ABSTRACT

PERFORMANCE ANALYSIS OF PSO-PID ON NETWORKED CONTROL SYSTEM

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Networked Control System (NCS) is a control system in which the unit of input, output, and controllers are connected via a network. The addition of a network of closed loop control system to make the process of analysis and design of control strategies more complex. One commonly used strategy is to control the Proportional, Integral, and Derivative (PID). However, one of the constraints in the implementation of the PID is determining the value of PID parameters. Some tunning methods such as Ziegler-Nichols, Cohen-Coon, Astrom-Hagglund, and Poulin-Pomerleau not been able to deliver optimal value tunning this is because the process of tunning stretcher require detailed modeling to be able to produce the optimal value tunning.

The development of computational algorithms generate new methods of doing tunning PID parameters. The difficulty of modeling is not an obstacle in the process of tunning with computational algorithms. Additionally tunning process using computational algorithms such as genetic algorithm (GA), ant colony optimization (ACO), and particle swarm optimization (PSO) is able to handle complex systems, nonlinear, time-varying as widely encountered in industrial processes. In this final project, the PSO algorithm will be used as a method of tunning for PID parameters. From the experimental results obtained by use of LDW-PSO give more satisfactory results with a rise time of 0.86617400009318 seconds, settling time 2.77762831589324 sec, and maximum overshoot of 2.008929% rotations per second.

Keywords: PSO, PID, NCS, delay, LDW-PSO, RIW-PSO