

Tracking Differentiator Algorithms

Theories, Implementations and Applications

This book highlights designs, implementations and applications of tracking differentiator (TD) algorithms. The real-time differentiation estimation of a given signal is of high importance in control science and engineering. A good differentiator shall have i) robustness against input noises and ii) exactness with a small phase delay. The book has three focuses:

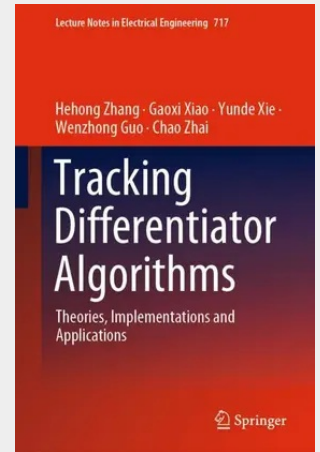
Designing practical, accurate and efficient TD based on discrete-time optimal control (DTC).

Presenting full convergence analysis on DTC-TDs.

Implementing the DTC-TDs in state estimations in power systems and signal processing, as well as feedback control in maglev train.

The proposed TD solution and its successful real-life applications shall stimulate wide interests in different areas including power systems, railway transportations and aerospace industry, etc.

Introduction.- Literature Review.- Discrete Time Optimal Control Algorithm.- Simple and Efficient Tracking Differentiator.- On Convergence Performance of DTC based Tracking Differentiator.- Time-Optimal Control Based Tracking Differentiator with Phase Delay Alleviation.- Tracking Differentiators in real-life engineering.- Summary.



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