



TECHNISCHE UNIVERSITÄT
ILMENAU

Institut für Automatisierungs- und
Systemtechnik

Prof. Dr.-Ing. Johann Reger
Fachgebiet Regelungstechnik

Discretization of Continuous Terminal Sliding Mode

Kolloquium

Prof. Bijnan Bandyopadhyay

Indian Institute of Technology
Bombay at Mumbai

Mittwoch,

29. Juni 2016

15:00 Uhr, Zusebau Z 2086

Zusammenfassung

Sliding mode control is one of the accepted techniques for robust control design. In sliding mode control the state trajectory reaches the sliding surface in finite time and then it slides along the surface and reaches to the origin asymptotically. However, in many applications reaching the origin in finite time is also desirable. This is achieved in terminal sliding mode control by considering a nonlinear sliding surface.

The results on discretization of terminal sliding mode came as a surprise. In this talk it will be discussed that finite reaching time of the state trajectory to origin is lost due to the discretization of terminal sliding mode. It will be shown that discretization of terminal sliding mode may lead to the instability of the origin or may lead to a two periodic motion.

This result has given also a way to think about the discrete-time terminal sliding mode control which will be discussed in this talk, as well.

Curriculum Vitae

Prof. Bandyopadhyay received his bachelor degree in Electronics and Telecommunication Engineering from the University of Calcutta, India, in 1978, and the Ph.D. in Electrical Engineering from the Indian Institute of Technology Delhi, India, in 1986. Since 1987 he is professor with the Indian Institute of Technology Bombay, India. He is a Fellow of Indian National Academy of Engineering (INAE), Senior member of IEEE, Fellow of IETE (India) and Fellow of Alexander von Humboldt Foundation. He has published 10 books and monographs, 10 book chapters and more than 340 journal articles and conference papers. He serves in various technical committees and editorial boards. His research interests include the areas of higher order sliding mode control, multirate output feedback control, discrete-time sliding mode control, large-scale systems, model order reduction, event-triggered control, nuclear reactor control and smart structure control. Currently he is a guest professor at Control Engineering Group, TU Ilmenau.