

Universiti Teknologi MARA

**Interactive Jigsaw Puzzle Using
Backtracking Algorithm**

Amizah Bt Mohd Kamaruzaman

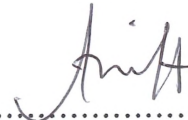
Thesis submitted in fulfillment of the requirements for
Bachelor of Computer Science (Hons)
Faculty of Computer & Mathematical Sciences

July 2012

DECLARATION

I certify that this thesis and the research to which it refers are the product of my own work and that any ideas or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline.

JULY 2012



.....
AMIZAH BT MOHD KAMARUZAMAN

2010805498

ABSTRACT

Jigsaw puzzle games have been proved to help players develop the formation of the brain and also give fun to the player. Besides that, having a jigsaw puzzle game can help add more value to a website by bringing in the element of fun. The Interactive Jigsaw Puzzle Using Backtracking Algorithm have been developed to be put on UiTM Terengganu's website to attract more visitors to visit the website and at the same time to ensure recurring visitors. The objective of this project is to study the various techniques to develop online jigsaw puzzle games. Based on the initial study, the Backtracking algorithm has been chosen as the most suitable algorithm to be used to develop the jigsaw puzzle according to available time and complexity of the algorithm. The developed jigsaw puzzle was then tested to see the effectiveness of the Backtracking algorithm. This project followed the System Development Life Cycle (SDLC) model for the developing of the system. SDLC consists of analysis, design, implementation, testing and documentation phase. Backtracking algorithm are implemented in the implementation phase. After testing the developed jigsaw puzzle by comparing the result with automatic jigsaw puzzle solver using Backtracking algorithm, it shows that Backtracking algorithm are not suitable algorithm to be used to develop the interactive jigsaw puzzle because it takes longer time in solving the game as compared to Backtracking algorithm that used in automatic jigsaw puzzle solver that was found in previous research.

Keywords: Backtracking, jigsaw puzzle, online game

TABLE OF CONTENT

Declaration	i
Approval	ii
Acknowledgement	iii
Abstract	iv
Table of Content	v
List of Figures	x
List of Tables	x

CHAPTER ONE : INTRODUCTION

1.1	Introduction	1
1.2	Research Background	1
1.3	Research Problem	2
1.4	Research Objective	2
1.5	Research Scope	3
1.6	Research Significance	3
1.7	Summary	4

CHAPTER TWO : LITERATURE REVIEW

2.1	Online Games	5
-----	--------------	---

2.1.1	Online Game Therapy For Mental Health	6
2.2	Jigsaw Puzzle	6
2.3	Types of Jigsaw Puzzles	8
2.4	Techniques In Developing Jigsaw Puzzle	9
2.4.1	Texture Based Matching Technique	10
2.4.2	Hopfield neural networks	11
2.4.3	An image processing approach	11
2.4.4	A probabilistic image	12
2.4.5	Fast Placement Algorithm	13
2.4.6	Geometrical and Color Features	15
2.4.7	Backtracking Method	17
2.4.8	BufferedImage Method	22
2.5	Comparing The Method	24
2.6	Summary	24

CHAPTER THREE : METHODOLOGY

3.1	Introduction	25
3.2	Phase 1 : Analysis	28
3.2.1	Literature Review	28
3.2.2	Hardware and Software Requirement	29
3.3	Phase 2 : Design	30
3.3.1	Choosing The Appropriate Picture	31