附件四、技術說明表

基於生成式AI開發一種設備精度輔助調校系統

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請參考機械系網頁
http://www.me.ntu.edu.tw/main.php?mod=adv_custom_page&func=show_page&site_id=0&page_id=299

市場及需求:

現有的LRT工具機調機技術是依靠操作員逐步完成LRT裝置的架設，並將LRT軟體生成的誤差量測NC碼手動輸入至CNC工具機，誤差量測結束後也需要人工識別圖表、分析數據再將補償參數手動輸入至CNC工具機進行誤差補償，操作過程繁雜且細節眾多。

技術摘要(含成果):

本發明是一種基於生成式AI的工具機自動誤差調機系統，包括Laser R-test多軸誤差檢測裝置、生成式AI模型以及工具機。所述Laser R-test裝置檢測工具機的動態誤差和靜態誤差並輸出誤差圖表，輸入誤差圖表數據至生成式AI模型並識別誤差類型及計算誤差量，最後生成補償參數並下發給CNC工具機實現自動補償。該系統取代了人工判讀圖表並計算、修改參數的過程，實現全自動誤差補償，大大降低操作難度，適用於工具機新手的學習與使用。總體來說，該發明具有高自動化、使用簡便、適用面廣等進步性。

優勢:

具備全自動、智慧化系統，理解並分析誤差報表後自動補償，過程中減少人力介入，降低人員操作失誤的風險，簡化人員操作的難度。

競爭產品:

工研院 AI 優化精準製造技術

專利現況:

無。

聯絡方式(請不用填):

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Developing a Precision Adjustment Assistance System Based on Generative AI

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Experience:

Please refer to the webpage of the Department of Mechanical Engineering.
http://www.me.ntu.edu.tw/main.php?mod=adv_custom_page&func=show_page&site_id=0&page_id=299

Market Needs:

The current LRT machine tool calibration technique relies on operators to sequentially set up the LRT device and manually input the error measurement NC code generated by the LRT software into the CNC machine tool. Following the error measurement, manual intervention is required to identify charts, analyze data, and then manually input compensation parameters into the CNC machine tool for error compensation. The operational process is intricate and involves numerous details.

Our Technology:

This invention is an automated error adjustment system for machine tools based on generative AI, comprising a Laser R-test multi-axis error detection device, a generative AI model, and the machine tool. The Laser R-test device detects both dynamic and static errors of the machine tool and outputs error charts. The error chart data is inputted into the generative AI model to identify error types, calculate error amounts, and generate compensation parameters. These parameters are then transmitted to the CNC machine tool to achieve automatic compensation. This system replaces the manual process of interpreting charts, calculating, and modifying parameters, enabling full automation of error compensation. It significantly reduces operational complexity and is suitable for the learning and use by novices in machine tool operations. Overall, this invention demonstrates advancements in high automation, user-friendliness, and wide applicability.

Strength:

The system is fully automated and intelligent, capable of automatically compensating after understanding and analyzing error reports. It reduces human intervention during the process, thus minimizing the risk of human error and simplifying the complexity of personnel operations.

Competing Products:

Industrial Technology Research Institute (ITRI) AI-Optimized Precision Manufacturing Technology.

Intellectual Properties: none.

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