IMPLEMENTATION OF REPETITIVE CONTROL ALGORITHM IN REDUCING VIBRATION USING MATLAB/SIMULINK

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DECLARATION

It is hereby declared that all the materials in this thesis are the result of my own work and all the materials, which are not the result of my own work, have been clearly acknowledged in this thesis.

25TH APRIL 2008 MOHAMAD ZUHAIRY BIN MOHAMED

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ABSTRACT

In this report, it analyzes an application of repetitive control algorithm that deal with periodic disturbance.. To investigates the possibility of using a truncated finite impulse response (FIR) model approximation to implement a well-known gradient type repetitive control algorithm. As a new result it is in fact shown that the algorithm iteratively solves a Model Predictive Control related cost function. Furthermore, it is shown how accurate the FIR approximation of the original system has to be in order for algorithm to converge to zero tracking error. Under certain assumption on the plant model it is shown that the algorithm results in monotonic convergence.

The theory of the repetitive control algorithm was applied to the MATLAB and SIMULINK software to making the algorithm converges to zero tracking error exponentially by satisfied the condition that was explained in chapter 2. MATLAB programming is sue to design the repetitive controller after that its implement to the SIMULINK software. However the repetitive controller can be implementing to the real system such as "smart spring". However for this project the repetitive controller just implement to the SIMULINK software. From the SIMULINK software the each repetitive controller represent each block diagram as a virtual hardware. From the output of SIMULINK system the convergence signal can be obtain. The result of the convergence signal showed in figure 5.4 below.