

高速高精度加工中NURBS曲线混合插补算法

董伯麟 王治森 韩江

合肥工业大学

关键词: NURBS曲线混合插补 FIR滤波器 加减速控制规律 高速高精度加工

摘要: 研究零件复杂表面高速高精度加工的NURBS曲线参数直接插补方法, 结合FIR数字滤波器原理, 提出了一种NURBS曲线混合插补算法。在保证零件加工精度的前提下, 实现基于S型速度曲线的加减速控制, 使运动速度准确平滑; 同时, 算法中不需要插补前瞻计算, 显著缩短了NURBS曲线插补算法运算时间。Aiming at the demand of complex surface high speed and high accuracy of CNC machining, the NURBS curve direct interpolators were investigated. A new NURBS curve hybrid interpolation algorithm which was put forward is a combination of FIR filters, second order Taylor algorithm, and interpolator's error control algorithm. On the basis of achieving high precision, S velocity profile was adopted to smoothly, exactly produce the velocity profile. Two cascade FIR filters were utilized to realize the acceleration and deceleration according to S velocity profile. By canceling the look-ahead algorithm in NURBS curve interpolation algorithm, NURBS curve hybrid interpolation algorithm could also greatly shorten the computing time of NURBS interpolator, increase the frequency of interpolator, and advance the machining feed-rate.

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