



Title	Study of a View-based 3-D Object Retrieval Method for 3-D Object Reconstruction [an abstract of dissertation and a summary of dissertation review]
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学 位 論 文 内 容 の 要 旨

博士の専攻分野の名称 博士（情報科学） 氏名 張 永生

学 位 論 文 題 名

Study of a View-based 3-D Object Retrieval Method for 3-D Object Reconstruction
(3次元再構成のためのビューベース 3D オブジェクト復元に関する研究)

With rapid advances in computer techniques and the popularity of the camera, a large number of photographs were obtained. How to obtain a novel 3-D object or 3-D scene from 2-D images is a challenging task.

To create a 3-D object, two methods can be applied. One is to create 3-D object by using some 3-D modeling methods. The other is to create 3-D object by combining or revising existing designs. According to a research report, 20

Many research about 3-D modeling has been investigated, but it is still a high-cost and laborious task to model highly realistic 3-D models. We have also proposed a super-pixel based method to get a 3-D model from image sequence. With the development of 3-D technology and 3-D applications, people can easily get a lot of existing 3-D model. We can use these existing model instead of a direct 3-D modeling from images. So we focus on the view-based 3-D object retrieval.

Object retrieval has attracted much research attention in recent years. Confronting object retrieval, how to estimate the relevance among objects is a challenging task. We focus on view-based object retrieval and propose a multi-scale object retrieval algorithm via learning on graph from multimodal data. In our work, shape features are extracted from each view of objects. The relevance among objects is formulated in a hypergraph structure, where the distance of different views in the feature space is employed to generate the connection in the hypergraph. To achieve better representation performance, we propose a multi-scale hypergraph structure to model object correlations. The learning on graph is conducted to estimate the optimal relevance among these objects, which are used for object retrieval. To evaluate the performance of the proposed method, we conduct experiments on the National Taiwan University dataset and the ETH dataset. To evaluate the 3D object retrieval performance of our method, we employ the state-of-the-art methods of ED, AVC and QVS for comparison. In order to measure the 3D object retrieval performance, the criteria of NN, F, DCG and ANMRR are employed to compare different methods in our experiments. Experimental results and comparisons with the state-of-the-art methods demonstrate the effectiveness of the proposed method.