

**UNIVERSITI TEKNOLOGI MARA**

**KNOWLEDGE REPRESENTATION  
FOR DURIAN VARIETIES IMAGES  
USING CONCEPTUAL GRAPH**

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Thesis submitted in fulfillment  
of the requirements for the degree of  
**Master of Science**

**Faculty of Computer and Mathematical Sciences**

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## **CONFIRMATION BY PANEL OF EXAMINERS**

I certify that a panel of examiners has met on 27th January 2016 to conduct the final examination of Nur Syafikah Binti Ibrahim on her Master of Science (Computer Science) thesis entitled “ Knowledge Representation for Durian Varieties Images using Conceptual Graph” in accordance with Universiti Teknologi MARA Act 1976 (Akta 173). The Panel of Examiners recommends that the student be awarded the relevant degree. The panel of Examiners was as follows:

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## AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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## **ABSTRACT**

Semantic Based Image Retrieval (SBIR) is an image retrieval approach mainly aims to improve the relevancy of the images retrieved. The researches in image retrieval were conducted in various domains and each domain requires specific queries. Knowledge Representation (KR) is a method under SBIR which represent the knowledge of a specific domain by using formal mathematical symbols. The existing hundreds of durian varieties which are currently registered in the Department of Agriculture Malaysia (DOA) make it a challenging task to differentiate the images of this crop. Hence, this research was intended to achieve three objectives. The first objective is to construct the Conceptual Graph (CG), which is one of the KR formalism to semantically represent the knowledge of durian varieties characteristics. The second objective is to employ the constructed CG in Knowledge Based Image Retrieval System (KBIRS). Meanwhile, the third objective is to evaluate the performance of the KBIRS. In this work, characteristics of 32 registered durian varieties were studied. There are three main characteristics that enable us to differentiate one variety from another variety which are fruit, aril (flesh) and spine (thorn) characteristics. These characteristics are called as concept types in CG. The KBIRS was tested by using 26 predefined queries and the retrieved results were evaluated by using the precision calculation. This precision result was then compared with the result in Exalead and Google Images search engine by using the same 26 predefined queries.

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