

OPTIMIZATION OF TURNING PARAMETERS USING
GENETIC ALGORITHM METHOD

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of the requirements for the award of the degree of
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SUPERVISOR'S DECLARATION

We hereby declare that we have checked this project and in our opinion this project is satisfactory in terms of scope and quality for the award of the degree of Bachelor of Mechanical Engineering with Manufacturing Engineering.

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STUDENT'S DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged. The thesis has not been accepted for any degree and is not concurrently submitted for award of other degree.

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Dedicated to my beloved

“Family”

For their endless support in term of motivation,
supportive and caring as well throughout the whole project

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ABSTRACT

This study about development of optimization for turning parameters based on the Genetic Algorithm (GA). This method was demonstrated for the optimization of machining parameters for turning operation using conventional lathe machines. Currently, everybody has start realizing the importance of this new manufacturing optimization in order to improve the performance and its efficiency. The purpose of this project is to find the optimum parameters values for turning operations that will benefit such as reduces the machining time, improves their quality and productivity and also minimize the unit cost of the product. GA can be used in optimization problems such as scheduling, materials engineering , optimal control, and so forth. This approach has led to the important following discoveries such as GA has robustness, the balance between efficiency and performances for survival in many different environments. The machining parameters that been consider in this thesis are cutting speed, feed rate and depth of cut. The GA simulation are been develop to achieve the objective. The MATLAB software will be use to develop the GA simulation. An example to apply the Genetic Algorithm to the problem has been presented at the end of this paper to give more understanding picture from the application of the system and how its work. The result obtained from this simulation shown GA has a potential for improvements in order to optimize the turning parameters and minimize the unit production cost. The simulation based on Genetic Algorithm are successful develop and the optimum parameters values are obtained from the simulation.

ABSTRAK

Kajian ini menerangkan tentang cara mengoptimumkan parameter yang digunakan oleh mesin larik mengikut kaedah *Genetic Algorithm (GA)*. Sekarang ini, semua sedar akan kepentingannya untuk meningkatkan kemajuan dan kecekapan dalam bidang pembuatan baru. Tujuan projek ini dijalankan adalah untuk mencari parameter yang optimum yang akan memberi kelebihan seperti mengurangkan masa penggunaan mesin, meningkatkan kualiti dan produktiviti, dan juga menjimatkan kos produk itu. *GA* dapat digunakan seperti jadual, kejuruteraan bahan, optimal control dan banyak lagi. Penemuan ini menunjukkan *GA* satu kaedah yang kukuh, yang mengandungi kecekapan dan kemajuan yang dapat digunakan bagi banyak keadaan. Parameter yang digunakan dalam thesis ini ialah kelajuan mata alat, kadar potongan dan kedalaman potongan. *GA* simulasi dicipta untuk mencapai objektif yang dirancang. Perisian MATLAB digunakan untuk mencipta simulasi ini. Satu contoh masalah akan digunakan untuk menerangkan cara penggunaan kaedah *GA* untuk memberi kefahaman yang lebih jelas tentang kaedah ini dan cara kaedah ini berfungsi. Keputusan yang diperolehi daripada simulasi ini menunjukkan *GA* ada potensi untuk mencapai parameter yang optimum dan menjimatkan kos produk. Simulasi mengikut kaedah *GA* berjaya dicipta dan parameter yang optimum dapat diketahui dari simulasi ini.

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