

Design of a Sliding Controller for Optical Disk Drives

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Abstract : This paper presents the design and implementation of a sliding-mod controller for tracking servo of optical disk drives. The tracking servo is majorly subject to two disturbance sources: radial run-out and shock. The lateral run-out disturbance is mostly repeatable, and a model of such disturbance is incorporated into the controller design to effectively compensate for it. Meanwhile, as a shock disturbance is usually non-repeatable and unpredictable, the sliding-mode controller is employed for its robustness to abrupt perturbations. As a result, a sliding-mode controller design based on the internal model principle is tailored for tracking servo of optical disk drives in order to deal with these two major disturbances. Experimental comparative studies are conducted to investigate the effectiveness of the specially designed controller.

Keywords : mechatronics, optical disk drive, sliding-mode control, servo systems

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