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Smart Surveillance Camera of Detection Human

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Abstract. The Surveillance camera problem in detection human and car remove noise, find object quickly. In orginal algorithm using different of frame or find curve to detection human. Surveillance camera system in illumination problem is very challenge task. Illumination and environment light is change object reflecting energy. From start using surveillance camera their system has many problems, wind change camera pose, cloud, illumination condition, cat and dog all these noise from surveillance camera is moving object because the camera field of view these object is change background. These problems for all automatic surveillance system detection object of interest in input scene. Common algorithm is for segmentation of moving object is DOF(Different of Frame) background subtraction. But all these algorithm not enough to find human accuracy. Early times HOG algorithm is need long computing time. GPU(graphic process unit) can support it to real time detection human and car.

Keywords: Image processing, computer vision, surveillance system, shadow removal

1 Introduction

The Surveillance camera problem in detection human and car remove noise, find object quickly. In orginal algorithm using different of frame or find curve to detection human. Dalal and Triggs compared their R-HOG[1] and C-HOG descriptor blocks against generalized Haar wavelets transform, PCA-SIFT algorithm, Generalized Haar wavelets algorithms are oriented Haar wavelets. PCA-SIFT algorithms are similar to common SIFT algorithm, but difference in that principal component analysis is applied to the normalized gradient patches. PCA-SIFT descriptors were first used in 2004 by Ke and Sukthankar and were claimed to outperform regular SIFT descriptors. Finally, Shape Contexts use circular bins, similar to those used in C-HOG blocks [2], but only tabulate votes on the basis of edge presence, making no distinction with regards to orientation. Shape Contexts were originally used in 2001 by Belongie, Malik, and Puzicha.

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2 Related works

The paper is main goal is found what object in a video suveillance system. If detection the object and recogonization object is easy improve algorithm and suveillance camera system performance[3]. Figure 1 shows car detection and Figure 2 shows human body detection. Naturally Car and human are different. But, the method of car detection program is very similar with the way of the detection program of a cat and dog. In detection system each object has 5 same features (car bodies, tiers like animal bodies and foot). So from the 1st finding of the object's size is more important than pattern recognition. The 2nd finding use of pattern recognition detection object 3rd activity analytics. Detection environment dynamic light and static light is main target. 1st our algorithm find object feature point from feature we find object silhouette. Second we need make 3D scene from real world. And that task need very easy, very simple, and cost need very low[4,5]. From surveillance system need make visualization scene to visualization about real world problem.

Fig. 1. HOG car detection

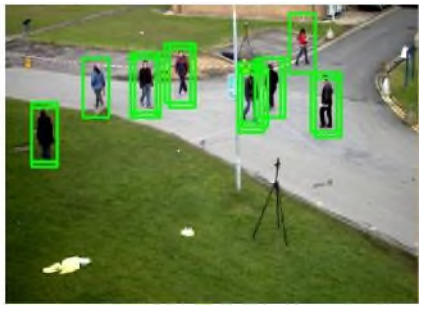

Fig. 2. Human Body Detection

3 Proposal Suveillance Camera System Method

The proposal method based on related work algorithm combine and using calibration make new surveillance system. Figure 3 shows algorithm based on Direct linear transformation (DLT) method 2 A classical approach is "Roger Y. Tsai Algorithm"[6]. It is a 2-stage algorithm, calculating the pose (3D Orientation, and x-axis and y-axis translation) in first stage. In second stage it computes the focal length, distortion coefficients and the z-axis translation. 3 Zhengyou Zhang's "a flexible new technique for camera calibration" based on a planar chess board. It is based on constrains on homography. 4 Tasi camera calibration algorithm Camera calibration and pose estimation are major issues in computer vision since they are related to many vision problems such as stereovision, structure from motion, robot navigation and change detection The Tsai model is based on a pinhole perspective projection

model and the following eleven parameters are to estimate: f - Focal length of camera, k - Radial lens distortion coefficient, Cx, Cy - Coordinates' center of radial lens distortion, Sx - Scale factor to account for any uncertainty due to imperfections in hardware timing for scanning and digitization, Rx, Ry, Rz - Rotation angles for the transformation between the world and camera co-ordinates, TX, Ty, Tz - Translation components for the transformation between the world and camera coordinates. From this algorithm can know object size and position[7]. Combine this algorithm to HOG algorithm can improve Smart Suveillance camera system[8].

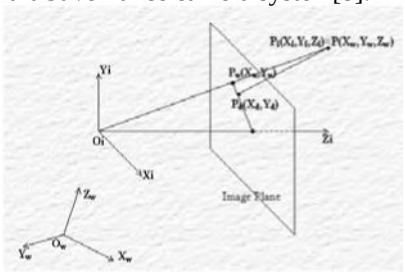

Fig. 3.Tasi camera calibration algorithm Camera calibration

4 Experiment result

Figure 4 shows method applied in Unity 3D game engine. The smoke follows stairs to up floor [8]. Unity 3D particle system initialsthese particles to upper space. The High Rise building model mesh indivisible outline. Simulation size is box mesh. Smoke coordinate flow FDS result [9] to show.

Fig. 4. HOG Human Detection 4 Camera

5 Conclusions and Future Work

In section 3 shows surveillance camera system detection object result, in this paper based on Tasi algorithm combine HOG in one system improve detection algorithm and object matching. When suveillance camera system running from input video find about car and human detection object find about that silhouette to know about that object is which group. After find feather detection can improve computing time to find morphology. All these input video impalement in camera calibration algorithm. Proposed surveillance camera system had good accuracy and divide object to group but problem is system need good computing power. Human detection part algorithm using GPU, Running need GPU support this algorithm. Future work find algorithm improves performance and tanning more object algorithm input it to surveillance object category.

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