

**Universiti Teknologi MARA**

**OPTIMAL ROUTE CHECKING USING GENETIC  
ALGORITHM  
FOR UITM'S BUS SERVICES**

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Thesis submitted in fulfillment of the requirements for  
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**Quantitative Sciences**

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## **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**

**APRIL 27, 2006**

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## ABSTRACT

Nowadays, the route management is very important to make sure the user can arrive to the destination much fastest. In the transportation industry, the route that been generated should consider the cost and time constraint which is dependently on the distance of the route. Although from human logical thinking, the route can be generated easily but the calculation of checking the route whether it is optimal route or not is difficult and will take long time to be implemented. This research study with the development of the Optimal Route Checking Using Genetic Algorithm system should solve this scenario. By taking the bus services in Universiti Teknologi MARA as sample, the research has used the genetic algorithm approach to solve the problem which is similar to the Travel Salesman Problem. The genetic algorithm approach that been used in this research has been proven by other research study before that it will easily handle this types of problem where the optimal solution will be generated. But the GA will not generate the best solution. The objective of this research is to develop the system that will check the route according to two criteria which is distance and time. Beside that, this research also has to fulfill the objective of find the comparison of the three types of selection methods which roulette wheel selection, tournament selection and rank selection. The GA operators that involved in this development are two-point crossover and fix mutation for reproduction phase. For the development of the prototype, the Active Server Page and Java script programming language with Microsoft Access database has been chosen in order to make the system can be publish online and easily retrieve by the user anywhere. This research has achieved the result that meets the objective and found the best selection method that can be used to handle the similar problem with this research.

**Keywords:** Genetic Algorithm, Roulette Wheel Selection, Tournament Selection, Rank Selection, Traveling Salesman Problem, Comparison Study.