Technical Committee on Variable Structure and Sliding Mode Control

The IEEE Control Systems Society (CSS) Technical Committee (TC) on Variable Structure and Sliding Mode Control (TC-VSSMC) was created in 1997 and is one of the oldest TCs. Its main goal is to coordinate the scientific groups working in the field. The activities of the TC-VSSMC include choosing the place, dates, and organizers for the biannual VSS workshop; coordinating the publication of special issues and book chapters on related topics; organizing the courses, summer schools, and preconference workshops on different aspects of SMC theory; and organizing special sessions at the major control conferences. Note that, since 1993, 11 books have been published (http://variable-structure.ieeecss.org/publications/books-selected-chapters), with [1] as the most recent.

Many of the associate editors (AEs) of IEEE CSS journals (and also *Automatica*) that manage VSS mode control papers are members of the TC-VSSMC executive committee, which helps to ensure that submitted papers have a representative set of reviewers. Christopher Edwards is an AE of *IEEE Transactions on Automatic Control* and has been appointed chair of the TC, starting in 2019.

WORKSHOPS

The 14th Variable Structure Systems (VSS16) workshop was held in June 2016 in Nanjing, China, and chaired by X. Yu and L. Fridman. The 15th IEEE VSS18 workshop will be held in Graz, Austria on July 9–11 and chaired by M. Horn and L. Fridman. A record number of submissions (111) were received and 86 papers accepted for VSS18. The next VSS workshop will be held in 2020 in Rio de Janeiro, Brazil with L. Hsu, T. Oliveira, and L. Fridman as the cochairs.

(From left) Leonid Fridman and Yury Shtessel during the VSS06 workshop, Alghero, Italy.

SCHOOLS FOR STUDENTS AND COURSES

The period 2016–2017 was very successful for TC-VSSMC. In 2016, the TC organized the Fall School on Modern Sliding Mode Control [2] and a Conference on Decision and Control workshop on continuous SMC with J. Moreno, L. Fridman, and V. Utkin as lecturers. In 2017, a course was delivered within the framework of the International Graduate School on Control as part of the European Embedded Control Institute, with J. Moreno and L. Fridman as the lecturers. Sarah Spurgeon taught the course Advanced Sliding Mode Control and Estimation for Real Complex Systems of the 21st Century [3], supported by the Global Initiative of the Academic Network of the Ministry of Human Development of India.

One of the traditions of the TC is to organize summer schools one year prior to the VSS workshop. In September 2017, the summer school Sliding Mode Control was organized in Graz, Austria [4]. The plan in 2019 is to establish a course within the framework of the International Graduate School on Control of the European Embedded Control Institute and a summer school in Brazil.

SPECIAL ISSUES

The special issues [5] and [6] were published in 2016, and the TC is now working on three new special issues. One issue is on differentiators, for *International Journal of Control*, and the other is on SMC-based observation, identification, uncertainties compensation, and fault detection for *Asian Journal of Control*. In total, 64 submissions are now under review.

ANNIVERSARIES AND NEWS

The book [7] is devoted to the retirement of Okyay Kaynak, and the special issue [6] is devoted to 70th birthday of Liu Hsu. A special issue of *International Journal on Robust and Nonlinear Control* is devoted to the 80th birthday of V. Utkin. In 2018, we will celebrate the 70th birthdays of Yury

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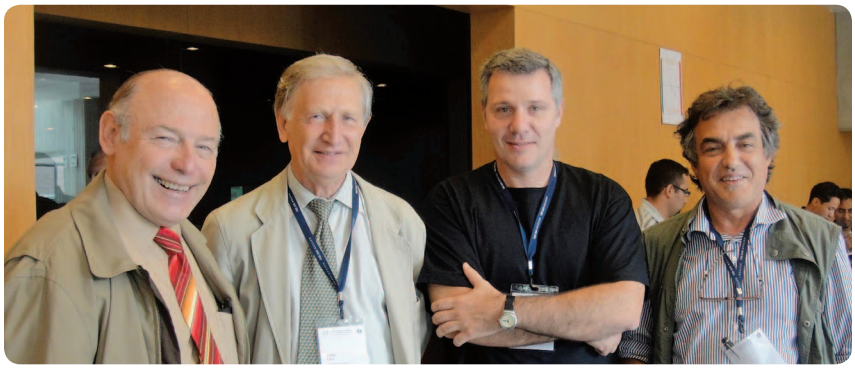

(From left) Hebertt Sira Ramirez, Vadim Utkin, Paul Puleston, and Giorgio Bartolilni during the VSS10 workshop in Mexico.

Shtessel and Hebertt Sira Ramirez. Unfortunately, in February 2018, Jean-Xin Xu, who was an executive committee member for 20 years, passed away.

JOIN TC-VSSMC

To join the TC, send an e-mail with your affiliation to levant@post.tau.ac.il asking to be included in the TC-VSSMC database, where you will receive all information about the community and can send proposals, suggestions, and information about new publications. Information about TC-VSSMC can be found on the TC website http://variable-structure.ieeecss.org/tc-variable-structure/home.

TC-VSSMC operates with an executive committee that organizes events on behalf of members. The executive committee roster can be found at http://variable-structure.ieeecss.org/sites-member-roster, and anyone on it can be contacted with ideas for events or feedback on the existing program. An extensive mailing list of TC members is also maintained and used to promote the committee's activities.

Leonid Fridman

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Technical Committee on Networks and Communication Systems

The rapid pace of innovation in the areas of systems control, computation, and communication is leading the way for a new class of networked systems characterized by their complex interconnections, diversity of components, and interactions with the physical world. These systems offer a vision of increased automation and benefit for society from environmental, economic, and social perspectives.

The IEEE Control Systems Society (CSS) Technical Committee on Networks and Communication Systems (TC-NCS) focuses on areas that involve the interplay among networks, communication, and systems control. TC-NCS currently has 72 members, including 17 students and postdoctoral associates. The TC is organized into eight working groups: Control of Network Systems (Paolo Frasca, chair), Information Networks and Control (Serdar Yüksel, chair), Networked Sensing and Sensor Networks (Venkatesh Saligrama, chair), Optimization and Game Theoretic Methods in Networks (Ali Jadbabaie, chair), Cybersecurity and Privacy (Yilin Mo, chair), Infrastructure Networks (Rahul Jain, chair), Internet of Things (Rolf Findeisen, chair), and the recently formed Learning, Dynamics, and Behaviors in Social Systems (Giacomo Como, chair).

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CONTROL OF NETWORK SYSTEMS

This working group focuses on the analysis and design of networks of dynamical systems, taking a control systems perspective. In particular, analysis questions focus on control-theoretic properties of these network systems, along with a study of the collective and emergent properties of network systems, such as consensus and synchronization. Design methods aim to develop distributed algorithms to achieve suitable collective goals at the network level. In these distributed algorithms, each system comprising the network uses only local information obtained by sensing or communication to determine its role toward the global objective.

The group activities encompass both theory and applications. Recent theoretical focal points have been network controllability and observability, with the purpose of uncovering how these system-theoretic properties depend on the network topology [1]. Another point of interest is model reduction for large