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PROCEEDINGS OF JOHOR INTERNATIONAL INNOVATION INVENTION COMPETITION AND SYMPOSIUM 2024 (JIIICaS 2024)



*"Flourish and Nurturing Sustainable
Innovation for a Prosperous Nation"*

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Preface

In the name of Allah, the Almighty who gives us the enlightenment, the truth, the knowledge and with regards to Prophet Muhammad (peace be upon him) for guiding us to the straight path. We thank to Allah for giving us guidance and strength to write this e-book.

This e-book compiles the extended abstracts that submitted to Johor International Innovation Invention Competition and Symposium 2024 (JIIICaS2024), where JIIICaS2024 is a virtual platform for all creative minds to share and present their invention and innovation. Each abstract gives a brief background on the innovation or project.

We hope that this e-book will help the readers to get to know the innovation done by the students and get some ideas to develop future innovation products.

Foreword Rector



Assalamualaikum warahmatullahi Wabarakatuh,
Salam Sejahtera, Salam Malaysia MADANI and
Salam UiTM Dihatiku.

In the name of Allah, the Most Gracious, the Most
Merciful.

It is a great honor to welcome you to the Johor
International Innovation, Invention, Competition, and
Symposium 2024 (JIIICaS 2024). This event

connects various disciplines, focusing on education and engaging educators,
students, researchers, and innovators from all walks of life.

Innovation is not just about ideas; it demands perseverance, creativity, and
determination to turn those ideas into reality. The remarkable projects
showcased today highlight the dedication and spirit of all participants.
Initiatives like this not only explore new technologies but also cultivate skills
and leadership among our youth. At Universiti Teknologi MARA (UiTM) Johor
Branch, we are fully committed to fostering a dynamic culture of innovation,
promoting the commercialization of new products, and encouraging
meaningful collaborations with industry and society.

As we celebrate this event, I would like to extend my heartfelt gratitude to all
sponsors, judges, the College of Computing, Informatics and Mathematics,
UiTM Pasir Gudang Campus as the event organizer, as well as to the
researchers and participants for their hard work in making this event a
success. Let us continue striving for innovation and excellence. May the
ideas presented today inspire us and lay the groundwork for future
achievements.

Thank you.

Associate Professor Dr. Saunah Zainon
Rector
Universiti Teknologi MARA (UiTM)
Johor Branch

**(A-PP016) TRAFFIC LIGHT AUTO-DETECTION (TLAD) TOWARDS
SUSTAINABLE SMART TRANSPORTATION**

MUHAMMAD FIRDAUS BIN ZURAI
MAISARAH NABILAH BINTI AHMAD AMIRUDDIN
ZIRAWANI BAHARUM
SALLAUDIN HASSAN

ABSTRACT

Introduction:

In this rapidly advancing era, buses faced a challenge of low demand from road users, despite being designed to reduce the number of private vehicles on the road.

Problem Background:

The core issue originated from a lack of prioritization for public transport on the road, resulting in lengthy travel times between stations and infrequent bus trips. This modelled a challenge as the number of private vehicles increased, and demand for buses decreased. To tackle this issue, our project prioritized the buses that seamlessly integrated with traffic lights.

Objective:

Therefore, the objective of this study is to develop a simulation model for traffic light auto-detection (TLAD) recognition in order to support the ministry agenda into towards sustainable smart transportation. The TLAD recognition prioritised the public transport (e.g. buses) by decreased the waiting time at the junction.

Research Methodology:

The research begins by identification of 6 components of TLAD through the comprehensive content analysis. Before proceed with the design simulation model, the details observation to map the flow of the process in simulation model. Lastly, the TLAD simulation model is developed, and the data is analysed using PTV Vissim software, and also validated by the industry expert. The efficiency of the existing transport system was evaluated and analysed using statistical data obtained from a site survey.

Result:

As a result, this project proves the decrease of the waiting time of buses using TLAD recognition, focuses at traffic lights.

Significant/Contribution:

The project had the significant potential to impact communities by decreasing the amount of time buses spent waiting at traffic lights. By implementing this approach, it was believed that road users would convert from using private vehicles to utilizing buses, resulting in reduced congestion and lower carbon emissions. Furthermore, this

project had the possibility to expand into a device that could bring numerous benefits for future togetherness.

Keywords:

Transportation, Automatic, Traffic Light, Smart City, Sustainability

PRODUCT DESCRIPTION

The Traffic Light Auto Detection (TLAD) system is an innovative solution designed to optimize urban traffic flow by prioritizing public buses at intersections. Utilizing advanced RFID technology, TLAD detects approaching buses and adjusts traffic signals in real-time to minimize bus waiting times. This system integrates seamlessly with existing traffic control infrastructure, ensuring efficient and smooth transit for public transportation.

Key Features:

1. **RFID Detection:** Equipped with RFID readers to identify and prioritize buses at a distance.
2. **Real-Time Signal Adjustment:** Dynamically alters traffic light phases to reduce bus delays.
3. **Data Analytics:** Collects and analyses traffic data to continuously improve signal timings.
4. **Compatibility:** Integrates with existing traffic management systems for easy implementation.
5. **Environmental Impact:** Reduces fuel consumption and emissions by decreasing idle times for buses.

Benefits:

- **Reduced Travel Time:** Significantly cuts down on bus travel times, enhancing public transit efficiency.
- **Improved Punctuality:** Ensures buses adhere to schedules, boosting passenger satisfaction.
- **Lower Congestion:** Frees up road space by encouraging public transport use, thus reducing overall traffic congestion.
- **Sustainability:** Promotes greener urban environments through reduced carbon emissions.

The TLAD system represents a forward-thinking approach to urban mobility, offering a scalable and effective solution to modern traffic challenges.