

A texture-based feature point detection and matching method

黃雅軒, 游鴻修, 歐志鴻, 謝祥文

Computer Science & Information Engineering

Computer Science and Informatics

yeashuan@chu.edu.tw

Abstract

This paper presents a method for detecting feature points from an image and locating their matching correspondence points across images. The proposed method leverages novel rapid LBP (Local Binary Pattern) feature point detection to filter out texture-less feature points from SURF (Speeded Up Robust Features). The detected feature points, also known as Non-Uniform SURF feature points (NUS), are used to match corresponding feature points from other frame images to reliably locate positions of moving objects. The proposed method consists of two processing modules: Feature Point Extraction (FPE) and Feature Point Mapping (FPM). First, FPE extracts salient feature points with Feature Transform and Feature Point Detection. FPM is then applied to generate motion vectors of each feature point with Feature Descriptor and Feature Point Matching. Experiments are conducted on artificial template patterns and real scenes captured from moving camera at different speed settings. Results show that average matching accuracy rate for pure SURF method is 92.96% and 97.79% for the proposed NUS with artificial template patterns, respectively. On the other hand, the average matching accuracy rates in real scenes are 97.36% and 98.46% for pure SURF and the proposed NUS respectively. Moreover, overall moving object detection and matching time for the proposed method is less than the time for pure SURF method.

Keyword : Block matching, feature point detection, motion vector detectio