

Nitirong Pongpanich 2009: Command Shaping Applied to Point to Point Motion of Hard Disk Actuator. Master of Engineering (Mechanical Engineering), Major Field: Mechanical Engineering, Department of Mechanical Engineering. Thesis Advisor: Mr. Withit Chatlatanagulchai, Ph.D. 68 pages.

Hard disk actuator is required to move from one track to another with high-level accuracy and with fast move time. However, the actuator cannot move as fast as it should because of the residual vibration at the target track. The cause of this vibration is partly from the fact that the reference signals, which are acceleration, velocity, and position, have high power spectrum energy over wide frequency range including over the actuator's natural frequency. This induces resonance. The command shaping technique re-constructs the reference signals such that its energy content is lower around the natural frequencies of the system to reduce the effect of resonance. In this paper, we use a ramped sinusoidal basis function to reconstruct the reference signals. From the simulation and experimental results, it is clear that the residual vibration of the actuator in the command shaping technique is significantly reduced, enabling the actuator to move faster.

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