

Technical Committee for Healthcare and Medical Systems: 2018 Meeting

Alexander Medvedev

Uppsala University

alexander.medvedev@it.uu.se

December 19, 2018

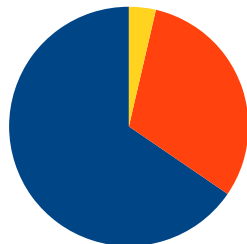
Overview

- 1 Previous meeting
- 2 Some numbers
- 3 Activity report
- 4 Coming activities

- CDC 2017, Melbourne, 8 participants
- It is agreed that a meeting will be held in connection with CDC18, Miami Beach.
- Minutes are published and sent out.

Members: Geographical distribution

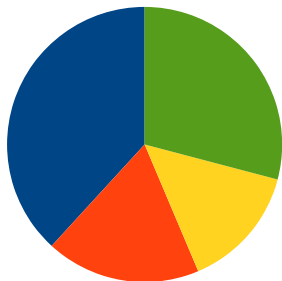
TC HMS members



Area	Members
Americas	36
Europe	17
Asia	2

Today, TC HMS has 55 members, two new members joined in 2018. TC size ranges between 30 and more than 200.

Members: Academic position



Position	Members
Professor	21
Associate professor	10
Assistant professor	8
Other	16

Areas of biomedicine

- Neural systems and neuroscience
- Rehabilitation robotics and prosthetics
- Behavioral medicine
- Wearable systems and mHealth
- Drug delivery systems
- HIV
- diabetes

Areas of control

- Modelling and system identification
- Networks
- Robotics
- Machine learning

Awards and Recognition:

- Naira Hovakimyan became Fellow of the IEEE in 2018.
- Jin-Oh Hahn received a U.S. National Science Foundation (NSF) Faculty Early Career Development (CAREER) Award in 2018.

Activities:

- Juergen Hahn started serving as editor for the Biological Systems section of the journal Processes in 2018. He is also associate editor for Control Engineering Practice and on the editorial board of the Journal of Process Control.

Conferences and Workshops

- Pasquale Palumbo and Alessandro Borri co-organized the mini-symposium "Recent trends in the modeling and control of the glucose-insulin system" at the European Conference on Mathematical and Theoretical Biology, Lisbon, July 2018.
- B. Wayne Bequette served as International Programming Committee Chair, ADCHEM 2018, Shenyang, China (2018).
- Naira Hovakimyan co-organized NSF workshop "Machine Learning for Discovery Sciences", Yerevan, Armenia (with Aram Galstyan, USC), co-sponsored by Foundation for Armenian Science and Technology, 2017. She also served as General Co-Chair of ICNPAA World Congress: Mathematical Problems in Engineering, Sciences and Aerospace, Yerevan, Armenia, 2018.
- Juergen Hahn served as the Vice Chair for Invited Sessions for the 2018 American Control Conference (ACC) and as conference chair for the 2018 Foundations of Systems Biology in Engineering (FOSBE) conference.

Invited Sessions

- Alexander Medvedev organized an invited session "System Identification and Data-Driven Modeling in Medicine", The 18th IFAC Symposium on System Identification (SYSID 2018), Stockholm, July 9-11, 2018.

Journal Special Issues

- IEEE Transactions on Control Systems Technology, "System identification and control in biomedical applications". 65 papers submitted, 35 accepted.
 - Guillaume Mercere, Universit de Poitiers, France
 - Daniel E. Rivera, Arizona State University, Tempe, Arizona, USA
 - Alexander Medvedev, Uppsala University, Sweden
 - Caterina Scoglio, Kansas State University, Manhattan, Kansas, USA
 - Bayu Jayawardhana, University of Groningen, The Netherlands

Organization of Workshops

- Every TC is encouraged to organize workshops - a highly effective mechanism
- Financial support (2 to 3K USD, per TC, year) available

Emerging Topics: Intra-TC and Inter-TC

- Present emerging topics in the form of position paper in the Control Systems magazine
- What is the new hot topic in the TC?
- Promote it in column (each 18 month in CSM), TC website

Conference editorial board nominations

- 229 CEB members. About 30 new appointees every year.
- 10 people were added to the CEB in October based on TC recommendations
- One person from each TC is nominated for the CEB.
- Of the total of 19 names, about 10 will be recommended by the CEB Chair, discussed at Excomm, then approved by the BOG at ACC.
- Deadline for you to send this Joao: January 20, 2019

- Analysis, Design, and Control of Systems in Neuroscience, I–III
 - Alexander Medvedev (Uppsala University, Sweden)
 - Warren Dixon (University of Florida, USA)
 - Sergio Pequito (the Rensselaer Polytechnic Institute, USA),
 - Fabio Pasqualetti (University of California at Riverside, USA)

- Tutorial "Neuromodulation is control"? Control in Neuroscience and Neurology?
- Tutorial "Feedback drug delivery"?
- Tutorial/Workshop "Wearable and implanted medical systems"?
- Invited session on particular classes of systems
 - Nonlinear modeling and control in medicine
 - Hybrid systems in biology and medicine (together with TC Systems and Synthetic Biology)

- Topics?
 - Neuroscience/Neurology
 - Individualization of therapies
 - Control of drug delivery
- Journals?

- Daniel E. Rivera looks for new outreach activities. Funding is available.
- Examples of projects that can be supported include (not an exhaustive list):
 - Outreach activities for pre-university students and teachers
 - Outreach activities for developing nations
 - Promotional materials for CSS or the field
 - Workshops on control-related topics
 - CSS membership drives

The End