

Universiti Teknologi MARA

**Adaptive Glioblastoma Detection using
Evolutionary-Based Algorithm**

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**Thesis submitted in fulfilment of the requirements
for Bachelor of Computer Science (Hons.)
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SUPERVISOR APPROVAL

ADAPTIVE GLIOBLASTOMA DETECTION USING EVOLUTIONARY- BASED ALGORITHM

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This thesis was prepared under the supervision of the project supervisor, Dr. Shafaf Ibrahim. It was submitted to the Faculty of Computer and Mathematical Sciences and was accepted in partial fulfilment of the requirements for the degree of Bachelor of Computer Science (Hons.).

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STUDENT DECLARATION

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



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ABSTRACT

Brain tumor is a common disease with low survival rate. Various types of brain tumor are exist but Glioblastoma is the most aggressive and dangerous among all of it which has caused plenty of deaths. It required an early diagnosis to prevent it from spreading therefore, the brain tumor need to be detected early. The process of brain tumor detection usually done by a radiologist, but it may be susceptible to errors due to large amount of patients and any late diagnosis may harm the patient. Hence, this project was proposed to help in overcome the problems. The objectives of the project are to design and develop a prototype of adaptive Glioblastoma detection using Evolutionary-based algorithm to assist in detecting brain tumor and also to test the prototype's functionality and detection accuracy. Artificial Bee Colony algorithm has been selected as the algorithm used in segmenting the brain tumor from MRI image. It was inspired by honeybee's foraging behavior. The prototype's functionality testing proves that the prototype works well, and the detection accuracy testing proves that the algorithm shows a good performance in producing the output of segmented image. The testing on adaptive glioblastoma detection produced 93.51% of average accuracy indicates the prototype produced a good glioblastoma segmentation result by using ABC algorithm. In conclusion, all three objectives have been achieved as the glioblastoma detection prototype has been designed, developed and tested.

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