



DHOLE PATIL COLLEGE OF ENGINEERING,PUNE

DEPARTMENT OF ELECTRONIC AND TELECOMMUNICATION

Presentation on

T1-3

Title: Smart Traffic Management System

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1. Introduction

- In urban areas where the number of vehicles is rapidly increasing and resources are limited, traffic management has become a significant challenge. The resulting congestion and its associated issues, such as accidents, pollution, and wasted time, have a detrimental impact on various aspects of society, including economic development and public well-being.
- To address these challenges, the concept of smart traffic signal systems has emerged. It aims to minimize traffic congestion, enhance safety, reduce travel times, and improve overall traffic flow efficiency.
- Our proposed system focus on the empty space in order to reduce the time spends in traffic signals, detect it, and prevent traffic.



2. Problem Statement

- Now a days in our country where the number of vehicles continuously increases faster than the available resources ,it is becoming difficult to handle this issue, and it becomes even worse in case of accidents.
- Lack of coordination and adaptability in the current traffic signal system to respond to varying traffic demands, resulting in underutilization of road capacity and suboptimal traffic flow.
- Traffic congestion problem affects many aspects as society including economic development, traffic accidents, and increase in pollution, time spent and health issues.



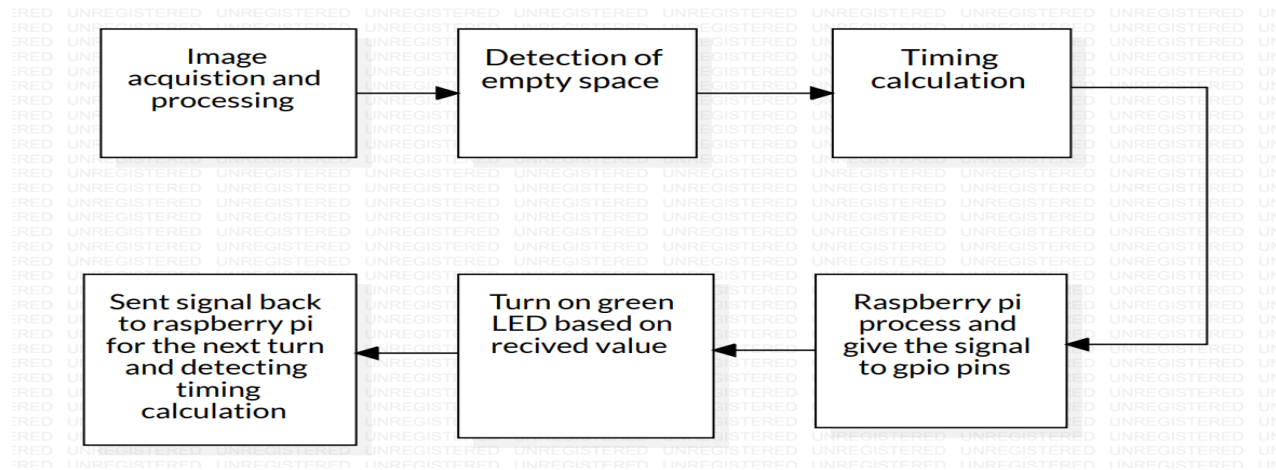
3. Objectives

- Evaluate the existing traffic management system and its limitations.
- Design a smart traffic management system using advanced technologies.
- Implement a design or system of the smart traffic management system.
- Evaluate the system's performance in reducing congestion and improving traffic flow.
- Analyze the results and provide recommendations for system enhancement.

4. Literature Review

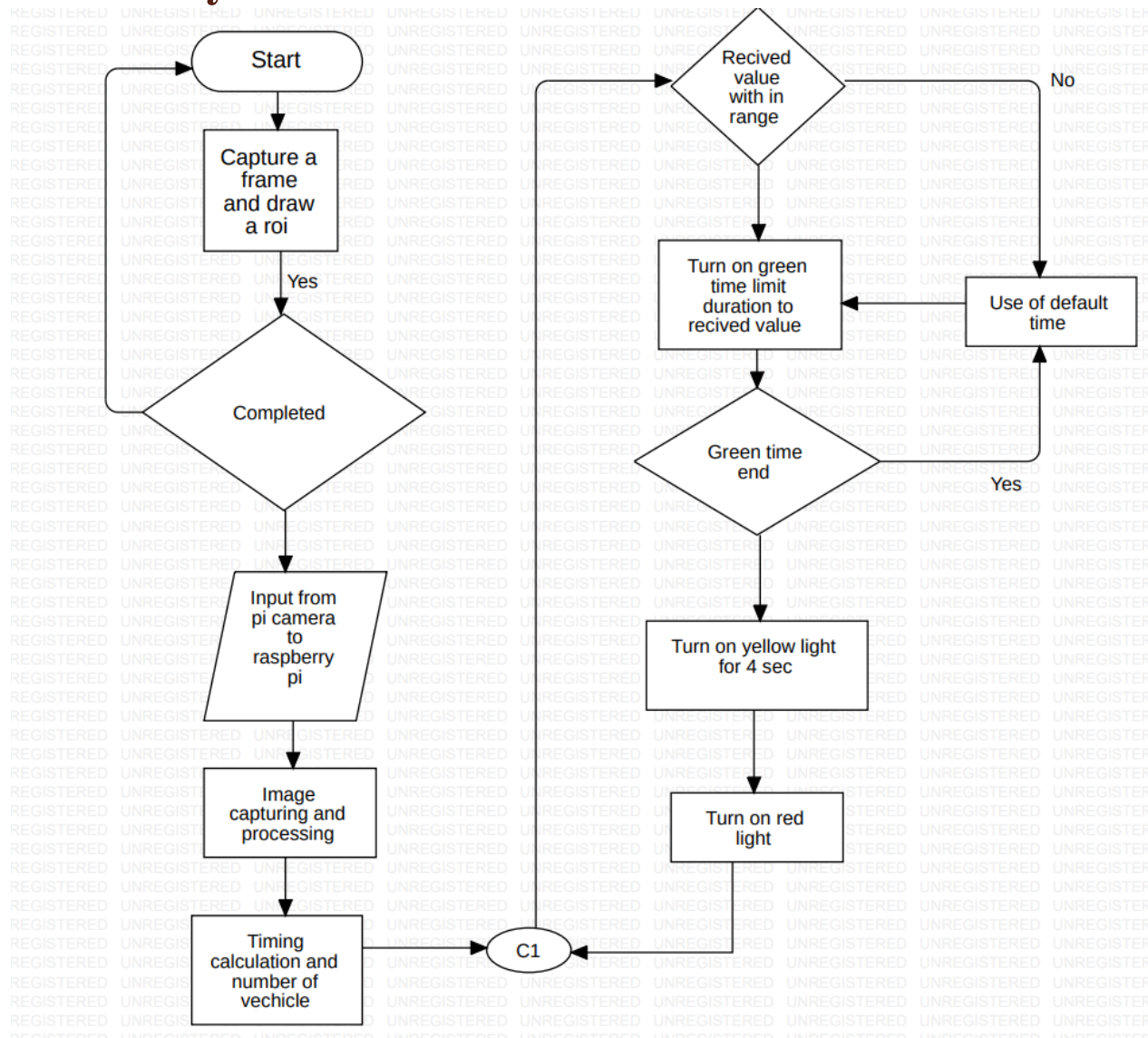
Sr. No	Title	Year of Publication	Author	Summary
1.	Raspberry Pi-Based Intelligent Traffic Signal Control at Intersections	2022	Zammeri Abd Rahman and Zulkifli Abd Rahman	<ul style="list-style-type: none">• Raspberry pi controlled traffic density monitoring system.• Intersections in a network in order to minimize traffic congestion.
2.	Adaptive Traffic signal system	2021	Mihir Gandhi	<ul style="list-style-type: none">• Uses live images from the cameras at traffic junctions for traffic density calculation.• Signal switching algorithm updates the red, green, and yellow times of all signals after calculating the density.
3.	Traffic Signal Management using Machine Learning Algorithm.	2020	Sunayana Jadhav and Siddharth Vaghela and Shubham Tawde.	<ul style="list-style-type: none">• Complex backgrounds are eliminated from real photos prior to being inputted for the CNN model.• Not an uneven distribution of Wait Time and therefore uneven accumulation of traffic at a junction.

5. Proposed System

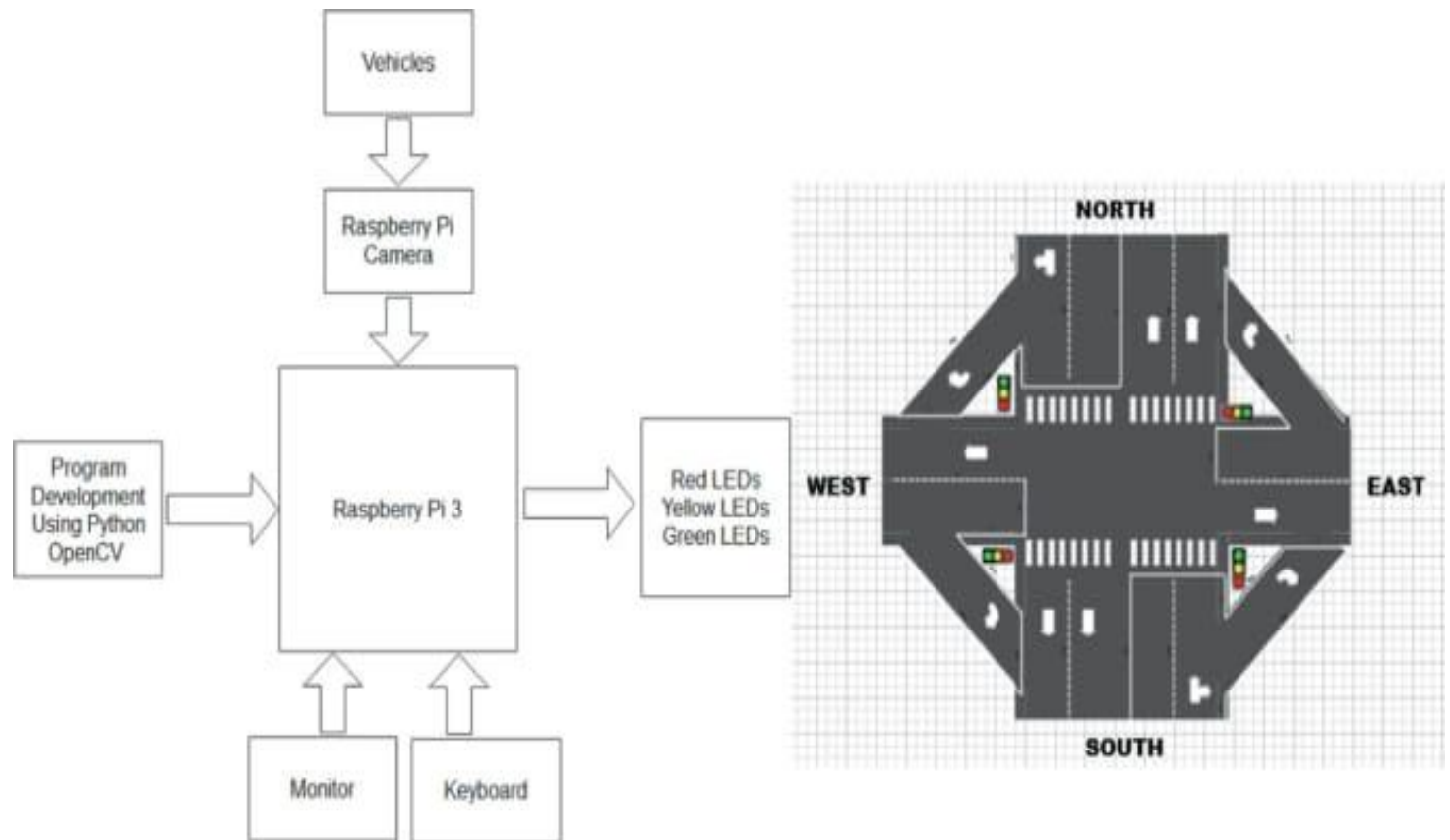


- Images captured from the camera on junctions are processed in Raspberry pi OS.
- They are sent to Opencv algorithm to detect the empty spaces on the road by using Gray Level Slicing technique .
- After comparing the empty spaces in all the lanes , our algorithm will change the signal timing.

6. Flow of the System



7. Architecture



8. Advantages and Disadvantages

Advantages:

- Improved traffic flow.
- Reduced travel times.
- Environmental benefits.
- Data-driven decision-making.

Disadvantages:

- Different weather conditions can create issues detecting empty space.
- Technical challenges.
- Implementation costs.



9. Conclusion

- The implementation of a smart traffic signal system offers significant potential for improving traffic management and addressing the challenges associated with increasing vehicle numbers.
- By capturing real-time data, this system can optimize traffic signal timings, reduce congestion, enhance safety, and minimize travel times.

10. Future Scope

- Integrating the system which can keep records of vehicles who breaks the law.
- Ambulance or Emergency vehicles gateway integration.

11. References

- [1] Raspberry Pi-Based Intelligent Traffic Signal Control at Intersections by Zammeri Abd Rahman and Zulkifli Abd Rahman March 2022.
- [2] Adaptive Traffic signal by Timer Mihir Gandhi Feb – 2021.
- [3] Traffic Signal Management using Machine Learning Algorithm Sunayana Jadhav and Siddharth Vaghela and Shubham Tawde, and Rashmi Bharambe and Stuti Mangalvedhe June-2020.
- [4] Automated Traffic Light System Based on Image Processing and Machine Learning Techniques Arakatla Mamatha October-2018.
- [5] Intelligent Traffic Light System for Green Traffic Management Hassan Bashir and Habibu Rabi December-201