

**DPSs have become essential in novel areas involving quantum systems, traffic flow control, information science, neuroscience and neuronal networks, and even machine learning.**

other funding agencies, such as the European Commission, Agence Nationale de la Recherche (ANR), Deutsche Forschungsgemeinschaft (DFG), and industrial partners through major projects, for example, the European Research Council (ERC) PortWings, ERC

DyCon, Innovative Training Network ConFlex, and ANR-DFG INFIDHEM (see the TC webpage for an updated list).

### GETTING INVOLVED

To facilitate easier sharing of information regarding open positions in the

field of DPS control, the TC launched a dedicated website DPS Jobs (<http://dps-jobs.org>) in early 2023. More information on future events and additional material can be found on the TC website <https://ieeecss.org/tc/distributed-parameter-systems>.

Any CSS member is more than welcome to join the TC and take an active part in its activities; just send me an e-mail ([lassi.paunonen@tuni.fi](mailto:lassi.paunonen@tuni.fi)) with your contact information to receive updates on forthcoming events.

**Lassi Paunonen** 

*Technical Committee chair from 2023*

**Thomas Meurer** 

*Technical Committee chair from 2020 to 2022*

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## Networks and Communication Systems

The IEEE Control Systems Society Technical Committee (CSS TC) on Networks and Communication Systems aims to promote communication among researchers active in the area of control of network systems with a broad spectrum of applications, including communication networks, transportation and energy systems, social and economic networks, financial systems, and biological networks. The TC on Networks and Communication Systems provides a forum to discuss new research directions on modeling, analysis, optimization, and control of emerging networks, both with social and technological aspects. It allows members to coordinate activities, including organization of new workshops and several invited sessions on networks at the IEEE Conference on Decision and Control (CDC) and other major conferences. Another important objective is to increase CSS

publications that could provide a visible outlet for high-quality research in this area. Over the last few years, this TC has grown to more than 110 members, including around 30 students and postdocs. It is chaired by Giacomo Como and is organized into eight working groups: “Control of Network Systems” (chaired by Paolo Frasca), “Information Networks and Control” (chaired by Serdar Yüksel), “Networked Sensing and Sensor Networks” (chaired by Venkatesh Saligrama), “Optimization and Game Theoretic Methods in Networks” (chaired by Francesca Parise), “Cybersecurity and Privacy” (chaired by Yilin Mo), “Infrastructure Networks” (chaired by Ketan Savla), “Internet of Things” (chaired by Rolf Findeisen), and “Learning, Dynamics and Behaviours in Social Systems” (chaired by Chiara Ravazzi).

### RECENT ACTIVITIES

Over the past months, our TC has been involved in the organization of

several scientific initiatives. In particular, our working groups have been actively organizing several invited sessions at the 61st CDC that was held in Cancún, Mexico, from 6 to 9 December 2022, including those on “Resilience and Robustness in Large-Scale Networked Systems,” “Networked CPS Resilience,” “Event-Triggered Control,” “Event-Triggered Control for Multi-Vehicle, Multi-Robot, and Multi-Agent Systems,” “Learning and Resilience in Event-Triggered Control,” “Modeling, Estimation, and Control of Epidemic Systems,” and “Dynamics in Complex Networks: Estimation, Analysis, Control.”

Our TC has also contributed to the organization of the half-day workshop “Challenges in Robust and Complex Systems” [1] that was held at the Department of Mathematical Sciences “G.L. Lagrange” of Politecnico di Torino, Torino, Italy, within the first Control Systems CSS day on 20 October 2022. A four-day workshop on “Algorithmic Game Theory, Mechanism Design, and

Learning” has been organized in Torino, Italy from 8 to 11 November 2022. This workshop has been held at the Department of Mathematical Sciences “G.L. Lagrange” of Politecnico di Torino within the framework of the Ministero dell’Istruzione, dell’Università e della Ricerca (MIUR) Excellence Project 2018–2022. Please refer to the webpage [2] for more information. Our working group on “Optimization and Game Theoretic Methods in Networks” organized a four-day workshop on “Games on Networks” [3] that was held from 3 to 6 April 2023, at the Institute for Mathematical Sciences of the National University of Singapore within the program “Games, Learning, and Networks” [4] (see Figure 1 for a picture of the participants that was taken during the last day of the workshop). Finally, some of our TC members contributed to the special issue on “Control Technology for Networked and Distributed Robotics” that has been published in the journal *Advanced Robotics* [5].

### PLANNED ACTIVITIES

Within the upcoming 22nd IFAC World Congress, which will be held in Yokohama, Japan from 9 to 14 July 2023, our TC has organized two open invited tracks on “New Trends in Control and Optimization in Smart City Networks” and “Control for Socio-Technical Network Systems,” as well as a one-day workshop on “Emerging Trends in Resilient Control of Networked Systems” [6]. A five-week focus period on “Network Dynamics and Control” will be held at Linköping University, Linköping, Sweden from 4 September to 6 October 2023 [7]. This focus period is organized within the Excellence Center ELLIT [8] and will culminate with a three-day workshop from 20 to 22 September 2023. Finally, some of our TC members contributed to the organization of special issues on “Event-Triggered and Self-Triggered Control” in the journal *Nonlinear Analysis Hybrid Systems* [9] and on “Multi-Agent Coordination for Energy Systems: From Model Based to Data-Driven Methods” in *IEEE Control Systems Letters* [10].

### NETWORKS AND COMMUNICATION SYSTEMS TC OUTSTANDING STUDENT PAPER PRIZE

In 2022, we held the first edition of the TC Outstanding Student Paper Prize. The aim of this new award is to recognize young talent associated with a technical area and promote student membership and participation in the TC. The prize is presented at the TC meeting at CDC and is assigned to a student who is a TC member and is the primary author of a paper presented at the previous year’s CDC or Conference on Control Technology and Applications. For the first edition of this award, six high-quality papers were nominated. They were then evaluated by a

committee of five independent experts. The 2022 Networks and Communication Systems Technical Committee Outstanding Student Paper Prize was awarded to Charles Monnoyer de Galland and Renato Vizuete for their paper “Random Coordinate Descent Algorithm for Open Multiagent Systems With Complete Topology and Homogeneous Agents,” coauthored with Julien M. Hendrickx, Paolo Frasca, and Elena Panteley [11]. Figure 2 shows the presentation of the award during our TC meeting at the 61st CDC in Cancún, Mexico on 9 December 2022. In 2023, we will run the second edition of this award: five nominations have already been received, and the winner will be announced at the 62nd CDC to be held



FIGURE 1 Participants of the workshop “Games on Networks” at the Institute for Mathematical Sciences of the National University of Singapore, 6 April 2023.



FIGURE 2 Presentation of the 2022 Networks and Communication Systems Technical Committee Outstanding Student Paper Prize at CDC 2022.

at Marina Bay Sands, Singapore from 13 to 15 December 2023.

**Giacomo Como** 

**Paolo Frasca**, *Senior Member IEEE*

**Francesca Parise**

**Chiara Ravazzi**

**Ketan Savla**, *Member IEEE*

**Serdar Yüksel**

## REFERENCES

- [1] "Challenges in robust and complex systems - CROCS2022," Consiglio Nazionale delle Ricerche, Rome, Italy, Oct. 2022. [Online]. Available: <https://www.ieiit.cnr.it/news/article/challenges-in-robust-and-complex-systems-crocs2022>
- [2] S. Amin et al. (Nov. 2022). Algorithmic game theory, mechanism design, and learning. Presented at Dept. Math. Sci., Politecnico di Torino.

[Online]. Available: [https://areweb.polito.it/disma-excellence/events\\_2022/GameT1/index.html](https://areweb.polito.it/disma-excellence/events_2022/GameT1/index.html)

[3] IMS Auditorium. (Apr. 2023). Games, learning, and networks. Presented at Workshop 1 on Games on Networks. [Online]. Available: <https://ims.nus.edu.sg/wp-content/uploads/2023/04/0604-GLN-Workshop-1.pdf>

[4] "Games, learning, and networks," Inst. Math. Sci., Nat. Univ. Singapore, Singapore, Singapore, Apr. 2023. [Online]. Available: <https://ims.nus.edu.sg/events/games-learning-and-networks/>

[5] M. Nagahara et al., "Special issue on control technology for networked and distributed robotics," *Adv. Robot.*, vol. 37, nos. 1–2, p. 1, Jan. 2023, doi: 10.1080/01691864.2022.2156058.

[6] Automatica. (Jul. 2023). Emerging trends in resilient control of networked systems. Presented at the Workshop offered at the 22nd IFAC World Congress. [Online]. Available: <https://automatica.dei.unipd.it/workshop-ifac-2023/>

[7] "Network dynamics and control," *Elliit*, Sep./Oct. 2023. [Online]. Available: <https://elliit.se/news-and-events/focus-period-linkoping-2023>

[8] "Excellence center at Linköping – Lund in information technology." *Elliit*. [Online]. Available: <https://elliit.se>

[9] "Nonlinear analysis: Hybrid systems," *Int. Federation Automat. Contr.*, early access, Aug. 2023.

[10] "Data-driven analysis and control," in *IEEE Contr. Syst. Lett.*, Jan. 2023. [Online]. Available: [http://ieeecsletters.dei.unipd.it/Page\\_specialissue\\_2.php?p=1](http://ieeecsletters.dei.unipd.it/Page_specialissue_2.php?p=1)

[11] C. M. de Gallaand, R. Vizuete, J. M. Hendrickx, P. Frasca, and E. Panteley, "Random coordinate descent algorithm for open multi-agent systems with complete topology and homogeneous agents," in *Proc. 60th IEEE Conf. Decis. Contr. (CDC)*, 2021, pp. 1701–1708, doi: 10.1109/CDC45484.2021.9683049.



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