Abstract

Object recognition is an essential part of computer vision system. In this thesis, we present the principle of object recognition by using the dominant points to recognize and locate partially occluded objects. Generally, object recognition processing can be subdivided into two major tasks: The first task is to extract the features of the object contour in a scene containing the high curvature points. These high curvature points are called the "dominant points". The dominant points along an object contour are rich in information content and are sufficient to characterize the shape of the object. Therefore, in this task we propose the extraction of the features by using the detection of dominant points with various scale-space of Gaussian filter. They, then, are traced back into the right location. From this method the dominant points do not change. They are stable when the scale-space of Gaussian filter is varied. In the second task of the object recognition. The dominant points are matched between the dominant points of a scene, consisting of partially occluded objects, and the set of models which are predefined in the model database. The matching task is implemented by Hopfield neural network. By this principle, the partially occluded objects can be exactly matched with the set of models in the database, though, the objects in a scene are heavily obstructed and complicated.