論 文 の 内 容 の 要 旨

Abstract

論文題目　Manipulation, Visualization, Interaction for Adaptive
　　　　　Category-Aware Image Exploration
　　　　　(適応的なカテゴリ画像探索のための編集操作、可視化、対話処理)

氏　　名　水野　加寿代

　The recent rapid popularization of image collections allows the user to search images in various and complicated use cases. Searching preferred set of images from image collections in daily life has become more exploratory activity such as seeking favorite clothes at on-line shopping website and finding beautiful images for a resource of website design at a photo sharing website. However, simple text-based search operations provided by conventional image search systems are insufficient to achieve such activity, and thus the search results often fall short of the user expectation. One underlying reason is a mismatch between the system-defined image categorization extracted from image collection and the user-designed categorization based on his/her search context.

　This thesis addresses the issue by presenting methods for performing category-aware image exploration by allowing the user to understand and manipulate the system-defined image categorization adaptively. First, the thesis deals with a manipulation method of image feature space that includes both the similarity between categories and the visual similarity between images. This method enables the user to edit the distance between categories in image feature space to close

to his/her designed image categorization through screen space. Second, the thesis proposes an integrated search interface with providing both content- and keyword-based image browsing and bridges these browsers with keyword suggestion technique. This interface assists the user to start a search without complete information of target category and understand the target category incrementally through search session. Third, the thesis proposes a visualization technique for understanding the change history of image categorization while minimizing the cognitive load of the user. This method visualizes the trend of dynamic categories which assists the user to understand the history of category editing.

All these proposed methods attempt to reduce the gap between the system-defined image categorization and the user-designed image categorization by providing sophisticated visualization and interaction techniques. These proposed methods support the user's image exploration by allowing him/her to adaptively understand and manipulate the system-defined image categorization. The results demonstrate the effectiveness of our approach in practical image exploration process.