UNIVERSITI TEKNOLOGI MARA

A FEASIBILITY STUDY ON A LOW-COST SOLUTION OF ESSENTIAL TREMOR SUPPRESSION MECHANISM

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MSc

March 2021

AUTHOR'S DECLARATION

I declare that the work in this dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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Dissertation Title	:	A Feasibility Study on A Low-cost Solution of Essential Tremor Suppression Mechanism
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Date	:	8 March 2021

ABSTRACT

Tremor is a condition where the patient's body part moves involuntarily in an uncontrollable rhythmic motion. Most people do have tremor but it is unnoticed as the detected tremor occurs to a small degree. However, when the tremor becomes perceptible it is then classified as an essential tremor. Patients suffering from severe essential tremors have problems in conducting daily activities as their movements were disrupted by the involuntary tremble. Essential tremor has become more prevalent nowadays to people in any group of age, however it is most commonly found among people aged older than 65 years old. Due to the cases becoming more common, a lot of research was conducted to suppress the tremor in order to significantly reduce the displeasing condition. The current approach of treating tremor is either by medication and brain surgery or wearable devices. The brain surgery and medication may lead to the risk of complication and side effects, whereas the wearable devices have less risk and many recent researches have shown positive results. Despite having positive results, wearable devices tend to come in a weighty and bulky design. In this study, a validation on a less known method of using mechanical vibration as tremor suppression was conducted. A feasibility study on a low-cost solution of essential tremor suppression mechanism was conducted in this research. With limitation on conducting tests to an actual patient, an imitation of tremor condition was recreated using a simulation device consisting of a DC motor attached to a deconstructed small propeller. As for the suppression mechanism, a few vibration motors were selected as the actuator of the system and the suppression on the tremor was tested by placing the vibration motor in several arrangements. The vibration analysis of three axis linear acceleration and three axis angular acceleration of simulated tremor and suppressed tremor were tested and evaluated. The final results show high similarities in tremor simulation as per compared to existing study and the suppression system manages to produce a reduction on the simulated tremor.

ACKNOWLEDGEMENT

Firstly, I want to thank God for giving me the opportunity to take the challenge of pursuing my Master of Science (Mechanical Engineering) and allowing me to complete my dissertation. I would like to give my gratitude to my supervisor Dr Mohd Nor Azmi bin Ab. Patar for his support and patience in assisting me with this project especially during the tough time of pandemic. His encouragement has helped me in finishing my dissertation despite being in limitation due to the current situation. I also would like to express my gratitude to Mashhuda Binti Nasir for her never-ending support and assistance throughout my journey in this course. Finally, my appreciation goes to my family and friends for their encouragement and support towards me during my time conducting this dissertation. I feel blessed to be having this people around me and always keeping me grounded. Alhamdulillah.

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