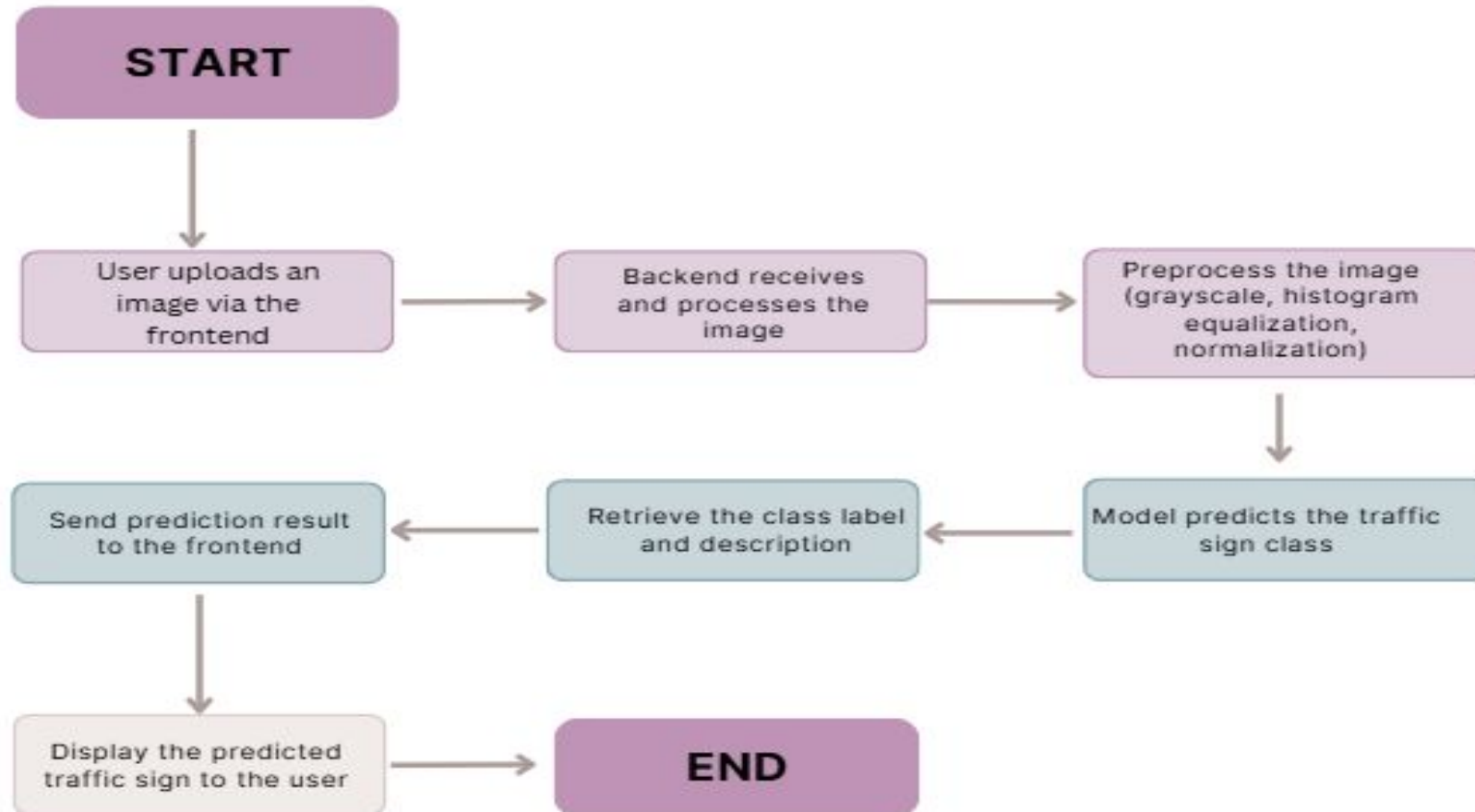
PROPOSED METHODOLOGY (Gantt Chart)

	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7
Research	███						
Content	███						
Design		███					
Uploading		███					
Developing			███	███			
Finalizing							
Marketing							

CHOICE OF TECHNOLOGIES / MODULES / METHODS USED FOR PROJECT DEVELOPMENT

Technologies Used:

- **Backend Framework:** Flask

- **Programming Language:** Python

- **Machine Learning Framework:** TensorFlow, Keras

- **Image Processing Library:** OpenCV

- **Frontend:** React js, Material UI, Axios

- **Data Handling:** NumPy

- **Server:** Localhost or Deployment (Heroku, AWS, etc.)

CHOICE OF MODULES / METHODS USED FOR PROJECT DEVELOPMENT

Modules Developed:

1. **Image Upload Module:**
   - Users can capture or upload an image of a traffic sign. The system processes the image for recognition.
2. **Preprocessing Module:**
   - Applies image normalization, resizing, and noise reduction techniques to enhance recognition accuracy.
3. **Traffic Sign Classification Module**
   - Uses a Convolutional Neural Network (CNN) trained on datasets to classify traffic signs.
4. **Dashboard Module**
   - Displays the recognized traffic sign name along with its description, category.

DESIGN(S) (SOFTWARE ARCHITECTURE)

- **Presentation Layer (Frontend)**

  - Technologies Used: **React JS, CSS**
  - **Functions:** Users can capture or upload traffic sign images via a user-friendly dashboard. Displays predicted sign name and description.

- **Business Logic Layer (Backend)**

  - Technology Used: **Python , flask ,keras**
  - **Functions:** Implements deep learning models for traffic sign classification. Handles image preprocessing and prediction logic.

INDIVIDUAL CONTRIBUTIONS TO THE WORK

Batch Member 1 : Subaleka K R 7376222AD208

Modules Designed :

Designed the **UI/UX** for the project, ensuring a user-friendly and visually appealing interface.

Batch Member 2 : Harini M 7376222AD143

Modules Developed - Frontend development:

Developed the **frontend**, implementing the UI and connecting it with the backend.

Batch Member 3 : Dharshini J -7376222AD126

Modules Developed - Backend development:

Built the **backend**, handling data processing, model integration, and API functionalities.

PLAN FOR PUBLICATIONS

- **Competition Name :** 11th international conference on advance computing and communication system ICACCS'25

- **Tentative Dates for Submission :** 22nd March 2025

- **Place :** Sri Eshwar college of engineering

REFERENCES
(Journal Papers/ Books / Website in IEEE Format)

Journals

[1] *Recent Advances in Traffic Sign Recognition: Approaches and Challenges* (2023): This comprehensive review covers the latest developments in traffic sign recognition, including preprocessing techniques, feature extraction methods, and classification strategies. Link

[2] *A Robust Traffic SignNet Algorithm for Enhanced Traffic Sign Recognition* (2024): This paper introduces a novel TrafficSignNet algorithm designed to improve the accuracy and reliability of traffic sign recognition systems. Link

[3] **"Efficient Vision Transformer for Accurate Traffic Sign Detection"** (2023): This research proposes an improved Vision Transformer model incorporating locality inductive bias for precise traffic sign detection. Link