

E-MAIL: [NEWSLETTER@IFAC-CONTROL.ORG](mailto:NEWSLETTER@IFAC-CONTROL.ORG) | PHONE +43 2236 71447

[www.ifac-control.org](http://www.ifac-control.org)

## IFAC Journal of Systems & Control: Update & Expansion

The major change to *IFAC JSC* is the commencement of Geoff Chase as EiC, replacing Bob Bitmead after seeing the journal through its first 6 years. The journal expects to see a larger surge of submissions in the near future as it obtains its first impact factor this year. To meet this surge and maintain the high quality of the journal (bench rejection rate of 70-85%), the journal is looking for:

**New members of the Editorial Board**, particularly early career researchers and women at all career levels, to ensure the board matches the ever changing diversity of those submitting. All areas of systems and control will be considered, but there is a particular need for a member with abilities around areas as diverse as power engineering applications to meet growing papers addressing renewable energy and control systems, and fractional order systems and stability.

**High Quality Special Editions**, with a particular focus on emerging areas of control systems and theory not often seen or considered. These areas can be anywhere within systems and control, but areas focusing on emerging application areas, such as renewable energy power systems and distribution, biomedical engineering, and digital twins, as well as others are highly encouraged. Our goal is for these special editions to be diverse geographically in both papers submitted and Guest Editors, so they can best represent the international control systems community.



**IFAC JSC Editor-in-Chief**  
Geoff Chase

*IFAC JSC* EiC Geoff Chase will be at the 2023 IFAC World Congress in Yokohama, JP in July. Please feel free to approach him directly or contact him via IFAC/Elsevier at the conference. The

journal is growing internationally, and we are looking to better reflect that growth within the journal and its operation.

About *IFAC JSC* EiC Geoff Chase (NZ): University of Canterbury Distinguished Professor Chase is the Editor-in-Chief of the *IFAC Journal of Systems and Control*. His research focuses on development, validation and application of digital twin models and related sensors and devices, primarily in medicine, but also a range of areas. His research focuses on saving lives and cost to increase the quality and equity of access to care. He is a Fellow of the Royal Society of NZ (FRSNZ) and American Society of Mechanical Engineers (FASME), and Distinguished Fellow of Engineering NZ (DistFEngNZ) with over 1600 scientific publication and patents, and has founded three venture funded start-ups.



### The IFAC Conference App is available!

The App is paid for by IFAC and can be used free of charge by IFAC conference organizers and attendees.

How to download:  
App Store [apple.co/3mpaER7](https://apple.co/3mpaER7)  
Google Play [bit.ly/3lazFjx](https://bit.ly/3lazFjx)  
Web version [ifac.floq.live](https://ifac.floq.live)

You can also search for 'IFAC' in the Apple App Store or in the Google Play Store.

## No.3

June 2023

### IN THIS ISSUE:

***IFAC JSC Update & Expansion***

***IFAC President's Column***

***IFAC World Congress 2023 Update***

***Transition: Janos Gertler (US/HU)***

***Road Map 2023***

***Reports from IFAC Conferences:***  
***CPHS (US), COSY (IT), ACD (FR),***  
***NOLCOS (AU)***

***Calendar of IFAC Conferences***

### The IFAC Journals

#### Automatica

[journals.elsevier.com/automatica](https://journals.elsevier.com/automatica)

#### Control Engineering Practice

[journals.elsevier.com/control-engineering-practice](https://journals.elsevier.com/control-engineering-practice)

#### Engineering Applications of Artificial Intelligence

[journals.elsevier.com/engineering-applications-of-artificial-intelligence](https://journals.elsevier.com/engineering-applications-of-artificial-intelligence)

#### Journal of Process Control

[journals.elsevier.com/journal-of-process-control](https://journals.elsevier.com/journal-of-process-control)

#### Annual Reviews in Control

[journals.elsevier.com/annual-reviews-in-control](https://journals.elsevier.com/annual-reviews-in-control)

#### Journal on Mechatronics

[journals.elsevier.com/mechatronics](https://journals.elsevier.com/mechatronics)

#### Nonlinear Analysis: Hybrid Systems

[journals.elsevier.com/nonlinear-analysis-hybrid-systems](https://journals.elsevier.com/nonlinear-analysis-hybrid-systems)

#### IFAC Journal of Systems & Control

[journals.elsevier.com/ifac-journal-of-systems-and-control](https://journals.elsevier.com/ifac-journal-of-systems-and-control)

#### IFAC-PapersOnLine

[journals.elsevier.com/ifac-papersonline](https://journals.elsevier.com/ifac-papersonline)

## From the IFAC President

Dear IFAC Friends and Colleagues,

Since my term of IFAC President will be completed at the General Assembly during the World Congress in July 2023, this must be my last contribution to this Newsletter as IFAC's president.

I assumed the presidency in the middle of pandemic of COVID-19. During the pandemic, movement and mutual contact of people were severely restricted. Although we found that online communication tools were very useful, I did not think they were as effective as face-to-face communication. This caused various difficulties in IFAC activities. I would like to express my deepest gratitude to all the people who organized IFAC conferences and events, edited IFAC journals, and managed administrative activities within IFAC under such difficult circumstances.

The Russian invasion of Ukraine happened during my IFAC presidency. In the Constitution of IFAC, it is stated that "the Federation is not to become involved in any kind of political activity". On the other hand, the vision of IFAC is also described as "the worldwide federation for promoting automatic control for the benefit of humankind". Therefore, after carefully studying the IFAC Constitution and Code of Conduct, and deep discussion with the Executive Officers of IFAC, the Statement was prepared and issued.

My important mission when I became the president was to get the new initiative initiated by the immediate past IFAC President, Frank Allgöwer on track with newly elected IFAC officials within the new IFAC structure. With the efforts of the IFAC Executive Officers, the IFAC Secretariat, and the many volunteers working for IFAC, I think it was successfully achieved within this triennium. I would like to express my sincere gratitude to them.

Over the past three years, despite the COVID-19 pandemic, the academic activities of IFAC have been kept as active as before, and the financial situation of IFAC is very sound. I would like to thank the people and organizations who participated in the activities and supported IFAC, including IFAC affiliates, the IFAC NMOs, and the BMK (Austrian Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology).

In addition, IFAC is establishing a new membership category, AMO (Associated Member Organization), so that organizations in financially weak countries can become members of IFAC. We hope that more members will take this opportunity to participate in IFAC activities. If you are interested in AMOs, please look at the following link:

<https://www.ifac-control.org/structure/ifac-membership-category-associated-member-organizations-amos>

The 22<sup>nd</sup> IFAC World Congress 2023 will be held from 9-14 July 2023 in Yokohama, Japan. It is the first time since 1981 that the IFAC World Congress will take place in Japan. As of the end of April 2023, about 2,500 people had already registered to participate, which seems it must be successful.

Under the vision of "*Wa: Control for Solving Societal Problems and Creating Societal Values*", different themes are set for each day of the week, and various exciting events are planned, not only technical session for oral and poster presentations, workshops, tutorials, plenary/semi-plenary talks, but also various forums, public lectures, competitions, exhibitions, technical and technical/social tours, social events, etc. Please participate in these programs. Moreover, Yokohama is the second largest city in Japan, as well as a very cultural and dynamic city, with a long history in Japan. There are many tourism spots and attractions in and near Yokohama. Please come to Yokohama, and enjoy!

Finally, during my presidential term, I have been working with a focus on promotion of diversity & inclusion in IFAC, and solutions for social issues such as sustainability through the concept and technology of automatic control. However, there are still some issues left that I have not been able to tackle enough. I entrust the future management of IFAC for the 2023-2026 triennium to the next president, Dan Cho.

Best regards,

Hajime Asama  
IFAC President 2020- 2023



## IFAC is on social media!

### Facebook

[facebook.com/groups/632582025190533](https://facebook.com/groups/632582025190533)

### LinkedIn

[linkedin.com/groups/13400016/](https://linkedin.com/groups/13400016/)

### Twitter

[twitter.com/IFAC\\_Control](https://twitter.com/IFAC_Control)

### YouTube

[youtube.com/channel/UCLcWogbYNxo9rVSS9NKQDeA](https://youtube.com/channel/UCLcWogbYNxo9rVSS9NKQDeA)

## IFAC World Congress 2023 Update

Dear IFAC Friends and Colleagues,

By the time you read this article, many of you will have made your first preparations for your departure for Japan. The Organizing Committee of the 2023 IFAC World Congress will also be devoting all of our energy to last-minute preparations to achieve a safe and successful Congress.

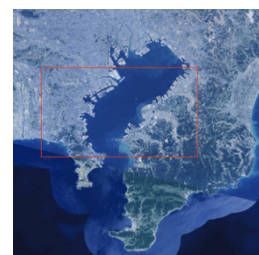
It is our pleasure to start with this news: As of May 8, the COVID-19-related measures in Japan have been significantly relaxed as the outbreak has calmed down. Almost everything has returned to normal, as in the days before 2020. We hope all participants enjoy face-to-face gatherings with friends from all over the world.

The program is full of attractive events, thanks to everyone who contributed to the organization, not to mention the authors and reviewers (please see [ifac2023.org/program](https://ifac2023.org/program) for an overall view of the events). The congress week starts with a series of workshops and tutorials on Saturday, July 8. Plenary talks start from 8:30 every morning from Monday to Friday, while the eight semi-plenary talks are given in the evenings. We'll have 24 parallel and three interactive ceremonies, including forums covering various topics.

Wednesday, in particular, includes "Diversity and Inclusion Day" programs such as panel discussions, a luncheon session, and award ceremonies. We'll also have exciting competitions and demonstrations, such as Mathworks Minidrone Competition, World Drone Competition (see below), and the Marine Robot Night Festival.



**World Drone Competition: requiring long-distance unmanned flights across the Tokyo Bay**



There will also be various social events, including technical tours to visit cutting-edge technology sites such as Honda and Hitachi, social tours to visit historical places like Kamakura and Asakusa, or to enjoy the natural scenery of the Fuji-Hakone area. On the last day, the closing ceremony will feature a performance by the Control Orchestra by our music-loving colleagues.

We look forward to welcoming you from all over the world to Yokohama. It is a port city that became a hub connecting Japan to the world 160 years ago. Please have a safe trip!



The latest information is available at our website ([ifac2023.org/](https://ifac2023.org/)). We also suggest you install the IFAC App (<https://www.ifac-control.org/conferences/conference-app>) before your departure, which helps you to access the information throughout the congress. Finally, follow us on Twitter @ifac2023, and mention @ifac2023 in your IFAC-related tweets!

Submitted by:  
IFAC 2023 Organizing Committee

Jun-ichi Imura, General Chair (pictured below)



Masato ISHIKAWA and Noriaki Ando, Publicity Chairs

## Transition: IFAC Advisor Janos Gertler 1936- 2023

As I was preparing this sad news of Janos' death I was made aware of a biographical sketch released several years ago

[www.24-7pressrelease.com/press-release/458748](http://www.24-7pressrelease.com/press-release/458748)

It is with permission of that publisher that I use some of that information below.

Emeritus Professor Janos Gertler was born in Vienna in 1936 and lived, was educated, and worked for his first 40 years or so in Hungary. Influenced by his electrical engineer stepfather, he studied EE at Budapest University of Technology and Economics achieving his Diploma with Distinction in Electrical Engineering in 1959. In 1967 he earned the Candidate in Science degree followed in 1980 with his Doctor of Science from the Hungarian Academy of Sciences. He was Deputy Director of the Computing and Automation Research Institute in Budapest from 1971 to 1981 and then emigrated

to the United States. His early US career included faculty positions at Case Western Reserve University (Visiting Professor) and Brooklyn Polytech University (Associate Engineering Dean) and then from 1985 at George Mason University (Professor 1985-2015 and Emeritus Professor 2015-2023). He consulted for major industrial firms during some of these years including Bailey Controls and General Motors.

His honors include IFAC Fellow, IEEE Fellow, and foreign member of the Hungarian National Academy of Sciences. In 1999 he was appointed IFAC Advisor, in recognition of decades of contributions to IFAC.



Janos' early involvement with the IFAC family began in the 1970's when he joined the TC on Computers followed by leadership roles on the IFAC Policy Committee. This positioned him well to be named to a team (Coales, Kahne, Gertler) to rewrite the IFAC Constitution that had served the federation well since its inception in the late 1950's. Many things had occurred in this period as IFAC's work had expanded (e.g. from 5 TCs to about 40 TCs, and from 13 NMOs to about 40 NMOs) that required a new executive structure. This new structure worked well for another two decades until further adjustments were required in the new century. In the early 1980's he was selected to be IPC Chairman and Proceedings General Editor for the 1984 IFAC World Congress in Budapest.

The 1970's were years of dramatic change in IFAC's publication program as described elsewhere (*The IFAC Story*) and Gertler was a leader of the evolution of IFAC publications from the 1970s until the 2010s. Decade after decade, a growing team of IFAC volunteers produced a greatly expanded scientific publication portfolio. From a single technical journal (*Automatica*) in the early 1960s to nine IFAC journals now. There was an explosion of published technical papers, now numbering 4600 per year. All of this expansion provided more and more service to the IFAC NMOs and provided a solid financial base for the federation. Publications now provide more than half of IFAC's annual income. We find Janos Gertler's imprint on all of these developments.

Since 1980, Gertler's IFAC roles have included Publications Committee Chair, leadership of the IFAC Publications Managing Board, Editor in Chief (EiC) of the *IFAC Conference Proceedings Series* that evolved into *IFAC Papers On Line* and EiC of *Annual Reviews in Control*. He authored a remarkable compilation *Historic*

*Control Textbooks* as part of his contribution to IFAC's 50<sup>th</sup> Anniversary activities. He was responsible for the Publications Chapter in *The IFAC Story* that describes decades of IFAC publications management.

<https://www.ifac-control.org/about/the-ifac-story>

Janos was always a quiet-spoken considerate man in all his relationships in IFAC, always ready to take on an additional task when the opportunity arose. He consistently added value in numerous team efforts.

Dr. Gertler's technical work concentrated on fault detection and diagnosis in engineering systems. His work on model-based diagnosis techniques led to a generalized parity relation method based on analytical models in the framework of principle component analysis. This effort included collaboration with General Motors on on-board diagnostics for automobile engines. His book "*Fault Detection and Diagnosis*" is a well cited book appreciated both in industry and academia.

During his 30 years at George Mason University (VA, US), Professor Gertler developed and taught courses on digital control systems and failure detection methods. His research interests later expanded to include analysis of economic consequences of outsourcing in manufacturing. His insight and breadth of knowledge were highly regarded by colleagues and students.

After his divorce he married Eva Vass in 2000. He had some minor health issues during much of his career. In the past several years his physical health steadily declined until March 2023 when he passed away at the age of 86. He is survived by his first wife Judit Andai in Baltimore, his son Nicholas Gertler (and wife Eva Gellert) and two granddaughters Sophie and Mia in Budapest. He will be missed by many members of the IFAC Family throughout the world.

On a personal note, my wife Irena Nowacka Kahne and I developed a wonderful relationship with Janos and Judi beginning in the late 1970s. It started at the Helsinki Congress (1978) and continued at many subsequent Congresses. Then our professional paths intersected in Cleveland, Brooklyn, and Northern Virginia in the 80s and 90s and the families got to know each other in these various home towns. The news of his death has been hard to accept by Irena and me.

Stephen Kahne (US, IFAC Advisor),  
IFAC President 1993-1996

**IFAC Cartoon Archive  
is available!**

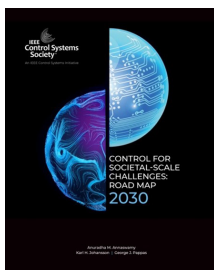
[www.ifac-control.org/publications/cartoons](https://www.ifac-control.org/publications/cartoons)



# Control for Societal-scale Challenges: Road Map 2030

The world faces some of its greatest challenges of modern time and how we address them will have a dramatic impact on the life for generations to come. Simultaneously, control systems, consisting of information enriched by various degrees of analytics followed by decision-making, are pervading a variety of sectors, in engineering and beyond. Increased levels of automation are sought after in various sectors and being introduced into new domains. All these advances and transformations urge a shift in the conversation toward how control systems can meet grand societal-scale challenges.

A report on “Control for Societal-scale Challenges: Road Map 2030” has been put together through the efforts of over 100 leaders in the area with a forward-looking goal of investigating societal imperatives on a global scale that the controls community can shape and influence. The report is freely accessible at <https://ieeecss.org/control-societal-scale-challenges-road-map-2030>. We encourage the IFAC community to read and discuss the report, and help in disseminating the information to funding agencies and other stakeholders.



At the IFAC World Congress 2023 in Yokohama there will be a panel session on Monday 10 July, 18:15-19:10. During this panel, the role of control systems in the global canvas of societal needs will be discussed together with goals and highlights of the Road Map report.

The sponsors for this report include IEEE Control Systems Society, IFAC, the US National Science Foundation, and Digital Futures. As part of the Road Map dissemination effort, a series of videos is being produced and it is planned that they will be available on the IFAC YouTube Channel.

The contents of the road map are as follows:

## 1: Introduction

## 2: Societal Drivers

- 2.A Climate Change Mitigation and Adaptation
- 2.B Healthcare and Ensuring Quality of Life
- 2.C Smart Infrastructure Systems
- 2.D The Sharing Economy
- 2.E Resilience of Societal-scale Systems

## Appendices

- A Pandemics: Modeling and Control
- B Neuroengineering

## 3: Technological Trends

- 3.A AI and Big Data
- 3.B Electrify Everything
- 3.C Engineering Biology
- 3.D Robots in the Real World

## 4: Emerging Methodologies

- 4.A Learning and Data-Driven Control
- 4.B Safety-Critical Systems
- 4.C Resilient Cyber-Physical Systems
- 4.D Cyber-Physical-Human Systems
- 4.E Control Architecture

## 5: Technology Validation & Translation

- 5.A Introduction
- 5.B Engagement in Industrial Ecosystems
- 5.C Validation
- 5.D Current Status of Benchmark and Testbeds
- 5.E Validation Steps and Corresponding Tools
- 5.F Desired Features of Validation Infrastructure
- 5.G Translation of Research Outcomes to Innovation and Products
- 5.H Concluding Remarks

## 6: Education

- 6.A Present State and Future Outlook
- 6.B Curriculum Changes
- 6.C Creating Success Stories in Curriculum Changes

## 7: Ethics, Fairness, and Regulatory Issues

- 7.A Ethics of Autonomous Systems
- 7.B Ethics and Fairness
- 7.C Regulatory Issues
- 7.D Intersection with control

## 8: Recommendations

- Chapter 2: Societal Drivers
  - 2.A Climate Change Mitigation and Adaptation
  - 2.B Healthcare and Ensuring Quality of Life
  - 2.C Smart Infrastructure Systems
  - 2.D The Sharing Economy
  - 2.E Resilience of Societal-Scale Systems

## Chapter 3: Technological Trends

- 3.A AI and Big Data
- 3.B Electrify Everything
- 3.C Engineering Biology
- 3.D Robots in the Real World

## Chapter 4: Emerging Methodologies

- 4.A Learning and Data-Driven Control
- 4.B Safety-Critical Systems
- 4.C Resilient Cyber-Physical Systems
- 4.D Cyber-Physical-Human Systems
- 4.E Control Architecture

## Chapter 5: Technology Validation and Translation

## Chapter 6: Education, Training, and Retraining

## Chapter 7: Ethics, Regulatory Issues, and Interoperability

## Epilogue

## Acknowledgments

## Glossary

## Index

Submitted by: Road Map 2030 Editors Anuradha M. Annaswamy, Karl H. Johansson, and George J. Pappas

## IFAC Conference on Cyber-Physical & Human Systems (CPHS 2022) 1-2 December 2022 Houston, TX, US

The 4<sup>th</sup> IFAC Conference on Cyber-Physical & Human Systems (CPHS 2022) took place in Houston, TX, USA from 1-2 December 2022. Meeko Oishi (University of New Mexico, NM, US) served as the General Chair, and Ufuk Topcu (UT Austin, TX, US), Lu Feng (University of Virginia, US), and Franck Mars (CRNS, FR) served as Program Chair and Co-Chairs, respectively.

CPHS 2022 built on the successes of CPHS 2016, CPHS 2018 and CPHS 2020, bringing together researchers and practitioners to share scientific and technological advances. The workshop focused on modeling, design, analysis, control, verification, and certification of CPHS, including theoretical, algorithmic, computational, and experimental aspects. Participants had expertise in control theory, human-machine interaction, robotics, formal methods, autonomous systems, human factors, cognitive psychology, and aerospace and transportation systems.

The conference received 43 submissions, 31 of which were accepted, resulting in a 72% acceptance rate. Eight of the accepted papers were associated with invited sessions. A total of 78 researchers registered, including 27 students. Among the 10 countries represented by the registrants, the highest number of registrations came from US (54), Japan (13), Sweden (3) and France (2).

The technical talks were divided into three oral sessions, each with four 15 minute slots for presentations and questions, and two interactive sessions, which featured 3-minute lightning talks followed by a 30-minute poster session. One invited session was held during an oral session, and the other invited session was held during an interactive session.

CPHS 2022 featured two plenary sessions, by Ayanna Howard (Ohio State University, OH, US), “The trusting of cyber-physical systems: How AI influences human behavior,” and by Wendy Ju (Cornell Tech, NY, US), “Strangers passing: On public interactions between people and autonomous systems.”

CPHS 2022 included three special sessions, consisting of two panels and one NSF funding information session. One panel focused on CPHS in Aerospace, with panelists Julia Badger (NASA Johnson Space Center, US),

John-Paul Clarke (UT Austin, US), Laura Humphrey (AFRL, US), and Paul Schutte, (Sandia Nat'l Labs, US). The second panel focused on CPHS in Robotics and Healthcare, with panelists Lydia Kavradi (Rice University, TX, US), John D'Aigle, (ABB Robotics for Healthcare, US), and Kumar Akash (Honda Research Institute, US). The funding information session, HMI Funding Opportunities in NSF ENG, was presented by Jordan Berg (NSF, US) and Alex Leonessa (NSF, US).



CPHS attendees at a poster session

The U.S. National Science Foundation (NSF) sponsored the travel and registration for 12 US students from historically underrepresented groups to attend CPHS 2022, as part of the CPHS Fellows program. Beyond providing financial support, this program sought to create a sense of community among CPHS Fellows by establishing formal mentorship and orientation structures. The Fellows were featured in a session right after the main plenary, in which they gave 3-minute lightning talks describing their research, their progress toward degree, their post-degree goals, and their favorite hobbies. The Fellows' talks were warmly received, and the Fellows were well integrated into all workshop activities.

In addition, a Best Student Paper Award and two Best Student Paper Finalists were recognized at CPHS 2022. The paper, "*Task-agnostic adaptation for safe human-robot handover*," by Ruixuan Liu, Rui Chen, Changliu Liu (Carnegie Mellon University, PA, US) was awarded the Best Student Paper Award.

Social events included an opening reception, a conference banquet lunch, and arranged transportation to the Museum of Fine Arts Houston.

We thank the sponsoring organizations, the CPHS Steering Committee, the National Organizing Committee, and the Program Committee for their valuable support, and our participants for their time and effort in making CPHS 2022 a success.

Submitted by: Meeko Oishi (Univ. of New Mexico, US), Ufuk Topcu (UT Austin, US), Lu Feng (Univ. of Virginia, US), and Franck Mars (CNRS, FR)

## IFAC Workshop on Control of Complex Systems (COSY 2022) 24-25 November 2022 Bologna, IT

The 1<sup>st</sup> IFAC Workshop on Control of Complex Systems (COSY 2022) took place from 24-25 November 2022 at Aemilia Hotel, in the heart of Bologna, Italy. Complexity is a mantra of our times, which often blends with sustainability, resiliency, innovation, transition (to digitalization, to low-emission mobility, to green economy,...), thus impacting on the everyday work of Systems-&Control scientists and professionals. COSY 2022 was launched as the first of what is expected to become a series of IFAC Workshops on Control of Complex Systems, with the main sponsorship of the Technical Committee on Linear Control Systems (TC 2.2) and with a focus on the activities of the homonymous Working Group. The workshop gathered academics and professionals from the control community who shared the interest for complex systems, with the intent to offer them a forum where discussing current research developments, open problems and emerging methodologies. The workshop was a fully in-person meeting and was attended by 76 participants.

Elena Zattoni (Alma Mater Studiorum Università di Bologna) served as the NOC General Chair and Jean Jacques Loiseau (CNRS and École Centrale de Nantes) served as IPC Chair. Pierdomenico Pepe (University of L'Aquila) and Danilo Mascolo (BI-REX Competence Center) served as NOC Vice Chairs. Xiang Chen (University of Windsor) and Stefano Di Cairano (Mitsubishi Electric Research Laboratory) served as IPC Vice Chairs. Anna Maria Perdon (Accademia Marchigiana di Scienze, Lettere e Arti) served as Editor. Radu-Emil Precup (Politehnica University Timisoara) chaired the IFAC Young Author Best Paper Award Committee.

As the first workshop of a series, COSY 2022 received a remarkable number of high-quality submissions, which shows the keen interest which it was capable to attract: 48 contributed papers, four invited session proposals, 17 invited papers, seven young author best paper award nominations. The workshop technical program featured 55 selected papers organized in five regular sessions and four invited sessions, which covered the main emerging topics in the area: structure and control of max-plus and hybrid systems; fault diagnosis and control of distributed and networked systems; recent advances in robust observation and control of complex systems; mathematical control theory for biological and medical applications; innovative applications of complex systems; learning-based and data-driven control strategies for complex systems; multiagent and networked systems coordination and control; modelling, management and security of critical infrastructures; automation and control solutions for the steel industry.



COSY 2022 took place in Bologna, IT

The workshop was opened by the brilliant plenary lecture "*Scalable Controllability Analysis of Structured Networks*" delivered by M. Kanat Camlibel (University of Groningen, NL). The closing ceremony included the announcement of the recipient of the Young Author Best Paper Award: Ghania Khodja (École Centrale de Lille, CH), with the paper "*Local Practical Stabilization for a Class of Discrete-Time Switched Affine Systems*", coauthored by C. Fiter, L. Hetel and T. Floquet. Moreover, an Honorable Mention was received by the two finalists (in alphabetical order): Guilherme Espindola-Winck (Université D'Angers), with the paper "*Criteria Stochastic Filtering of Max-Plus Discrete-Event Systems with Bounded Random Variables*", coauthored by L. Hardouin, M. Lhommeau and R. Santos-Mendes; Davide Zorzenon (Technical University Berlin), with the paper "*Weak Consistency of P-Time Event Graphs*", coauthored by J. Balun and J. Raisch.

The attendees of COSY 2022 also had the opportunity to participate in the outreach event "*Innovation, Sustainability and Resiliency from a Systems-&Control Perspective: A Forum for Ideas and Networking*", which was held as a pre-workshop, in-person, meeting on November 23 and which included a visit to the Industry 4.0 Pilot Plant at BI-REX headquarters on November 25. The outreach event was framed in the actions of the IFAC Activity Fund, whose grant made its realization possible. The main motivation of the initiative was to create the awareness of the crucial role of Systems & Control in the implementation of the measures needed to achieve the present main goals of the local, national and international policy: notably, the transition to digitalization, to a greener and sustainable industry, to cleaner energy, to low-emission mobility. Hence, a wide and varied audience was targeted by the event, including not only public and private enterprises and universities, but also start-ups and spin-offs, industrial associations, leagues of cooperative enterprises, private consultants, civic and cultural associations. The event was organized as a round table whose panelists were 10 high-profile professionals in the field of automation and control and was attended by approximately 40 representatives of the labor market and the civil society. The feedback on this initiative was extremely positive, most of the attendees judging it as mind-opening and inspiring.

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](http://www.ifac-control.org/about/affiliate-registration)



The two-day COSY workshop also included some social events. The conference banquet was held on the first evening. The banquet featured an exquisite multi-course dinner, based on the traditional dishes of Bologna. The second day featured a visit to the Specola Museum of Astronomy, which is part of the Alma Mater Museum Network and is located in Palazzo Poggi, the present seat of the University of Bologna. The visit to the Specola Museum was a guided one and included climbing up the Specola Tower through a staircase of 272 steps. The tower was built as a place from where to observe the movement of the planets and to study astronomy and now it remains a place that offers an amazing view of the town and the nearby Apennines.

The Organizing Committee of COSY 2022 gratefully acknowledge the Alma Mater Studiorum Università di Bologna, and, in particular, the Department of Electrical, Electronic and Information Engineering "G. Marconi" and the Fondazione Alma Mater, for their support in the administrative, logistic and public communication matters. The contribution of the National Competence BI-REX was also essential, especially in the organization of the IFAC Activity Fund Outreach Event, and it is recognized with appreciation. We are also grateful to the authors who submitted their papers as well as to the reviewers, the associate editors, the IPC members and the award committee for their great evaluation and selection work. Last but not least, the Organizing Committee wishes to thank all the participants for making the 1<sup>st</sup> IFAC Workshop on Control of Complex Systems a brilliant success.

Further information about the workshop can be found at <https://eventi.unibo.it/cosy2022>.

Submitted by: Elena Zattoni (IT), COSY 2022 NOC Chair

### European Workshop on Advanced Control & Diagnosis (ACD 2022) 16-18 November 2022 Nancy, FR

The 16<sup>th</sup> European Workshop on Advanced Control and Diagnosis (ACD 2022) held in Nancy, FR from 16-18 November 2022, was a conference organized by European Advanced Intelligent Control and Diagnosis working group with the support of Centre of Research in Automatic Control (CRAN) and Ecole Polytechnique (Polytech Nancy), Université de Lorraine. ACD 2022 was technically co-sponsored by IFAC, of which SAGIP is the National Member Organization for France.

At ACD 2022, three outstanding keynote talks were delivered:

- Prof. Vicenç PUIG (Spain) "Cyberphysical Security of Critical Infrastructures"
- Dr. Lorenzo FAGIANO (Italy) "Dealing with uncertainty in learning-based con-

*trol and optimization: the Set membership paradigm"*

- Dr. Jean Baptiste MOURET (France) "Damage compensation in robotics without diagnosis"

ACD 2022 was an opportunity for high-profile scientists and experts in advanced control, diagnosis, and health monitoring of systems to present recent results on focused on advanced fault tolerant control strategies, health-aware control design strategies, advanced control approaches, deep learning based methods for control and diagnosis, reinforcement learning based approaches for advanced control, diagnosis & prognosis techniques applied to industrial problems, Industry 4.0 as well as instrumentation and sensors.



All accepted and presented papers will appear online in a volume titled *Recent Developments in Model-based and Data-driven Methods for Advanced Control and Diagnosis by Springer in the Studies in Systems, Decision and Control* (Editors: Prof. D. Theilliol, Prof. J. Korbicz and Prof. J. Kacprzyk)

Regarding the statistics of the ACD 2022 workshop, all together 39 submissions were reviewed, out of which 32 were accepted and 31 were presented at the workshop (acceptance rate around 80%) during three days with parallel sessions. The papers were presented by authors from 11 countries for an audience of 50 (registered or not) participants at Ecole Polytechnique (Polytech Nancy).

Submitted by: Didier Theilliol (FR), ACD 2022 Editor

### IFAC Symposium on Nonlinear Control Systems (NOLCOS 2022) 16-18 November 2023 Canberra, AU

The 12<sup>th</sup> IFAC Symposium on Nonlinear Control Systems (NOLCOS) took place from 4-6 January 2023 in Canberra, Australia. With advances in science, technology and computing, the importance of the theory and applications of nonlinear control systems has grown in importance and NOLCOS is acknowledged as the major international gathering of leading experts in the field of nonlinear control from industry and academia.

Amongst the conference highlights was a collection of plenary and semi-plenary talks that provided a vibrant and current snapshot of the state-of-the-art in nonlinear control systems around the world.

Zhong-Ping Jiang provided the opening plenary with a talk on "Learning Based Control". Large data and learning is impacting the non-

linear control systems community as it is on all communities and Zhong-Ping's talk provided an opening perspective for a conference with sessions on Data-Based Optimal Control and many other examples of big data in non-linear systems. Kenji Fujimoto provided the opening of day two with a talk entitled "Passivity Based Sliding Mode Control" and a tour de force in generalized canonical transformations for port Hamiltonian systems with applications in stabilization, tracking, and sliding mode control. The final plenary was given by IFAC Council member Kristin Y. Pettersen entitled "Snake Robots and the Power of Nonlinear Control", providing a powerful story of the application of non-linear control in the development of innovative mechatronic systems.

Non-linear control of robotic and mechatronic systems was a major theme in the semi-plenary talks also with Tarek Hamel providing an excellent outline of non-linear control for aerial robotic vehicles, Airlie Chapman providing insight into control techniques used in human interaction in art installations, and Pauline Pounds talking of mechatronic/control systems codesign of complex robotic systems to improve overall performance and crucially robustness. The conference also called back to its roots in nonlinear systems theory with an exceptional presentation by Pauline Bernard speaking on recent results in Kazantzis-Kravaris-Luenberger (KKL) observers.

The conference also hosted the official presentation of the International Federation of Automatic Control (IFAC) Technical Committee Award on Non-Linear Control Systems. The award recognizes individuals who have made outstanding technical contributions in the non-linear control area, as well as supplied remarkable service to IFAC. The award was presented to Distinguished Professor Eduardo Sontag "for outstanding scientific contributions to non-linear systems and systems biology" in a short, dedicated session after the plenary on Day 2 of the conference. Unfortunately, Eduardo could not be present, but he provided a short video with some perspective on his academic contributions and scientific philosophy that can be viewed on the NOLCOS website.

[nolcos2022.com/](https://nolcos2022.com/)

The Young Author Award was run as a single-track plenary session, providing all delegates with an opportunity to see the best of the young talent emerging in the field. The three nominees all provided exceptional talks that made the YAA session a highlight of the conference and the job of the YAA committee chaired by Lorenzo Marconi (IPC Chair) difficult. The winner, Erlend A. Basso "Synergistic PID and Output Feedback Control on Matrix Lie Groups", was presented the award at the excellent banquet dinner on the shore of Lake Burley Griffin.

NOLCOS 2022 was sponsored by Technical Committee TC 2.3, and co-sponsored by Technical Committees 1.2, 2.1, 4.3, 7.3, and 8.1.

Submitted by: Chris Kellett (AU), General Chair, and Robert Mahony (AU), Program Chair

# Calendar of IFAC Conferences

Title	2023	Place	Further Information
9th International Conference on Control, Decision and Information Technologies CoDIT 2023	July 03 – 06	Rome Italy	<a href="https://codit2023.com/">codit2023.com/</a>
22 <sup>nd</sup> IFAC World Congress 2023 WC 2023	July 09 – 14	Yokohama Japan	<a href="https://ifac2023.org/">ifac2023.org/</a> <a href="mailto:ifac2023@congre.co.jp">ifac2023@congre.co.jp</a>
3 <sup>rd</sup> AACC Conference on Modeling, Estimation and Control Conference MECC 2023	October 02 – 05	Lake Tahoe, NV USA	<a href="https://mecc2023.a2c2.org/">mecc2023.a2c2.org/</a>
20 <sup>th</sup> International Conference on Informatics in Control, Automation and Robotics (in cooperation with IFAC) ICINCO 2023	November 13 – 15	Rome Italy	<a href="https://icinco.scitevents.org/">icinco.scitevents.org/</a> <a href="mailto:icinco.secretariat@insticc.org">icinco.secretariat@insticc.org</a>
17 <sup>th</sup> International Workshop on Enterprise Integration, Interoperability and Networking EI2N 2022	November 15 – 16	Rome Italy	<a href="https://in4pl.scitevents.org/EI2N.aspx">in4pl.scitevents.org/EI2N.aspx</a> <a href="mailto:in4pl.secretariat@insticc.org">in4pl.secretariat@insticc.org</a>
Title	2024	Place	Further Information
Conference on Australian & New Zealand Control Conference (in cooperation with IFAC) ANZCC 2024	February 01 – 02	Gold Coast Australia	<a href="https://anzcc.org.au/ANZCC2024/">anzcc.org.au/ANZCC2024/</a> <a href="mailto:l.vlagic@griffith.edu.au">l.vlagic@griffith.edu.au</a>
8 <sup>th</sup> ACDOS Conference on Advances in Control and Optimization of Dynamical Systems ACODS 2024	March 12 – 15	Delhi NCR India	<a href="https://acods-conference.org/">acods-conference.org/</a> <a href="mailto:naveen.babu@snu.edu.in">naveen.babu@snu.edu.in</a>
12 <sup>th</sup> IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes SAFEPROCESS 2024	June 04 – 07	Ferrara Italy	<a href="https://safeprocess2024.eu/">safeprocess2024.eu/</a> <a href="mailto:silvio.simani@unife.it">silvio.simani@unife.it</a>
7 <sup>th</sup> IFAC Conference on Analysis and Control of Nonlinear Dynamics and Chaos ACNDC 2024	June 05 – 07	London United Kingdom	<a href="https://acndc2024.org/">acndc2024.org/</a>
4 <sup>th</sup> IFAC Conference on Advances in Proportional-Integral-Derivate Control PID 2024	June 12 – 14	Almería Spain	
6 <sup>th</sup> IFAC Workshop on Advanced Maintenance Engineering, Services and Technology AMEST 2024	June 12 – 14	Cagliari Italy	
18 <sup>th</sup> IFAC Conference on Programmable Devices and Embedded Systems PDES 2024	June 19 – 21	Brno Czech Republic	
Conference on American Control Conference (in cooperation with IFAC) ACC 2024	July 08 – 12	Toronto Canada	<a href="https://acc2024.a2c2.org/">acc2024.a2c2.org/</a>
12 <sup>th</sup> IFAC Symposium on Control of Power and Energy Systems CPES 2024	July 10 – 12	Rabat Morocco	

## Impressum:

Medieninhaber und Herausgeber:  
International Federation of Automatic Control (IFAC), Zurich  
Schlossplatz 12, 2361 Laxenburg, Austria

Verlagsort und Redaktion: Dr. Dimitri Peaucelle,  
Schlossplatz 12, 2361 Laxenburg  
[newsletter@ifac-control.org](mailto:newsletter@ifac-control.org)  
Editor: Dimitri Peaucelle  
Deputy Editor: Moritz Schulze Darup  
Layout: Elske Haberl  
published bimonthly

ISSN 0254-3109

Das Sekretariat der IFAC befindet sich seit 1978 aufgrund eines Übereinkommens mit der Österreichischen Bundesregierung und mit der Österreichischen Akademie der Wissenschaften in Laxenburg und wird derzeit aus Mitteln des Bundesministeriums für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie „BMK“ gefördert.

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

# Calendar of IFAC Conferences

Title	2024	Place	Further Information
12 <sup>th</sup> IFAC Symposium on Advanced Control of Chemical Processes ADCHEM 2024	July 14 – 17	Toronto Canada	
20 <sup>th</sup> IFAC Symposium on System Identification SYSID 2024	July 17 – 19	Boston, MA USA	
26 <sup>th</sup> International Symposium on Mathematical Theory of Networks and Systems (in cooperation with IFAC) MTNS 2024	August 19 – 23	Cambridge United Kingdom	<a href="https://mtns2024.eng.cam.ac.uk/">mtns2024.eng.cam.ac.uk/</a>
8 <sup>th</sup> IFAC Conference on Nonlinear Model Predictive Control NMPC 2024	August 27 – 30	Kyoto Japan	<a href="https://nmmpc2024.org/">nmmpc2024.org/</a> <a href="mailto:secretariat@nmmpc2024.org">secretariat@nmmpc2024.org</a>
18 <sup>th</sup> IFAC Symposium on Information Control Problems in Manufacturing INCOM 2024	August 28 – 30	Vienna Austria	
4 <sup>th</sup> IFAC Conference on Modelling, Identification and Control of Nonlinear Systems MICNON 2024	September 04 – 06	Lyon France	
12 <sup>th</sup> IFAC Symposium on Biological and Medical Systems BMS 2024	September 11 – 13	Villingen- Schwenningen Germany	
4 <sup>th</sup> IFAC Workshop on Internet Based Control Education IBCE 2024	September 18 – 20	Ghent Belgium	

*To our readers: To comply with the Austrian 'Media Act', every publication must contain a declaration once a year concerning ownership and purpose, as below.*

Offenlegung: Das Medienwerk 'IFAC Newsletter' wird als Organ der 'International Federation of Automatic Control' (IFAC) verlegt und ist Eigentum dieser Internationalen Föderation, deren Tätigkeit der Förderung von Wissenschaft und Technik automatischer Regelung und Steuerung dient. Die Föderation hat ihren Sitz in Zürich (CH) und ist nach Schweizer Recht als gemeinnütziger Verein angemeldet. Sie verfolgt weder wirtschaftliche noch praktische Ziele.

Das Sekretariat der IFAC befindet sich seit 1978 aufgrund eines Übereinkommens mit der Österreichischen Bundesregierung mit der Österreichischen Akademie der Wissenschaften in Laxenburg.

Der 'IFAC Newsletter' erscheint sechsmal jährlich in englischer Sprache unter der Redaktion des Generalsekretärs der IFAC, Dr. Dimitri Peaucelle (Frankreich). Die Zeitschrift dient der Information über die Aktivitäten der IFAC. Sie wird kostenlos an Abonnenten in 50+ Länder versandt. Die Kosten werden von der IFAC aus Beiträgen der derzeit 48 Mitgliedsländer getragen.

Präsident der IFAC für 2020-2023 ist Prof. Hajime Asama (Japan), Vizepräsidenten sind Prof. Dr. John Lygeros (Schweiz), Prof. Dr.-Ing. Carlos Eduardo Pereira (Brasilien), Dr. Dimitri Peaucelle (Frankreich), Prof. Maria Prandini (Italien), und Prof. Sarah K. Spurgeon (Vereinigtes Königreich). Alle Funktionen werden ehrenamtlich ausgeübt.

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/>