Path Generation and Motion Planning of Industrial Robot Based On Genetic Algorithm for Engraver Robot Application

By: Rakhmad Gusta Putra

Student Identity Number: 2211204002

Supervisor: Ir. Djoko Purwanto, M.Eng., Ph.D.

ABSTRACT

Engraver robot is a robot that used to engrave wood into the specific shape. This system can be used to duplicate a historical artifact or wood based on computer data. In order to realize it, a path generation and motion planning algorithm has been developed. 3D data used in this research is a mesh data which is familiar in computer graphics. Engraving processes were divided into two processes, those are roughing process by using multi-layer concept and finishing process. The strategic used in this research is zig-zag which is modified in order to make the shorter process path by dividing and sequencing the area use Genetic Algorithm (GA). GA is used to optimize the path when it is move from one process area to others. Conventional zig-zag method was applied in finishing process to get better result. System is realized by using dual-arm industrial robot Motoman SDA 10. R2 arm held engraver machine and R1 arm held the vacuum cleaner. According to the experiment, path length with GA was shorter than without GA as 9.299%. Process time in roughing process was faster 7.325%. The results of engraving get the average margin of error 1.45 mm and possibly applied for complex shape.

Keywords: Motion planning, path generation, industrial robot, engraver robot, genetic algorithm
Halaman ini sengaja dikosongkan