

BORANG PENGESAHAN STATUS TESIS*

JUDUL: INTELLIGENT VACATION PLANNER SYSTEM USING ANT COLONY
OPTIMIZATION

SESI PENGAJIAN: 2009 / 2010

Saya PERLY PEH THAI EE
(HURUF BESAR)

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(TANDATANGAN PENULIS)



(TANDATANGAN PENYELIA)

Alamat tetap: No. 4, Jalan Tun Perak 15,
Taman Tun Perak, 48000,
Rawang, Selangor, Malaysia.

DR. CHOO YUN HUOY

Nama Penyelia

Tarikh: 28 JUNE 2010

Tarikh: 20/6/2010

CATATAN: * Tesis dimaksudkan sebagai Laporan Akhir Projek Sarjana Muda (PSM)
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**INTELLIGENT VACATION PLANNER SYSTEM USING ANT COLONY
OPTIMISATION TECHINQUE**

PERLY PEH THAI EE

The report is submitted in partial fulfillment of the requirements for the Bachelor
of Computer Science (Artificial Intelligence)

**FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA
2010**

DECLARATION

I hereby declare that this project report entitled
INTELLIGENT VACATION PLANNER SYSTEM

is written by me and is my own effort and that no part has been plagiarized
without citation.

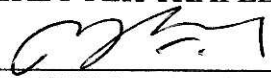
STUDENT :



(PERLY PEH THAI EE)

Date: 28 JUNE 2010

SUPERVISOR :



(DR. CHOO YUN HUOY)

Date: 30/6/2010

DEDICATION

To my beloved parents, Mr. Peh Hock Beng and Mrs. Tan Sok Ooi, for their
expression of love and fully support...

To my supervisor, Dr. Choo Yun Huoy, for making it all worthwhile...

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ABSTRACT

Tourism is an information-intensive industry and it is an important engine in developing the government's industrial strategy in Malaysia. The problem nowadays is the lack of vacation planning system that can help users in planning their holidays. Thus, the objective of this project is to develop an Intelligent Vacation Planner System (IVPS) which contains an intelligent module that can optimize the travelling distance based on user's preference. The target users of the system are the potential tourist to Malaysia and the administrators that manage the website. The system is using 3-tier web based application as the architecture. The technologies that used to develop the system are hypertext markup language (HTML), javascript, java language, Structured Query Language (SQL) and Java Server Page (JSP). The project methodology that used in this project is Object-Oriented Software Engineering (OOSE). The optimisation uses Ant Colony System technique to optimize the route. It generates customise travel plan based on the selected destination, departure location, transport type, travel group size, accommodation type and travel duration. The test strategies that use to test the system after implementation are black-box testing and bottom-up testing. The testing procedures that used in testing the system are code debugging, functionality testing and security testing. As a conclusion, the proposed system in this study has fulfilled the study objectives. The ACO technique performs well in optimizing Travelling Salesman Problem (TSP). Besides that, the system contributes in tourism area to promote Malaysia tourism. For further improvement, more research on AI technique has to be made so that suitable technique is used for future system. The administrator module can add in more functions so that the administrators can manage the webpage easily.

ABSTRAK

Pelancongan adalah satu industri maklumat-intensif dan merupakan mesin yang penting dalam mengembangkan strategi industri kerajaan di Malaysia. Masalah yang timbul kebalakangan ini adalah kekurangan sistem perancangan percutian yang boleh membantu pengguna dalam perancangan percutian. Dengan demikian, tujuan projek ini adalah untuk mengembangkan satu Sistem Planner Percutian Intelligent (IVPS) yang mengandungi modul cerdas yang dapat mengoptimumkan jarak perjalanan berdasarkan keutamaan pengguna. Target pengguna sistem adalah pelancong yang datang ke Malaysia dan pentadbir yang menguruskan laman web. Sistem ini menggunakan 3-tier web aplikasi yang berasaskan sebagai arsitektur. Teknologi yang digunakan untuk membangunkan sistem ini adalah bahasa hypertext markup (HTML), javascript, java, Structured Query Language (SQL) dan Java Server Page (JSP). Metodologi projek yang digunakan dalam projek ini adalah Object-Oriented Software Engineering (OOSE). System ini menggunakan teknik Ant Colony System untuk mengoptimumkan laluan. Perancangan percutian dihasil berdasarkan tujuan yang dipilih, lokasi berlepas, jenis pengangkutan, perjalanan kumpulan saiz, jenis penginapan dan tempoh perjalanan. Ujian strategi yang digunakan untuk menguji sistem selepas pelaksanaan adalah ujian kotak hitam dan ujian bottom-up. Ujian prosedur yang digunakan dalam ujian sistem ini adalah kod debugging, ujian fungsi dan ujian keselamatan. Sebagai kesimpulan, sistem yang dicadangkan dalam kajian ini telah memenuhi tujuan kajian. Teknik ACO berprestasi baik dalam mengoptimumkan Travelling Salesman Problem (TSP). Selain itu, sistem memberi sumbangan dalam bidang pelancongan untuk mempromosikan pelancongan Malaysia. Untuk memperbaiki system in dengan lebih lanjut, penelitian mengenai teknik AI harus dibuat sehingga teknik yang cocok digunakan untuk sistem yang akan datang. Modul pentadbir boleh menambah lebih fungsi sehingga pentadbir boleh menguruskan laman web dengan mudah.

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LIST OF ABBREVIATIONS

IVPS -	Intelligent Vacation Planner System
AI -	Artificial Intelligent
ACO -	Ant Colony Optimization
DIY -	Do-it-yourself
HTML -	Hypertext Markup Language
JSP -	Java Server Page
IT -	Internet Technology
CRS -	Computerized Reservation Systems
GDS -	Global Distribution System
URL -	Uniform Resource Locator
CGI -	Common Gateway Interface
ASP -	Active Server Page
NP -	Nondeterministic Polynomial time
TSP -	Travelling Salesman Problem
QAP -	Quadratic Assignment Problem
AS -	Ant System
ACS -	Ant Colony System
MMAS -	MAX-MIN Ant System
JVM -	Java Virtual Machine
RMI -	Remote Method Invocation
JTIS -	Johore Tourism Information System
GA -	Genetic Algorithm
PSO -	Particle Swarm Optimization
BA -	Bees Algorithm
RAD -	Rapid Application Development

OOSE -	Object-Oriented Software Engineering
UML -	Unified Modeling Language
SQL -	Structured Query Language
IC -	Identity Card
ERD -	Entity Relationship Diagram
JDK -	Java Development Kit
HTTP -	Hypertext Transfer Protocol
LAN -	Local area Network
WAN -	Wide Area Network
ASF -	Apache Software Foundation
JRE -	Java Runtime Environment
JDBC -	Java Database Connectivity
OOP -	Object-Oriented Programming

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CHAPTER I

INTRODUCTION

1.1 Project Background

Malaysia is endowed with abundance of natural resources which are apt to sustain tourism. Malaysia which has many natural wonders, is one of the top 12 biodiversity countries in the world (Backhaus, 2006). Our government has given fundamentally focus in tourism industry as it is considered one of the important engines in developing the government's industrial strategy. This is proven by the increasing allocations for this industry's development over the years. It has been increased from RM 605.5 million in the 7th Malaysian plan to RM 1009.0 million in the 8th Malaysian plan period, experiences 60% increases in its allocation. In the 9th Malaysian plan period, the allocation reached to RM 1367.0 million (Mazumder, *et al.*, 2009). A lot of campaigns and events have been held to promote tourism in Malaysia.

Information is essential to the lifeblood of tourism industry. Therefore information technologies are needed tremendously as to provide the customers details (Buhalis, 1998). We can find a large amount of websites for the details and information of places that we are interested to visit via the Internet (e.g. location description, things to do, hotels, transports, *etc.*). The problem nowadays is the lack of vacation planning systems that can help users in planning their holidays. The data they obtained may be too overwhelming thus difficult to make a decision. Normally, they will find the travelling agencies to help them to organize their schedules. It will be hectic for those who need to drive all the way to the travelling agencies to get

their services and information. Moreover, the vacation that the travelling agents help to plan might not be the ideal one as they normally will recommend their company's offered package. Furthermore, the schedule that they organized might not be the best in terms of time or distance.

The proposed system – Intelligent Vacation Planner System (IVPS) is an intelligent tourism web application which involved the Artificial Intelligent (AI) concept in it. It involved route and time optimization which have a very mathematical and complex background in the area of AI. The Ant Colony Optimization (ACO) method is used to construct and organize the route path of the vacation which helps the users to manage their time and distance more efficiently. It contains the intelligent agents – the ants in helping the optimization task.

Throughout this project, ways of applying the AI techniques and skills will be learned. This study aims to bring about convenience to the customers in arranging their vacations by implementing the application of AI.

1.2 Problem Statement(s)

Based on the project background above, the main problem of the whole scenario is:

- The lack of intelligent tourism web application that can help the users in planning their vacation schedules.
- The lack of intelligent tourism web application that can optimise the travelling time and distance.

1.3 Objective

As a guideline to conduct this research, the objectives of the project are outlined as follows: