ABSTRACT

Object tracking is a field in computer vision that learn how to track a moving object in a space. Tracked object is an object that has been determined. Tracking a moving object is very useful to help an important task in computer vision applications such as: the introduction of motion, vehicle tracking, vehicle counts, augmented reality and video compression. Object tracking has many problems such as the noise, clutter occlusion, and dynamic changes in the motion of the object. So that the final project, designed a multiple object tracking system with particle filter method. Particle filters, also known as sequential Monte Carlo is a stochastic method that has been developed in the computer vision community and applied to tracking problems.

Tracking's system works by using video processing in a non-real time. Tracked object in the form of humans. In the human detection process, use the Histogram of Oriented Gradient method. After the detection of human doing, then the object will be tracked with a particle filter method. Tracking process is done by generating random particles at close to the object area. Then performed the observations made models to calculate the probability of a particle that has the same histogram as the target object. Similarity calculation is done by using the Bhattacharyya coefficient. Then made a new estimate of the object's position.

Testing the system using modified parameters namely maximum threshold, the minimum threshold, the number of particles, the number of objects and the recording condition of the object. Best accuracy rate at 0.88 threshold and the minimum threshold of 0.73. Total objects in the tracking process using the particle filter is directly proportional to the processing time, whereas in the tracking Histogram of Oriented Gradient method proportional to the resolution of the video.

Keywords: object tracking, histogram, Bhattacharyya coefficient, Histogram of Oriented Gradient, particle filters.