ROAD TRAFFIC ROUTING FOR MOBILE APPLICATION

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Abstract

In urban traffic area such as Klang Valley, many studies are conducted in order to produce a good planning of routing direction from one place to another place by taking into account of reducing the distances and lowering the time travel required to complete the journey as much as possible. The least travel time path, the least travel expense path and the least synthesis expense are considered as well as the shortest travel distance in vehicle navigation system, those different significance path are generally called optimal paths (Pan, Zhang & Wang, 2009). Besides, research interests are growing on how efficiently traffic can be directed in a non-congested manner towards their destinations (Humaun Kabir, Nasre Alam & Kyung Sup, 2013).

Therefore, the main idea of this study is to design, develop and test Road Traffic Routing application which is an extension to a prototype system called Traffic Status system. The Traffic Status system is an android based application that collects input of traffic flow information from fixed detection sensors installed at each node in the roadways. By using the sensors that located along the road, the vehicles' average speed will be collected for formulating a node's travel time and the Road Traffic Routing application then will use the node's travel time for planning and suggesting a routing direction for optimal paths.

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Sincere Grateful

Zulkefli Abu Bakar

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CHAPTER ONE
INTRODUCTION

1.1 Introduction

Nowadays, Klang Valley roads are increasingly becoming congested and effort for expanding existing roads and developing new roads are limited. This problem is exacerbated by the increasing number of cars on the road and the road itself could not supply the demand of the vehicles. Beside, constructing roads to meet the demand is not so easy especially in Kuala Lumpur (Morikawa et al, 2001). This is proved by the study that carried by Dissanayake and Morikawa (2002) where both in developed and developing countries, traffic congestion is a major problem in many urban regions. Shokri, Chu, Mokhtarian, Rahmat & Ismail (2009) also shared due to dramatic increase in the number of vehicles, traffic congestion has become an increasingly serious problem in large cities around the world. Much effort has been made in transportation engineering to control and management of the travel time especially in the peak-period (Hau, 2005).

Therefore, the goal of this study is to design, develop and test Road Traffic Routing application that used the vehicles' average speed to formulate a node's travel time for planning and suggesting a routing direction for optimal paths.

1.2 Problem Statement

This paper focuses on problem faced by car drivers that using the roads in Klang Valley area, to find the most precise and suitable roads with least travel time

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REFERENCES

Fuquan Pan, Lixia Zhang and Fengyuan Wang, 2009. Algorithm for Optimal Path Accounted for Traffic Rules in Vehicle Navigation System. *International Conf. on Industrial and Information System*.

Dissanayake, D. and T. Morikawa, 2002. Household travel behavior in developing countries: Nested logit model of vehicle ownership, mode choice, and trip chaining. *Trans. Res. Board*, 1805: 45-52.

Morikawa, T., T. Yamamoto, D. Dissanayake, N. Sanko and S.Kurauchi et al., 2001. Travel Behavior Analysis and its Implication to Urban Transport Planning for Asia Cities: Case Studies of Bangkok, Kuala Lumpur, Manila and Nagoya. ICRA, Nagoya University, Japan.

Foad Shokri, May-Yen Chu, Hamid Reza Mkhtarian, Riza Atiq O.K. Rahmat and Amiruddin Ismail, 2009. Best Route Based on Fuel-Economy. *European Journal of Scientific Reasearch*, vol.32, 177-186

G.R. Jagadeesh & T. Srikanthan, 2002. Heuristic Techniques for Accelerating Hierarchical Routing on Road Networks. *IEEE Transactions on Intelligent Transportation Systems*, vol.3, 301-309

T.D. Hau, 2005. Economic fundamentals of road pricing: a diagrammatic analysis, Part I-Funcamentals. *Transportation*, vol.1, 81-117

Y. Zhao and T. E. Weymouth (1991). An adaptive route guidance algorithm for intelligent vehicle highway system. *Proc. American Control Conf.*, vol.3, 2568-2573

Hatem F. Halaoui, 2009. Smart Traffic Systems: Dynamic A* Traffic in GIS Driving Paths Applications.

Lin, H. E. & Zito, R, 2005. A review of travel-time prediction in transport and logistics. *In Proceedings of the Eastern Asia Society for transportation studies*, vol.5, 1433-1448