外 国 語 要 旨

学位論文題目（英 語）

User interface for media contents with multidimensional visualization.

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This thesis presents visual user interfaces for effective media contents recommendation and adjustment. They visualized processes to learn users' preferences for media contents.

In recent years, we are able to access variety of media contents easily in a large amount of media contents provided by subscription services which allow unlimited access to music, movies, books, magazines, cartoons, and games. As the amount of media contents increases, it has been more difficult to find suitable media contents which match users' preferences. Therefore, various techniques on this problem have been developed to make easier for users to efficiently search for media contents suited to their preferences from among enormous media contents, from the viewpoint of recommendation algorithms and user interfaces.

In addition, it has been easy to share media contents such as snapshot photos and videos taken by digital cameras and smartphones due to the expansion of social networking service (SNS) that enables communication with media contents. Here, it often takes time and effort to adjust parameters of media contents before users upload media contents on social networking service. Therefore, various techniques on this problem have been developed to make easier for users to adjust the parameters according to the users' preference without taking time and effort, from the viewpoint of crowdsourcing and human computing.

This thesis presents visual interfaces to reflect users' preferences efficiently to media contents recommendation and retouch. They extract features of media contents, and then visualizes the processes of searching for media contents and learning the correction parameters that suit the users' preferences in multidimensional feature spaces. As the scope of this thesis, it is not practical if systems require heavy tasks to learn the users' preferences. Meanwhile, applicable learning methods are limited if only a small number of inputs can be obtained while applying light tasks. Development of effective user interfaces is essential to solve this problem.

The former part of this thesis proposes MusiCube, a visual interface for music selection. MusiCube extracts numeric feature values from acoustic data of tunes, and arranges icons corresponding to the tunes to generate a multidimensional feature space. Next, in the multidimensional feature space, user's preference is learned by using the interactive evolutionary calculation. MusiCube enables to reflect users' preferences to the recommendation results with light tasks, by visualizing the learning processes in order to make the users aware of their preference tendency. We conducted user evaluation with 10 participants with MusiCube to demonstrate its usefulness.

The latter part of this thesis proposes a new image retouch system "CrowdRetouch" which reflects users' tendency of image retouch for a set of similar photographs. CrowdRetouch firstly asks initial users to manually retouch sample training images, and then divides the initial users based on the image retouch parameters. It then applies a regression analysis to each of user clusters to solve the relationship between the retouch parameters and image features, and automatically retouches rest of similar photographs based on the regression analysis results. After forming the user clusters, CrowdRetouch specifies the clusters of new users with smaller number of training images by visualizing the learning processes, and therefore we do not need to require heavy preprocesses to the new users. CrowdRetouch realizes personalized automatic image retouching to large number of photographs while reflecting preferences of novice users.

This thesis concludes that visualization and navigation of learning process of users' preference are useful while users search for and retouch media contents, based on the evaluation results of the presented two user interfaces.