



**MODELLING OF DRILLING OPERATION FOR MEASURING
SPEED AND FEED RATE**

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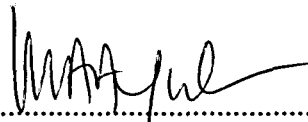
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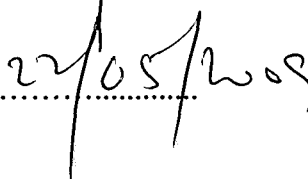
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“I declare that I read this thesis and in our point of view this thesis is qualified in term of scope and quality for the purpose of awarding the Bachelor of Engineering (Hons.) Mechanical”

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ABSTRACT

Automated robot drilling operation needs accurate speed and feed rate to drill bones as the one of the medical method. In this project, the prosthetic implant is used as a mechanical fastener for joining broken bones. Therefore, the bone needs to be drilled and aligned with the holes of the implant. Bone material is able to be hard and dense, or else relatively soft and spongy, so MATLAB simulation and experimental work are done in this project to ensure an accurate and fast drilling operation. To achieve this, suitable speed and feed rate of DC motor exerted on the bone during the drilling operation are critical to ensure the human bones are not smashed up and affect the medical operation process. The selection of motor also must be acceptable to confirm the drilling operation can be done efficiently. In this project, the Low Inertia DC servo encoder unit model M66CI DC motor is used as a vital part attached to CRS robot end-effector. This CRS-robot is available at the Mechatronic Laboratory of Universiti Teknologi Mara (UiTM) in mechanical faculty and is used in orthopedic surgery. The CRS robot and DC motor had been coupled together and modeled by using CATIA animation. In this study, experimental had been done to get speed and feed rate of DC motor by calibration using digital tachometer. The experimental and MATLAB simulation result had been analyzed to get the speed and feed rate of the DC motor. To accomplish this project, DC motor had been calibrated at CRS robot and being recorded. In conclusion, all the gathering result had been analyzed and proposes DC motor drilling process.

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