

عنوان مقاله:

A Novel 3D Object Categorization and Retrieval System Using Geometric Features

محل انتشار:

مجله بین المللی ارتباطات و فناوری اطلاعات, دوره 4, شماره 1 (سال: 1390)

تعداد صفحات اصل مقاله: 12

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خلاصه مقاله:

In this paper, we propose a novel geometric features based method to categorize 3D models using probabilistic neural network and support vector machine classifiers. The employed features are extracted from face and vertex characteristics. In addition, we utilize the proposed features in 3D object retrieval. To achieve this end, each model is decomposed into a set of local/global geometrical features. We use histograms of two variables, i.e., deviation angle of normal vector on the object surface point from the vector that connect shape center to that point; and distance of object surface point from shape center. To achieve better separability of different models, mutual Euclidean distance histogram for the pairs of surface points is also used. The most advantage of using histogram to represent the features is that it shows the density of data and enables creating of low dimensional feature vector and consequently decreasing of computational cost in classification process. The effectiveness of our proposed 3D object categorization system has been evaluated on the generalized McGill 3D model dataset in terms of both accuracy and speed measures. Widespread experimental results and comparison with the other similar methods, demonstrate efficiency of the proposed approach to improve both accuracy and speed of categorization system.

کلمات کلیدی:

3D object, vertex normal vector, center- to-vertex vector, mutual Euclidean distance, histogram

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