

International Federation of Automatic Control

The IFAC Brochure 2020-2023 Edition

Aims	Structure	Activities
		June 2021

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1. Preface

This triennially updated IFAC Information Brochure is addressed to you, as a professional, theorist, engineer, researcher, student, or representative of a technical society, interested and active in the broad field of Automatic Control. In the pages to follow you can find some useful information about IFAC, the International Federation of Automatic Control, including its aims, activities, outputs, and organization, as well as some information about the people currently serving the Federation on a voluntary basis. Regularly updated information can be accessed at our webpage https://www.ifac-control.org/

The current version of this brochure can be downloaded from: https://www.ifac-control.org/about/information-brochure

August 2020

Message from the IFAC President



It is a great honor and a privilege to deliver this speech as the 23rd President of IFAC. I must start by expressing my deepest appreciation to the German team led by now the past President Frank Allgöwer for their unimaginable amount of work they have put together to realize this virtual World Congress. Their preparations took a totally different course towards the end due to the worldwide COVID-19 came pandemic. Since 1957, IFAC has contributed greatly to promoting outstanding scientific activities and technological developments in the field of automatic control and various related areas, and has also provided excellent services for research and education, thanks to the great contribution of IFAC's successive presidents, officers, and council members. Overall, IFAC is currently in very good health. From technical activities including journals

and conferences, to federation management and services for members and affiliates, we heavily rely on the efforts of about 2.000 volunteers who are highly competent. All the administrative tasks are handled perfectly and timely thanks to Kurt Schlacher, the IFAC Secretary, and the IFAC Secretariat, Katharina Willixhofer, Elske Haberl, and Harald Albrecht working at the IFAC office in Laxenburg, Austria. In particular, Kurt has fulfilled this position since 2005. I am extremely grateful to all of them. I'd like to express my thanks to the NMOs of many countries for their strong support of IFAC as members, as well as the Austrian government through the BMK (Austrian Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology), for their long-time association support subsidy. IFAC has introduced a number of important changes to improve our activities and services. IFAC works with Elsevier to publish many journals. In particular, IFAC-PapersOnLine is an open access journal in which the papers presented at IFAC technical meetings are indexed and archived. Juan A. de la Puente, the EiC of IFAC-POL, made tremendous efforts for this. IFAC-POL has even changed to Diamond Open Access.

We can all benefit from submission and download of papers without any fees. Moreover, IFAC is currently making major change of executive structure to cope with changes in social needs, technological advancement, and environmental situations. The current Executive Board is replaced with the Executive Officers, and the Publications Board and the Conference Board are newly created. In addition, new committees such as the Activity Funds Committee, Distinguished Lecturer Program Committee, Diversity and Inclusion Committee are established. These changes have been planned under the leadership of Frank Allgöwer, the 22nd President of IFAC, and by the hard work of IFAC officers, council members, and Frank's assistant Anne Koch. During my term, I would like to continue with these policies and implement the changes with newly elected IFAC officials. Moreover, I would like to carry out the reform through digital transformation to further expand the possibility for diverse people to participate in IFAC activities and events.

The next IFAC World Congress in 2023 will be held in Yokohama, Japan. This is the second World Congress held in Japan since 1981. It was a long-cherished dream of the Japanese control community

to host the IFAC World Congress again. I am very excited about this great occasion. I would like to express my gratitude to my Japanese colleagues, such as Shinji Hara, Junichi Imura, Hideaki Ishii, Tetsuo Sawaragi, and Keiko Takahashi, who worked on the proposal for the bid, and acknowledge the support by Japan National Tourism Organization, Yokohama Convention & Visitors Bureau, Pacifico Yokohama (venue of IFAC 2023), as well as the many academic societies represented by the Society of Instrument and Control Engineers of Japan, companies, and national ministries.

Even though technologies have solved many problems in our life, as revealed in the COVID-19 pandemic this time, many issues still re-main for scientists and engineers to contribute. Cooperation is especially important and essential to tackle societal problems for sustainable developments in the future. I would like to make efforts to construct an arena for cooperation, because automatic control is the key technology for it. Based on this idea, for the IFAC 2023, we have proposed the concept of "Wa (Harmony)". From the Japanese perspective, it means harmony of traditional culture and innovative technology, but in a broader sense, it represents the design of the large harmonious control loop to solve societal problems and to create societal values. IFAC 2023 will provide many opportunities for us to discuss the cooperation of various stakeholders in the world related to automatic control to achieve the goal for addressing societal problems, creation of new values, and sustainable developments. I very much look forward to working with you in the next triennium. Thank you very much.

b. Aram.

Hajime Asama The University of Tokyo, President of IFAC



Executive Summary

Structure of IFAC

The membership of IFAC consists of National Member Organizations (NMOs) who are responsible for furthering the aims and objectives of IFAC within their respective countries. IFAC provides NMOs with full international participation, whilst at the same time preserving local customs in the development of their activities.

Individuals can participate in IFAC in many ways: as Affiliates, who have the opportunity to receive the IFAC Newsletter; as Technical Committee Members through nomination either by the NMO or by the Technical Committee Chair; as members of the International Program Committees of IFAC events; as authors of papers for IFAC events; as Executive Committee Members; as attendees of IFAC events; as authors, reviewers, and editors of the IFAC journals; and, ultimately as officials of IFAC.

IFAC Events

Promotion of the science and technology of automatic control and all of its technical, educational and social implications is of paramount importance for IFAC. This is achieved mainly by organizing and sponsoring technical meetings, and through technical publications. IFAC organizes about 40 high-quality technical meetings per year, whose scheduling, scope, and ways of participation can be accessed through our webpage. Technical meetings are proposed by NMOs, sponsored by one or more of the 39 IFAC Technical Committees, and reviewed by the IFAC Technical Board. Every third year, IFAC organizes a World Congress. Papers presented at IFAC technical meetings are published, in partnership with Elsevier (official IFAC publisher), on IFAC-PapersOnLine, at no cost to the event organizers. Papers archived in this form can be viewed and downloaded at no cost, and can be cited using the Journal ISSN, and the individual paper DOI (digital object identifier). The IFAC-PapersOnLine series has the following main features:

- Diamond Open Access free of charge both for authors and readers.
- Papers are published under a Creative Commons CC-BY-NC-ND license, and can be shared in many flexible ways.
- Copyright belongs to the authors, while IFAC gets exclusive publication rights.

IFAC Journals

A fundamental role in the dissemination of automatic control science and technology is also achieved by IFAC through the editorship of eight prestigious archival journals: *Automatica, Control Engineering Practice, Annual Reviews of Control, Engineering Applications of Artificial Intelligence, Journal of Process Control, Mechatronics, Nonlinear Analysis: Hybrid Systems*, and *IFAC Journal of Systems and Control,* which are known as IFAC Journals and published in partnership with the official IFAC publisher, Elsevier.

IFAC Awards

Extraordinary contributions to automatic control science and technology are acknowledged by IFAC in various ways. Lifetime contributions, with either a theoretical or practical emphasis, are honoured by means of the Giorgio Quazza and Nathaniel Nichols Medals, awarded every third year. The High Impact Paper Award acknowledges the impact of a paper published in any of the official IFAC journals. The Industrial Achievement Award is presented to an individual, or a team of individuals, who has made a significant contribution to industrial applications of control. The Manfred Thoma Medal recognizes outstanding contributions of a young researcher and/or engineer under the age of 40 to the field of systems and control in its widest sense Distinguished individuals may be honored by the Council as IFAC Fellows. This recognition is given triennially to a limited number of individuals who have made outstanding and extraordinary contributions in the fields of interest of IFAC as engineers/scientists, technical leaders or educators. The relevance of education is emphasized through the Harold Chestnut Control Engineering Textbook Prize. At the time of the triennial World Congress, the best research articles published in each IFAC journal, with the exception of Annual Reviews of Control, are acknowledged and awarded. The best papers presented at the Congress in the area of applications, by a young author, or as an interactive paper, are also awarded. Long-term service to the Federation is recognized by the Outstanding Service Award, and by presidential appointment of a restricted number of individuals as IFAC Advisors.

Boards and Committees of IFAC

IFAC's executive organ is the IFAC Officers consisting of the IFAC President, the IFAC President-Elect, the immediate past President, and the Vice-Presidents.

The Technical Board, chaired by the Vice-President of Technical Activities/Technical Board Chair relies on the highly competent efforts of more than 2.000 volunteers, and is responsible for managing the technical activities of the Federation. Its main purpose is to manage the portfolio of IFAC technical meetings. In addition, the Technical Board advises the Council on all technical matters related to technical meetings, publications, and the technical contents of the Triennial Congress. It is also responsible for reviewing the technical activities of IFAC. The Publications Board, chaired by the Vice-President of Publications/ Publications Board Chair, coordinates and supervises the publication activities of IFAC, in accordance with guidelines laid down by the IFAC Council and will authorize expenditure on publications within strict budgetary limits approved by the Council. The Conference Board is chaired by the Vice-President of Conferences. The main duty of the Conference Board will be to consider symposia, conferences, workshops and other technical meetings as may be recommended to it by the Technical Committees and if it sees fit, arrange for their regulation and organization. It shall monitor IFAC technical meetings and advise their organizers. In addition, the Conference Board will advise the Council on all matters regarding technical meetings. It shall from time to time review the technical meetings of IFAC in the light of its aims and objectives and shall report to the Council each year.

Two additional IFAC Vice-Presidents are the Vice-President for Finances and the Vice-President for Operations. The Vice-President for Finances oversees and manages the financial assets of IFAC, as directed by the Executive Officers after approval of the IFAC Council. The Vice-President for Operations can be added each triennium to the Executive Officers by a vote of the IFAC Council.

Within IFAC there are several Executive Committees, which are each led by a dedicated chair. The Awards Committee, the Membership Committee, the Activity Fund Committee, the Distinguished Lecturer Program Committee and the Diversity and Inclusion Committee.

The IFAC Council decides on most IFAC matters, having been empowered to do so by the General Assembly, which is composed of all NMOs. The IFAC Council interacts with the IFAC Executive Officers who conduct the day-to-day business of IFAC. Please also feel free to contact me at <u>asama@robot.t.u-tokyo.ac.jp</u> about any matter pertaining to IFAC. The most important goal of IFAC is to serve all of you who are part of the greater worldwide Automatic Control community.

1.1 WHAT IS IFAC, WHAT ARE ITS AIMS?

The International Federation of Automatic Control, founded in September 1957, is a multinational federation of National Member Organizations (NMOs), each one representing the engineering and scientific societies concerned with automatic control in its own country.

The purpose of the Federation is to promote the science and technology of control in the broadest sense in all systems, whether, for example, engineering, physical, biological, social or economic, in both theory and application. IFAC is also concerned with the impact of control technology on society. The Federation serves to all those concerned with the theory and application of automatic control and systems engineering, wherever situated. To further this aim, it maintains working relationships with other organizations, national and international, especially with other non-governmental professional organizations.

IFAC provides a framework for collaboration between those working in automatic control and systems engineering, irrespective of race, creed or colour, or of geographic location, and promotes free exchange of ideas and experts within its professional fields.

The Federation does not become involved in any kind of political activity, nor does it take a position in any such issue.

IFAC does not take part in any commercial activity with the explicit aim to acquire financial gain.

IFAC pursues its purpose by organizing technical meetings, by publications, and by any other means consistent with its constitution and which will enhance the interchange and circulation of information on automatic control activities.

Information on activities appears on the IFAC homepage:

https://www.ifac-control.org/

and in the IFAC Newsletter which may be obtained free of charge from the IFAC Secretariat (<u>secretariat@ifac-control.org</u>) or can be downloaded from the IFAC homepage: <u>https://www.ifac-control.org/publications/newsletters</u>

The official journals of IFAC are Automatica, Control Engineering Practice, Annual Reviews in Control, the Journal of Process Control, Engineering Applications of Artificial Intelligence, the Journal on Mechatronics, Nonlinear Analysis: Hybrid Systems and the IFAC Journal of Systems and Control to which one may subscribe by writing to the publisher, Elsevier Ltd. As an IFAC affiliate you are entitled

to a special rate for subscription to IFAC journals. After your registration as an IFAC affiliate you can write to the following e-mail address: <u>emeacslsm@elsevier.com</u> and have to note that you are qualified for the IFAC special rate.

Starting from 2015, all papers from IFAC meetings (where IFAC is the main sponsor) are published, in partnership with Elsevier, the IFAC Publisher, in the IFAC-PapersOnLine proceedings series hosted at the ScienceDirect web service. All papers published on the web site can be cited using the series ISSN and the individual paper DOI (Digital Object Identifier). Papers presented at IFAC technical meetings are published, in partnership with Elsevier, at no cost to the event organizers. Recently proceedings from the early years have been scanned and added to the IFAC-PapersOnLine collection (published as IFAC Proceedings Volumes). Starting from January 1, 2020 IFAC-PapersOnLine is Diamond Open Access with the following features:

- Diamond Open Access free of charge both for authors and readers.
- Papers are published under a Creative Commons CC-BY-NC-ND license, and can be shared in many flexible ways.
- Copyright belongs to the authors, while IFAC gets exclusive publication rights.
- The IFAC event Organizer Guide has been updated to include some changes in the publication procedures reflecting the new structure. An Editor's Guide is available for the use of event editors.
- Papers can be searched, cited, and individually downloaded.

All papers published in IFAC-PapersOnLine have undergone a peer review selection process according to the IFAC rules.

In addition, IFAC publishes Milestone Reports, technical committee and task force reports as well as brochures of particular interest, such as guidelines for organizers of workshops, symposia, conferences and congresses.

IFAC closely cooperates with many other international organizations, by mutually co-sponsoring technical meetings and conducting activities of interest to the control and automation community.

1.2 IFAC's Vision and Mission

<u>Vision</u>

...for IFAC to be <u>the</u> worldwide federation for promoting automatic control for the benefit of Humankind.

<u>Mission</u>

...to promote the science and technology of automatic control through technical meetings,

publications and other means consistent with the goals and values of IFAC.

<u>Goals</u>

- Organize and sponsor high-quality technical meetings that are relevant to the automatic control community
- Be a trusted source of publication material on automatic control renowned for its technical excellence

- Help create an environment within which the automatic control community can prosper
- Provide volunteers and staff with meaningful and rewarding opportunities for careerenhancing participation in the Federation
- Help promote the benefits of automatic control among the public at large

Values

- Honesty and Integrity
- Excellence and Relevance
- Sustainability
- Diversity and Inclusivity

1.3 IFAC's HISTORY

In September 1956, the German VDI/VDE-Fachgruppe Regelungstechnik organized an International Conference on Automatic Control in Heidelberg. At that conference 30 participants signed a declaration in which the need to create an international organization of automatic control was clearly defined. The signatories pledged to promote the formation of national organizations, if not already existing at that time.

At the end of the conference in Heidelberg a Provisional Committee was established under the chairmanship of Victor Broida (France) to draft a constitution for the planned International Federation of Automatic Control.

On September 12, 1957, the First General Assembly convened at the constituent meeting in Paris. Delegates from 18 countries representing their national organizations assembled at the Conservatoire National des Arts et Métiers under the chairmanship of Victor Broida. They voted on the Constitution and By-Laws; they elected the first President, Harold Chestnut, as well as the members of the Executive Council; and they appointed committee chairs.

The IFAC Presidents:

1957-1959	Harold Chestnut	(US) *
1959-1961	Aleksander M. Letov	(SU) *
1961-1963	Eduard Gerecke	(CH) *
1963-1966	John F. Coales	(UK) *
1966-1969	Pawel J. Nowacki	(PL) *
1969-1972	Victor Broida	(FR) *
1972-1975	John C. Lozier	(US) *
1975-1978	Uolevi A. Luoto	(FI) *
1978-1981	Yoshikazu Sawaragi	(JP) *
1981-1984	Tibor Vamos	(HU) *
1984-1987	Manfred Thoma	(DE) *
1987-1990	Boris Tamm	(SU) *
1990-1993	Brian D.O. Anderson	(AU)
1993-1996	Stephen J. Kahne	(US)
1996-1999	Yong-Zai Lu	(CN)
1999-2002	Pedro Albertos	(ES)
2002-2005	Vladimir Kucera	(CZ)
2005-2008	Wook Hyun Kwon	(KR)
2008-2011	Alberto Isidori	(IT)
2011-2014	lan K. Craig	(ZA)

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2014-2017	Janan Zaytoon	(FR)
2017-2020	Frank Allgöwer	(DE)
2020-2023	Hajime Asama	(JP)

* deceased

The IFAC Secretariat has a permanent home. By invitation of the Austrian Government it has been situated in Laxenburg, Austria (south of Vienna) since 1978. For more information please visit: https://www.ifac-control.org/about/history

On the occasion of the 60th anniversary of IFAC a "<u>The IFAC Story e-book</u>" was compiled under the leadership of Stephen Kahne (former IFAC President, IFAC Advisor). The e-book is a narrative created from an archive of formal records and recollections of a number of long time volunteers of the International Federation of Automatic Control. The central role of IFAC's National Member Organizations is explained as is IFAC's global technical structure that has enhanced progress in the control and system field over the decades. A robust publications program has played an important role in IFAC's scientific impact on the community, as well as on IFAC's fiscal stability.

2. STRUCTURE OF IFAC

2.1 IFAC CONSTITUTION AND BY-LAWS

Copies of the Constitution and By-Laws, as well as information about IFAC and its activities, are available from the IFAC Secretariat:

IFAC Secretariat Schlossplatz 12 2361 Laxenburg, Austria Tel: +43/2236/71447 e-mail: <u>secretariat@ifac-control.org</u> website: <u>https://www.ifac-control.org/structure/constitution-and-by-laws</u>

2.2 GOVERNANCE



The structure of IFAC's administration is depicted in the following chart:

The supreme body of the Federation is the General Assembly (GA) which consists of delegations from all National Member Organizations (NMOs), each one having equal rights and equal voting power. As of January 2021 IFAC has had 48 NMOs. NMOs are responsible for furthering the aims and objectives of IFAC within their respective countries. The General Assembly elects the Council. The Council is responsible for the management of the Federation to the General Assembly. The Council directs and supervises the functioning of the Federation. The Council consist of Executive Officers and Ordinary Members.

To manage the technical and executive activities, respectively, there are working organs of the Federation, reporting to the Council the Technical Board (TB), Conference Board (CB), Publications Board (PB) and Executive Committees. All Technical Committees report to their cognizant Coordinating Committee Chair on the Technical Board. The Executive Committees report to the Executive Officers.

The President legally represents IFAC. All services to IFAC by any IFAC officer or official are voluntary and unpaid.

3. ACTIVITIES

3.1 TECHNICAL BOARD AND COMMITTEES

The technical work of IFAC is performed by the Technical Board (TB) including the Coordinating Committees (CCs). The Technical Board (TB) forms Technical Committees and oversees their work and coordinates the activities of the different Technical Committees through the Technical Board members. The TB is responsible for the final decision regarding symposia, conferences, workshops and other technical meetings as proposed by the Technical Committees. The TB also advises the Council on all technical matters and makes recommendations with respect to technical meetings, publications, and on the technical content of the triennial Congress. Each CC consists of a number of Technical Committees (TCs). The Technical Committees (TCs) are responsible for the planning and monitoring of technical events, such as symposia, conferences and workshops, with the NMOs acting as hosts. They also promote their respective areas in other ways, such as establishing contacts with other international organizations, publishing reports on selected topics, etc. The IFAC TCs cover specialized topics in control engineering. Their tasks among many others include promoting interest in emerging control subfields, assuming responsibility for technical meetings (or for series of such), providing for cooperation among specialists of their particular field, etc.

Participation in Technical Committees

For membership in a Technical Committee, there are different paths of participation. An individual may write a letter to the Secretariat, which will forward it to the respective TC Chair. A nomination may be made to the TC Chair by one's National Member Organization through the IFAC Secretariat. A person interested in participating in IFAC work may also contact the TC Chair directly.

List of Coordinating and Technical Committees and their Brief Scopes

IFAC currently has 9 Coordinating Committees (CCs), each comprising 3 to 6 Technical Committees (TCs). The list of CCs and TCs and Brief Scopes of Technical Committees are given below.

CC1. Systems and Signals

CC Chair Hideaki Ishii

1.1 Modelling, Identification and Signal Processing

Chair: Alessandro Chiuso

All aspects of system modelling and identification, from theoretical and methodological developments to practical applications.

1.2 Adaptive and Learning Systems

Tiago Roux Oliveira Chair:

Methods for analysis and design of control systems where model uncertainty is compensated for using adaptation and learning techniques, including adaptive state observers, adaptive parameter estimators, adaptive predictors, adaptive filters,

Discrete Event and Hybrid Systems 1.3

Chair: Carla Seatzu

All aspects of analysis and control of Discrete Event Systems and Hybrid Systems.

1.4 Stochastic Systems

Yilin Mo Chair:

All aspects related to probabilistic and statistical methods in modelling, identification, estimation and control.

1.5 **Networked Systems**

Chair: Maurice Heemels

All aspects related to distributed and interconnected systems of systems (networks of dynamical systems and agents) and control systems exploiting digital communication networks.

CC2. Design Methods

CC Chair Laura Menini

2.1 **Control Design**

Chair: Sergio Galeani

Various topics in the design of feedback systems, including data-based control, fault tolerant control, switching control, supervision and computational techniques.

2.2 Linear Control Systems

Chair: Silviu-Iulian Niculescu Study and investigation on structural properties, analysis and synthesis of linear dynamical systems, including n-D, infinite dimensional, singular, positive, fractional, delayed, time and structure varying systems.

2.3 **Non-Linear Control Systems**

Chair: **Christophe Prieur**

Methods for analysis and design of control systems described by non-linear differential or difference equations including the application of these methods.

2.4 **Optimal Control**

Chair: Eric Kerrigan

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.

(IT)

(FR)

(FR)

(GB)

(JP)

(IT)

(BR)

(IT)

(CN)

(IT)

(NL)

Particular methods include, but are not limited to, the calculus of variations, Pontryagin's maximum principle, dynamic programming, model predictive control, optimization based estimation, and differential games. Control methodologies can be based on first-principles models, data-based models or a combination of both.

2.5 **Robust Control**

Mario Sznaier Chair:

(US)

(FR)

(FR)

(DE)

Modelling of systems affected by uncertainty and the development of computational techniques for analysis, optimal controller synthesis and implementation.

Distributed Parameter Systems 2.6

Chair: Yann Le Gorrec

Fostering methods and systematics for modeling, analysis, and control/observer design for distributed parameter systems.

CC3. Computers, Cognition and Communication CC Chair **Thierry Marie Guerra**

3.1 Computers for Control

Birgit Vogel-Heuser Chair:

Embedded and cyber-physical systems for real- time control with special emphasis in modeldriven paradigm, modeling languages, verification & validation and certification, execution platforms including multi-core, real-time operating systems, virtualization layer for mixed-criticality systems and networks. Scheduling methods and real-time networks, as well as control techniques for computer systems.

Computational Intelligence in Control 3.2

Kevin Guelton Chair:

Focuses on all aspects of knowledge-based, fuzzy and neuro-fuzzy and neural (both, artificial and biologically plausible) systems and evolutionary algorithms relevant to control, both in theory and application driven.

3.3 **Telematics: Control via Communication Networks**

Chair: Lei Ma (CN) Computerized and telecommunication-based automation systems providing services to remote equipment for tele-operation, tele-maintenance, tele-medicine and tele-education, and their methodologies.

CC4. Mechatronics, Robotics and Components CC Chair Andreas Kugi

4.2 Mechatronic Systems

Chair: **Tsu-Chin Tsao**

The synergistic combination of precision mechanical engineering, electronic control and systems thinking in the design of products and processes.

4.3 **Robotics**

Chair: **Ivan Petrovic**

(HR) Robots manipulators and stationary robots, mobile and flying robots, autonomous systems, telerobotics and internet robots. Intelligent robotics, perception and sensing, information and sensor fusion, guidance, navigation and control.

(FR)

(US)

(AT)

4.5 **Human Machine Systems**

Chair: Jianhua Zhang

All conditions where humans (individuals as well as groups) use control or supervise tools, machines or technological systems.

(NO)

(FR)

(IT)

(DE)

(AT)

(US)

CC5. Cyber-Physical Manufacturing Enterprises CC Chair **Benoit lung**

5.1 **Manufacturing Plant Control**

Marco Macchi Chair:

All applications of automation, information and communication technologies in order to control the manufacturing plant within the e-enterprise.

5.2 Management and Control in Manufacturing and Logistics

Chair: **Dmitry Ivanov**

Models of e-manufacturing and supply chain systems, for production and service management, design, and control in communication and Internet based enterprises.

Integration and Interoperability of Enterprise Systems (I2ES) 5.3

Georg Weichhart Chair:

Theory and Models of Integration and Interoperability of Enterprise Systems, with special attention to Production and Manufacturing.

5.4 Large Scale Complex Systems

Chair: Wei Ren

Theory of complex systems, decentralized control and estimation, decision-making, hierarchical optimization and control, networked/interconnected systems, communication-based information systems.

CC6. Process and Power Systems

CC Chair Jay H. Lee

Chemical Process Control 6.1

Rolf Findeisen Chair:

Development of new control techniques and algorithms for application in pilot and industrial-sized plants that involve the knowledge of chemistry and, increasingly, biology.

6.2 Mining, Mineral and Metal Processing

Chair: **Chris Aldrich**

All aspects of modeling, automation, control and optimization in the field of mining, mineral and metal processing.

6.3 **Power and Energy Systems**

Chair: Yriö Maianne

All aspects of modelling, operation, and control of power and energy systems.

6.4 Fault Detection, Supervision & Safety of Technical Processes - SAFEPROCESS

Chair: Vicenc Puia

On-line fault and cyber-attack detection, isolation, estimation, and diagnosis, with a view to predictive maintenance and supervision, as well as fault tolerant, sustainable and cyber-secure control.

(ES)

(KR)

(DE)

(AU)

(FI)

CC7. Transportation and Vehicles Systems

CC Chair Lars Eriksson

7.1 **Automotive Control**

Chair: Per Tunestal

Modeling, supervision, control, and diagnosis of automotive systems, power trains, vehicle dynamic systems, automotive sensors, integrated traffic, and in-vehicle communication.

7.2 Marine Systems

Chair: **Roberto Galeazzi**

Theory and application of control engineering and artificial intelligence techniques to the maritime field. Navigation, guidance and control, monitoring and surveillance, fault diagnosis, optimization, planning, modelling, identification, human factors and control architectures.

7.3 Aerospace

Chair: Antonios Tsourdos

Dynamics, control, and mission control of all aeronautical and space related vehicles and vehicle systems.

7.4 **Transportation Systems**

Tankut Acarman Chair:

Ground transportation systems (road and guided transport) and air traffic control systems for both passengers and transported goods.

7.5 Intelligent Autonomous Vehicles

Chair: Zdzislaw Kowalczuk

Generic system methodologies and technologies applicable to intelligent autonomous vehicles including mobile robots on land, at sea, or in space.

CC8. Bio & Ecological Systems

Ronald van Nooijen CC Chair

Control in Agriculture 8.1

Chair: Manoj Karkee (US) Control aspects of agricultural processes. Methodologies for crop production and animal husbandry, post-harvest processes (grading, drying, storage of crops), food processing (quality and safety). Environmental and climate control of greenhouses, warehouses and animal houses, energy issues.

Biological and Medical Systems 8.2

Chair: **Thomas Desaive**

Applications of systems, modelling, informatics and control concepts, methodology and techniques in biology, physiology, medicine and healthcare.

8.3 Modelling and Control of Environmental Systems

Chair: Marialuisa Volta

Monitoring, modelling and control of environmental systems with the aim of designing methodologies and tools to support the development and implementation of sustainable, costeffective and socially acceptable decision-making processes.

(NL)

(BE)

(IT)

(TR)

(GB)

(SE)

(SE)

(DK)

(PL)

8.4 Biosystems and Bioprocesses

Chair: Alejandro Vargas

(MX)

(IE)

Promotion of research and development in all major areas of biotechnology where computers are used to aid bioprocess design, supervision, diagnosis, operation, optimisation and control.

CC9. Social Systems CC Chair Lawrence (Larry) Stapleton

9.1 Economic, Business, and Financial Systems

Chair: Fei-Yue Wang (CN)

Modelling and control of economic, management, and business systems. Optimization, decision and control in economics, business and finance. Interface between engineering and economic/business techniques and approaches.

9.2 Systems and Control for Societal Impact

Chair: Mariana Netto (FR) Stimulate research and education on the fundamental and applied systems and control approaches, including their combinations with learning, optimization, communication (5G), human, and social sciences, for societal and environmental impact.

9.3 Control for Smart Cities

Chair: (Samuel) Qing-Shan Jia

Promote research and education of control for smart cities, includes but is not limited to buildings, transportation systems, water system management, pollution monitoring and control systems.

9.4 Control Education

Chair: Antonio Visioli

Education issues in control engineering. Methodology for improving the theory, practice, accessibility of control systems education. Control Engineering Textbook Prize nomination.

9.5 Technology, Culture and International Stability (TECIS)

Chair: Peter Kopacek

Identification, definition, and improvement of factors which significantly influence international and regional stability, cultural diversity and inclusion. Socially responsible applications of control and automation systems.

3.2 INDUSTRY COMMITTEE

Starting from the 2017 World Congress in Toulouse (France), IFAC has established an Industry Committee (IndCom), reporting to the IFAC Council. The goals of the committee are to:

- Strengthen the engagement of industry and industry representatives in IFAC activities
- Enhance the value of IFAC to industry
- Help control research realize its full potential for industry impact
- Help research and education in academia be better informed by industry perspectives

Since its inception, the IndCom has launched several initiatives in pursuit of these goals. Examples of outputs include <u>https://doi.org/10.1016/j.arcontrol.2020.03.002</u>, <u>https://doi.org/10.1109/MCS.2016.2621438</u>, and <u>https://tinyurl.com/y4yaq8he</u>.

ulion

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Several additional activities are under way.

The committee currently numbers about 100 members, more than half of whom are affiliated with industry (most of the rest have had substantial industry experience over their careers). The Industry Committee welcomes additional members with significant industry experience. If you are interested please contact the IndCom chair, Tariq Samad (<u>tsamad@umn.edu</u>).

For more information on the Industry Committee and its activities, have a look at the Industry Committee webpage:

https://sites.ifac-control.org/industry

3.3 ACTIVITY FUND

The IFAC Activity Fund invites applications for financial support of initiatives that foster and promote public engagement and outreach from the control community.

The IFAC Activity Fund invites applications for financial support of initiatives that foster and promote public engagement and outreach from the control community. The fund sponsors initiatives that:

- Maximize control community engagement;
- Promote inclusion and diversity in alignment with the IFAC guidelines;
- Increase control engineering influence in public discourse and decision-making.

Financial assistance of Euro 5,000 is provided to activity organisers. Applications will be sought twice a year. A committee of five members from different geographical regions and technical backgrounds administers the fund.

Submission deadline is the 15th April and the 15th October. For more information email <u>activityfund@ifac-control.org</u>.

3.4 EXECUTIVE COMMITTEES

The scopes of the respective committees are as follows:

Awards Committee (Chair: Janan Zaytoon, FR)

The Awards Committee is responsible for the management of the IFAC awards program including recommendations to the Council for award selection committees, awards planning and procedures, recommendations for initiating and terminating each award, and awards funding.

Membership Committee (Chair: Frank Allgöwer, DE)

The Membership Committee shall normally take care of the relationship to NMOs and consider all applications for IFAC membership and make recommendations to the Council. It shall also advise the Executive Officers and Council on matters concerning IFAC affiliate members.

Activity Fund Committee (Chair: Margret Bauer, DE)

The Activity Fund Committee shall normally take care of the IFAC Activity Fund, the call of proposals, their evaluation and selection. It shall report to the Executive Officers for final approval.

Distinguished Lecturer Program Committee (Chair: Ian R. Petersen, AU)

The Distinguished Lecturer Program Committee shall normally take care of the Pawel J. Nowacki Distinguished Lecturer Program. Its tasks include the lecturer selection, the evaluation and the handling of the financial support of a lecture. It shall report to the Executive Officers.

Diversity and Inclusion Committee (Chair: Mary Doyle-Kent, IE)

The Diversity and Inclusion Committee shall raise awareness for diversity, it shall monitor different aspects of diversity within IFAC and consult the Executive Officers and Council on all matters related to Diversity and Inclusion.

3.5 IFAC AFFILIATES: INDIVIDUAL INVOLVEMENT IN IFAC

Anyone interested in control engineering may become an IFAC Affiliate. IFAC Affiliates receive the IFAC Newsletter free of charge. The Newsletter contains information about IFAC technical meetings as well as about other matters of interest to the control community. IFAC Affiliates will also receive Calls for Papers for technical meetings in their selected areas of interest and are entitled to a special rate for subscriptions to the IFAC Journals. On-line registration as an Affiliate is possible from the IFAC homepage.

For membership in a Technical Committee, there are different paths of participation. An individual may write a letter to the Secretariat, which will forward it to the respective TC Chair. A nomination may be made to the TC Chair by one's National Member Organization through the IFAC Secretariat. A person interested in participating in IFAC work may also contact the TC Chair directly.

3.6 FINANCES

The revenue of IFAC chiefly consists of annual membership fees paid by the NMOs and publications income from the IFAC Journals. It is used for administrative expenses. Its recommendations are approved by the Council which is held accountable by the General Assembly for the expenses.

IFAC has three membership categories and the fees for each category are determined by the General Assembly (current annual membership fees in brackets):

- Ordinary membership category (€1.500/€3.000/€6.000/€12.000)
- Reduced-fee membership category (€500)
- Introductory membership category (€150)

For the Ordinary membership category, each NMO can select an appropriate fee level in the four subcategories from €1.500 to €12.000. NMOs in the ordinary membership category must communicate to the IFAC Vice-President for Finances by October 1st of each year if they wish to change their subcategory of membership for the ensuing year.

All financial matters of IFAC are managed by the Vice-President for Finances:

Prof. John Lygeros ETH Zurich, Automatic Control Laboratory, IfA Physikstrasse 3, ETL I 22 8092 Zurich Switzerland e-mail: jlygeros@ethz.ch

3.7 Non-binding suggested membership fee

The following formula offers a non-binding membership fee suggestion and can be seen as indicator for a suitable category. The formula takes the minimum of each category

Suggested fee = min (category wrt. participation, category wrt. GDP, category wrt. GDP p. capita),

with the categories being defined in Table. 1.

Average participation in IFAC World Congresses (%)	GDP (US\$MM)	GDP per capita (1000US\$)	Suggested category
0 – 1	0 - 500.000	0 - 5	1.500
1 – 2	500.000 - 1.000.000	5 - 10	3.000
2 – 4	1.000.000 - 2.000.000	10 - 20	6.000
> 4	> 2.000.000	> 20	12.000

Table 1: Proposed categories with respect to participation, with respect to GDP and with respect to GDP per capita.

The NMOs are encouraged to ask the IFAC secretariat for their respective data.

3.8 IFAC FOUNDATION - Support

Since 2006, the IFAC Foundation has been officially incorporated in Switzerland, following Swiss law. Its mission is to acquire, manage and distribute resources to further the scientific goals of the International Federation of Automatic Control (IFAC). The IFAC Foundation is a not-for-profit organization that accepts donations from individuals and organizations, both private and public, who wish to contribute to the mission of IFAC. Like IFAC, the goal of the IFAC Foundation is to support the development of automation and automatic control science, technology, and education which benefits the global economy and human life. The website of the IFAC Foundation is https://foundation.ifac-control.org/

4. IFAC CONFERENCE BOARD & EVENTS

4.1 CONFERENCE BOARD

The newly installed Conference Board was established at the IFAC 2020 General Assembly. It focuses on the objectives to elaborate a plan for a direct involvement of IFAC in its sponsored technical events with the purpose of reducing registration fees, while maintaining a high quality; and proposes a strategy to implement the elaborated plan. Therefore, a test phase should be run on two IFAC events of different size in the next triennium. With the Conference Board for the first time IFAC will be directly, financially involved in IFAC technical events. IFAC will offer a support package to the organizers that comprises of guidance and advice in budget planning and financial support, which means that IFAC will help to offset possible losses. Event organizers will be offered IFAC support and will have the freedom to choose if accepting or not. If they accept, they will have to sign a legal contract with IFAC, specifying the agreement on loan, loan interest rate and surplus/loss sharing, the possibility of an audit, the authorization to share their budget information with the IFAC Conference Board and IFAC Secretariat and possibly other IFAC event organizers.

4.2 IFAC World CONGRESSES

Triennial IFAC World Congresses are organized on a worldwide scale, with attendance up to 3.500 persons. They are traditionally held in the home country of the President in office during the third year of his/her term of office.

Location and dates of IFAC World Congresses are shown below:

	no wond congresses are si	
1 st Congress	1960 Moscow	(SU)
2 nd Congress	1963 Basel	(CH)
3 rd Congress	1966 London	(UK)
4 th Congress	1969 Warsaw	(PL)
5 th Congress	1972 Paris	(FR)
6 th Congress	1975 Boston/Cambridge	(US)
7 th Congress	1978 Helsinki	(FI)
8 th Congress	1981 Kyoto	(JP)
9 th Congress	1984 Budapest	(HU)
10 th Congress	1987 Munich	(DE)
11 th Congress	1990 Tallinn	(SU)
12 th Congress	1993 Sydney	(AU)
13 th Congress	1996 San Francisco	(US)
14 th Congress	1999 Beijing	(CN)
15 th Congress	2002 Barcelona	(ES)
16 th Congress	2005 Prague	(CZ)
17 th Congress	2008 Seoul	(KR)
18 th Congress	2011 Milan	(IT)
19 th Congress	2014 Cape Town	(ZA)
20 th Congress	2017 Toulouse	(FR)
21 st Congress	2020 Berlin	(DE)
22 nd Congress	2023 Yokohama	(JP)
23 rd Congress	2026 Busan	(KR)

4.3 SYMPOSIA, CONFERENCES AND WORKSHOPS

In addition to the triennial IFAC World Congresses, the Federation manifests the progress of automatic control through international symposia, conferences and workshops sponsored or co-sponsored by IFAC.

An **IFAC Symposium** is a technical meeting covering a well-defined theme of control engineering. Symposia on the same subject are arranged as a regular series, usually on a triennial basis. They are organized by a host country NMO and are scientifically assisted by those IFAC Technical Committees which take an active interest in the selected topics of the meeting. Attendance usually ranges between 100 and 500 participants.

An **IFAC Conference** is a technical meeting of about the same scope and size as a Symposium but it is not necessarily part of a series of events. Conferences may also cover topics that are more specialized.

An IFAC Workshop is a more informal and less structured meeting than a Symposium or a Conference. It usually has a narrower scope and a more limited attendance (between 50 and 100 participants). However, provisions for the host country NMO acting as organizer, for the scientific support by the appropriate TCs and for co-sponsorship by other scientific organizations are similar to those for Symposia.

As a general rule, during the year of the Congress, there are no Symposia or Conferences, and the number of Workshops is restricted.

Information on forthcoming IFAC technical meetings can be found in every issue of the IFAC Newsletter and on the IFAC website:

https://www.ifac-control.org/events/@@events view

To assist those involved in organizing and preparing Symposia and Workshops a booklet entitled "Procedure for the Organization of IFAC Technical Meetings" is available from the IFAC Secretariat or can be downloaded from the IFAC website:

https://www.ifac-control.org/events/organizer-guide

4.4 MASTERPLAN OF IFAC SYMPOSIA

Future IFAC events include the following regular symposia:

- Advanced Control in Chemical Processes (ADCHEM)
- Advances in Automotive Control (AAC)
- Advances in Control Education (ACE) •
- Automatic Control in Aerospace (ACA) •
- **Biological and Medical Systems (BMS)**
- Control in Transportation Systems (CTS)
- Dynamics and Control of Process Systems, including Biosystems (DYCOPS)
- Fault Detection, Supervision and Safety for Technical Processes (SAFEPROCESS)
- Human-Machine Systems (HMS)
- Information Control in Manufacturing (INCOM)
- Intelligent Autonomous Vehicles (IAV)
- Large Scale (Complex) Systems (LSS)
- Mechatronic Systems (MECHATRONICS)
- Control, Optimization and Automation in Mining, Mineral and Metal Processing (MMM)

- Non-Linear Control Systems (NOLCOS)
- New name: Control of Power and Energy Systems (CPES) until 2012: Power Systems and Power Plants (PSPP)
- Robot Control (SYRÓCO)
- Robust Control Design (ROCOND)
- System Identification (SYSYID)
- System Structure and Control (SSSC)
- Telematics Applications (TA)

5. IFAC PUBLICATIONS BOARD AND IFAC PUBLICATIONS

The Publications Board was also newly installed at the IFAC General Assembly in 2020. It regulates and controls all IFAC publications, mainly the proceedings, the IFAC Journals, as well as other publications as the case maybe. The Publications Board reports to the IFAC Council each year.

Under the terms of an agreement between Pergamon Press Ltd (as of January 1994 Elsevier Ltd) and IFAC, <u>Elsevier Ltd.</u> is the official, sole publisher of IFAC publications. The agreement covers all of the publications listed below, with the exception of the IFAC Newsletter and reports.

- IFAC-PapersOnLine
- IFAC Journal Automatica
- IFAC Journal Control Engineering Practice
- IFAC Journal Annual Reviews in Control
- IFAC Journal of *Process Control*
- IFAC Journal on Engineering Applications in Artificial Intelligence
- IFAC Journal on *Mechatronics*
- IFAC Journal Nonlinear Analysis: Hybrid Systems
- IFAC Journal of Systems and Control
- IFAC Newsletter
- IFAC Technical Committee and Task Force Reports
- Milestone Reports

The management of IFAC Publications, the IFAC - Elsevier joint publication venture, is vested in the Publications Managing Board, presently chaired by Prof. Tamer Başar (US). All inquiries regarding IFAC Publications should be addressed to:

Kay Tancock, Senior Publisher - Signal Processing and Control Elsevier Ldt. The Boulevard Langford Lane, Kidlington Oxford, OX5 1GP, UK Tel: +44 (0) 1865 843 721

5.1 PREPRINTS AND IFAC-PapersOnLine

Preprints:

Preprints are the collection of accepted papers produced prior to a meeting for distribution at the meeting, either in printed or electronic form. Preprints provide easy access for participants to papers before or during a meeting. Preprints are provided solely for meeting participants, included as part of the registration fee. They may be available for sale, but they must not carry an ISBN, Bar Code, cataloguing details or the words "published by..." Preprints are not a publication and should not have any mark that enables them to be cited as such.

IFAC-PapersOnLine:

Proceedings are the final collection of papers from an IFAC meeting. They are the only way in which papers from IFAC meetings are published. Proceedings from all IFAC events are published by IFAC, in cooperation with the IFAC publisher, on *IFAC-PapersOnLine*, and can be cited by means of a unique DOI (Digital Object Identifier). *IFAC-PapersOnline* is hosted on the ScienceDirect platform.

Proceedings must be published for Symposia and Conferences, but they are not mandatory for Workshops. If the organizers of a Workshop choose to publish proceedings, the same procedures as for Symposia, including peer review of full draft papers, must be followed. If the Organizers decide not to publish proceedings, they must not produce any other publication of the Workshop.

IFAC Publications and Copyright Policy

"All publication material submitted for presentation at an IFAC-sponsored meeting (Congress, Symposium, Conference, Workshop) must be original and hence cannot be already published, nor can it be under review elsewhere. The authors take responsibility for the material that has been submitted. IFAC-sponsored conferences will abide by the highest standard of ethical behavior in the review process as explained on the Elsevier webpage (https://www.elsevier.com/authors/journal-authors/policies-and-ethics), and the authors will abide by the IFAC publication ethics guidelines (https://www.ifac-control.org/events/organizers-guide/PublicationEthicsGuidelines.pdf/view).

Accepted papers that have been presented at an IFAC meeting will be published in the proceedings of the event using the open-access IFAC-PapersOnLine series hosted on ScienceDirect (https://sciencedirect.com/). To this end, the author(s) must grant exclusive publishing rights to IFAC under a Creative Commons license when they submit the final version of the paper. The copyright belongs to the authors, who have the right to share the paper in the same terms allowed by the end user license, and retain all patent, trademark and other intellectual property rights (including research data)."

5.2 IFAC JOURNALS

Automatica is an IFAC journal, published monthly. It is a leading archival publication in the field of systems and control, featuring a characteristic blend of theoretical and applied papers of lasting value, reporting cutting edge research results by authors across the globe. All submissions undergo a rigorous review process. The Journal features articles in distinct categories, including regular, brief and survey papers, technical communiqués, correspondence items, as well as reviews on published books of interest to the readership.

Control Engineering Practice is IFAC's applications journal, published monthly. It contains highquality papers which illustrate the direct application of control theory and its supporting technologies in all possible areas of automation. Papers demonstrating the contribution of automation and control in improving the performance, quality, productivity, sustainability, resource and energy efficiency, and the manageability of systems and processes for the benefit of mankind and are relevant to industrial practitioners are most welcome. All papers, whether originating from IFAC events or directly submitted, are rigorously reviewed by an international panel of referees.

Annual Reviews in Control is published twice a year, averaging about 200 pages per issue. The Journal contains review articles selected from the material of the most recent IFAC symposia, conferences and workshops, and of the latest Congress. It may also carry papers specifically written for the Journal, either review papers on main methodologies or technical advances – 'Survey papers' or cutting-edge papers on topics that are just emerging or tend to bring together several disciplines – 'Vision papers'.

The *Journal of Process Control* is published eight times per year and invites papers relating to all aspects of Chemical Process Control, including many papers arising from the regular IFAC meetings in process control. All papers are rigorously reviewed.

Engineering Applications of Artificial Intelligence is an international journal that publishes rigorously reviewed papers relating to intelligent real-time automation. It is published ten times per year. Regular special issues are published on new and emerging topics of interest.

Mechatronics is an international journal that publishes papers relating to the multidisciplinary area of design and use of advanced automated systems, where the synergistic integration of mechanics, electronics, and control plays a fundamental role. It is published ten times a year and all papers are rigorously reviewed prior to publication. Special issues are published on new and emerging topics of interest.

Nonlinear Analysis: Hybrid Systems is the IFAC journal devoted to hybrid dynamic systems, i.e., systems involving the interplay between discrete and continuous dynamic behaviors. It publishes 4 issues per year including special issues on new and emerging topics. It features regular submissions as well as papers originating from IFAC meetings. All papers are rigorously reviewed under the supervision of a Senior Editor and of an Associate Editor.

The IFAC Journal of Systems and Control is the newest addition to the IFAC Journal portfolio. The journal, invites leading Researchers in the area of Systems and control to submit papers that present significant, novel, generalizable, extensible and transferable innovations across Areas of Automation and control.

For information, inspection copies and subscriptions of all Journals, please contact

IFAC Publications: Kay Tancock, Senior Publisher - Signal Processing and Control Elsevier Ldt. The Boulevard Langford Lane, Kidlington Oxford, OX5 1GP, UK Tel: +44 (0) 1865 843 721 e-mail: k.tancock@elsevier.com

5.3 IFAC NEWSLETTER

The IFAC Newsletter is produced bimonthly for the purpose of disseminating current information relevant to IFAC. It is sent free of charge to NMOs, IFAC Affiliates (electronically) and libraries. It contains up-to-date information about forthcoming IFAC events as well as brief announcements of other IFAC-related activities. All material proposed for publication in the IFAC Newsletter should be sent to the Newsletter Editor, Dimitri Peaucelle, c/o IFAC Secretariat (<u>newsletter@ifac-control.org</u>). The latest edition of the IFAC Newsletter is available on the IFAC homepage, as well as an online archive dating back to the very beginning of IFAC (1958).

https://www.ifac-control.org/publications/newsletters

5.4 IFAC Social Media Activities

IFAC is active on the social media platforms of Facebook, LinkedIn, and Twitter. We encourage you to join/like/follow these platforms for news on IFAC events, awards, and general news about automatic control. You are welcome to post appropriate news on these managed sites, or you can email news to Linda Bushnell at <u>lb2@uw.edu</u>.

Facebook: <u>https://www.facebook.com/IFACcontrol/</u> LinkedIn: <u>https://www.linkedin.com/groups/13400016</u> Twitter: https://twitter.com/IFAC Control

IFAC also has a YouTube channel with videos of plenary talks and historical talks. In addition, IFAC posts a Blog with interesting articles for a general audience.

IFAC YouTube channel: https://www.youtube.com/channel/UCLcWoqbVNxo9rVSS9NKQDeA

IFAC Blog: http://blog.ifac-control.org

6. IFAC AWARDS

The Giorgio Quazza Medal (Chair: Tamer Basar, US)

The Giorgio Quazza Medal recognizes outstanding lifetime contributions of a researcher and/or engineer to conceptual foundations in the field of systems and control. This IFAC award, created in 1979, is a memorial to the late Giorgio Quazza, a leading Italian electrical and control engineer who served IFAC in many capacities in a most distinguished manner. The medal is presented by the President at each IFAC Triennial Congress at the Opening Ceremony. A prize is presented to the recipient together with the medal. Medal winners have been:

•	4004		(1117)
-	1981	John F. Coales	(UK)
-	1984	Yakov Z. Tsypkin	(RU)
-	1987	Karl J. Åström	(SE)
-	1990	Petar Kokotovic	(US)
-	1993	Edward J. Davison	(CA)
-	1996	Alberto Isidori	(IT)
-	1999	Brian D.O. Anderson	(AU)
-	2002	Lennart Ljung	(SE)
-	2005	Tamer Başar	(US)
-	2008	Graham Goodwin	(AU)
-	2011	Hidenori Kimura	(JP)
-	2014	David Mayne	(UK)
-	2017	Roger Brockett	(US)
-	2020	W. Murray Wonham	(CA)

Nathaniel B. Nichols Medal (Chair: Maria Domenica Di Benedetto, IT)

The Nichols Medal recognizes outstanding contributions of an individual to design methods, software tools and instrumentation, or to significant projects resulting in major applications and advancement of control education. The spirit is captured by the name of Nathaniel Nichols, one of the pioneers of control engineering. The medal is awarded by the IFAC Council on the recommendation of a selection committee. A monetary prize is presented to the recipient together with the medal. Medal winners have been:

- 1996	Jürgen Ackermann	(DE)
- 1999	Gunter Stein	(US)

- 2002	Carl Nett	(US)
- 2005	William F. Powers	(US)
- 2008	Gerd Hirzinger	(DE)
- 2011	Siva Banda	(US)
- 2014	Reza Moheimani	(AU)
- 2017	Lennart Ljung	(SE)
- 2020	Masayoshi Tomizuka	(JP)

Manfred Thoma Medal (Chair: Anuradha Annaswamy, US)

The Manfred Thoma Medal, created in 2015, recognizes outstanding contributions of a young researcher and/or engineer under the age of 40 to the field of systems and control in its widest sense. It is named after Manfred Thoma, a leading contributor to the field of control and to IFAC, and supporter of the careers of many young scientists. The medal is awarded by the IFAC Council on the recommendation of a selection committee. A monetary prize is presented to the recipient together with the medal.

- 2017	Ming Cao	(NL)
- 2020	Florian Dörfler	(CH)

Industrial Achievement Award (Chair: Iven Mareels, AU)

This is an IFAC award to an individual, or a team of individuals, who has made a significant contribution to industrial applications of control. The award is given in technical fields covered by IFAC. The selection is based on industrial achievements measured in terms of:

- Inventions in the control area
- Engineering significance of products and projects
- Industrial leadership
- Promotion of control technology in industry
- Impact of patents
- International recognition

A monetary prize is presented to the winner or team of winners. Winners have been:

- 2002	Yasuo Ichii, Shoji Murayama, and Takahiro Yamasaki	
	(of the Kawasaki Steel Corporation)	(JP)
- 2005	Serge Boverie	(FR)
- 2008	not awarded	
- 2011	Anton van Zanten	(DE)
- 2014	Giovanni Cherubini, Jens Jelitto, Mark Lantz	, and Angeliki Pantazi
	(of IBM Zurich)	(CH)
- 2017	Francesco Borrelli, David Germann, Dejan K	(ihas, Daniel Pachner,
	Jaroslav Pekar, Greg Stewart	(US/CA/CZ)
	(Honeywell Int. Inc., University of California,	Berkley)
- 2020	Francis J. Doyle III (Harvard University)	(US)

High Impact Paper Award (Chair: Carlos Canudas De Wit, FR)

This IFAC Award was introduced in 2009 and first awarded in 2011. It acknowledges the impact of a paper published in any of the official IFAC journals on the broad areas of Automatic Control theory and application. A monetary prize is presented to the recipient together with a plaque.

Winners I	have	been:
- 201	1	

D.Q. Mayne	(UK)
J.B. Rawlings	(US)
C.V. Rao	(US)
P.O.M. Scokaert	(BE)
<u> </u>	

in recognition of the high impact of the paper entitled "Constrained Model Predictive Control: Stability and Optimality," *Automatica*, Vol. 36, pp. 789-814, 2000.

- 2014	Manfred Morari	(CH)
	Alberto Bemporad	(IT)

in recognition of the high impact of the paper entitled "Control of systems integrating logic, dynamics and constraints," *Automatica*, Vol. 35, No. 3, pp. 407-427, 1999.

- 2017 Franco Blanchini (IT) in recognition of the high impact of the paper entitled "Set Invariance in Control", published in the IFAC Journal *Automatica*, vol. 35, no. 11, 1999.

- 2020 Wilson J. Rugh and Jeff S. Shamma (US, SA)

in recognition of the high impact of the paper entitled "Research on gain scheduling", IFAC Journal *Automatica*, Vol. 36, pp. 1401-1425, 2000.

IFAC Fellows (Chair: Christos G. Cassandras, US)

This distinction was awarded for the first time at the 16th IFAC World Congress in Prague, Czech Republic in 2005. It consists of a lapel pin and a certificate and is given to individuals for outstanding and extraordinary individual contributions in the fields of interest of IFAC. The IFAC Fellow award provides a distinction of excellence in the Federation and is conferred by the IFAC Council based on the proposal of a Fellow Selection Committee, which is appointed by the President. The Fellow Selection Committee responds to nominations. At the meeting of the incoming Council in Milan in 2011, the decision was taken to change from an annual selection process to a triennial one.

The list of all Fellows elected so far can be obtained from the IFAC website at <u>https://www.ifac-control.org/awards/ifac-fellows</u>

IFAC Journal Awards

- Automatica Paper Prize Award
- Control Engineering Practice Paper Prize Award
- Engineering Applications in Artificial Intelligence Paper Prize Award
- Journal of Process Control Paper Prize Award
- Journal of Mechatronics Paper Prize Award
- Nonlinear Analysis: Hybrid Systems Paper Prize Award
- Annual Reviews in Control Paper Prize

The IFAC Journal Awards are given for outstanding papers published in the above IFAC journals. At each Triennial IFAC World Congress monetary prizes are presented to the authors of papers selected by the Journal Prize Awards Selection Committees. The prize funds are provided by the publisher of the IFAC Journals, Elsevier Ltd.

IFAC Congress Applications Paper Prize (Chair: Jay H. Lee, KR)

This prize is awarded at each IFAC World Congress for the best Applications Paper.

IFAC Congress Young Author Prize (Chair: Li Qiu, HK/CN)

This prize is awarded at each IFAC World Congress for the best paper of an author (authors) younger than 35 years of age.

IFAC Congress Interactive Paper Prize (Chair: Mario Sznaier, US)

This prize is awarded at each IFAC World Congress for the best interactive (or poster) paper.

Candidates for all of the above-mentioned prizes are nominated by a selection committee appointed by the Council. The prizes consist of a monetary prize and a certificate. The prize funds are provided by IFAC.

A list of prize winners for all awards is available on the IFAC website at <u>https://www.ifac-control.org/awards</u>

Harold Chestnut Control Engineering Textbook Prize

This 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.

The funds for this prize were donated by the family of Harold Chestnut, IFAC's first president.

IFAC Outstanding Service Award

This award is presented to IFAC officials who have served and contributed substantially to IFAC in various capacities, according to criteria set by the Council. The award consists of a certificate and a lapel pin and is presented to the candidates on the occasion of the World Congress.

7. NATIONAL MEMBER ORGANIZATIONS

AUSTRALIA The Institution of Engineers, Australia	AU	
Att: Att. Prof. Victor Sreeram http://www.engineersaustralia.org.au/	victor.sreeram@uwa.edu.au	
AUSTRIA	AT	
Oest. Ges. f. Automatisierung & Robotertechn Att: Prof. Peter Kopacek <u>http://www.ifac-austria.at/</u>	ik - OeGART <u>kopacek@ihrt.tuwien.ac.at</u>	
AZERBAIJAN	AZ	
Azerbaijan Robotics and Automation Society (Att. Dr. techn. Bahadur Ibrahimov	(ARAS) aras.azerbaijan@gmail.com	
BELGIUM	BE	
DYSCO, IC TEAM/INMA Att: Denis Dochain <u>https://sites.uclouvain.be/dysco/</u>	denis.dochain@uclouvain.be	
BRAZIL	BR	
Sociedade Brasileira de Automatica, SBA Att: President Prof. Vilma Alves de Oliveira <u>http://www.sba.org.br/</u>	voliveira@usp.br	
BULGARIA	BG	
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KoREMA Att: Prof. Zeljko Jakopovic <u>http://www.korema.hr/</u>	<u>zeljko.jakopovic@fer.hr</u>	
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SWEDEN Kommiten Svenska IFAC Att: Prof. Bo Wahlberg	<u>bo@kth.se</u>	SE
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UNITED STATES OF AMERICA American Automatic Control Council - AACC Att: Prof. Wayne Bequette <u>bequette@rpi.edu</u> <u>http://a2c2.org/</u>	US

For current mailing addresses and possible changes over the course of the triennium, consult the IFAC website at: <u>https://www.ifac-control.org/structure/nmo</u>

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Mechatronics Journal	Andreas Kugi	AT
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