

## *ABSTRACT*

Control system with single PID control has been widely used in DC motor speed. The control system is able to control the rotation speed of the DC motor until it reaches the given setpoint. In fact, a single PID control system is only able to work for conditions that are linear. But the DC motor is a plant that has the effect of non-linearity. Effect of non-linearity create a single PID control system is not able to produce output response that has the same characteristics if the given setpoint values are different.

In this final project the authors designed an adaptive PID control that is able to control the rotation speed of the DC motor in any given setpoint corresponding limits specified by removing the non-linear characteristics. Adaptive PID control is designed by using an adaptive control with Gain Scheduling method. This method is implemented in PID control by mapping the work area of DC motor.

The use of adaptive PID using Gain scheduling produces the rise time (rise time) of 0.9 sec. Overshoot and error steady-state trajectory of response does not exist, but there is still a slight oscillation at 1 rpm.

**Keyword :** Single PID, PID Adaptive, non-linearity, linear, gain scheduling