TWO DIMENSION OF MOTION OF THE INVERTED PENDULUM USING A BELTING SYSTEM

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ABSTRACT

Inverted pendulum is a classical problem in control theory. It has been used many times as a model on how to control an unstabilize system. Many control theorists and engineers had studied this problem using different controlling methods and construction of the model. The main objective is to stabilize the unstable state of the inverted pendulum, i.e. to maintain the inverted pendulum vertically. The approach for this thesis will be based on a two dimension of motion using a pulley-belt transmission system. The main thrust of this project is on the construction of the plant and modelling of the system. The importance of studying this system is that, it enables us to relate to the real system, such as the study of monopod walking machine and biped locomotive machine and the representation of a dynamic model of a space booster on take off.

CONTENTS

1.0 INTRODUCTION.

In the development of the control theory, its applicability to practical problems has been often demonstrated by synthesising control systems for practical systems with simple mechanisms. A typical example for a system to be controlled is an inverted pendulum particularly as an example of an unstable system.

1.1 CONTROL SYSTEM ARCHITECTURE.

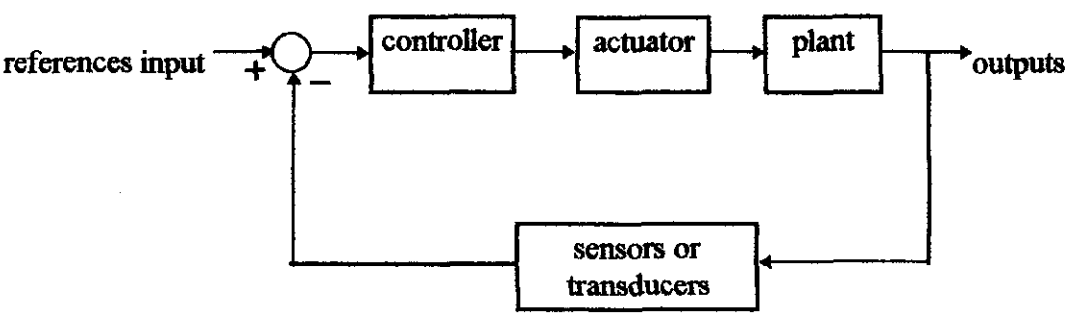

Figure 1.1. Block diagram of a typical controller system.

The generalized control system represented by the block diagram shown in figure 1.1. is useful in understanding the basic concept of the control system architecture.

(i) Plant

It is the system or "process" that is to be controlled.

(ii) Actuator/Drive system

It is the device that drives/actuates the plant based on the signals from the controller. Actuating devices include DC motors,AC motors, stepper motors, solenoids, valves, and relays.