

## 数控多轮廓加工走刀空行程路径优化

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关键词: 数控加工 多轮廓加工 路径优化 蚁群算法 最近邻算法

摘要: 将多轮廓加工走刀空行程路径优化归结为广义旅行商问题, 基于蚁群算法和最近邻算法, 提出一种走刀空行程路径优化算法。采用蚁群算法优化任意选择的走刀路径, 得到一条轮廓排列序列, 对该轮廓序列, 采用最近邻算法在相邻轮廓上寻找节点构建走刀路径, 再采用蚁群优化及最近邻算法由此路径构建新的走刀路径, 如此反复迭代, 就得到一条优化的走刀路径。给出一个优化实例, 验证了算法可有效构建走刀空行程路径。采用单因素分析和均匀试验设计的方法, 详细给出了优化参数选择方法。 Multi-contour processing empty run optimization was regarded as generalized salesman problem. A novel algorithm based on ant colony system optimization and nearest neighbor rule was proposed. Ant colony algorithm was applied to a selected cutting path arbitrarily, an optimal contour sequence was found, with nearest neighbor rule, nodes on each adjacent contour were obtained to construct a cutting path. A new cutting path was built with ant colony optimization algorithm and nearest neighbor rule based on this constructed path. An optimal cutting path was constructed through several iterations in this way. A multi-contour processing instance was given and the results of it indicated a reasonable cutting path could be gained with this algorithm effectively. With single factor analysis and uniform design, the method of how to select optimization parameters was given.

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