SEESAW SYSTEM: MODELING AND ANALYSIS

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ABSTRACT

The seesaw system is one example of an unstable system and is a classical problem in control theory. Many different approaches in construction and control methodologies have been studied by different researchers in order to solve this problem. It has been used many times as a model on how to control an unstabilize system.

The main task of this project is to study the method or technique that allows a cart on the seesaw to be balanced in less than 5 seconds and maintain the balance. The cart is controlled by a d.c motor and moves along the pendulum track on the seesaw. A computer is used to control the position of the cart and the angular position of the seesaw.

This project apply the optimal control theory to maintains the seesaw to remains at horizontal position or at stable state.

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CHAPTER 1

1.0 INTRODUCTION

Seesaw sometimes being called as tooter-teeter is not just used by children to play around in the garden. When we saw a seesaw, immediately we can imagine that there are two or more persons involve where one is at the left side and the other is at the right side. If one of the person push himself up, the other one will going down, and this will happen many time, and vice-versa. Then, when both just sit without pushing the ground, we can observe that the seesaw is going to be balanced horizontally depending on the weight of the two persons. The seesaw will remain horizontally if the two persons are of the same weight.

With the nature of seesaw, a control theory can be applied to balance the seesaw. An optimal control theory is used in this project to balance the seesaw because this is the multi-input multi-output (MIMO) case of studies.
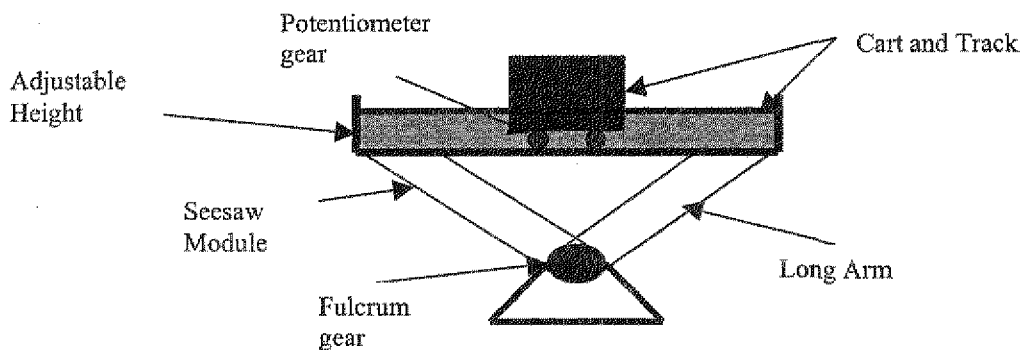

Figure 1: The Seesaw Module.