



**DEVELOPMENT OF GRAPHICAL USER
INTERFACE FOR MILLING MACHINE ENERGY
PREDICTION TOOL**

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“I declared that this thesis is the result of my own work except for the ideas and summaries which I have clarified their sources. The thesis has not been accepted for any degree and is not concurrently submitted in the candidature of any degree.”

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ABSTRACT

In this modern technologies, manufacturing industries facing a crisis that affect the environmental performance which is exceed of energy consumption in production. The machinists and manufacturers have found a way of reducing energy consumption during machining processes such as machining strategies optimization. Unfortunately, manufacturing industries have difficulties in practicing the optimization of machining strategies which is there is limited guidance to measure and predict the energy usage. This research developed a prediction tool to analyze the energy consumption in CNC milling machine operation and verified the effectiveness and functionality of the energy prediction tool. The prediction tool was generated using MATLAB Graphical User Interface (GUI) which study the energy consumption of CNC milling machine which affected by the optimization of machining parameters such as spindle speed (rpm), feed rate (mm/min) and depth of cut (mm) and also the behaviour of cutting paths used which are morph spiral, parallel and spiral. The finding of this research is the development of comprehensive GUI tool to predict the energy consumption during machining operation of 5-axis CNC milling. The accuracy of this developed GUI is measured to be 95% accurate which is done by comparing the predicted value with experimental data. As a consequence, the proposed machining energy GUI is capable to measure and predict the energy usage during machining operation of 5-axis CNC milling.