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IFAC Industry Connect

IFAC's constitution has always stated that its mission is to support people in the control community world-wide and in any professional situation that they find themselves in. Now at an age of 65 years, IFAC has long acknowledged its weakness to reach its industry employed Affiliates. In 2017, IFAC's 60th year, this deficiency was formally recognized by the IFAC Council and put on the table for resolution.

Spearheaded by Roger Goodall, an IFAC Advisor, and informed by a planning team, the Council created a new IFAC Industry Committee reporting to the governing body. The IFAC Industry Committee Chair would be a non-voting member of the Council and a Vice Chair of the Technical Board. The Industry Committee would include Vice Chairs of all the TCs plus other IFAC Affiliates from industry and NMOs. It would "strengthen the engagement of industry and industry representatives in IFAC activities." A goal is to help control research realize its full potential for industry impact and ensure that research and education in academia is informed by industry perspectives.

This mandate has been realized by the IFAC Industry Committee since 2017. It has been chaired for two triennia by Tariq Samad who had spent much of his career in industry before heading up a program in Technological Leadership at the University of Minnesota (US). This was the period that virtual events were starting to dominate communication among scholars and others, the pandemic was raging, and IFAC realized that it had to catch up in this new domain. It was evident that the traditional academic research community style of work: doing research, writing a paper, going through peer review, attending a technical meeting, presenting the paper in a short session, having the paper appear in print, was not attractive to industrial style of work. It was inefficient and violated many standard industry expectations of employees.

During this period Stephen Kahne, an IFAC Advisor and Past President (1993-1996), prepared a white paper suggesting a new style of IFAC activity suitable for the control industry community: virtual panel discussions among industry experts on important contemporary topics. Pre-competitive topics were to be identified by a program director supported by the Industry Committee. A suitable team of industry experts would be recruited into a 4 or 5 person panel

discussion event conducted by the Program Director in a webinar format. Publicity within NMOs and in the wider control community for the event were to be managed by the IFAC Secretariat with webinar technical support by an outside management company under contract with IFAC. Each event was to be recorded and provided on IFAC's YouTube channel. This program plan was initiated by the Industry Committee, support by the IFAC Technical Board, and approved by the IFAC Council.

The name of this activity is "IFAC Industry Connect." This model has proven durable and up to the middle of 2023, five of these panel discussions have been conducted under the able leadership of Moncef Chioua who has years of industrial employment experience and is now at Polytechnique Montreal (CA). The five webinars are recorded and available to all at IFAC's YouTube channel:

youtube.com/@ifacyoutube3132

Topics up to now are:

-Machine Learning and Control

-The Impact of Control Research on Industrial Innovation

-How do Optimization, Monitoring and Control Bring Performance and Economic value to Industry?

-Digitalization and Industry 4.0 – Victories and Failures

-Control Opportunities in Green Energy Systems

Attendance has approached 100 live viewers each and a few hundred views of the recordings. It is planned to hold three or four of these events per year as topics and participants are identified.

The IFAC Industry Committee now has more than 100 members, a majority of whom are employed in the world's companies with substantial interest in control and systems. The chair for the triennium 2023-2026 is Kevin Brooks (ZA).

Suggestions for future IFAC Industry Connect topics are being sought. Please contact Moncef Chioua at moncef.chioua@polymtl.ca with your thoughts.

Submitted by: Stephen Kahne (US),
IFAC Advisor

No.4

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Upcoming IFAC Conferences

The IFAC Journals

Automatica
journals.elsevier.com/automatica

Control Engineering Practice
journals.elsevier.com/control-engineering-practice

**Engineering Applications of
Artificial Intelligence**
journals.elsevier.com/engineering-applications-of-artificial-intelligence

Journal of Process Control
journals.elsevier.com/journal-of-process-control

Annual Reviews in Control
journals.elsevier.com/annual-reviews-in-control

**Journal on
Mechatronics**
journals.elsevier.com/mechatronics

**Nonlinear Analysis: Hybrid
Systems**
journals.elsevier.com/nonlinear-analysis-hybrid-systems

**IFAC Journal of
Systems & Control**
journals.elsevier.com/ifac-journal-of-systems-and-control

IFAC-PapersOnLine
journals.elsevier.com/ifac-papersonline

IFAC Harold Chestnut Control Engineering Textbook Prize Award Introducing the 2020-2023 Winner: Emilia Fridman

The IFAC Harold Chestnut Control Engineering Textbook Prize Award is presented at each triennial Congress for the best Control Engineering textbook for which the first edition(s) occurred not later than the Congress just prior to the one at which the award is presented. It recognizes the author(s) of the textbook(s) judged to have most contributed to the education of control engineers. The candidates for the prize are nominated by a selection committee, while the books under consideration come before the committee through recommendation of the control engineering community. The prize consists of a monetary prize and a certificate. This prize was created in 1986 and renamed in 2002. The prize is named after Harold Chestnut (US), IFAC's first president.

The winner of the IFAC Harold Chestnut Control Engineering Textbook Prize Award for 2020-2023 is **Emilia Fridman** (IL) for **Introduction of Time-Delay Systems: Analysis and Control**, publisher: Birkhäuser, Copyright Information: Springer International Publishing Switzerland 2014, ISBN: 978-3-319-09392-5, DOI [10.1007/978-3-319-09393-2](https://doi.org/10.1007/978-3-319-09393-2) Published: 16 September 2014.

Emilia Fridman received the M.Sc. degree from Kuibyshev State University, USSR, in 1981 and the Ph.D. degree from Voronezh State University, USSR, in 1986, all in mathematics. From 1986 to 1992 she was an Assistant and Associate Professor in the Department of Mathematics at Kuibyshev Institute of Railway Engineers, USSR. Since 1993 she has been at Tel Aviv University (IL), where she is currently Professor of Electrical Engineering Systems.



She has held visiting positions at the Weierstrass Institute for Applied Analysis and Stochastics in Berlin (DE), INRIA in Rocquencourt (FR), Ecole Centrale de Lille (FR), Valenciennes University (France), Leicester University (UK), Kent University (UK), CINVESTAV (Mexico), Zhejiang University (CN), St. Petersburg IPM (RU), Melbourne University (AU), Supélec (FR), KTH (SE). Her research interests include time-delay systems, networked control systems, distributed parameter systems, robust control, singular perturbations and nonlinear control.

E. Fridman has published more than 200 journal articles and two monographs. She serves/served as Associate Editor of *Automatica*,

SIAM Journal on Control and Optimization and *IMA Journal of Mathematical Control and Information*. She was ranked as a Highly Cited Researcher by Thomson Reuters (Web of Science) in 2014.

Since 2018, E. Fridman has been the incumbent for Chana and Heinrich Manderman Chair on System Control at Tel Aviv University. She is a IEEE Fellow since 2019. In 2021 she was recipient of the IFAC (Linear Systems TC) Delay Systems Life Time Achievement Award and of the Kadar Award for outstanding research in Tel Aviv University.

E. Fridman served as a member of the IFAC Council for 2017-2023. She is IEEE CSS Distinguished Lecturer for 2023-2025.

IFAC Control Orchestra 2023: First Live Performance

For the 2023 IFAC World Congress in Yokohama, Japan, 33 musicians from the automatic control community have joined to form a – in some sense – highly dynamic, distributed, nonlinear, robust, and adaptive multi-agent system: The IFAC Control Orchestra. The closing ceremony featured the first live performance of this unique ensemble, which will be remembered for years to come.

The idea of forming the IFAC Control Orchestra was originally proposed by past IFAC president Frank Allgöwer (DE). After the first performance in an online format at the virtual IFAC World Congress 2020, the plan was to switch gears to the real world and organize a performance live on stage at the IFAC World Congress 2023 in Yokohama.

The planning of the performance began much in advance with a first call for participation around 18 months before the congress. Many members from the automatic control community expressed their interest, in the end leading to a group of 33 talented musicians from 13 countries: Brazil, Canada, China, France, Germany, Italy, Japan, The Netherlands, Norway, South Africa, Switzerland, United Arab Emirates, and the United States of America. Not only the origins of the musicians but also their instruments were quite diverse, containing a wide spectrum from strings over woodwinds and brass to pianos, drums, and guitars.

From the IFAC President

Dear IFAC Friends and Colleagues,

IFAC is a worldwide federation promoting automatic control for the benefit of humankind. IFAC is run by thousands of volunteers. As the Incoming President, I would like to thank all the volunteers for making IFAC strong and supporting our mission. Also, many thanks go to all the great leaders who have contributed to making IFAC a very strong organization up to now.

In detail, the IFAC Technical Board is very strong, hosting approximately 95 conferences every triennium. Under the guidance of Vice President Carlos Eduardo Pereira, a new project will be started to evaluate IFAC's technical areas in a holistic way, aiming to make IFAC even stronger. A Presidential Task Force headed by Robert Bitmead will also complement this effort. IFAC's Conference Board was established in 2020. With Richard Braatz as the Vice President, IFAC will thrive in improving the quality of its conferences in the next triennium. Under the guidance of Sarah Spurgeon as the Vice President, and in collaboration with Elsevier as the publisher, IFAC will further strengthen its publication portfolio in the next triennium.

With Dimitri Peaucelle as the Vice President of Operations, we have made tremendous changes for efficient information dissemination, including our portal, individual affiliated memberships, and conference web archiving. The Secretariat and overall IFAC operations have been outstanding. I must also thank Katharina Willixhofer, Elske Haberl, and Harald Albrecht, who have been running the Secretariat from Laxenburg, Austria, so efficiently. IFAC is also financially strong. With Vice President Silvia Mastellone working with various Executive Committees, we will expand its activities to promote various control-related initiatives for the benefit of humankind. This will include education activities for younger generations, industrial initiatives, as well as diversity and inclusion activities.

Activities conducted by IFAC will always be fair, honest, and transparent. People will be treated fairly, respectfully, and their human rights will be protected. IFAC is committed to the highest principles of equality, diversity, and inclusion. IFAC will also be very concerned with our environment and sustainability for the future. We will try to improve all aspects in which IFAC is involved during the next triennium. To achieve these goals, support from all the NMOs, all the individual volunteers, and you are a must. I am also open to all ideas from all of you for any improvement. Please feel free to send me suggestions. Lastly, the IFAC World Congress in 2026 will be held in Busan, Republic of Korea. Please join us in Busan three years from now, to see how we have done and to celebrate together. I wish you success in all your endeavors. Thank you very much.

Dong-Il "Dan" Cho,
IFAC President 2023- 2026

IFAC is on social media!

Facebook

facebook.com/groups/632582025190533

LinkedIn

linkedin.com/groups/13400016/

Twitter

twitter.com/IFAC_Control

YouTube

www.youtube.com/@ifacyoutube3132

Jochen Rieber, the conductor of the IFAC Control Orchestra, wrote tailored arrangements for the orchestra and distributed the sheet music to the musicians roughly six weeks before the World Congress. In parallel, large musical instruments were rented by the local team to equip the musicians who could not bring their instruments to Japan. Two 90-minute rehearsals took place during the World Congress on Monday and Wednesday after the technical sessions. The commitment and energy of the musicians could be felt right away, and the great harmony and skills of the orchestra members led to smooth rehearsals on a very high musical level.



On Friday, 14 July three pieces were performed on-stage at the closing ceremony in front of an estimated audience of 2000 attendees: the festive ballad *"You Raise Me Up"* by Norwegian composer Rolf Lovland, the fast-paced modern pop song *"Blinding Lights"* by Canadian singer The Weeknd, and the well-known rock classic *"Don't Stop Believin'"* by the American band Journey. With a lot of passion and energy, the orchestra performed their first live concert and was met by enthusiastic applause from the audience.

Links to the performance as well as further information on the orchestra will be made available on

ifac-control.org/about/ifac-control-orchestra.

We are grateful to the National Organizing Committee of IFAC 2023 who supported the orchestra from the beginning. The following people were involved in organizing the orchestra performance:

Local organization: Tetsuo Shiotsuki (Tokyo Denki University), Takashi Yamaguchi (Ricoh Ltd), Masaki Nagahara (Hiroshima University), Masahiro Mae (University of Tokyo)

International organization: Julian Berberich (University of Stuttgart), Musical arrangements and conductor: Jochen Rieber (DHBW Ravensburg)

The organizers of the 2026 IFAC World Congress in Busan, KR intend to again include the IFAC Control Orchestra in the congress program. Hence, any musicians from the automatic control community who are interested in joining the above-mentioned highly dynamic multi-agent system are asked to send a note to Julian Berberich or Jochen Rieber. The system is certainly very scalable. :-)

Submitted by Julian Berberich (DE), University of Stuttgart, julian.berberich@ist.uni-stuttgart.de, and Jochen Rieber (DE), [DHBW Ravensburg.rieber@dhbw-ravensburg.de](mailto:DHBW_Ravensburg.rieber@dhbw-ravensburg.de)

IFAC World Congress 2023 Opening: Speech Given by the Japanese Emperor

The IFAC World Congress 2023 Opening Ceremony included a visit by the Japanese Imperial Couple Emperor Naruhito and Empress Masako, with a speech by the emperor. The text of the emperor's speech is below.



IFAC President Hajime Asama (2020-23) with the Japanese imperial couple at IFAC 2023

Professor Asama, Distinguished guests and participants,

It is a great pleasure for me to attend this opening ceremony of the 22nd World Congress of the International Federation of Automatic Control together with participants from many countries and regions of the world.

Automatic control technology is becoming increasingly important in all aspects of our lives. Advances in automatic control will play a critical role in enhancing sustainability of our society through self-driving cars, drones, robots, energy management, medical and bio technologies, and so on. This is today further supported by the availability of a large amount of data and novel techniques in artificial intelligence.

Automatic control plays an important part in the field of water issues, which I have been involved in. Water is essential to life on earth, while water scarcity is a common issue across the globe. I hope that automatic control continues to contribute to the technologies for appropriate and efficient distribution of water resources around the world.

I would like to pay tribute to all those who have worked tirelessly over the years to promote the responsible development and deployment of the science and technology of automatic control.

Towards solving various societal challenges that our global community faces today, it is essential that we share the awareness and the goals and proceed through international collaboration. I would like to conclude my remarks by expressing my wish that this congress marks an important step to this end, providing a venue for fruitful discussions and exchanges, towards the theme of *"Wa: Control for Solving Societal Problems and Creating Societal Values"*.

Text available from The Imperial Household Agency (JP), kunaicho.go.jp/page/okotoba/detailEn/116

IFAC Diversity and Inclusion: Inspiring Future Generations in IFAC

IFAC's inaugural Diversity and Inclusion (D&I) Day took place on 12 July 2023 at the World Congress in Yokohama, Japan. This well-attended day was comprised of four separate events and each event proved to be inspirational and innovative in its own right. The day was enthusiastically supported by President Hajime Asama and the local organising committee and complimented the theme 'Wa', harmony of traditional culture and innovation. The day was kindly sponsored by The Society of Instrument and Control Engineers (SICE) Japan.

IFAC World Congress 2023 had a dedicated National Organizing Committee on D&I, chaired by Keiko Shimizu (Toshiba Energy Systems & Solutions Corporation, JP) and Reiko J. Tanaka (Imperial College London, UK). IFAC's executive D&I Committee is chaired by Mary Doyle-Kent (South East Technological University, IE) and its members are Hye-Kyung Cho (Hansung University, KR), Patricia Pena (Federal University of Minas Gerais, BR) and Maria Prandini (Politecnico di Milano, IT). The D&I Consultants are Bozena Pasik-Duncan (University of Kansas, US), Dawn Tilbury (University of Michigan, US) and Brenda O'Neill (South East Technological University, IE.)

The following four events were developed specifically for World Congress participants and will be available to all on IFAC's YouTube channel at a later date.

1. D&I panel discussion 1: "Empowering young researchers for career success in academia and industry." This honest and inspiring discussion was chaired by Mary Doyle-Kent and panellists were Takako Hashimoto (Chiba University of Commerce, JP), Hyoun Jin Kim (Seoul National University, KR), Maria Prandini (Politecnico di Milano, IT), Noboru Sakamoto (Nanzan University, JP) and Dawn Tilbury (University of Michigan, US).



Participants discussing and brainstorming at the IFAC D&I Luncheon Networking event (Yokohama, JP at IFAC 2023)

2. Luncheon Networking Event. This event was a brainstorming event attended by over 160 participants including four past, present and future Presidents of IFAC, Executive Officers and members of Coordinating and Technical Committees. A series of themes were discussed and the ideas generated were col-

lected and will be used to inform our work in the next triennium.

3. IFAC Foundation's inaugural Diversity and Inclusion Award was presented to Bozena Pasik-Duncan in recognition for her outstanding contributions to our community in the area of D&I. The title of Bozena's enlightening speech was "*Four Decades of Transformation: Pioneering Diversity, Equity, and Inclusion in the IFAC Community.*" Sponsorship of the D&I Award was by Elsevier and organized by the IFAC Foundation

4. D&I panel discussion 2: Proposals for future IFAC Diversity and Inclusion Initiatives. Thank you to Patricia Pena for the enlightening and heartfelt talk on her experiences of working as a professor and researcher in Brazil highlighting the challenges of working in her country. The title was "*An introductory talk on the situation of female researchers in emerging nations: Brazil.*"

The Local Organizing Committee of IFAC 2023 put the Childcare Support Program in place, which provided limited financial support to parents attending IFAC2023. Grants of up to JPY 30,000 per family were available to attendees who incurred extra expenses in either bringing children to the conference or in leaving their children at home while attending the conference.

In addition a new Diversity and Inclusion Travel Support Programme facilitated the promotion of diversity and inclusion. IFAC Foundation and the WC organizing committee offered financial support for diverse candidates to attend the World Congress. Details for this programme can be found on the IFAC Foundation webpage.

Since the IFAC D&I Executive Committee was established in 2020 there have been several successful D&I initiatives implemented. Our work will continue over the next triennium and we welcome your ideas.

IFAC, as an international federation serving and representing all those concerned with the theory and application of automatic control and systems engineering wherever situated, is devoted to creating and fostering an inclusive environment that is open to diverse thoughts, ideas, and communications, without fear of discrimination, harassment, or retaliation against any member of this community. It is committed to providing equal opportunities and a safe environment for every person who chooses to participate in its work. Additionally, IFAC strives for these same principles for all IFAC activities, including technical events, journals, and its various committees and governing boards. IFAC actively promotes the inclusion of a diverse set of speakers, which will lead to more representative discussions across IFAC. IFAC actively promotes the inclusion of a diverse set of members of its boards and committees at all levels, which will lead to more representative decisions, policies and activities across IFAC.

Submitted by: Mary Doyle-Kent (IE),
IFAC Diversity & Inclusion Committee chair

22nd IFAC World Congress 9-14 July 2023 Yokohama, JP

The 22nd IFAC World Congress was held in Yokohama, Japan, from 9-14 July, 2023. After a long period of inaccessibility due to the pandemic, we were delighted to have the opportunity to meet and interact with colleagues from around the world. The organizing committee would like to express its deepest gratitude to all participants and everyone involved in the congress. Here we briefly summarize the congress as follows.



Opening Ceremony

The IFAC 2023 World Congress started with a memorable Opening Ceremony that was graced by Their Majesties the Emperor and Empress of Japan, whose speech addressed the increasing importance of automatic control technology in all aspects of our lives. The official ceremony was followed by a calligraphy performance, featuring the vision of the congress, "Wa" (the artwork was on display throughout the congress), and a traditional Japanese dance Awa Odori performance.

Plenary and Semi-Plenary Talks

Five plenaries and six semi-plenaries were given by leading researchers, with topics ranging from machine learning to renewable power grid. All of these lectures were broadcasted through the Virtual Conference Platform (VCP) and will also be made available on the IFAC YouTube channel.

Plenary speakers in alphabetic order:

- Kazuyuki Aihara, *Dynamical Network Biomarkers: Data Analysis on Early Warning Signals in Complex Systems and its Application to Early Precision Medicine*
- Anuradha Annaswamy, *Resilience and Distributed Decision-making in a Renewable-rich Power Grid*
- Tamer Basar, *Multi-Agent Dynamical Systems: Misaligned Objectives, Equilibria, Learning, and Asymptotics*
- Sandra Hirche, *Towards Trustworthy Data-driven Control*
- Erik Hollnagel, *Is Resilience a Quality or a Quantity?*

Semi-Plenary speakers

- Avinash Balachandran, *Human Interactive Driving: Amplify People for a Safer, More Enjoyable Driving Experience*
- Jie Chen, *The Blessing and Curse of Feedback: Persistence of Fundamental Limits*
- Maria Domenica Di Benedetto, *Observability, Diagnosability and Predictability of Hybrid Dynamical Systems*

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- Mustafa Khammash, *The Future is Now: Engineering Advanced Control Systems in Living Cells for Novel Therapies*
- Yusuke Kobayashi, *Towards the Sustainable Space Environment ? Development of On-Orbit Servicing Technologies*
- Rene Vidal, *Learning Dynamics of Overparameterized Networks*

In addition, two special events were held as part of the Semi-Plenary sessions. One was the panel session on a broad topic of how control systems can meet grand societal-scale challenges that the world faces. This was organized by Anuradha M. Annaswamy, Karl H. Johansson, and George J. Pappas: *Panel Session on "Control for Societal-Scale Challenges: Road Map 2030"*

Another was the public lecture *Advances in Control and Optimization Techniques in Sustainable Water Desalination using Solar Energy and Application Examples in the Water-Energy-Food Nexus*, which was given by the awardees of the IFAC Foundation Kwon Award Manuel Berenguel and Juan Diego Gil

Technical Contributions

The congress attracted a total number of 2945 contributions, which include:

- 86 Open Invited Tracks with an average of 9.1 papers per track. Seven of these Open Invited Tracks have attracted more than 20 contributions
- 44 invited sessions of six papers
- 28 workshops and tutorials
- 2787 papers

The 2787 submitted papers have the following distributions

- 2607 Regular papers, 129 Discussion presentations, and 26 Survey papers
- 1720 Contributed papers, 784 Open Invited Track papers, 248 Invited Session papers, 10 Demonstrator papers, 12 Dissemination papers, and 13 Plenary and Semi-Plenary papers (with only abstracts).

Reviewing of the contributions was conducted under the supervision of the International Program Committee Chair and Co-Chair, with the help of the nine IFAC Coordinating Committee Chairs, the 39 Technical Committee Chairs, 433 Technical Associate Editors, and 4791 reviewers. Overall 8913 reviews have been collected.

A total of 2319 submissions were accepted. Details of accepted contributions are as follows:

- 1293 Contributed Papers
- 875 Papers submitted in Invited Sessions or Open Invited Tracks
- Eight Demonstrator papers
- 11 Dissemination presentations
- 36 Invited Sessions
- 65 Open Invited Tracks that appear in the program as Open Invited Sessions with a number of sessions ranging from 1 to 4.

Among the Regular paper submissions, 125 were accepted as Discussion presentations.

The acceptance rate for Regular and Survey papers is 73.4%. It goes up to 78% for papers submitted to Open Invited Tracks, and up to 85% for those submitted to Invited Sessions, thus indicating the excellent work done by the organizers of these invited items. Overall, the acceptance rate of papers appearing in the official proceedings is 72.4%.

All authors were asked to submit prerecorded video presentations as well as their slides. Videos were played when authors were not present on-site. These were also made available to all registered participants through the VCP during the congress and then until August.

The statistics per IFAC areas as represented by the Coordinating Committees (CC) are as indicated in the following table. Column A gives the percentage of papers of a CC among all submitted contributions. Column B gives the percentage of papers of a CC among accepted papers.

CC	A	B
1	9.1%	18.8%
2	25.2%	24.2%
3	4.4%	4.5%
4	9.4%	9.6%
5	9.2%	9.1%
6	10.3%	10.5%
7	11.2%	11.3%
8	5.9%	6.1%
9	5.3%	5.9%

The final program included 2133 presentations (some accepted papers were not submitted on time to be included in the program) organized in 337 sessions. Among these, 305 were oral podium sessions, 24 were oral interactive sessions with individual TV screens for each presentation, and 8 shotgun talk sessions. Demonstrator papers were presented as part of one interactive session.

Among the 337 sessions, 36 were invited sessions and 100 were open invited sessions. No value ranking is implied by the presentation format, all the papers underwent the same review process and appear the same way in the proceedings.

Panels and Forums

One of the highlights of IFAC 2023 was the large number of special sessions organized by the active participation of various groups.

Special Forums including those related to "Wa", the vision of IFAC2023

- Panel Discussion: *Societal Harmony through "Wa"*
- Forum on Funding for International Cooperations towards Solving Societal Problems
- HCMI Forum: *Human-Machine Collaboration for Manufacturing of the Future*
- Competition Session: *Aerospace Industrial Benchmark on Fault Detection*
- Competition Session: *ECCV Control Benchmark for Sustainable Transport*

Forums organized by the Industry Committee in IFAC (IC Forums)

- *The Impact of Automatic Control Research on Industrial Innovation*
- *The Entrepreneurship Route: From Controls Research to Startup Ventures*
- *Control Systems for Climate Change Mitigation and Adaptation: An Urgent Call*

Forums organized by IFAC 2023 Industry Groups (IG Forums)

- *Current Progress in AI Technology Application*
- *Artificial Intelligence in Biological and Medical Systems*
- *Technologies and Initiatives in Smart Agriculture and Smart Agricultural Machines in the Japanese Market*
- *Co-creative Systems Approach for Sustainable Society*
- *Automatic Control for Smart Cities: Can People Accelerate Control of Urban Systems?*
- *State-of-the-art Technology and Future Vision for Environment, Energy, and Power Systems*
- *IG & IC Forum: Industry 4.0: Examples, Challenges and the Way Forward for Human-AI Collaboration*

Control Education Forums

- *What should control education look like in 2030?*
- *A custom MATLAB toolbox for teaching control 101*

Diversity and Inclusion Day Events

- D&I Panel Discussion 1: *Empowering Young Researchers for Career Success in Academia and Industry*
- D&I Luncheon Networking Event
- IFAC Foundation Diversity and Inclusion Award Speech by Bozena Pasik-Duncan: *Four Decades of Transformation: Pioneering Diversity, Equity, and Inclusion in the IFAC Community*
- D&I Panel Discussion 2: *Proposals for Future IFAC Diversity and Inclusion Initiatives*

Workshops and Tutorials

The pre-congress Workshops and Tutorials took place on 8 and 9 July. Most of them were selected by the IPC for their tutorial features. Among the 18 Workshops and Tutorials, 12 were held full-day and six half-day. These high-quality events have been extremely well received, with 489 participants. The list of Workshops and Tutorials can be found at the congress website.

Competitions

During IFAC 2023, five competitions were held. While some started well in advance before the congress, all of them had onsite components in the form of the actual competitions using drones and robots, video streamings from drones crossing the Tokyo Bay, or presentations by the competitors of their control methods.

- *MathWorks Minidrone Competition*, sponsored by MathWorks.
- *WRS Future Convenience Store Challenge*, sponsored by Seven & i Holdings Co., Ltd.
- *World Drone Competition*, sponsored by Advanced Robotics Foundation.
- *Aerospace Industrial Benchmark on Fault Detection and Fault Tolerant Control*, sponsored by Airbus.
- *ECCV Control Benchmark for Sustainable Transport*, organized by CC7.

Exhibitions

Exhibitions were demonstrated in the Exhibition Hall, by 19 companies, 6 industrial subgroups and several academic organizations including the invitation to IFAC 2026. They attracted a large number of participants throughout the week, together with competitions and interactive sessions held in the same area. Some of the exhibitions were associated with related seminars.

Public Events

Several public events associated with the congress were held during the week.

Citizens' Forums

- IFAC Foundation Kwon Award Public Lecture by Manuel Berengues and Juan D. Gill
- *Girls in Control* - Introductory programming class
- Control in the Field of Aerospace
- Advanced Technology in Construction Industry
- Also on the evening of 12 July (Wed.) the "Marine Robot Night Festivals" was held in the Sea Kayak Park, which attracted over 800 people.

Technical Tours

- Honda R&D Ltd.: *Experience of intelligent mobility using automated driving and human-machine communication technologies*
- Hitachi R&D "Kyoso-no-Mori": Explore Hitachi R&D's co-creation activities at the Open Innovation Site established under the Kyoso-no-Mori initiative
- Hino Motors Ltd.: Heavy-duty vehicle test ride at Hino Motors
- Field Robotics in Japan: Robotics to be deployed in Smart Agriculture in Japan.

Closing Ceremony

The congress ended successfully with a Closing Ceremony on the evening of Friday, 14 July. An unforgettable event there was the performance by the IFAC Control Orchestra. It was organized by music-loving colleagues of control community and conducted by Jochen Rieber.

Authors and Delegates

There were a total of 7460 authors of papers in the Congress program from 81 countries/regions. The total number of delegates was 3206 from 61 countries/regions. Over 95% of the participants were on-site. Those who registered for online participation had access to the Plena-

ry and Semi-Plenary lectures and pre-recorded presentation videos via the VCP. To promote an eco-friendly conference experience, the congress program was distributed through the IFAC Conference App.

The following table indicates in column A the number of corresponding authors of submitted contributions; in column B the number of corresponding authors of papers in the program; in column C the number of authors of papers in the program; in column D the number of delegates. This table shows the top five countries/regions. The full list will be published later.

	A	B	C	D
Japan	327	276	912	848
China	293	205	714	324
Germany	262	217	769	246
France	245	188	653	205
USA	196	165	568	201

Organizers and Sponsors

IFAC 2023 was organized by IFAC, Science Council of Japan and Japan Association of Automatic Control (JAAC), jointly with The Society of Instrument and Control Engineers (SICE) and The Institute of Systems, Control and Information Engineers (ISCIE).

IFAC 2023 was supported by the following sponsors.

Platinum Sponsors:

The Society of Instrument and Control Engineers (SICE), Hitachi, Ltd.

Gold Sponsors:

Azbil Corporation, Fujita Corporation, Kumagai Gumi, Co.,Ltd., The MathWorks, Inc., NOKOV Motion Capture, Yokogawa Digital Corporation, Yokogawa Electric Corporation

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IFAC 2023 was also supported by the City of Yokohama, Yokohama Convention & Visitors Bureau, Japan National Tourism Organization, Kanagawa Prefecture, Tateisi Science and Technology Foundation, The Telecommunications Advancement Foundation, Mitutoyo Association for Science and Technology(MAST), The Precise Measurement Technology Promotion Foundation and Machine Tool Engineering Foundation. Moreover, 17 academic and industrial organizations cooperated to realize IFAC 2023 (the full list is available at ifac2023.org/sponsor-exhibit). We thank all these organizations for their cooperation.

Preparations for IFAC 2023 began three years ago, when the unprecedented pandemic covered the world and the 21st Congress in Berlin was held virtually. No one was able to foresee the future at the beginning, and the committee members could not gather face-to-face. After long and frequent meetings on-line, and thanks to the efforts of everyone involved, IFAC 2023 was successfully opened and ended with great success.

We sincerely acknowledge IFAC Executive Officers, Council, Advisors, National Member Organizations, Secretariat, Technical Board and Technical Committees, Conference Board, Publications Board, and Executive Committees. Our gratitude extends to all the delegates, authors, reviewers, organizers, sponsors and supporters, IPC members, volunteers, NOC members, Industry subgroup members, and staff of Congrès Inc. who tirelessly supported us. Without their cooperation, this conference would not have been possible. The national organizing committee express our deepest gratitude to all of you. Thank you very much. Let's all gather together at IFAC 2026 in Busan!

IFAC 2023 National Organizing Committee Jun-ichi Imura, IFAC 2023 General Chair Hajime Asama, IFAC 2020-2023 President Congress website: ifac2023.org/

Submitted by Masato Ishikawa and Noriaki Ando (JP), IFAC 2023 Publicity Chairs

23rd IFAC World Congress Preview

23-28 August 2026

Busan, KR

The IFAC World Congress 2026 will be held in Busan, Republic of Korea, from August 23 to 28, 2026.

In 2026, no IFAC-sponsored conference other than the World Congress will take place. In fact, this is the purpose of the World Congress: to gather people from various areas within IFAC, enabling them to connect, share their discoveries, and engage in discussions that go beyond the barrier of specific subjects. Based on previous records, it is anticipated that nearly or over 4,000 attendees will participate, making it the largest event organized by IFAC. To accommodate this large gathering, BEXCO (Busan Exhibition and Convention Center) has

been chosen as the venue, as it offers ample capacity to comfortably host an event of this magnitude.

Busan is a truly beautiful city, being the second-largest in Korea and situated at the southern tip of the Korean peninsula. The city boasts numerous public beaches, with Haeundae beach and Gwangalli beach standing out among them. These two friendly beaches are located just 2.2 km and 2.6 km away from BEXCO respectively. The 2026 Congress logo reflects the cool undulating Pacific Ocean waves of Busan. Five days of the Congress are too short to fully enjoy Busan, and hence the Organizing Committee is going to prepare programs that are not only academically interesting but also culturally entertaining. One example is the Welcome Reception, which will be held at Busan Cinema Center, the venue for the annual Busan International Film Festival. This outdoor event will be followed by a free movie night at the outdoor theatre, offering attendees a delightful cultural experience.



Thanks to the Technical Board and many Technical Committees, the Congress program will be of a high quality and up-to-date. Additionally, the International Program Committee will develop many interesting special technical programs. The National Organizing Committee will support the technical programs by creating an environment suitable for individual discussions and exchanging ideas. To achieve this, discussion rooms will be provided where researchers can freely meet with whiteboards and monitors. This will enhance the overall experience for the participants and foster meaningful interactions during the Congress. We hope all IFAC participants will meet and "feedback" in Busan and build our global friendship. For further information, please visit ifac2026.org. The submission process will begin in May 2025.

Submitted by: Hyungbo Shim (KR), IFAC 2026 General Chair

IFAC Cartoon Archive is available!

www.ifac-control.org/publications/cartoons

Readers of this Newsletter are kindly requested to keep their contact details updated with IFAC. Please do so by updating your data in the new affiliates portal:

www.ifac-control.org/about/affiliate-registration

Calendar of IFAC Conferences

Title	2023	Place	Further Information
3 rd AACC Conference on Modeling, Estimation and Control Conference MECC 2023	October 02 – 05	Lake Tahoe, NV USA	mecc2023.a2c2.org/
20 th International Conference on Informatics in Control, Automation and Robotics (in cooperation with IFAC) ICINCO 2023	November 13 – 15	Rome Italy	icinco.scitevents.org/ icinco.secretariat@insticc.org
17 th International Workshop on Enterprise Integration, Interoperability and Networking EI2N 2022	November 15 – 16	Rome Italy	in4pl.scitevents.org/EI2N.aspx in4pl.secretariat@insticc.org
Title	2024	Place	Further Information
Conference on Australian & New Zealand Control Conference (in cooperation with IFAC) ANZCC 2024	February 01 – 02	Gold Coast Australia	anzcc.org.au/ANZCC2024/ l.vlacic@griffith.edu.au
8 th ACDOS Conference on Advances in Control and Optimization of Dynamical Systems ACODS 2024	March 12 – 15	Delhi NCR India	acods-conference.org/ naveen.babu@snu.edu.in
3 rd IFAC Workshop on Integrated Assessment Modeling for Environmental Systems IAMES 2024	May 29 – 31	Savona Italy	
22 nd IFAC Conference on Technology, Culture and International Stability TECIS 2024	May 29 – 31	Waterford Ireland	
12 th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes SAFEPROCESS 2024	June 04 – 07	Ferrara Italy	safeprocess2024.eu/ silvio.simani@unife.it
7 th IFAC Conference on Analysis and Control of Nonlinear Dynamics and Chaos ACNDC 2024	June 05 – 07	London United Kingdom	acndc2024.org/
8 th IFAC Workshop on Lagrangian and Hamiltonian Methods for Nonlinear Control LHMNC 2024	June 10 – 12	Besançon France	
4 th IFAC Conference on Advances in Proportional-Integral-Derivate Control PID 2024	June 12 – 14	Almería Spain	arm.ual.es/pid2024/
6 th IFAC Workshop on Advanced Maintenance Engineering, Services and Technology AMEST 2024	June 12 – 14	Cagliari Italy	
18 th IFAC Conference on Programmable Devices and Embedded Systems PDES 2024	June 19 – 21	Brno Czech Republic	
EUCA Conference on European Control Conference (in cooperation with IFAC) ECC 2024	June 25 – 28	Stockholm Sweden	ecc24.euca-ecc.org/ ecc24@euca-ecc.org
Conference on American Control Conference (in cooperation with IFAC) ACC 2024	July 08 – 12	Toronto Canada	acc2024.a2c2.org/
12 th IFAC Symposium on Control of Power and Energy Systems CPES 2024	July 10 – 12	Rabat Morocco	cpes2024.org/ cpes2024@unicaen.fr


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 **Bundesministerium**
Klimaschutz, Umwelt,
Energie, Mobilität,
Innovation und Technologie

Calendar of IFAC Conferences

Title	2024	Place	Further Information
12 th IFAC Symposium on Advanced Control of Chemical Processes ADCHEM 2024	July 14 – 17	Toronto Canada	adchem2024.org/
20 th IFAC Symposium on System Identification SYSID 2024	July 17 – 19	Boston, MA USA	
26 th International Symposium on Mathematical Theory of Networks and Systems (in cooperation with IFAC) MTNS 2024	August 19 – 23	Cambridge United Kingdom	mtns2024.eng.cam.ac.uk/
8 th IFAC Conference on Nonlinear Model Predictive Control NMPC 2024	August 21 – 24	Kyoto Japan	nmcp2024.org/ secretariat@nmcp2024.org
18 th IFAC Symposium on Information Control Problems in Manufacturing INCOM 2024	August 28 – 30	Vienna Austria	incom2024.org/ incom2024@tuwien.ac.at
15 th IFAC Conference on Control Applications in Marine Systems, Robotics and Vehicles CAMS 2024	September 03 – 05	Blacksburg (VA) USA	
4 th IFAC Conference on Modelling, Identification and Control of Nonlinear Systems MICNON 2024	September 04 – 06	Lyon France	
12 th IFAC Symposium on Biological and Medical Systems BMS 2024	September 11 – 13	Villingen- Schwenningen Germany	
4 th IFAC Workshop on Internet Based Control Education IBCE 2024	September 18 – 20	Ghent Belgium	
18 th IFAC Workshop on Time Delay Systems TDS 2024	September 24 – 27	Udine Italy	tds2024.uniud.it tds2024@uniud.it
Title	2026	Place	Further Information
23 rd IFAC World Congress WC 2026	August 23– 28	Busan Republic of Korea	ifac2026.org/main.asp ifac2026@ifac2026.org

The IFAC Calendar of Conferences is constantly updated as additional IFAC Conferences (Workshops, Symposia, and Conferences) are approved. Please check back often for the current status.
The complete version of the IFAC Calendar of Conferences is available online at:
<https://www.ifac-control.org/events/>