**IEEE Technical Committee on Variable Structure and Sliding Mode Control: Spring 2011 Report**

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Since the previous report submitted in November 2010, the Variable Structure and Sliding Mode Control community has been involved with the following activities:-

1. Material for a book entitled “Sliding mode theory: present and future” representing a series of tutorials from the 11th International Workshop on Variable Structure Systems (VSS 2010) has been finalised. It is hoped the book will be published for launch at the IFAC World Congress.
2. Papers have been submitted for a Journal Special Issue of the Franklin Institute entitled “Advances in Guidance and Control of Aerospace Vehicles using Sliding Mode Control and Observation Techniques” which will be guest edited by Professor Yuri B. Shtessel, Dr. Christian H. Tournes and Professor Leonid Fridman.
3. Papers have been submitted for a Special Issue of the IMA Journal of Mathematical Control and Information entitled ‘Lyapunov methods for Second Order Sliding Modes’ which will be guest edited by Professor Jaime Moreno.
4. Jian-Xin Xu, Xinhuo Yu and Asif Sabanovic organized a special session entitled Variable Structure Control and Industrial Applications within the 36th Annual Conference of the IEEE Industrial Electronics Society, 7-10 November 2010, Glendale, USA. The team received 11 submissions and finally 8 were recommended and accepted. The special session included the 7 papers listed below.

 1. Robust Control for Slosh-free Motion using Sliding Modes

2. An Integral Sliding Mode Control Design for a Class of Underactuated Motion Systems

3. High-order Terminal Sliding Modes Control for Induction Motor

4. A Smooth Second-Order Sliding Mode Controller for Relative Degree Two Systems

5. A chattering free Lyapunov function based sliding mode controller applied to single phase series connected PV Inverter for grid voltage compensation

6. Sliding mode control for offshore steel jacket platforms

7. Laser Autofocusing: A Sliding Mode Approach

The following paper was recommended for presentation at another session

RBF Neural Networks Based Quasi Sliding Mode Controller and Robust Speed Estimation for PM Synchronous Motors

1. Preparations continue for the twelfth international workshop on variable structure systems which will be held in Mumbai from 12th-14th Jan 2012. Professor Bijnan Bandyopadhyay is the general Chair. The call for papers was launched at CDC in Atlanta and the conference website is now available: <http://www.sc.iitb.ac.in/~vss2012/call_paper.php>. Professor Bandyopadhyay has applied to both CSS and IES for co-sponsorship. We hope to receive approval from the two societies to enable us to use the logos of IEEE CSS and IES. The website will then be formally launched for paper submission.
2. A form has been designed which can be used in the future for groups or consortia wishing to host the workshop. The form is now on the TC website. The Technical Committee is now seeking bids from groups or consortia which wish to host the next Workshop in 2014. Anyone interested in making an application should complete the form before November 2011 and submit it to the TC Chair. The Committee will consider bids at the Technical Committee meeting at the CDC in 2011.
3. Special sessions with the theme “Variable Structure and Sliding Mode Control: State of the Art” have been accepted for presentation at the IFAC World Congress in Milan, 2011 by Professor Vadim Utkin.
4. A Special Session on Lyapunov Methods for Second Order Sliding Modes" has been organised by Leonid M. Fridman and Jaime A. Moreno and submitted for consideration for presentation at the 50th IEEE Conference on Decision and Control and European Control Conference to be held in Orlando, FL, USA in 2011.
5. TC members are involved in the organisation of a special session on variable structure control at 37th Annual Conference of the IEEE Industrial Electronics Society (IECON 2011) to be held from 7-11 November 2011 in Melbourne, Australia.. .