ABSTRACT

In this thesis an artificial intelligent control method is proposed to design temperature controller suitable for low temperature applications such as laboratory equipments (e.g. ovens and incubators).

The proposed design uses fuzzy logic as a control method that maintains the temperature of simulated heater to the desired point. Microcontroller based circuit is built to acquire data from sensor, actuate heat element and communicate with computer workstation. MATLAB fuzzy logic controller is designed, tested, and tuned to control the circuit.

The Fuzzy Logic Controller performance is evaluated in several situations by comparing it with conventional Proportional Integral Derivative controller in terms of speed of response to the desired setting value, overshoot in fixed set point and robustness against disturbance.