

Minutes of IFAC TC 2.4 Optimal Control Meeting

9 November 2021, Online

Chair: Eric Kerrigan (EK)

1. Welcome

EK welcomed everybody. All current TC members were invited. Approximately 30 people attended.

2. What does a TC do?

EK reminded everybody what a TC does and highlighted the following:

- Fostering cooperation and communication among specialists within their particular field of interest
- Planning and monitoring IFAC Technical Events (Symposiums, Conferences, and Workshops) with the NMOs acting as hosts
- Promoting their respective technical areas in other ways, e.g. establishing contacts with other International Organizations, publishing reports on selected topics
- Promoting interest in emerging control fields
- Education
- Engagement between Academia to Industry
- Build some presence on the www and/or on social media
- Acting as Associate Editors, IPC members and reviewers for IFAC events and the World Congress.

3. Scope of TC

EK mentioned that the scope of the TC has, since the World Congress, been revised to the following:

“The development and application of theory and methods for solving optimal control and planning problems, the development of numerical optimization methods, as well as the closed-loop implementation of optimal controllers on real-time computer systems and networked architectures. Particular methods include, but are not limited to, the calculus of variations, Pontryagin's maximum principle, dynamic programming, model predictive control, optimization-based estimation, and differential games. Control methodologies can be based on first-principles models, data-driven models or a combination of both.”

It was proposed that “learning” should probably be in the scope, but care should be taken so as not for this to conflict with any other TCs on intelligent control. No definitive decision was reached. It was proposed to discuss this off-line.

All TC members are to consider the scope and send suggestions to EK.

4. Membership

EK announced that there are currently 71 TC members and that the Vice Chairs are:

- Stefano Di Cairano (US) - Vice Chair for Industry
- Paul Goulart (UK) - Vice Chair for Publication
- Gabriele Pannocchia (IT) - Vice Chair for Education
- Sergio Lucia (DE) - Vice Chair for Social Media
- Stefan Pickl (DE)
- Alexander Tarasyev (RU)
- Anatolii Kleimenov (RU)

The member list and contact details for Chairs and Vice-chairs can be found on the TC website: <https://tc.ifac-control.org/2/4>

5. Events

It was noted that TC 2.4 is the main sponsor of the following events:

- Conference on Nonlinear Model Predictive Control:
 - 2021: Bratislava, Slovakia, 11-14 July 2021. nmpc2021.org
 - 2024: Kyoto, Japan. subject to official approval
- Workshop on Control Applications of Optimization (CAO):
 - 2022 Gif sur Yvette, France, 18-22 July. <https://cao2022.sciencesconf.org>
 - 2025 Krakow, Poland, subject to official approval.
 - 2028 München, Germany, subject to official approval.

It was reported that a new Virtual Seminar Series on Optimal Control organised by TC 2.4 has been approved by IFAC. The organisers are Thulasi Mylvanagam and Timm Faulwasser. The following dates have already been confirmed and planned:

- 8 July 2021
- 9 December 2021.

The topic for the above are “Data-driven Methods in Control”. TC members were asked to approach the organisers for suggestions for future events and speakers.

6. Report from Industry Vice Chair

Stefano Di Cairano (SDC) commented that his main role is as liaison between the TC and the recently established IFAC Industry Committee. The committee is currently looking for participants, including academics who collaborate with industry. Interested TC members are encouraged to contact SDC for further information.

He reported the following updates from the IFAC Industry Committee:

- Best practices for TCs and technical events to attract industry participants have been approved and published at <https://sites.ifac-control.org/industry/committee-reports-and-presentations/indcom-publications-and-reports/best-practice-guide>
- A proposal for a volume on the impact of control on next-generation products and services and been completed and that they are moving into the writing phase.
- Virtual webinar seminars for industry (IFAC INDUSTRY CONNECT) launched June 15.
- Case studies of practice and academic collaborations will be gathered.
- Industry Committee Awards are being studied and proposals are being made.

He also proposed that the TC establish and maintain an Optimization-based Control Repository:

- Repository/web page to link major toolboxes, package software for optimal control, MPC, computational geometry, solvers, etc.
- Enables fast finding/surveying of tools for optimization-based control
- Can evolve into a page with design practices
- Need volunteer(s) to drive it

8. Report from Education Vice Chair

Gabriele Pannocchia (GP) reported that his role is to:

- Promote educational activities related to the scope of TC2.4, including:
 - Pre-conference workshops
 - Short-courses
 - Primary/Middle/High school reach out activities
- Gather and report such activities
- Connect with other TC's Vice Chairs in a so-called TC Liaisons to Education

He also reported the new proposed structure for IFAC Education Activities.

He asked all TC members to:

- Fill in the following form to report any relevant activity of the last three years (years 2019-2021): <https://forms.office.com/r/BZhJkDbyDX>

- Volunteer for a task force
- Discuss possible activities

9. Report from Social Media Vice Chair

Sergio Lucia (SL) reported some links to general IFAC social media venues:

- Facebook <https://www.facebook.com/IFACcontrol/>
- LinkedIn <https://www.linkedin.com/groups/13400016/>
- Twitter https://twitter.com/IFAC_Control
- YouTube <https://www.youtube.com/channel/UCLcWoqbVNxo9rVSS9NKQDeA>
- IFAC Blog <http://blog.ifac-control.org>

If TC members wished to contribute to these venues, then the following needs to be noted:

- All content needs to be approved by the IFAC secretariat secretariat@ifac-control.org
- To avoid too much duplicate work these venues are planned for the most important announcements:
 - Conferences or workshops
 - A detailed post on a TC event
 - Detailed blog entries on some TC topics

TC 2.4 has the following dedicated social media outlets:

- Twitter @ifac_tc_24 ; https://twitter.com/ifac_tc_24
- LinkedIn <https://www.linkedin.com/groups/9020534/>

SL suggested the following for ideas for contributions:

The main activities on promoting IFAC TC 2.4 events have been:

- IFAC NMPC 2021, preparations of IFAC WC
- IFAC TC 2.4. seminar series (organized by Thulasi Mylvaganam and Timm Faulwasser)
- Like and retweet of related activities
- TC members can send content directly to SL (e.g. related events, workshops, EU-projects, etc...)
- Mention the TC in your tweets and TC-related content will be retweeted
- Other ideas and interest in contributing could include:
 - informal threads on optimal control history
 - Optimal control-related GIFs
 - Teasers (20-60 sec videos) explaining new OC-related papers + link to paper

The official website for TC 2.4 is <https://tc.ifac-control.org/2/4>

10. Report from Publications Vice Chair

Paul Goulart (PG) asked members to contact him on ideas and proposals for areas/topics of potential special issues, or other publications-related matters.

He also reminded everyone about the IFAC Activity Fund, which invites applications for financial support of initiatives that foster and promote public engagement and outreach from the control community.

11. Working Groups / Task Forces

It was noted that there was one working group:

- Virtual Seminar Series on Optimization and Optimal Control, organised by Thulasi Mylvaganam and Timm Faulwasser.

EK mentioned the interest in establishing the following working groups or task forces, based on previous TC meetings and discussions with TC members:

- Setting up discussion boards for TC, e.g. Discord, Slack, other.
- Transitioning of optimal control tools to industry.

- Benchmarking.
- Establishing a workshop/conference on Optimal Control.

Interested TC members who wish to lead or participate in the above were asked to contact EK.