Control of a DC Motor Drive: Design and Implementation

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Prerequisite: EE 380

Introduction

Recent developments in power semiconductor technology and control theory have enabled modern motor drives to face challenging high efficiency and high performance requirements in the industrial sector. Fast and accurate speed response and quick recovery of speed are some of the important criteria of the high performance drive systems used in robotics, rolling mills, machine tools etc.

Objective of Project

Design and implement of a controller that adjusts the motor speed. Controller design will be carried out for a laboratory DC servo system.

Major Tasks:

1. Identify the dynamic model of a DC servo motor. The identification will involve the following:
    - Performing frequency response tests on the servo motor and then determination of the transfer function from Bode diagrams

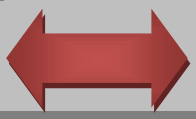
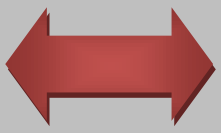
2. Design controllers in the forward or feedback path for specified transient response of the motor. The controllers to be designed will be

- PI/PID controller in the forward/feedback path
- Typical lead-lag compensators in the forward path of the control system

3. Implement the controllers.

4. Test the response of the servo motor with the implemented controllers.

Proposed Schedule of tasks

Task	Proposed Time of Tasks								
	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Studying about control of a DC motor drive									
Identify the dynamic model of a DC servo motor									
Design controllers in the forward or feedback path for specified transient response of the motor									
Implementation of controllers									
Test the response of the servo motor with the implemented controllers									
Writing final report