

MOTOR SPEED CONTROL SYSTEM FOR WATER DISTRIBUTION USING PRESSURE SENSOR AND FUZZY LOGIC METHOD

Student Name : Riski Romadhan
Student ID Number : 3204211400
Supervisor : Jefri Lianda,ST., M.T

ABSTRACT

An efficient water distribution system requires adaptive control of motor speed in response to pressure changes within the pipeline. Conventional controllers such as PID have limitations in dealing with uncertainty and nonlinear systems. This study develops a motor speed control system using a pressure sensor based on the fuzzy logic method. The research involved designing and implementing a prototype using Arduino Uno, a pressure sensor, and an AC light dimmer module. Input and output variables were categorized into three fuzzy sets, and the control process consisted of fuzzification, inference, and defuzzification using the centroid method. Testing results showed the system was capable of automatically and responsively adjusting motor speed according to water pressure variations, with voltage error averaging below 12% and power error below 15%. The system proves effective in enhancing the efficiency and flexibility of water distribution, offering an innovative solution for small-scale hydraulic applications.

Keywords: *motor speed, fuzzy logic, water distribution, pressure sensor, Arduino Uno.*