

# Minutes of IFAC TC 2.4 Optimal Control Meeting

10 July 2023, IFAC World Congress, Yokohama, Japan

Chair: Eric Kerrigan (EK)

## 1. Welcome

EK welcomed everybody. All current TC members were invited. Approximately 19 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.

Frank Allgöwer reminded the TC about the IFAC TC Awards scheme and that the TC doesn't currently have any. It was agreed that we should start the process of establishing a TC award.

Stefano Di Cairano pointed out that one of the roles of the TC is also organising knowledge for industry and academia. He suggested that the TC could form working groups or task forces to set up archival websites or white papers on optimal control.

## 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, reinforcement learning, optimization-based estimation, and differential games. Control methodologies can be based on first-principles models, data-driven models or a combination of both.”

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

## 4. Membership

EK announced that there are currently 72 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>

It was also noted that EK's tenure as chair has ended and that the new chair for the 2023-2026 triennium would be Gabriele Pannocchia, who will start the process of renewing membership and vice chairs in due course.

## 5. Events

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

- Conference on Nonlinear Model Predictive Control (NMPC):
  - 2021: Bratislava, Slovakia, 11-14 July 2021. [nmpc2021.org](http://nmpc2021.org)
  - 2024: Kyoto, Japan, 21-24 August. [nmpc2024.org](http://nmpc2024.org)
- 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.

Toshiyuki Ohtsuka gave a brief report on the organisation of the NMPC conference.

Thulasi Mylvaganam and Timm Faulwasser also reported that the Virtual Seminar Series on Optimal Control would still continue. They reported that these seminars were attracting a good number of speakers, with the largest proportion of attendance being offline via the YouTube. They suggested that the format for future webinars might be different, e.g. only a single speaker rather than a group of speakers as in the past. The organisers invited suggestions for future speakers.

It was also reported that the TC has endorsed the Chinese MPC Summer School for 2022 and 2023.

## 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:

- There are new awards for a PhD Thesis and Practitioner's Impact.
- IFAC Industry Connect is a new seminar series and candidates may be proposed by the TC.
- The committee was involved in a volume on impact of control on next-generation products and services.
- The committee has established best practices for TCs and technical events to attract industry participation, which should be acquired for the next NMPC and CAO,
- There has been some activities on control concepts for managerial decision making.
- The committee would like to establish open access resources for Practitioner Education. It may be good for the TC members to contribute with optimal control and MPC-related resources.
- He suggested the following potential new task forces:
  - Preparing graduate students in control for industry employment
  - Entrepreneurship & Start-ups
  - A Benchmarking Platform for Industrial Control Practices

## 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 also reported that it would be desirable that IFAC TCs could grant proper scientific sponsoring to educational activities (including the use of IFAC logo), but this is not possible at the moment and is a work in progress.

Finally, he asked all TC members to:

- Fill in the following form to report any relevant activity over the last triennium at: <https://forms.office.com/r/BZhJkDbyDX>
- Volunteer for a task force
- Discuss possible activities

## 9. Report from Social Media Vice Chair

Sergio Lucia (SL) was unable to attend, but EK reported on his behalf. He reminded people of 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](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](mailto: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) ; [https://twitter.com/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:

- Promoting IFAC TC 2.4 events, such as the NMPC and CAO.
- IFAC TC 2.4 webinar 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:
  - Put together a collection of links, e.g. in the TC webpage, with freely available teaching material on the TC topics. This collection could be shared via Twitter/LinkedIn.

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

It was also pointed out that IFAC is considering a new platform for the website.

## 10. Report from Publications Vice Chair

There were no updates from Paul Goulart (PG) since the last meeting.

## **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 reminded members of 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 on Optimal Control.

Interested TC members who wish to lead or participate in the above were asked to contact the TC Chair or any of the VCs if they wish to be involved or start any further activities.

## **12. Handover to New Chair**

EK handed over to the new chair, Gabriele Pannocchia. He said that, over the next few months, he will:

- Refresh the member list and set up a web form where current TC members could indicate whether they wish to continue as TC members.
- Refresh the list of Vice Chairs.
- Help the organisers of CAO to apply for official IFAC approval.
- Start a call for expressions of interest to host NMPC 2027.