Traffic Flow Control In Urban Cities

Fakhar Ul Hassan (SP21-BCS-004)

Computer Science Department, COMSATS University Islamabad, Attock Campus.

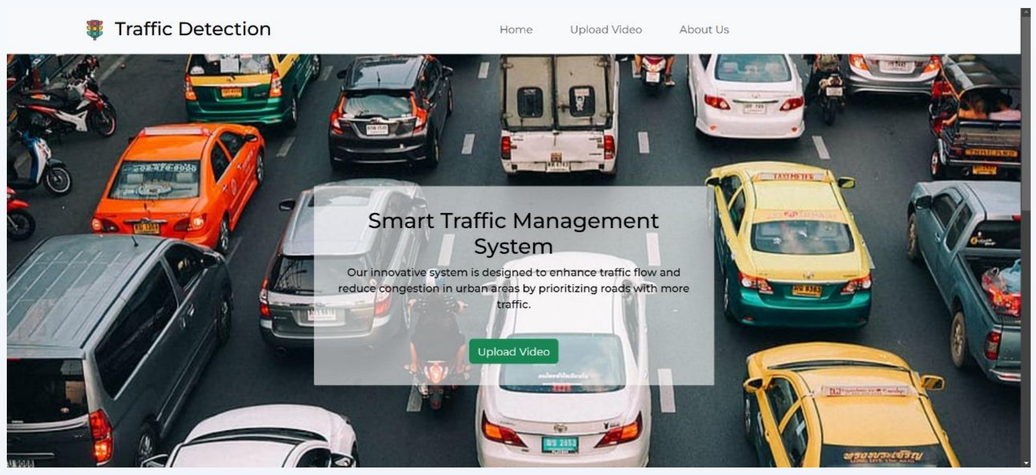
INTRODUCTION

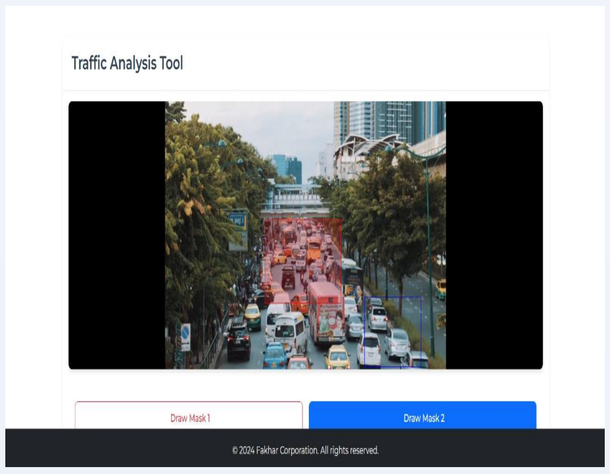
Traffic congestion in urban cities has become a significant issue, leading to delays, fuel wastage, and pollution. The project focuses on optimizing traffic flow by developing an intelligent system that uses real-time vehicle detection to manage traffic signals efficiently. Using YOLOv5, our system counts vehicles at each intersection and dynamically adjusts the signal timings to reduce congestion. The system prioritizes roads with a higher vehicle count, ensuring smoother traffic flow while maintaining fairness by periodically opening all roads.

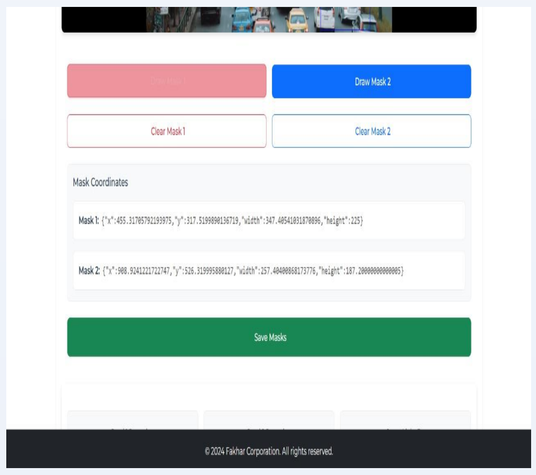
OBJECTIVES

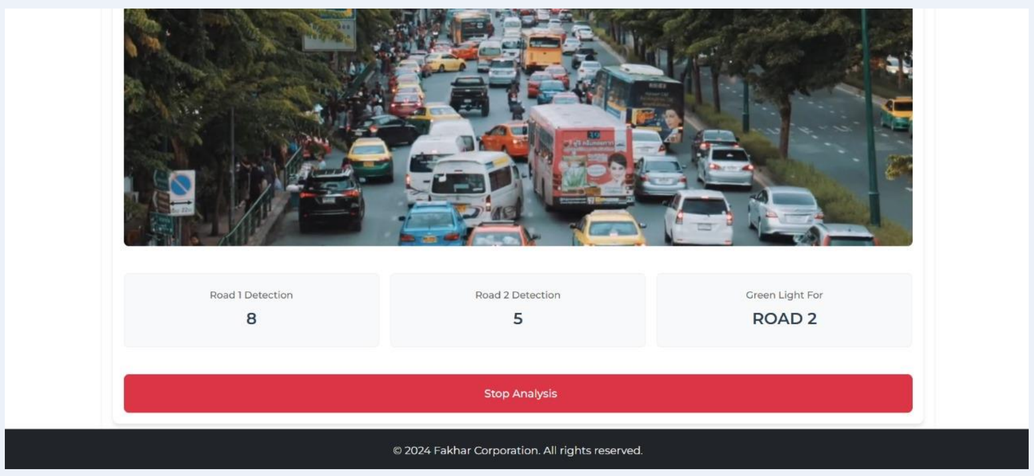
- Develop a real-time traffic monitoring system using YOLOv5.
- Efficiently manage traffic signals based on the vehicle count.
- Reduce congestion by dynamically prioritizing roads with high traffic.
- Ensure fairness by periodically opening all roads for a fixed duration.
- Improve fuel efficiency and reduce vehicle emissions caused by traffic delays.

RESULTS

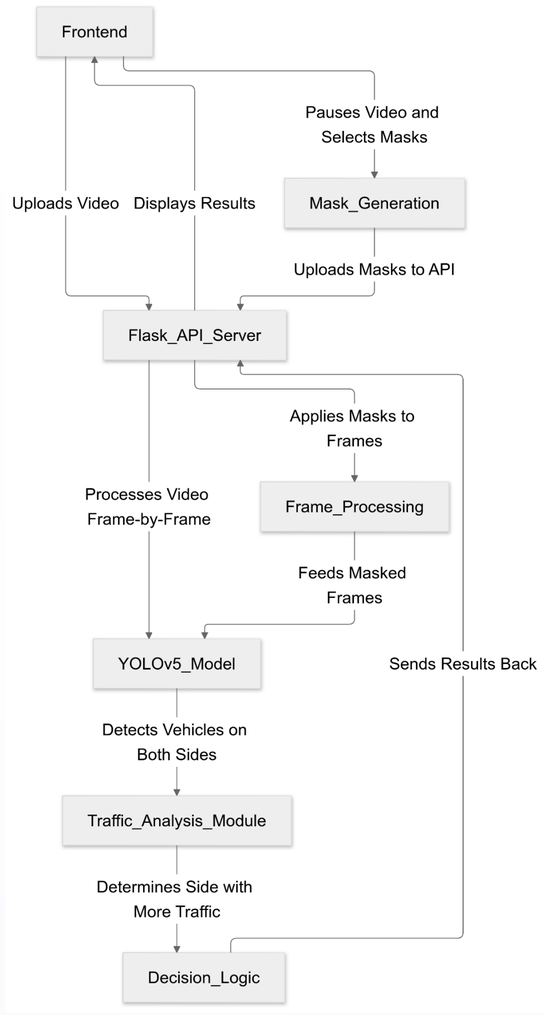








ARCHITECTURE



CONCLUSIONS

The proposed system successfully reduces traffic congestion by prioritizing traffic flow based on real-time vehicle counts. YOLOv5 proved to be an efficient model for vehicle detection, offering accuracy and speed required for urban traffic management. By dynamically optimizing signal durations, the system minimizes delays and enhances fuel efficiency.

FUTURE DIRECTIONS

- Integrate the system with IoT for real-world deployment.
- Add predictive analytics using historical data to improve traffic flow further.
- Extend the model to include emergency vehicles for priority clearance.
- Develop a mobile application for traffic monitoring and updates.

ACKNOWLEDGEMENT

All praise is to Almighty Allah who bestowed upon us a minute portion of His boundless knowledge by virtue of which we were able to accomplish this challenging task. I am greatly indebted to my project Ms. Fouzia Jabeen. Without her personal supervision, advice and valuable guidance, completion of this project would have been doubtful. I am grateful to him for her encouragement and continual help during this work. And I am also thankful to my parents and family who have been a constant source of encouragement for me and brought me with the values of honesty & hard work.