1993 IEEE Transactions on Industrial Electronics

A Fuzzy Scheduling Controller for a ComputerDisk File Track-Following Servo

Jia-Yush Yen, Fu-Jeng Wang and Yung-Yaw Chen

Abstract

In this paper, a fuzzy scheduling capability is superimposed on a computer disk drive track-following servocontroller to adjust for the plant variation as the actuator is locked onto different tracks on the disk. The fuzzy algorithm is used to best represent the complex relationship among the controllers for various tracks. Models of a Zentek 3100 disk drive actuator as it locks on a number of different tracks are experimentally identified to be the reference points. The H_∞ design technique is then employed to obtain a robust optimal controller for each reference point. The actual controller for the disk drive actuator is then calculated using fuzzy interpolation. It is shown that with the controller scheduling action, the closed-loop performance is improved for the actuator at every track position. Error can be kept at a lower level than in the case where only a single controller is used.