

## **Improvement of particle swarm optimization in multi-robot trajectory motion coordination**

### **ABSTRACT**

In swarm robotics, motion coordination is being viewed as a whole system consists of multiple robots each with different velocity and path being optimized. This research focus on improve an optimization process called Particle Swarm Optimization (PSO) by altering the fitness function from static to dynamic. PSO has tendency to being trapped in local optima. By employing dynamic acceleration coefficient, the position of particles will be less dependent on the global best position if the global best fitness is found to be saturated in the region and hence release the swarm to another region for searching in other unexplored region. Nominal, dynamic and extreme scenarios were employed to test the performance between PSO and dynamic coefficient PSO. The different on expected optimization time between DCPSO and PSO for nominal condition is DCPSO lead only 0.26 second. While in dynamic condition the different is DCPSO lead 1.09 second. For extreme condition, the different become significant, which DCPSO lead 3.58 second.