UNIVERSITI TEKNOLOGI MARA

TEMPERATURE CONTROL RESPONSE USING FUZZY PI+PID CONTROLLER

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ABSTRACT

The aim of this project is to evaluate the process performance of temperature control process using combination of Fuzzy PI and PID. In this work, the experimental data is used to determine the process model and the control analysis is done using LabVIEW software. The PID control was tuned by using Ziegler-Nichols method and the Fuzzy PI controller are design with different sets of membership functions. The performance of the output response is evaluated and compared in term of settling time, rise time and percent overshoot. The result had shown that the performance with 7 membership function gives better performance for temperature control process.

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INTRODUCTION

1.1 BACKGROUND

Temperature is definitely an essential parameter within the listing of industrial control objectives. Temperature control objects have nonlinearity, strong coupling, time varying delay and other characteristics [1]. The methods used usually for the control of a temperature system includes PID, Fuzzy Logic Controllers (FLC), Artificial Intelligence (AI), Self-tuning PID, or a combination of Fuzzy and etc. In case the speed and the accuracy of the control system under study were critical, industries used PID controllers. How to enhance the accuracy of temperature control system has been an importance subject in the turf of industry temperature control [2]

Process control states to the actions of ensuring a process is stable and continuously operating at a desired temperature by controlling the temperature of energy from the source to the output device. One of the vital parts in a process control is the controller, it acting a big role in term of producing and maintaining the desired output [3]. Proportional integral derivative (PID) controller is the popular controller used in a process industries