A mobile camera tracking system using GbLN-PSO with an adaptive window

Zalili Musa[a]; Rohani Abu Bakar[a]; Junzo Watada[b]
[a]Faculty of Computer System and Software Engineering University Malaysia Pahang Kuantan, Malaysia
[b]Graduate School of Information, Production & Systems Waseda University Fukuoka, Japan

ABSTRACT

The availability of high quality and inexpensive video camera, as well as the increasing need for automated video analysis is leading towards a great deal of interest in numerous applications. However the video tracking systems is still having many open problems. Thus, some of research activities in a video tracking system are still being explored. Generally, most of the researchers are used a static camera in order to track an object motion. However, the use of a static camera system for detecting and tracking the motion of an object is only capable for capturing a limited view. Therefore, to overcome the above mentioned problem in a large view space, researcher may use several cameras to capture images. Thus, the cost will increases with the number of cameras. To overcome the cost increment a mobile camera is employed with the ability to track the wide field of view in an environment. Conversely, mobile camera technologies for tracking applications have faced several problems; simultaneous motion (when an object and camera are concurrently movable), distinguishing objects in occlusion, and dynamic changes in the background during data capture. In this study we propose a new method of Global best Local Neighborhood Oriented Particle Swarm Optimization (GbLN-PSO) to address these problems. The advantages of tracking using GbLN-PSO are demonstrated in experiments for intelligent human and vehicle tracking systems in comparison to a conventional method. The comparative study of the method is provided to evaluate its capabilities at the end of this paper.

KEYWORDS:

Dynamic tracking; particle swarm optimization; an adaptive window; pattern matching; mobile camera

REFERENCES

1. M. Ebbecke, M.B.H. Ali, and A. Dengel, Real time object detection, tracking and classification in monocular image sequences of road traffic scenes, International Conference on Image Processing, Vol. 2, pp. 402-405, 1997

2. I. Fernandez, M. Mazo, J.L. Lazaro, D. Pizarro, E. Santiso, P. Martin and C. Losada, Guidance of a mobile robot using an array of static cameras located in the environment, Vol. 23, pp. 305-324 , 2007.

3. B. Lai, D. Y. Zhang, Z. Y. Yuan and J. H. Zhao, Crowd Segmentation from a Static Camera, Lecture Notes in Computer Science, Advanced Intelligent Computing Theories and Applications. With Aspects of Theoretical and Methodological Issues, Vol. 5226/2008, pp. 1134-1140, 2008.

4. Z. B. Musa, and J. Watada, A Grid-Computing Based MultiCamera Tracking System for Vehicle Plate Recognition, Kybernetika Journal, Vol. 42, No. 4, pp. 495-514, 2006.

5. X. Zhang, W. H. Maybank, S. X. Li, M. Zhu, Sequential particle swarm optimization for visual tracking, IEEE Conference on Computer Vision and Pattern Recognition, pp. 1-8, 2008.