



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

SCHOOL OF COMPUTING
Faculty of Engineering

Project Proposal Form MCST 1043

Sem:..... Session:.....

SECTION A: Project Information.

Program Name: **Masters of Science (Data Science)**

Subject Name: **Project 1 (MCST 1043)**

Student Name: YANG YUEFEI

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Project Title: Optimization of urban traffic in Malaysia using machine learning algorithm

Supervisor 1:

Supervisor 2 /

Industry Advisor(if

any):

SECTION B: Project Proposal

Introduction:

Traffic congestion is a worldwide problem resulting in many urban and regional areas, including Malaysia. Bringing shoulder to shoulder with an insufficient number of road users, Vehicle congestion and ineffective traffic control, can cause less delays, higher fuel Spending, rising air pollution, and reduced commercial efficiency. Evidently, the challenges require good understanding of the traffic problem and end line congestion. The congestion in traffic congestion is quite clear in urban areas such as Kuala Lumpur, Penang, and Johor Bahru. This periodic traffic jam is a problem not limited to urban areas, but also from cities to rural areas. Such as geographical a map, each location has its own population and other traffic congestion problems.

The study is impactful at a scale as it provides first-tier data and algorithmic output to city

and state traffic planning department, where real-world problems require efficient and practical segregation from data driving devices.

Problem Background:

Malaysia is located in Southeast Asia that has seen its cities and economy urbanize quite rapidly in the past decade. Growing with major cities such as Kuala Lumpur, Penang, and Johor Bahru, Malaysia is also home to a very large number of traveling population, and the number of vehicles on the road has increased at a rate higher than the number of vehicles. Such data on the usage of the road is a significant contributor to the current state of traffic congestion in Malaysia. The impact of congestion extends over all major socioeconomic Metrics, predicts higher consumption of time and fuel by commuters, lower rate of economic productivity, and even an increase in air pollution attributed to acrid fuel burn and waste. In Malaysia there are a vast majority of hotspots that are the cause of congestion. The vast number of jurisdictions is of an entirely different geocentric location, and with often a rural village at the distance, there can be an extremely difference in the ability of the jurisdiction to invest in its roads and people. In a time where money and efficiency are the goal of a great society, the scientific data science approach can come to addinventively in the planning and management of traffic congestion in cities and states of Malaysia.

Problem Statement:

Traffic congestion is a widespread issue influenced by various factors such as traffic volume, road conditions, weather, and public events. Analyzing and addressing this problem is complex. Traditional methods of managing traffic have often failed to effectively control traffic volume and provide a smoother experience for commuters.

Aim of the Project:

This project aims to leverage machine learning techniques to address the urban traffic problems in Malaysia. By identifying congestion hotspots, predicting traffic flow patterns, and proposing data-driven optimization strategies, the study aims to enhance traffic efficiency, reduce congestion, and improve the overall urban transportation experience.

Objectives of the Project:

1. To identify significant factors of traffic congestion in various states of Malaysia.
2. To construct and develop models to predict the degree of traffic congestion in different regions of Malaysia.
3. To measure the impact of traffic patterns on congestion factors in various regions of Malaysia.

Scopes of the Project:

1. Geographic Scope: Analysis of traffic flow of diverse sources at different categories of locations such as urban centers, lesser cities and rural areas within different states.
2. Data Scope: The data traffic reports, weather, road work, public events will be fetched from various open sources. The geo traffic data sets include Waze, Google Traffic and other road info from Department of Public Works or any local government available in open data portals.
3. Methodological Scope: Apply various machine learning algorithms such as regression analysis, classification, clustering, and neural networks to analyze and predict traffic patterns.
4. Technological Scope: Incorporate visualization tools to present traffic data and prediction results effectively.

Expected Contribution of the Project:

1. Improve Traffic Management: This research can help in creating machine learning algorithm that could be used to predict traffic congestion reliably in real-time.
2. Data-Driven Decision Making: The results of this study can be useful for informing policymakers and decision makers in how to achieve better solutions using quantitative data.
3. Economic Impact: Congestion in traffic congestion is usually costly and has a number of influences on the economy, including lost production, higher fuel use, and increased vehicle repair has West global warming. Imagine that this study aims to reduce the time of

movement to destruction.

Project Requirements:

Software: MySQL, Visual Studio Code, RStudio, scikit-learn, TensorFlow

Hardware: High-Performance Computers, Cloud storage options

Technology/Technique/ Python, R, data visualization, machine learning, EDA,

Methodology/Algorithm: regression for traffic flow prediction, classification for congestion detection, clustering for identifying traffic patterns

da (Focusing on Data Science):

- ☐ Data Preparation and Modeling
- ☐ Data Analysis and Visualization
- ☐ Business Intelligence and Analytics
- ☒ Machine Learning and Prediction
- ☐ Data Science Application in Business Domain

Status of Project:

- ☒ New
- ☐ Continued

If continued, what

is the previous

title?

SECTION C: Declaration

I declare that this project is proposed by:

- ☐ Myself
- ☐ Supervisor/Industry Advisor ()

Student

Name:

Signature

Date

SECTION D: Supervisor Acknowledgement

The Supervisor(s) shall complete this section.

I/We agree to become the supervisor(s) for this student under aforesaid proposed title.

Name of Supervisor 1:

Signature

Date

Name of Supervisor 2 (if any):

Signature

Date

SECTION E: Evaluation Panel Approval

The Evaluator(s) shall complete this section.

Result:

[] FULL APPROVAL

[] CONDITIONAL APPROVAL (Major)*

☐ CONDITIONAL APPROVAL (Minor)

[] FAIL*

* Student has to submit new proposal form considering the evaluators' comments.

Comments:

Name of Evaluator 1:

DateName of Evaluator 2:

Date _____