

A Nonlinear PID Servo Controller For Computer Hard Disk Drives

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Advanced Motion Control, 2006. 9th IEEE International Workshop on; Publication

Date: 0-00; ISBN: 0-7803-9511-1

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Summary

A nonlinear PID scheme is proposed as an efficient hard disk drive servo controller, reducing the settling time and lowering the required control effort. The controller is capable of increasing (decreasing) damping effect when the system output is moving away from (towards) the desired track. This is carried out by utilizing a derivative action tuned by a nonlinear function to provide the system with the needed level of damping. Simulation results, including step function response, control signal history, robustness in terms of the influence of a rate limiter, and a disturbance rejection capability are presented

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