



US007558016B1

(12) **United States Patent**  
**Le et al.**

(10) **Patent No.:** **US 7,558,016 B1**  
(45) **Date of Patent:** **Jul. 7, 2009**

(54) **DISK DRIVE SERVO CONTROL TECHNIQUES FOR PREDICTING AN OFF-TRACK CONDITION UTILIZING AN ESTIMATION FILTER**

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 77 days.

(21) Appl. No.: **11/788,641**

(22) Filed: **Apr. 20, 2007**

(51) **Int. Cl.**  
**G11B 21/02** (2006.01)

(52) **U.S. Cl.** ..... **360/75**

(58) **Field of Classification Search** ..... 360/75, 360/77.08, 78.05, 73.03, 78.07, 78.09, 78.04, 360/31, 78.06; 318/569; 702/141

See application file for complete search history.

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(57) **ABSTRACT**

A disk drive comprising a moveable head, a disk, and a servo controller to control track following operations including implementing an estimation filter is disclosed. The disk includes a plurality of tracks in which a substantial majority of the tracks include a plurality of servo sectors utilized in track following operations. The servo controller implements an estimation filter and performs operations that include: determining a current position estimate of the moveable head relative to the track; predicting a subsequent position estimate of the moveable head relative to the track based upon the current position estimate; and determining whether the predicted subsequent position exceeds an error threshold.

**18 Claims, 6 Drawing Sheets**

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