

Iterative Feedback Tuning (IFT) of Head Positioning Servomechanism in Hard Disk Drive

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Abstract — Actuators used in hard disk drives (HDD) are produced en mass and therefore their dynamic properties vary within a given tolerance bound. A nominal model representing the batch of actuators is used to design the head positioning servomechanism. Equal performance can not be expected for all actuators when such controller is used. Disk drive servomechanism is expected to provide performance with increasingly tighter tolerance as the demand for higher storage capacity continues. Moreover, physical properties of any actuator may change over time causing the degradation of performance. All these issues demand for good on-line tuning of controller. This paper explores the usage of Iterative Feedback Tuning (IFT) in HDD servomechanism. Improved performance of the tuned controller is demonstrated using simulation and experimental results.