

INVESTIGATION ON CONTROLLABILITY, OBSERVABILITY AND STABILITY FOR PLANT OPTIMAL CONTROL PERFORMANCE

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ABSTRACT

This study examines the controllability, observability and stability of control systems as vital factors during the design stage. In order to achieve optimal control performance of controlled systems, the plant should be examined for controllability, observability and stability before applying control techniques. However, in some cases, these factors are neglected during design stages which eventually cause poor performance of the system in the long run. The principles behind controllability, observability and stability of control systems were reviewed in this work. Position control plant model was used for demonstration of control system design and dynamics tests. From the test results, the plant model was controllable and observable since their respective matrix determinants exist. From the Bode plot result, the system is stable. Therefore, the position control plant design can be controlled using any control technique such as open loop or closed loop (i.e. feedback) control technique.

Keywords: Plant, Observability, Controllability, Stability, Control System.