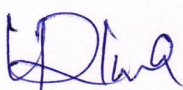# IEEE INDICON 2021

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Design and experimental validation of non-singular terminal sliding mode control for level control system

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Mukesh Ghogare ; Sanjay Patil ; Chetankumar Patil ; Ajit Laware ; Lalit Chaudhari   All Authors

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Abstract:

In this paper, a non-singular terminal sliding mode controller (NSTSMC) design is presented for level control system. Singularity issues in terminal sliding mode control (TSMC) are successfully removed by using NSTSMC. NSTSMC guarantees finite-time convergence from initial state to final state. Higher-order system with long delay is considered for checking the efficacy of the proposed controller in simulation. Real-time experiment is performed on laboratory level system to validate the performance of controller. Stability of the system is guaranteed by Lyapunov stability criteria. Simulation and experimental results shows that the proposed strategy outperforms the conventional methods.

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Abstract

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II. Terminal Sliding Mode Control

III. Non-Singular Terminal Sliding Mode Control

IV. Simulation Example

V. Real-Time Experimentation

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Keywords

Metrics

I. Introduction

Performance of process control system is hampered and degraded due to higher order, non-linearities present, slow varying dynamic behavior and also system does not quickly responds to the external disturbances [1]. These properties makes the controller design task difficult. Proper mathematical ... designing the controller. But for deriving the accurate / correct model it impossible. Therefore ... be removed by finding the correct model ...

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