

## ABSTRACT

Digital control becomes one of important thing in process industry because it has various advantages. This is supported with constant the hardware technological growth and the flexible software growth, which can conduct the integration and differential signal slowly. But digital control also has some weakness because process of sampling and signal reconstruction, computing mistake with finite data space, data slicing and deviation of data friction. For that we are design control system with ability own identify also has ability to correct the mistake of output system using PID (Proportional, Integratif and Derivative) controller.

At this final task will be analyzed and implementated position control using PID controller in a plant of two degree-of-freedom robotic arm with joint-arm configuration controlled by two DC motor. Movement input of robotic arm will be controlled by a computer using Matlab and Simulink application. The input has given by the form of target position and PID constanta. Controlling the robotic arm use the DC motor which calculated movement direction and regardless dynamic motor constanta. This implementation process border with special purpose of two degree of freedom robotic arm has been designed to do the movement fluctuate.

Output from movement of robotic arm by performance feedback has result for the first and second arm with rise time 2,8 seconds, settling time 6,98 seconds, peak time 4 seconds, overshoot 0%. The first arm is got constanta of  $K_p=2$  and  $K_d=0,2$ , while the second arm is got constanta of  $K_p=0,1$  and  $K_d=0,01$ . With the data, expected knowable the parameter of PID controller which can be used to design the more complex robot with the same target input and arm weight.

Key Word : Proportional, Integratif and Derivative controller, DC motor, performance feedback