USE OF AI-BASED APPROACHES FOR DETERMINING CNC MACHINING PARAMETERS IN MANUFACTURING: A REVIEW[*]

SOUNG HIE KIM[1] **AND KYUNG SAM PARK**[2]

[1]*Department of Management Information Systems*

[2]*Department of Industrial Engineering*

Korea Advanced Institute of Science and Technology, Korea

ABSTRACT

In Computer Numerical Control (CNC) machining, one of the key issues is to determine machining parameters or conditions. Determining optimal or appropriate cutting parameters can minimize machining errors such as tool breakage, tool deflection and tool wear, thus yielding a high productivity or minimal cost. There have been a number of attempts to determine the machining parameters via off-line adjustment or on-line adaptive control. These attempts use many different kinds of techniques: CAD-based approaches, Operations Research approaches, and Artificial Intelligence (AI) approaches. This paper focuses on reviewing AI-based techniques for providing a better understanding of these techniques in machining control. AI-based methods fall into three categories: knowledge-based expert systems approach, neural networks approach and probabilistic inference approach. In particular, recent research interesting mainly tends to developing on-line or real-time expert systems for adapting machining parameters. The use of AI techniques would be valuable for the purpose.

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