

SPLINE WAVELETS BASED TEXTURE FEATURES FOR IMAGE RETRIEVAL

YU-LONG QIAO, ZHE-MING LU

Department of Automatic Test and Control
Harbin Institute of Technology
Harbin 150001, P. R. China
qiaoyulong@dsp.hit.edu.cn; zhemingl@yahoo.com

JENG-SHYANG PAN

Department of Electronic Engineering
Kaohsiung University of Applied Science
Kaohsiung 807, Taiwan
jspan@cc.kuas.edu.tw

SHENG-HE SUN

Department of Automatic Test and Control
Harbin Institute of Technology
Harbin 150001, P. R. China
sunshenghe@dsp.hit.edu.cn

Received February 2005; revised August 2005

ABSTRACT. An effective texture feature is very important for accurate image retrieval with less computational complexity. The spline wavelets based texture features, mean and standard deviation of the magnitudes of the subband coefficients in the wavelet frame decomposition, are proposed for image retrieval. The experiments are performed on a database of 1792 texture images to check the retrieval performance. We also perform feature selection and further compare the performances of several wavelets based features. The detailed comparison results indicate that the new method is superior to the existing methods.

Keywords: Spline wavelet, Texture image retrieval, Feature selection

1. Introduction. The amount of visual information available in digital format has grown exponentially in recent years. Retrieving particular images in a way that is both effective and efficient remains an open problem. The success of text-based retrieval systems is limited to the quality of the metadata produced during the cataloguing process, which can very often be incomplete, inaccurate, biased by the user's knowledge and ambiguous. In order to overcome the inefficiencies and limitations of text-based retrieval of previously annotated visual data, many researchers started to investigate possible ways of retrieving visual information based solely on its own visual content.

Content-Based Image Retrieval (CBIR) was proposed in the early 1990s [1]. The ideal CBIR systems should automatically extract and index the semantic content of images to meet the requirements of special application areas. Although it seems effortless for a human being to pick out photos of horses from a collection of pictures, automatic object