ABSTRACT

THE ANALYSIS OF THE USE OF STATE VARIABLE FEEDBACK ALGORITHM IN NETWORKED CONTROL SYSTEM

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Networked Control System (NCS) is a control system with network in it. At NCS, controller is separated from actuators and sensors by a network. NCS allows many things, such as: installation of many sensors which are connected through the network in a different and more actuators are connected to the controller via the network. The demand for diversity, complexity, and performance of real-time control system has been a challenge for Networked Control System. Some ways to accept this challenge by developing a network on Networked Control System and implementing appropriate algorithms in the system.

In the present study, Networked Control System will be designed using one of the LAN network with State Variable Feedback form algorithm, especially the Linear Quadratic Regulator (LQR). State Variable Feedback is one of the system with a feedback gain matrix. While the LQR is system which gets optimal control from gain of feedback of the state (state feedback) that found by using the Riccati equation.

From the work that has been done, it was known that the implementation of State Variable Feedback LQR algorithm in NCS worked well when the value of Q = 1.5 and K = 1.2021. Response of the system was match with the specifications desired by the value of maximum overshoot equals to 1.98%, 0.19% of steady state error, 0.67 second of rise time, settling time of 1.78 seconds, and the system was stable.

Key words: Networked Control System, State Variable Feedback, Perform of system, Transien response, Network