



**BALANCING TWO WHEELED USING ARDUINO
MICROCONTROLLER**

**SAIFUL AMIRUL ASYRAF BIN MOHD HALID
(2017275268)**

**BACHELOR ENGINEERING MECHANICAL
(MANUFACTURING) (HONOURS)
UNIVERSITI TEKNOLOGI MARA (UiTM)
JULY 2020**

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Signed :

Date :

Saiful Amirul Asyraf Bin Mohd Halid

UiTM No: 2017275268

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

Signed :

Date :

Supervisor or Project Advisor

Nurul Muthmainnah Binti Mohd Noor

Faculty of Mechanical Engineering

Universiti Teknologi MARA (UiTM)

13500 Permatang Pauh

Pulau Pinang

ACKNOWLEDGEMENT

Foremost, In the name of Allah, the Most Gracious and the Most Merciful Alhamdulillah, all praises to Allah for the strengths and His blessing in completing this Final Year Project 2. I would never have been able to finish my thesis without the guidance of my supervisor, friends and supporting from my family. I would like to express my sincerest appreciation and gratitude to my supervisor Puan Nurul Muthmainnah Mohd Noor for the continued support, generous guidance, help, patience and encouragement in the duration of the thesis preparation until its completion. I would like to say thank you to my family, especially my parents for their moral and spiritual support along the course of my studies and also my fellow friends for being inspirational.

ABSTRACT

Most of two-wheeled self-balancing robot are designed based on an inverted pendulum system, which is the dynamically system stable but not for steadily system. The robot involves various physic and control parameters such as Linear Quadratic Regulator (LQR). The project aims to design the modelling parameter in order to control the balancing of two-wheeled self-balancing robot. A sensor, which is called as IMU was used to estimate and will be obtain the tilt angle of the robot. Then PID concept was applied to correct the error between the desired set point and the actual tilt angle position can adjust the motor speed accordingly to balance and stable the robot. The result that obtained from the PID controller show that this robot was able to balance the system acceptably but with some limitations. The PID controller was implemented using Arduino microcontroller. The limitation of this project is the size of project is too high and highly cost. The simulation result of the model is compared with the developed prototype and performance of the controller is analyzed and discussed. In addition, the PID tuning using heuristic method is also performed and an improvement can clearly be seen in terms of the robot balancing.