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PROCEEDINGS

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15th IFAC Symposium on Large Scale Complex Systems —LSS 2019

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FOREWORD

The 15th IFAC Symposium on Large Scale Complex Systems (LSS 2019) was held at the Delft University of Technology (TU Delft), on May 26th-28th 2019.

The members of the International Program Committee, together with additional reviewers, provided multiple thorough reviews for the 47 submitted contributions. Based on the received reviews, 33 high-quality contributions were accepted for presentation during the 6 sessions, organised in two parallel tracks, at the 2-day conference. Of the 33 contributions, 28 are full papers and are included in the proceedings, while 5 are extended abstracts (for presentation and dissemination, without inclusion in the proceedings).

The 6 thematic sessions ranged over the following topics: theory-oriented sessions dealing with *Complex Network Systems*, *Decentralised and Distributed Control Systems*, *Efficient Strategies and Optimisation for Large Scale Complex Systems*, and *Multi-Agent Systems*, and application-oriented sessions dealing with *Transportation Systems* and *Applications to Aerospace Engineering and Fault Tolerant Control*. The four most represented keywords at the event were “Decentralised and distributed control systems”, “Multi-agent systems”, “Transportation systems” and “Complex network systems”.

A highlight of the symposium IFAC LSS 2019 was the presence of two exceptional invited plenary speakers: Giancarlo Ferrari Trecate, from École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, giving a talk on “Scalable control design for systems with flexible structure”, and Jacquelien Scherpen, from the University of Groningen, The Netherlands, presenting “Classical model reduction methods for structure preserving reduction of networks of systems”.

IFAC LSS 2019 was a success in terms of diversity: the attendees came from all over the world. The represented countries were China, France, Germany, Italy, Japan, Netherlands, Poland, Russia, South Africa, Switzerland, Turkey, United Kingdom, United States of America. Gender diversity was ensured also by the two distinguished plenary speakers. Numerous students and young researchers participated in the event, thus accomplishing the educational and training mission of the IFAC LSS Symposium. To promote the visibility of excellent young researchers, the IFAC Young Author Award was assigned by the selection committee composed of Ming Cao, Giulia Giordano, Sergio Grammatico, Mathias Staudigl and Siep Weiland.

The Program

After a welcome reception on Sunday evening, the Monday program started with the plenary lecture by Giancarlo Ferrari-Trecate (École Polytechnique Fédérale de Lausanne, CH).

Then, on Monday morning we had two parallel sessions: *Transportation systems*, with presentations of the work by Dekker and Panja (Utrecht Universitly, NL), by Tao, Jain and Baldi (TU Delft, NL), by Chen, Wang, van Arem and Alkim (TU Delft, NL), by Nnene, Joubert and Zuidgeest (Universities of Cape Town and of Pretoria, ZA), and by Davydenko and Fransen (TNO, NL); and *Complex Network Systems*, which included presentations of the work by Xue and Roy (Washington State University, US), by Lavaei and Zamani (TUM, DE, and University of Colorado Boulder, US), by Wendt, Dhal and Roy (Washington State University, US), by Casagrande, Krajewski and Viaro (University of Udine, IT, and Polish Academy of Sciences, PL), by Zhang, Yang and Wang (Shanghai Jiao Tong University and Jiangsu University, CN), and by Hofman (TNO, NL).

After a break for lunch and networking, the two parallel sessions on Monday afternoon were: *Applications to Aerospace Engineering and Fault Tolerant Control*, including presentations of the work by Macktoobian, Gillet and Kneib (EPFL, CH), by Zhou, Kawano and Cao (Fujian University,

CN, and University of Groningen, NL), by Akca and Efe (Hacettepe University, TR), by Sun, Li and Jia (Shenyang Jianzhu University, CN), and by Sun, Li, Jia, and Ying (Shenyang Jianzhu University, CN); and *Decentralised and distributed control systems*, featuring presentations of the work by Kubo and Fujisaki (Osaka University, JP), by Tedesco, Sarkar and Casavola (University of Calabria, IT), by La Bella, Bonassi, Farina and Scattolini (Politecnico di Milano, IT), by Iftar (Eskisehir Technical University, TR), by Xu, Wen, Wang, Xie (Guangxi University and Peking University, CN), and by Broecker (Heilbronn University, DE).

On Monday evening, a conference banquet was organised at Royal Delft, where the participants had dinner surrounded by the world-famous white and blue porcelain, hand-painted in Delft since 1653.

The Tuesday morning program kicked off with the plenary lecture by Jacquelien Scherpen (University of Groningen, NL).

Then, the recipient of the IFAC Young Author Award was announced by Mathias Staudigl and Siep Weiland: the committee assigned the award to Alessio La Bella (Politecnico di Milano, IT), while the other two finalists were Abolfazl Lavaei (Technical University of Munich, DE) and Matin Macktoobian (EPFL, CH).

Finally, two parallel sessions were held: *Efficient Strategies and Optimisation for Large Scale Complex Systems*, which included presentations of the work by Staudigl and Mertikopoulos (Maastricht University, NL, and CNRS, FR), by Estrella, Belgioioso and Grammatico (TU Eindhoven and TU Delft, NL), by Bai, Thomopoulos, Crisostomi and Pannocchia (University of Pisa, IT), by Wenzel and Engell (TU Dortmund, DE), by Ye, Roy, Godjevac and Baldi (TU Delft and Allseas, NL), and by Tsyganov (Russian Academy of Sciences, RU); and *Multi-Agent Systems*, with presentations of the work by Govaert and Cao (University of Groningen, NL), by Sharifi Kolarijani, Proskurnikov and Mohajerin Esfahani (TU Delft, NL), by Fele and Margellos (Oxford University, UK), by Liu and Zhang (Nankai University, CN), and by Gao, Yang, Zhao and Wang (East China University and Shanghai Jiao Tong University, CN).

Acknowledgements

First, I would like to thank the authors for entrusting their most recent work to IFAC LSS 2019, and the high-profile invited speakers Giancarlo Ferrari-Trecate and Jacquelien Scherpen, who accepted to open the symposium in the morning with their inspiring plenary talks.

Thanks also to the LSS steering committee, to all the supporters and sponsors, to the members of the National Organising Committee and to the head of the event secretariat, Martha Otte, for all the hard work required for the organisation and the logistics.

Finally, my most heartfelt thanks to the members of the International Program Committee and the reviewers, whose role was fundamental to ensure the high quality of the accepted contributions, and to the attendees who joined the IFAC LSS 2019, making it a memorable event.

Giulia Giordano
IFAC LSS 2019 Editor and Program Co-Chair