

**EXAMINATION TIMETABLING
USING GENETIC ALGORITHM
CASE STUDY: KUITTHO**
by
Mohd Zaki Bin Mohd Salikon

**EXAMINATION TIMETABLING USING
GENETIC ALGORITHM
CASE STUDY: KUITTHO**

**A Thesis submitted to the Graduate School in partial
fulfilment of the requirements for the degree
Master of Science (Intelligent System),
Universiti Utara Malaysia**

**by
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ABSTRAK

Algoritma Genetik merupakan salah satu kaedah yang popular dalam penyelesaian pengoptimuman. Ia telah diimplementasikan dalam pelbagai aplikasi seperti penjadualan. Aliran AG menggunakan proses pemilihan, persilangan dan mutasi terhadap populasi dari kromosom. Kertas ini membincangkan teknik yang berkesan menggunakan Algoritma Genetik untuk aplikasi penjadualan. Masalah jadual peperiksaan adalah satu daripada aplikasi dalam penjadualan. Pada satu aspek, ia bertujuan untuk mengatur slot masa pelajar yang ingin menduduki peperiksaan. Faktor ini penting bagi melicinkan perjalanan peperiksaan agar tiada pelajar yang menduduki lebih dari satu peperiksaan dalam slot masa yang sama. Di samping itu, beban subjek juga ditentukan kepada kurang dari tiga peperiksaan secara berturutan. Permasalahan penjadualan peperiksaan di Kolej Universiti Teknologi Tun Hussein Onn (KUiTTHO) diperkenalkan dan prototaip sistem telah dibangunkan menggunakan bahasa pengaturcaraan Java. Prototaip yang dicadangkan mempunyai pelbagai penyelesaian yang munasabah terhadap pengguna.

ABSTRACT

Genetic Algorithm (GA) is one of the most popular optimization solutions. It has been implemented in various applications such as scheduling. The flows of GA are using selection, crossover and mutation operators applied to populations of chromosomes. This paper reports the powerful techniques using GA in scheduling. Examination timetabling problem is one of the applications in scheduling. In one aspect, it deals with students such that it fulfils the process time slot. These aspects are important for the examination can be done in a smooth way and no students can sit more than one exam in a same time slot. The other constraint is the student workload should be arranged less than three exams in a row. The examination timetabling problem at Kolej Universiti Teknologi Tun Hussein Onn (KUiTTHO) is introduced and the prototype has been developed using Java language. The prototype suggested several feasible solutions to the user.

ACKNOWLEDGEMENTS

Praise be to Allah S.W.T, Most Gracious, Most Merciful whose blessing and guidance have helped me through entire project works. Peace be upon our Prophet Muhammad S.A.W, who has given light to mankind. My most sincere appreciation goes to my beloved mother, Tharina Bt Abdullah for their patience, prayers and understanding over the entire period of my study. Besides to my family who always there to giving me love and encourage me along the way.

Firstly, special thanks to my supervisor, Mr. Azman Bin Yasin for his idea, suggestion, support, important additions of material and supervision during the project development and in the preparation of this thesis. I am also grateful to Mr. Nurnasran Bin Puteh who contributed their time during the study.

To all my reviewers (Intelligent System) lecturers, thanks for the guidance and advice that you have given. These include Mr. Azizi Bin Aziz, Assoc. Prof. Dr. Norita Bt Norwawi, Mr. Wan Hussain Bin Wan Ishak and others.

I also wish to thank the graduate Intelligent System batch November 2004 who have supported me for the completion of this project as well as my friends Nor Rafidah, Norlia and Wan Faridah Hanum for their encouragement.

Finally, to my beloved best friends, Syaharudin, Farhan, Adrisham, Mandy, Warakorn, Fakhrul, Ahmad, Ishak, Rashid, Lim and all the individuals who share my laughter, sadness and motivations.

DEDICATION

To my mother Tharina Bt Abdullah,
for his love, patience and support.

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LIST OF ABBREVIATIONS

ACS	Ant Colony System
BSc. IT	Bachelor of Science Information Technology
CBR	Case Base Reasoning
EPP	exam proximity problem
ETS	Examination Timetabling System
FIFO	First In First Out
FTMM	Fakulti Teknologi Maklumat Dan Multimedia
GA	Genetic Algorithm
GDA	Great Deluge Algorithm
GUI	graphic user interface
HC	Hill Climbing
IS	Information System
JSDK 1.3.1_05	Java Software Development Kit version 1.3.1_05
KUiTTHO	Kolej Universiti Teknologi Tun Hussein Onn
MA	Memetic Algorithm
NP	Nondeterministic Polynomial
ODBC	Open Database Connectivity
PMRP	Point to Multipoint Routing Problem
TEDI	Timetabling Tool for Educational Institutions
UPJJ	Unit Pendidikan Jarak Jauh
UUM	Universiti Utara Malaysia

CHAPTER 1

INTRODUCTION

The aim of this paper is to discuss on the project background that mainly involves in examination timetabling using Genetic Algorithm (GA). The problem statement, the objective and the significance of the study and scope will be discussed in this section.

1.1 Background Study

Scheduling problems is a difficult task in the artificial intelligence. It deals with the allocation of limited resources to tasks over time (Pinedo, 2002). The process is to optimize one or more objectives. The measurement methods which is known as computationally NP (Nondeterministic Polynomial) is the most difficult parts that the researchers faced on the scheduling problems which is lacking with the elements of the polynomial time algorithm.

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