Team Members Dr. Mohd Nadhir Ab Wahab | Dr. Ahmad Sufril Azlan Mohamed | Dr. Mohd Halim Mohd Noor

INTRODUCTION

iPassenger is a cutting-edge automated system that counts incoming and outgoing bus passengers using cutting-edge technologies such as image processing and artificial intelligence. The system detects and tracks passengers to automatically count them by analyzing video frames captured by the bus surveillance camera. This eliminates the need for manual counting, which is often time-consuming and error prone. iPassenger system not only counts passengers, but it also extracts useful data from video frames such as date, time, bus number, and coordinates for the location (latitude and longitude). This data is then used to determine the bus route, as well as the arrival and departure times at each bus stop. This feature is beneficial to bus companies because it allows them to monitor and optimize their fleets and services. iPassenger has several advantages over traditional passenger counting methods as it is more accurate because it eliminates the possibility of human error. It is quicker because it can count passengers in real time. It also provides valuable insights into passenger behaviors and bus usage patterns, which can aid in improving bus service quality. iPassenger is a revolutionary system that provides a dependable, efficient, and cost-effective solution for counting bus passengers. It has the potential to transform the public transportation industry, allowing bus companies to better monitor their services and provide a better passenger experience.

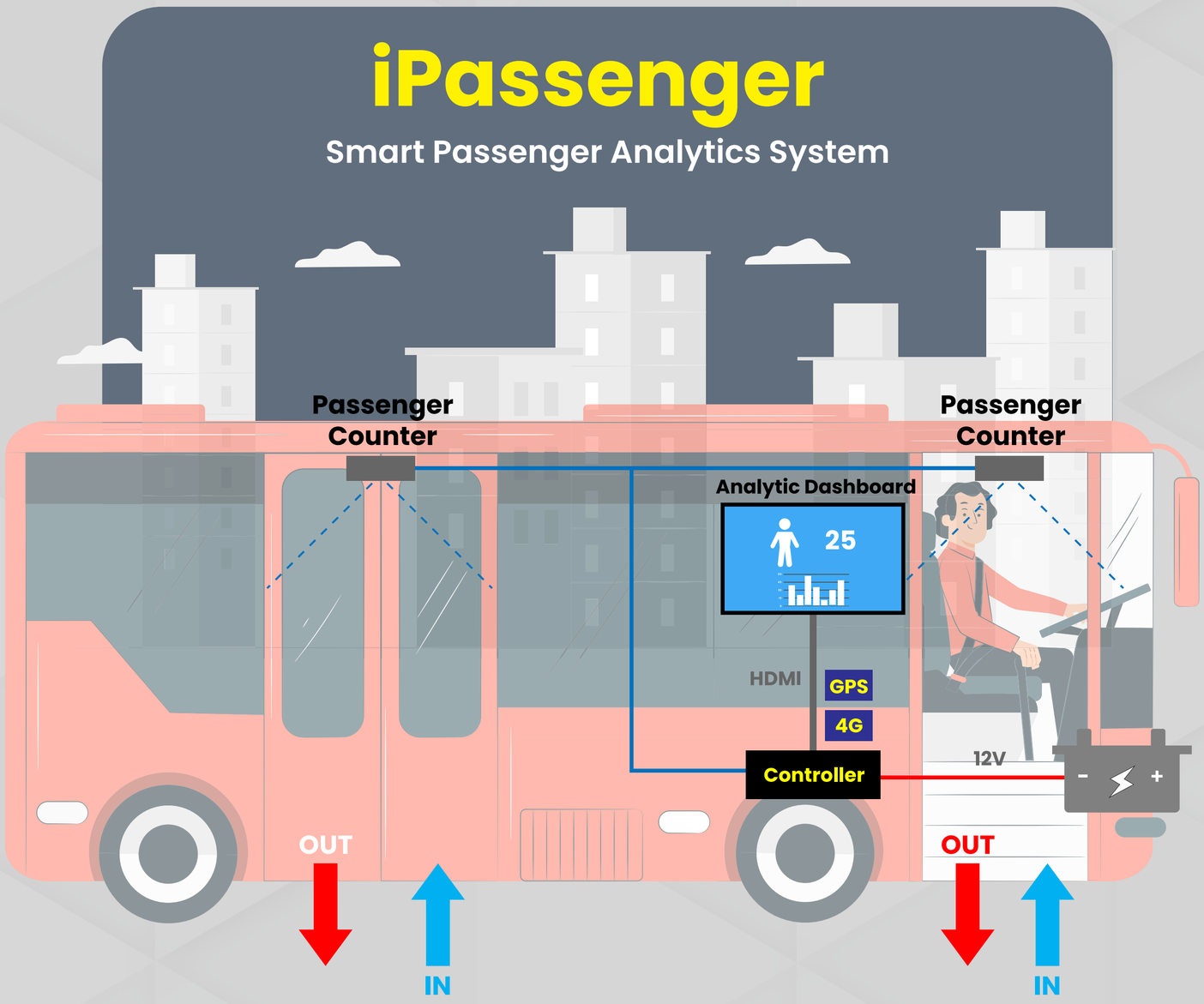
NOVELTY AND INVENTIVENESS

- A simple yet effective system for automatic counting of passengers with minimal human intervention
- A system that utilizes artificial intelligence to track passengers and the number of passengers in the bus from the video frames taken through the bus surveillance camera
- A dashboard that provides a comprehensive information such as passenger ridership, bus stops and routing for better bus line management and scheduling

APPLICABILITY & BENEFITS

iPassenger is applicable to any public transport services and other applications such as retail and mall management, queue management and social distancing. The benefits are as follows:

- Minimal human intervention
- Enhancing the passenger counting process
- Dashboard monitoring for data visualization and analytic



STATUS OF INVENTION

TRL 7

PROBLEM STATEMENT

Efficiency of public bus services has always been a serious issue due to inaccuracy of passenger ridership information and fare evasion. Which could lead to the following issues:

- Overcrowding and insufficient seating capacity on buses, particularly during peak hours, lead to discomfort and safety concerns.
- Inadequate frequency of bus services in many areas of Malaysia, resulting in long wait times for passengers.
- Limited coverage of bus routes in some areas, particularly rural areas, leading to a lack of accessibility to public transportation.

RESEARCH ACHIEVEMENT

- Presented at an International Conference
- Published as a book chapter with a highly recognized publisher
- Talent Development: 2 FYP students

INTELLECTUAL PROPERTY STATUS

- 1 copyright: i-Passenger: Smart Passenger Analytics System (CRLY00019040)

COMMERCIALIZATION POTENTIAL AND INDUSTRIAL PARTNER

- In Malaysia, there are numerous public transport services such as Rapid Penang Bus, Rapid KL Bus, LRT, KL Monorail and MRT.
- iPassenger system can also be used on premises such as shopping malls, supermarkets, exhibition malls and hospitals.
- Marketing - Intech Art Sdn Bhd, a spin-off company by USM 202201035990(1481687-X)
- Rapid Penang, Prasarana Malaysia Berhad

IMPACT OF INNOVATION

- **ENVIRONMENT** - iPassenger can improve the environment when public transportation providers can optimize services and reduce bus demand with accurate passenger counts which directly reduces carbon emissions, air pollution and traffic congestion.
- **INDUSTRY** - iPassenger can help public transport providers optimize their routes and services to improve efficiency, reduce costs, and improve passenger experience with real-time passenger count data. This boosts industry competitiveness and profitability, boosting growth and innovation.
- **ECONOMIC** - iPassenger can boost the economy when the optimized public transport services make passengers prefer public transportation over cars, reducing traffic and costs. Public transport providers can increase efficiency and profitability can create jobs and economic growth.
- **SOCIETY** - Optimized public transport reduces wait times, improve reliability, and enhance the passenger experience. This can boost public transportation ridership, especially for those with limited mobility or access to cars. This can make society more equitable and sustainable.
- **ACADEMIA** - Academic research can benefit from deep learning passenger counting analytics. Researchers can analyse bus usage patterns, trends, and public transportation improvements with accurate and real-time passenger count data. This can improve understanding of public transportation usage factors, leading to innovation and progress.

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