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A weighting scheme for content-based image retrieval

Yuan Zhong
University of Wollongong

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A WEIGHTING SCHEME FOR CONTENT-BASED IMAGE RETRIEVAL

A Thesis Submitted in Partial Fulfilment of
the Requirements for the Award of the Degree of

Master of Computer Science (Research)

from

UNIVERSITY OF WOLLONGONG

by

Yuan ZHONG

School of Computer Science and Software Engineering
Faculty of Informatics

2007

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CERTIFICATION

I, Yuan ZHONG, declare that this thesis, submitted in partial fulfilment of the requirements for the award of Master of Computer Science (Research), in the School of Computer Science and Software Engineering, Faculty of Informatics, University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at any other academic institution.

(Signature Required)

Yuan ZHONG

30 March 2007

Dedicated to

*My Parents
and
My Supervisors*

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A WEIGHTING SCHEME FOR CONTENT-BASED IMAGE RETRIEVAL

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A Thesis for Master of Computer Science (Research)

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ABSTRACT

In a query-by-example(QBE) image retrieval, the user is required to provide a single query image that most represents the features of the target images. On the other hand, “query by multiple images” paradigm assumes that the user is able to describe the target images more accurately by using multiple query images rather than one. Low level features, such as color, texture or edge information, are used to represent the images. These features are combined and expected to match the human perception properly. A set of psychological experiments are designed and conducted in this thesis with the aim of gaining insight into how a user perceives similar images. The retrieval results obtained by human subjects are compared with those obtained by using MPEG-7 visual descriptors. It is found that proper weight assignment in combining different features for retrieval can improve the retrieval performance. A novel weighting scheme for Query-by-Multiple-Images (QBMI) retrieval systems which aims to match human perception is proposed. The weights are derived by a new method of ascribing relative importance to feature descriptors for given a query set. Experimental results have shown that our weighing method is more effective than both equal weights and heuristic weighting method.

KEYWORDS: Content Based Image Retrieval, Query By Example, Multiple Image Query, Feature Weighting Scheme

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