

Route planning analysis in holes drilling process using magnetic optimization algorithm for electronic manufacturing sector

Abstract

Electronic manufacturing sector uses computer numerical controlled machines for drilling holes. Most of the computer numerical controlled machines used nearest neighbour algorithm to plan the route for the drill bit to travel. Based on this motivation, this paper proposes an approach which is based on the experimentation of Magnetic Optimization Algorithm. In this implementation, each magnetic agent or particle in Magnetic Optimization Algorithm represents a candidate solution of the problem. The magnitude of the magnetic force between these particles is inversely proportional to the distance calculated by the solution they represented. Particles with greater magnetic force will attract other particles with relatively smaller magnetic force, towards it. The process is repeated until the stopping condition meets and the solution with lowest distance is taken as the best-found solution. Result obtained from the case study shows that the proposed approach managed to find the optimal solution. With this method, electronics manufacturing sector can optimize the drilling process hence will increase the productivity of the manufacturer. This study can be extended further by tuning the parameters of MOA in order to enhance the drilling route process.

Keywords; Magnetic Optimization Algorithm, Swarm Intelligence, Route Planning, Holes drilling process, Computational Intelligence