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Multimedia-based healthcare

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The rapid advances in electronic devices, digital imaging, information technology, computer systems and networks in recent years have stimulated the explosive growth of multimedia computing with diverse applications to different areas including medical service and healthcare. Equipped with various multimedia tools, techniques and services, computerized healthcare is emerging as an ever-increasing important multidisciplinary area which offers tremendous opportunities and excellent facilities to doctors, healthcare professionals and other eligible users to enhance performance by fully utilizing the rich health related multimedia data for effective decision making. Although the current achievements are exciting and the results can be powerful, it remains a challenging task to manage diversity of health related multimedia data on an open heterogeneous landscape (multi-modality, big volume, mobility, time series) efficiently, accurately, reliably and cost-effectively. This talk presents a general multimedia-based framework to tackle the crucial issues on personalized healthcare. The new medical record e-book structure is proposed to facilitate flexible management of high-dimensional medical data on an open heterogeneous landscape. More specifically, our approach is revolved around three key aspects: Multimedia-based medical data management in the context of multi-modality, big volume, mobility and time series; feature selection and fusion of high-dimensional medical data analysis and evaluation with quantitative measurement and; classification and decision support scheme for convenient, reliable, efficient and cost effective medical services. A prototype of smart mobile healthcare is developed to demonstrate the feasibility and potentials of the new solution which bridges the gap between data management, medical applications and multimedia computing in a robust environment.

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A content-based goods image recommendation system

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The information of e-commerce images varies and different users may focus on different contents of the same image for different purpose. So the research on recommendation by computers is becoming more and more important. But retrieval based only on keywords obviously fall short for massive numbers of resource images. In this paper, we focus on a recommendation system of goods images based on image content. Goods images have a relatively homogenous background and have a wide range of applications. The recommendation consists of three stages. First, the image is pre-processed by removing the background. Second, a weighted representation model is proposed to represent the image. The separated features are extracted and normalized, and then the weights of each feature are computed based on the samples browsed by the users. Third, a feature indexing scheme is put forward based on the proposed representation. A binary-tree is used for the indexing, and a binary-tree updating algorithm is also given. Finally, the recommended images are given by a features combination searching scheme. Experimental results on a real goods image database show that our algorithm can achieve high accuracy in recommending similar goods images with high speed.

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Page 70