

IMAGE RETRIEVAL BASED ON FUZZY SEMANTIC RELEVANCE MATRIX

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ABSTRACT. *The semantic gap, between the low-level visual features and the high-level perceptive or semantic concepts, is a big hurdle in content-based image retrieval. To bridge the semantic gap, segmentation, machine-learning, clustering and classification techniques have been widely used in the preprocessing stages or during the relevance feedback. However, in these techniques, there are some problems such as long training or learning time, high computational complexity, some bad singular results occurring after feedback, and relearning required in the retrieval process for new queries. According to the fuzzy characteristic of the human's semantic knowledge, this paper presents a novel Fuzzy Semantic Relevance Matrix (FSRM) to bridge the gap between low-level features and semantic concepts. The updating of FSRM imitates the human's brain to search the similar images in the knowledge network and improve retrieval results continuously by memorizing the semantic concepts learned in previous relevance feedback processes. Experimental results demonstrate the effectiveness of the proposed retrieval scheme.*

Keywords: Content-based image retrieval, Semantic gap, Machine learning, Relevance feedback, Fuzzy semantic relevance matrix

1. **Introduction.** Interests in the search and management of digital images have increased tremendously over the last decade. For storing art collections, satellite images, medical images and many other real-time applications [1], image databases may be huge, containing hundreds of thousands of images. However, it is impossible to access or make use of this information unless it is organized to allow for efficient browsing and retrieval. Content-Based Image Retrieval (CBIR) systems are required to effectively and efficiently