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A PRACTICAL FAST POINT PATTERN MATCHING ALGORITHM BASED ON MATCHING PAIR SUPPORT AND REGISTRATION CONDITION

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Abstract. Based on 2-D cluster approach, a fast algorithm for point pattern matching is proposed to solve the problems of optimal matches between two point patterns effectively under geometrical transformation and identify the missing or spurious points of patterns correctly. The algorithm is developed to determine the matching pair support. Experiment results prove that the algorithm is of excellent performance in correctness and speed even under certain noisy or distorted condition, and is of translation, rotation and scale invariant.

Keywords. Pattern matching, registration condition, matching support, maximum matching pair.

1 Introduction

Point pattern matching plays an important role in pattern recognition and computer vision. Its main idea is to determine whether two images are originated from the same object based on geometrically related properties of feature points from the images. Minutia may be curve terminal points or bifurcated points in fingerprint identification. There are still many open problems that need to be resolved in the point pattern matching area, such as:

1. Two images of an object, captured from different observing spots or using different sensors, or captured at different times with the same sensor, may differ because of rotation, translation or scale. This type of difference has not yet been defined in feature extraction and model matching.

2. With a view to the influence of the noise and feature extraction, related position of feature points may be changed a little. It is very difficult to map feature points from one image one-to-one to that of another image precisely. So point model matching is to find out a way to match two point models satisfactorily, within a permitted error verge.