A new strategy of real-time thermal error compensation for CNC turning center using adaptive RBF network

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ABSTRACT

The factors that influence the machining accuracy of Computer Numerical Control (CNC) machine tool mainly come from the geometric errors and structural thermal deformation during cutting. Therefore there are more attention on thermal error compensation technology on CNC machine tool. Although real-time thermal error compensation technique have been successfully demonstrated in laboratory, there are still some major problem before application, such as optimal thermal sensor point, control machine technique and expensive. In the research, the on-line measurement system found by using LT02S displacement gauge for turning spindle. It is convenient to obtain radial and axial thermal drift information on spindle in machining. The model of thermal deformation established by cutting parameters with radial basis function network(RBFN).The method not only get dynamic data of thermal deformation on line, but it is unnecessary to find the optimal position of thermal sensors and place it. Therefore the way of founding the model of thermal drift will achieve the objects of economy and rapid.

Keywords : thermal error ; turning center ; compensation

Table of Contents

第一章 緒論……1 1.1 前言……1 1.2 文獻回顧……3 1.3 研究目的……7 1.4論文大綱……9 第二章 工具機溫昇變形之影響……10 2.1工具機熱源分析……10 2.2熱流動方式……15 2.3切削熱……17 2.4車床主軸溫昇變形……18 2.5解決熱誤差之方法……20 2.6其他的誤差……21 第三章 實驗方法與架構……23 3.1實驗架構……23 3.2位移量測系統……24 3.2.1位移量測系統使用目的……25 3.2.2 LT02S量測原理……26 3.2.3探針校正……30 3.3量測方式……31 3.4位移量測系統的重覆性分析……32 3.5 類神經網路……38 3.5.1輻狀基底函數網路結構……39 3.5.2網路學習……41 第四章 車床之溫升變形與建立模型……46 4.1車床主軸之實際溫昇變形……46 4.1.1空轉分析……46 4.1.2實際切削分析……54 4.2建立熱誤差模型……61 第五章 結論與未來發展……73 參考文獻……75 附錄……80

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