Midterm Project

1. Objective

The objective of this project is to design a closed-loop control system that regulates the speed of a DC motor. A tachometer is to be used to provide feed-back to the analog controller, as shown in Figure1. The PID controller has to be tuned to obtain an acceptable velocity response of the motor, and be able to reject any disturbances.

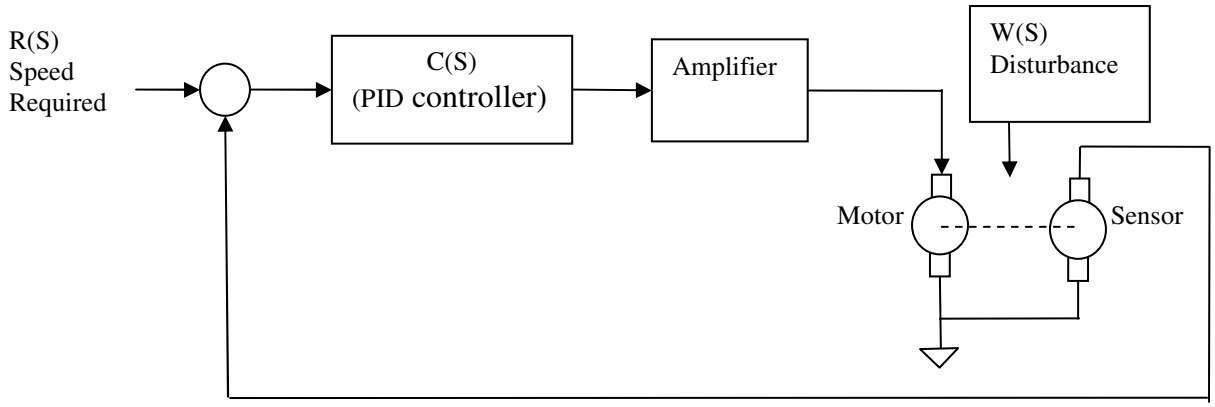

Figure 1. A closed-loop control system

2. Requirements

The control and any other circuitry required to control and drive the motor has to be analog, i.e. the adder, PID controller, and motor driver have to be implemented using operational amplifiers that are suitable for this type of application.

3. Deliverables

Teams of two students may be formed for this project. A working prototype needs to be demonstrated to receive credit for this project. Additionally, the team has to hand in a printed (or an electronic version) of the report which may include:

- Front page. Title of project, name of team members, date.
- Introduction. This section may include a simple description of what you wanted to demonstrate in this project.
- Theoretic results. This section may include MATLAB and/or SIMULINK simulations.
- Experimental results. This section may include the actual experimental results obtained, i.e. plots of motor responses with/without disturbance for different speed requirements.
- References (if any).