Summer School on Sliding Mode Control 2017

Between September 4 and September 8, the International Summer School on Sliding Mode Control took place at the Institute of Automation and Control, Graz University of Technology, Austria. The summer school was organized by Prof. Martin Horn, Martin Steinberger (Graz University of Technology) and Prof. Leonid Fridman (Universidad Nacional Autónoma de México). It was supported by the Technical Committee on Variable Structure and Sliding Mode control of the IEEE Control Systems Society (CSS). The summer school is the first stage of the preparation for the "15th International Workshop on Variable Structure Systems (VSS)" that will take place in Graz, Austria, from June 9 till June 11, 2018, see www.vss-graz.com.

The goal of the school was to promote basic techniques and recent results of sliding mode control and observation among students and researchers from Europe and especially from German speaking countries. The 22 participants (including five young female researchers) came from Universities and companies (Samsung SDI Battery systems, LAM Research, Virtual Vehicle, Joanneum Research) from Austria, Germany and the UK.

Figure 1: Participants and speakers of the summer school

In the first part, Prof. Martin Horn, Markus Reichhartinger and Martin Steinberger (Graz University of Technology, Austria) gave an introduction to sliding mode control and observation.

Prof. Antonella Ferrara (University of Pavia, Italy) presented an optimization approach to higher order sliding mode concepts and their application in robotics, power engineering and automotive systems.

Prof. Bernard Brogliato (INRIA Grenoble, France) introduced the effects of explicit discretization of sliding mode controllers and presented an implicit discretization approach.

Prof. Jaime Moreno (Universidad Nacional Autónoma de México, México) focused on the design of higher order sliding mode controllers. He presented a framework that takes advantage of the homogeneity property for Lyapunov based controller design.

Finally, Prof. Leonid Fridman (Universidad Nacional Autónoma de México, México) gave an introduction to the theory and practice of sliding mode observers, analysis of sliding mode controllers in the frequency domain as well as to the concept of the practical relative degree.

Figure 2: Speakers of the summer school (from left to right): Martin Steinberger, Leonid Fridman, Markus Reichhartinger, Bernard Brogliato, Martin Horn, Antonella Ferrara, Jaime Moreno

The summer school was partially supported by the IEEE CSS Outreach Fund to encourage young female researchers to participate. The organizers would like to thank the volunteers of the Institute of Automation and Control, Graz University of Technology for the support during the summer school.

Martin Steinberger
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Leonid Fridman