



Near-Time-Optimal Path Planning of a Rigid Machine with Multiple Axes

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Received: February 6, 2006; Revised: March 5, 2007

Abstract: A path planning method which is nearly time-optimal is designed for computer numerical control machines which must handle sharp corners. The nominal geometrical trajectory is modified in a way that limitations of the drives' accelerations are taken into account, which will avoid acceleration discontinuities at the cornering point. The method uses two consecutive optimization procedures based on the theory of time-optimal control of single axes while maximizing the travel length of the fastest axis. Simulation results show that the method, which can be generalized to a machine with several axes, is quite effective.

Keywords: *Computer numerical control machines; path-planning; contour error.*

Mathematics Subject Classification (2000): 49K15, 93C05, 93C95.