

Abstract

Nowadays, many entrepreneurs face to extreme conditions for instances; costs, quality, sales and services. Moreover, technology has always been intertwined with our demands. Then almost manufacturers or assembling lines adopt it and come out with more complicated process inevitably. At this stage, products and services improvement need to be shifted from competitors with sustainability. So, simulated process optimization is an alternative way for solving huge and complex problems. Many researchers suggested applying the problem with heuristic methodology i.e. Steepest Ascent, Simulated Annealing and Ant Colony Optimization Algorithms. An Ant Colony Optimization imitates the real ant activities for solving any problems which be done by a simple communication (Pheromone) among ants.

In this research, the problems are formulated to mathematical models with and without noises which are representing for ideal problems and easily illustrated by Response Surface Methodology. Heuristic algorithms have then been developed to solve these problems. In additional, implementation the proposed algorithm to applied problem in industry i.e. finding the cost optimization for adjusting parameters for Turning Machine through computer simulation program. From the experiments, a combined algorithm of Simulated Annealing and Ant Colony Optimization problems. However, Ant Colony Optimization Algorithms can search for the better yield with the same number of experimental runs.