

PROTOTYPE OF RICE FIELD IRRIGATION WATER GATE CONTROL SYSTEM USING FUZZY LOGIC METHOD

Ilham Nur Handoyo

*Electrical Engineering Study Program, Faculty of Science & Technology
University of Technology Yogyakarta
Jl. Ringroad Utara Jombor Sleman Yogyakarta
E-mail : ilham.handoyo123@gmail.com*

ABSTRACT

Rice field sluice gates play an important role in the irrigation system by regulating the flow of water to agricultural land. This study aims to design and develop a prototype of a rice field sluice gate control system using the Fuzzy Logic Control (FLC) method. FLC will be embedded in the rice field sluice gate control system through an Arduino microcontroller so that the sluice gate will work based on environmental conditions. In this study, the Mamdani method is used to regulate the control of the opening of the rice field irrigation sluice gate. FLC consists of 2 input variables, namely water level and rainfall intensity whose sensors are made using the Tipping Bucket method and one output variable, namely the angle value of the servo motor. Based on the tests that have been carried out, the fuzzy system that has been created and applied is quite good with an accuracy value of 97.34%. In testing the accuracy level of the sluice gate opening with reference conditions, an accuracy level of 81% was obtained with 7 conditions that did not match the reference from 36 tests. In testing the accuracy of water flow conditions by conducting 10 experiments, an accuracy result of 80% was obtained with 2 experiments that did not meet the reference. The research conducted has succeeded in improving the performance of the sluice gate control according to the water needs required by implementing FLC on the rice field sluice gate.

Keywords: *Fuzzy Logic, Automatic Sluice Gate, Tipping Bucket*