

## ***ABSTRACT***

*Object tracking is an area in computer vision that learn how to track a moving object in a room. Tracked object is an object that has been determined. In its application in the real world tracking a moving object is very useful for a variety of things such as gesture recognition, vehicle tracking, tracking humans in some cases track athletes, and augmented reality. In its application, the realization of an object tracking system has several challenges, among others, the noise, the chaos occlusion, and dynamic changes in the motion of the object. So in this final project, designed a system of multiple object tracking with particle swarm optimization method.*

*The tracking system works with inputs in the form of non-real time video containing moving objects that have been recorded previously. Highest number of objects tracked by the system in a time of testing up to 4 objects. The objects's features which will be tracked will be extracted using the color histogram. Afterwards, the object will be tracked using particle swarm optimization. The tracking process begins with randomly generated particles in an area close to the object and comparing the color histogram of particle with a target object using bhattacharya coefficient which is a process of observation to calculate the likelihood of particles that have a similarity histogram with the target object.*

*The system tested using several parameter, the number of particles, the number of objects and object recording conditions. The best accuracy rate in tracking with 50 particles in each swarm, but the number of particles that will cause longer computation time. The system can run well on multiple test objects. Compared using HOG tracking, particle swarm optimization has processing time much shorter with not much different in accuracy. In the tracking process using PSO, the number of objects will affect the required time for tracking process.*

*Keywords: multiple object tracking, particle swarm optimization, color histogram.*