

## ***Sliding Mode Control and Soft Computing: Interplay and Integration***

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### **Abstract**

Sliding Mode Control has been extensively studied for many years and successfully applied to solving many industrial problems due to its simplicity and robustness in systems variations and disturbances. Despite of its extensive research, key technical problems such as chattering, disturbances and uncertainties, unmodeled dynamics, adaptive learning, robustness remain to be challenging research questions.

Soft Computing is a rather recent development in Intelligent Systems, which has provided alternative means for adaptive learning and control. Technologies in Soft Computing include Neural Networks, Fuzzy Logic, Evolutionary Computation, and Complex Systems.

Significant efforts have been devoted in recent years in integration of Sliding Mode Control and Soft Computing to overcome the aforementioned technical problems. On the other hand, Sliding Mode Control technologies have found their place in Soft Computing for improving learning efficiency and accuracy.

In this talk, we provide an overview of recent developments in these areas and discuss issues concerning the interplay and integration of Sliding Mode Control and Soft Computing.

### ***Bibliography***

Xinghuo Yu received B. Eng. and M. Eng. degrees from the University of Science and Technology of China in 1982 and 1984, and the PhD degree from South-East University, China in 1988, respectively. He is now with RMIT University, Melbourne, Australia, where he is the Director of RMIT Platform Technologies Research Institute and Professor of Information Systems Engineering. Prof Yu's research interests include variable structure and nonlinear control, complex and intelligent systems and industrial information technologies. He has published over 340 refereed papers in technical journals, books and conference proceedings as well as co-edited 9 research books. Prof Yu served as an Associate Editor of IEEE Transactions on Circuits and Systems Part I (2001-2004) and IEEE Transactions on Industrial Informatics (2005-2008), and is currently as an Associate Editor of IEEE Transactions on Industrial Electronics and several other scholarly journals. He was the sole recipient of the 1995 Central Queensland University (CQU) Vice Chancellor's Award for Research, and was made an Emeritus Professor of CQU in 2002 for his long term contributions.

Prof Yu is a Fellow of the IEEE, and a Fellow of the Institution of Engineers Australia.