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IFAC Journal *Annual Reviews in Control*: Open to Spontaneous Submissions

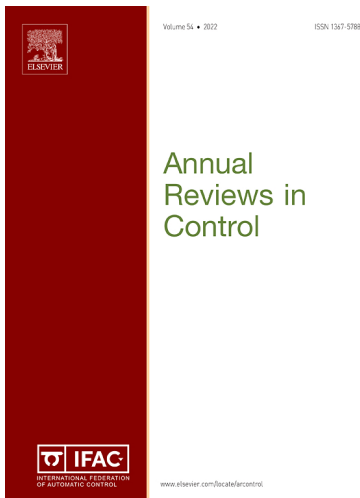
The aim of the IFAC Journal *Annual Reviews in Control* (ARC) is to provide comprehensive and visionary views of the field of Systems and Control which underpins both economic developments and future societal needs. ARC publishes details of methodological and technical approaches which enhance understanding of the dynamics of computers, software, networks, physical, chemical and biological processes and human in the loop, or any combinations of these.

Special Sections on hot topics are also encouraged. An ARC Special Section contains five to eight papers, plus a short editorial. Most of the papers of an ARC Special Section must follow the usual ARC paper types. However, a Special Section may contain also a few (one or two) technical papers with new results provided that these techniques show potential great interest for future research developments on the topic of the Special Section.

The 2022 Impact Factor of ARC is 10.699, ranking it 5 out of 65 in the Automation & Control Systems category. ARC potential contributors can be solicited by Editorial Board members. Spontaneous submissions are also most welcome, provided that they belong to the above scope. Special Section proposals are also most welcome. The Special Section proposals (title, scientific motivation, list of potential authors) must be sent to the ARC EIC for assessment by the Editorial Board.

The ARC Editorial Board looks forward to receiving your contribution or your Special Section proposal!

Submitted by: Françoise Lamnabhi-Lagarrigue (FR), ARC Editor-in-Chief



ARC publishes the following types of articles:

- Survey Article: Review papers on main methodologies or technical advances adding considerable technical value to the state of the art. Note that papers which purely rely on mechanistic searches and lack comprehensive analysis providing a clear contribution to the field will be rejected.
 - Vision Article: Cutting-edge and emerging topics with visionary perspective on the future of the field or how it will bridge multiple disciplines,
- and
- Tutorial research Article: Comprehensive conceptual approaches for projective studies.

A combination of Survey/Vision type paper is also very relevant.

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Calendar of IFAC Conferences

The IFAC Journals

Automatica
www.journals.elsevier.com/automatica

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

Engineering Applications of Artificial Intelligence
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Journal of Process Control
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Nonlinear Analysis: Hybrid Systems
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IFAC Journal of Systems & Control
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Transition: IFAC Advisor Mohamed Mansour

Mohamed Mansour: 1928—2022



Mohamed Mansour, a stalwart of IFAC, recently passed away. His association with IFAC began as early as 1963, when the second IFAC Congress was held in Basel, Switzerland and he assisted in the organization. His then doctoral supervisor at ETH Zurich, Professor Eduard Gerecke, was at that time the IFAC President (1960-63). In the later part of his career, he was vice chair of the Technical Committee on Education from 1978 to 1981, IFAC Treasurer from 1981 to 1993, and then he became a Lifetime IFAC Advisor.

Mohamed was born in Egypt and undertook undergraduate and Masters studies there. He moved to the ETH in 1962 to study under Gerecke, completing his PhD in 1965. It was an exceptional PhD and led to his being awarded the silver medal of the ETH. Following a short period at ETH as a senior assistant and lecturer, he became an assistant professor in Queens University in Ontario, Canada. However, only three years after completing his doctorate, he was offered the position of Professor at the ETH in the Institute for Automatic Control, becoming a successor of Gerecke in accepting the position. Here he remained for the remainder of his career until his retirement in 1993, apart from extended stays in other laboratories, including IBM Research, UC Berkeley, University of Illinois, and Australian National University. He received a number of awards, among them honorary degrees, and was a member of the Third World Academy of Sciences. In this capacity he was also a delegate to the United Nations.

Mohamed's contributions to Automatic Control principally had to do with theory, and especially questions of stability. Work at the ETH in the late 19th century in fact constituted a pointer to his own work starting a century or so later; at the time, an engineering professor Aurel Stodola became involved in handling a stability problem associated with the operation of water turbines at Davos. Stodola cast the problem in mathematical terms, and turned to a mathematics colleague, Adolf Hurwitz, for its resolution. The resulting theory, which had wide applicability far beyond its relevance just to water turbine control, allowed verification by hand calculation of the stability properties of a polynomial, well before computers had ever become available. When computers did indeed become available, and digital control and associated stability questions started to occupy

control engineers' attention, much of Mohamed's work was concerned with developing similar sorts of algorithms (i.e. checks executable without computer assistance for root finding or like purposes) for stability verification, but more often in a discrete-time context. Some of this was undertaken with Eli Jury. The author of this obituary also had the great fortune to work with Mohamed on some of these problems, including developments of ideas initially spawned by Kharitonov, for handling questions of robust stability (where stability needs to be established for a range of values of a physical parameter or parameters appearing in a model of a system, with this sometimes being achievable by looking at just the extreme parameter values).

In retirement, Mohamed's research contributions slowed down. However, always intellectually adventurous, he invested great effort in pursuing questions in the theory of numbers, in particular Goldbach's conjecture, which states that every even integer greater than 2 has to be the sum of two prime numbers.

Of course, Mohamed was also a teacher, and a revered one among his students. As one of his former PhD students put it, each doctoral student was assigned a small garden, a sort of allotment, which he or she should cultivate to grow their intellectual contribution. The contribution could be useful; it could be aesthetic. That did not matter. But it did have to be well done. Mohamed provided the water and the fertilizer, and if necessary, particular tools. He stood always ready to help find the way, but only to help: the student had to be the one to actually find the way. At the same time, Mohamed provided ample funding (including funding to make new professional contacts). Through this approach, students learnt to use their own initiative, and to take responsibility for what they did.

Though Mohamed was never my doctoral supervisor, my career was influenced by him to a similar degree as the careers of his students. We first met, through a mutual acquaintance Professor Eli Jury of the University of California, Berkeley in the 1970s, and the three of us completed one paper round that time. But starting around 1985, I made a number of longer visits to ETH and worked with Mohamed and his students. All in all, there resulted about 30 joint publications. Having predominantly spent

From the IFAC President

Dear IFAC Friends and Colleagues,

Preparations are in full force to gather the IFAC community for the first in-person triennial IFAC World Congress since the start of the pandemic. We hope to see many of you in July 2023 at the Pacifico Yokohama in Japan!

The number of submissions is at around 2700 papers which includes regular papers, demonstrator papers, invited session papers and open invited track papers. The latter were submitted respectively for being included in the about 45 invited session and 80 open invited track proposals. More submissions in the discussion contribution category are expected by February. Comparison in terms of numbers with previous IFAC World Congresses is not particularly relevant due to the pandemic and its related effects, and also due to the raising legitimate sustainability considerations. Nonetheless, the organizers and myself are very glad that the IFAC World Congress remains the major event for the control community.

To honor this special relationship between the IFAC and the control community a variety of special events and sessions are in the congress plan. These include sessions organized by the IFAC Industry Committee (chaired by Tariq Samad) and the IFAC WC 2023 Industry Group (chaired by Kazuya Asano). Many Japanese companies will be active program participants in this Congress. Strong connections to the robotics community have been established, which helps with the planned robotics competitions such as drones crossing Tokyo Bay and robots helping in convenience stores. The IFAC Control Orchestra (which was new in 2020 and conducted by Jochen M. Rieber) is already attracting many musically-talented members of the IFAC community to take part in its second concert (the first to take place in-person), which is currently scheduled to be performed at the Closing Ceremony. If you didn't catch the orchestra's 2020 performance you can view the video at: www.ifac-control.org/about/ifac-control-orchestra.

More information about the IFAC World Congress 2023 is and will be uploaded to the dedicated webpage: www.ifac2023.org. Please check back often for updates and to plan your visit to IFAC 2023 in Japan!

As 2022 draws to a close, I would like to thank each one of you for being part of IFAC. Whether you are an IFAC official, IFAC conference attendee, TC member, affiliate/reader of this Newsletter, etc., or whether you have been part of IFAC for many years or are newer to its activities, your contributions to this community are invaluable. IFAC works due to the efforts of its many volunteers and National Member Organizations around the world and thus would be nothing without its people. I would like to extend my best wishes for peace, health and harmony to each and every one of you for this holiday season and into 2023 and beyond.

Best regards,

Hajime Asama
IFAC President 2020- 2023

The IFAC Conference App is now available!

The App is paid for by IFAC and can be used free of charge by IFAC conference organizers and attendees. Many IFAC conferences are to be included soon!

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my career in USA and Australia, these visits, quite apart from the actual research content, and the environment Mohamed exposed me to, gave me a much wider perspective on our profession. He also visited the Australian National University more than once as part of our collaboration.

Understandably over such a long collaboration, and also within the framework of IFAC Council and Officers meetings where our terms as officers overlapped by nine years, we developed bonds of personal friendship, initially between each other, but spreading to our families. My youngest daughter used to call him 'grandpa', as a sort of honorary title. On one of the visits of Mohamed and his wife to Australia, we were spending a weekend at a beach house, and Mohamed and I went for a stroll on the beach to discuss a technical problem. There, we had a great idea. We sketched it with a stick in the sand, to check its accuracy. And it did indeed translate into a paper. It is a source of regret that we had no photograph to capture the original record, no doubt destroyed not long after by wind and waves.



Mohamed Mansour and his wife Zeinab Mansour with Brian D.O. Anderson and his wife Dianne Anderson at IFAC 50 celebrations in Heidelberg, DE

While Mohamed's activities as a control engineering professor were central to his career, there were other sides to his life which were unusual. By way of two examples, he was keenly interested in languages, and besides knowing a number of western European languages, taught himself, admittedly to a limited degree, elements of Chinese, Japanese and Estonian. He would strike up a conversation with strangers in a particular country, and use the conversation to absorb bits and pieces about the culture and the language. In another direction, he developed a friendship with a famous Swiss theologian, Hans Küng, to the point where they participated in one or more TV programs discussing the common features of the world's religions.

The world being what it is, nasty things at times can happen to nice people, and Mohamed was no exception. But everyone who knew Mohamed recalls him as one of the most cheery of men, always ready with a smile, if not a joke, and a word of encouragement. In one sentence, he was a lovely person. While we mourn his loss to our community, we remember him too as one of its longest serving and most positive contributors.

Submitted by: Brian D.O. Anderson (AU),
IFAC President 1990-93/IFAC Advisor

Introducing the 2020-2023 IFAC Major Award & Medal Winners

This is the second and final installment in a series in which Newsletter readers can learn about the winners of the 2020-2023 IFAC Major Awards and Medals.

Quazza Medal: A. Stephen Morse



A. Stephen Morse was born in Mt. Vernon, New York (US). He received a BSEE degree from Cornell University, a MS degree from the University of Arizona, and a Ph.D. degree from Purdue University. From 1967 to 1970 he was associated with the Office of Control Theory and Application {OCTA} at the NASA Electronics Research Center in Cambridge, Mass. Since 1970 he has been with Yale University where he is presently the Dudley Professor of Engineering. His main interest is in system theory and he has done research in network synthesis, optimal control, multivariable control, adaptive control, urban transportation, vision-based control, hybrid and nonlinear systems, sensor networks, and coordination and control of large groupings of mobile autonomous agents.

As an early advocate of the use of the use of operational amplifiers in active network theory, in 1964 Morse devised one of the first gyrator realizations using operational amplifiers. In the late 1960s he worked with Murray Wonham at the NASA Electronics Research Center on the development of the geometric theory of linear systems. Upon arriving at Yale in 1970, he and J. P. Corfmat used linear geometric control concepts to derive a pole-placement solution to the classical decentralized control problem. Later in the same decade he and Arie Feuer used a construction which later became known as back-stepping to solve the classical model reference adaptive control problem. The back-stepping idea was formalized and extended some years later by Ionnais Kanellakopoulos, Petar Kokotovic and Morse in an effort to resolve a range of problems in nonlinear control. Steve Morse spent a number of years collaborating with Joao Hespanha and Daniel Liberzon on various problems concerned with switching and logic in linear system theory. Morse's early research on the flocking problem with Jie Lin and Ali Jadbabaie drew widespread attention and helped jump-start research on distributed estimation and control. Over the years Steve Morse has collaborated with Brian Anderson on a broad range of problems in the areas of linear feedback control, decentralized

control, multiple model adaptive control, network localization, formation control, and distributed state estimation.

Morse is a Fellow of the IEEE, an IFAC Fellow, a Distinguished Lecturer of the IEEE Control System Society, and a co-recipient of the Society's 1993 and 2005 George S. Axelby Outstanding Paper Awards. He has twice received the American Automatic Control Council's Best Paper Award and is a co-recipient of the Automatica Theory/Methodology Prize. He is the 1999 recipient of the IEEE Technical Field Award for Control Systems. He is the 2013 recipient of the American Automatic Control Council's Richard E. Bellman Control Heritage Award. He is a member of the National Academy of Engineering and the Connecticut Academy of Science and Engineering.

High Impact Paper Award: Mayuresh V. Kothare



Mayuresh V. Kothare is the R. L. McCann Professor in the Department of Chemical and Biomolecular Engineering at Lehigh University in Bethlehem, Pennsylvania (US) and also holds a courtesy appointment in the Department of Electrical and Computer Engineering, an affiliate appointment in the Department of Bioengineering and is an affiliated faculty member in Lehigh's newly established College of Health. He recently completed a nine year term as Chairman of the Department of Chemical and Biomolecular Engineering at Lehigh.

He received his B.Tech. in Chemical Engineering from the Indian Institute of Technology, Bombay (1991) and MS/PhD degrees in Chemical Engineering from the California Institute of Technology (1995 and 1997). He has held a postdoctoral position at Mobil Oil Corporation and various visiting positions at Johns Hopkins School of Medicine; City College New York; Purdue University; ETH Zurich and East China U. of Science and Technology. His interdisciplinary areas of interest span the problems of constrained and optimal predictive control theory, robustness analysis, control of microsystems, embedded control of biomedical systems, neuroengineering and closed-loop neurostimulation systems.

M. Kothare is a recipient of the Institute Silver Medal from IIT Bombay for ranking first in Chemical Engineering, the Ted Peterson Student Paper Award (2000) and the Outstanding Young Researcher Award (2007) (under 40 years) from the Computing and Systems Technology division of the AIChE for his contributions to the literature of computing in engineering. He has received the US National Science Foundation CAREER award (2002),

the Robinson award and the Rossin and Hook Professorships at Lehigh University. He was a selected attendee (one of 82 engineers, ages 30-45 years) at the 2008 Frontiers of Engineering symposium of the US National Academy of Engineering. In 2016, he was listed in the most-cited researchers in the Shanghai Global Ranking (electrical engineering subgroup). In 2020, he received the Distinguished Alumnus Award from IIT Bombay.

M. Kothare's interdisciplinary service activities have involved associate editor appointments with the IFAC journal *Automatica*, the *IEEE Transactions on Automatic Control*, *IEEE Transactions on Systems, Man and Cybernetics: Systems* as well as guest editorial appointments for IFAC's *Journal of Process Control* and the IFAC sponsored conference DYCOPS in 2010. From 2011-2015 he was Deputy Editor-in-Chief of IFAC PapersOnLine. In 2012, Kothare served as Chair of the CAST division of the AIChE. Kothare is a fellow of IEEE and AIChE.

In 2021, Kothare co-founded Omnilife Systems, a start-up company based in India focused on developing medical oxygen concentrators for the Indian market based on a patented technology that his group has developed at Lehigh. Kothare holds six US patents.

High Impact Paper Award: Venkataramanan "Ragu" Balakrishnan



Venkataramanan "Ragu" Balakrishnan, the Charles H. Phipps Dean of the Case School of Engineering, received his B.Tech degree in electronics and communication engineering and the President of India Gold Medal from The Indian Institute of Technology, Madras, India in 1985, graduating at the top of the university. He received an MS degree in statistics in 1992, and MS and PhD degrees in electrical engineering, in 1989 and 1992 respectively, all from Stanford University. Following post-doctoral stints at Stanford, Caltech and the University of Maryland, he joined the faculty of the School of Electrical and Computer Engineering (ECE) at Purdue University (West Lafayette, Ind.) in 1994, where he last served as the Michael and Katherine Birck Head of ECE and professor. Prior to assuming the leadership of ECE, he served in a variety of leadership positions at Purdue, most notably as associate dean of research of the College of Engineering. He was appointed dean of the Case School of Engineering at Case Western Reserve University in September 2018.

Balakrishnan is also a professor in the Department of Electrical, Computer and Systems

Engineering; his research interests are primarily in the areas of control, and the application of convex optimization to problems from systems, control, robotics, communication and signal processing. He is a coauthor of the research monograph *Linear Matrix Inequalities in System and Control Theory*, SIAM, 1994. Balakrishnan has held several volunteer and leadership positions in the systems and control community, including editorial positions at the *IEEE Transactions on Automatic Control* and the *SIAM Journal on Control and Optimization*. He was appointed to the IEEE Control Systems Society Board of Governors for 2014, served on the IEEE CSS Executive Committee as the Director of Operations during 2016-18, and served as an elected member of the CSS Board of Governors during 2019-21.

V. Balakrishnan received an Office of Naval Research Young Investigator Award (ONR-YI) in 1997. From the School of Electrical and Computer Engineering at Purdue, he received the Ruth and Joel Spira Outstanding Teacher Award in 1997, and the Honeywell Award for excellence in teaching in 2001. He was named a Purdue University Scholar in 2008. Balakrishnan is a Fellow of the IEEE.

High Impact Paper Award: Manfred Morari



Manfred Morari has been the Peter & Susanne Armstrong Faculty Fellow in the Dept. of Electrical and Systems Engineering at the University of Pennsylvania (US) since 2016. In 1994 he was appointed Professor at ETH Zurich (CH) and head of the Automatic Control Laboratory. From 2009-2012 he was the Head of the Department of Information Technology and Electrical Engineering at ETH.

M. Morari was born in Graz, Austria. He earned a Diploma in chemical engineering from the ETH Zurich. Upon completing his Ph.D. in chemical engineering at the University of Minnesota, he became a professor at the University of Wisconsin in Madison. In 1983, Morari joined the Chemical Engineering Department at the California Institute of Technology (Caltech). During his 11-year tenure at Caltech he was named Ross McCollum-William H. Corcoran Professor, headed the Department of Chemical Engineering as Executive Officer, and co-founded the Department of Control and Dynamical Systems.

M. Morari's recent research has focused on the predictive control of linear and switched dynamical systems ("hybrid systems") and the application to problems in the automotive, power electronics, building energy management and biomedical domains.

M. Morari's more than 85 former PhD students and about 30 former Postdocs hold positions of high responsibility in academia and industry all over the world.

M. Morari's research is internationally recognized. The analysis techniques and software developed in his group are used in universities and industry throughout the world. He has received numerous awards, including the Eckman Award, Ragazzini Award and Bellman Control Heritage Award from the American Automatic Control Council; the Colburn Award, Professional Progress Award and CAST Division Award from the American Institute of Chemical Engineers; the Control Systems Award and the Bode Lecture Prize from IEEE; the Nyquist Lectureship Award and the Rufus Oldenburger Medal from ASME; and the IFAC High Impact Paper Award. He is a Fellow of IEEE, AIChE and IFAC. In 1993 he was elected to the U.S. National Academy of Engineering and in 2015 he became an International Fellow of the Royal Academy of Engineering (U.K.).

Introducing the 2020-2023 IFAC Fellows

This is the second in a series in which Newsletter readers can learn more about the 25 new 2020-2023 IFAC Fellows.

Nina Thornhill



Nina Thornhill is Emeritus Professor of Process Automation at Imperial College London (UK). She graduated in physics from the University of Oxford in 1976 and joined ICI working on research and development of polyester film and other products. She returned to studies in 1982 with an MSc in Control Systems from Imperial College. After a short time working on satellite control systems with British Aerospace she became a lecturer in the Department of Electronic and Electrical Engineering at University College London. She gained her PhD through part-time study while at UCL. In 2007, she moved to Imperial College to take up the ABB/Royal Academy of Engineering Chair of Process Automation in the Centre for Process Systems Engineering. She retired from academic life in 2021 and is now employed with Seeq Corporation in the Applied Machine Learning group.

N. Thornhill's research mission is to find ways to maintain and improve the condition and operation of processes in oil and gas, refining, chemicals and electricity supply through data analytics and machine learning. She and her

students have created algorithms that are now widely used in industry, for example for the detection and diagnosis of the root causes of upsets and disturbances. Nina was the recipient of the 2019 Nordic Process Control award in recognition of this work.

N. Thornhill is a Fellow of the Royal Academy of Engineering, Fellow of IET, Fellow of IChemE, and a Senior Member of IEEE. She is the author and co-author of many papers and several books. Papers co-authored with University of Alberta and with Imperial College colleagues won Journal of Process Control Best Paper Award in the category "methodology/theory" for the period 2002 to 2005, and the 2018 IEEE Power & Energy Society (PES) Prize Paper Award.

Minyue Fu



Minyue Fu received his Bachelor's degree in Electrical Engineering from the University of Science and Technology of China, Hefei, China, in 1982, and Master and Ph.D. degrees in Electrical Engineering from the University of Wisconsin-Madison, USA in 1983 and 1987, respectively. From 1987 to 1989, he served as an Assistant Professor in the Department of Electrical and Computer Engineering, Wayne State University, USA. He joined the University of Newcastle, Australia, in 1989 and became a Chair Professor in Electrical Engineering in 2003.

M. Fu's current research interests include networked control systems, distributed estimation and control, high-precision control, and reinforcement learning. He has been an Associate Editor for the IEEE Transactions on Automatic Control, IEEE Transactions on Signal Processing, Automatica, Unmanned Systems, and Journal of Optimization and Engineering. He is a Fellow of IEEE, Fellow of IFAC, Fellow of Engineers Australia, and Fellow of Chinese Association of Automation.

Fernando Paganini



Fernando Paganini received degrees in both Electrical Engineering and Mathematics from Universidad de la República, Uruguay (1990),

and his MS (1992) and PhD (1996) degrees in Electrical Engineering from the California Institute of Technology, Pasadena, CA, USA. Between 1996 and 1997 he was a postdoctoral associate at MIT. Between 1997 and 2005 he was on the faculty of the Electrical Engineering Department at the University of California, Los Angeles, reaching the rank of Associate Professor. Since 2005 he is Professor of Engineering at Universidad ORT Uruguay, and since 2019 Associate Dean of Research.

F. Paganini has received the 1995 O. Hugo Schuck Best Paper Award, the 1999 Packard Fellowship, and the 2004 George S. Axelby Best Paper Award. He is a member of the Uruguayan National Academies, both of Sciences and of Engineering, and a member of the Latin American Academy of Sciences. He is a Fellow of the IEEE, and has served in Editorial boards of IEEE journals in his fields of interest: control and networks. Between 2020 and 2021 he acted as one of the three coordinators of the Honorary Scientific Advisory Group advising the Uruguayan government on the Covid-19 pandemic; for this contribution he was awarded the Presidency of the Republic Award in 2021.

Kirsten A. Morris



Kirsten Morris' research interests are control and estimation of systems modelled by partial differential equations and also systems, such as smart materials, involving hysteresis. Her recent research has focused on improving performance through attention to actuator location as part of controller design, and sensor location as part of estimator design. She has written several books "Controller Design for Distributed Parameter Systems" and "Introduction to Feedback Control", and was editor of the book "Control of Flexible Structures".

K. Morris is a professor in the Applied Mathematics Department at the University of Waterloo (CA) and a Faculty of Mathematics Research Chair. She has held visiting positions at ICASE (NASA Langley), the Fields Institute, the Institute for Mathematics & Applications, and the Institut de Mathematiques in Bordeaux. Prof. Morris served as a vice-president of the IEEE Control System Society from 2013-2016, vice-chair of the SIAM Control & Systems Theory group 2016-2017 and chair 2018-2019.

She was an associate editor with the IEEE Transactions on Automatic Control and is currently an associate editor for SIAM Journal on Control & Optimization; associate editor for Asian Journal of Control; honorary editor for Mathematics of Control, Signals & Systems; and a member of the editorial board of the

SIAM book series Advances in Design & Control. Prof. Morris is a Fellow of IEEE and SIAM and a recipient of the CSS Distinguished Member Award.

Bart De Moor



Bart De Moor (born in 1960) obtained his electrical engineering degree (1983) and his PhD (1988), both from the KU Leuven, Belgium, in systems and control theory. He was a research associate at Stanford University (1988-1989) and is now a full Professor at the Department of Electrical Engineering of KU Leuven, Belgium.

His fields of research are in mathematical engineering, including numerical linear algebra and algebraic geometry, system theory and control, numerical optimization, machine learning and data science, with many projects in industry and biomedicine. He has been guiding more than 85 PhD students and co-authored more than 400 scientific papers and 11 books. He is an ERC Advanced Grant holder.

B. De Moor's scientific work was recognized with many international awards (including fellowships of IEEE, SIAM, IFAC) and led to the creation of 10 spin-off companies (5 in Health 2.0, 5 in Industry 4.0). An elected member of the Royal Academy since 2004, in 2010 he received the Science Excellence Award from King Albert II of Belgium and in 2020 was nominated a Commander in the Order of Leopold I, by King Filip I. He served three times (1991-1992, 1994-1999, 2006-2008) as head of cabinet of ministers of Science and Socio-Economic Policy in Belgium/Flanders and acted as a vice-rector of International Policy of his university KU Leuven (2009-2012).

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B. De Moor has been serving as chair or member in numerous international scientific boards, funding agencies and science policy assessment committees, in Flanders, Finland, Sweden, Denmark, Ireland, the Netherlands, Italy, Serbia, Slovakia. He was a committee member with the European Research Council, and member of ESGAB (the European Statistics Governance Advisory Board). In Flanders, he was/is member in or chair of several scientific institutes, including the Flanders Biotech Institute (VIB) and science funding agencies. Since 2019, he is one of the architects and coordinators of the large Flanders AI program that involves all 5 universities and 4 strategic research institutes in Flanders.

B. De Moor is the chairman of the Capricorn Digital Growth Fund (venture capital) since 2018, of Health-House (a high-tech biomedicine science outreach centre) since 2015, of the Alamire Foundation (digital humanities, polyphonic music) since 2016 and co-founded Technopolis (children's science centre) in 1999.

14th IFAC Conference on Control Applications in Marine Systems, Robotics, and Vehicles (CAMS 2022)

14-16 September 2022
Kongens Lyngby, DK

The 14th IFAC Conference on Control Applications in Marine Systems, Robotics, and Vehicles was held in Kongens Lyngby, Denmark from 14-16 September 2022. The conference was hosted within the premises of the Technical University of Denmark, located 15 km north of Copenhagen, the Danish capital. CAMS 22 provided the first opportunity for the IFAC community on marine systems to meet again in person. The response has been overwhelming, with more than 100 participants from all over the world joining the event.

Perspective contributors submitted 92 research manuscripts for evaluation, and 79 high-quality scientific papers were accepted and presented over the three days of the conference. The technical program was reach and diverse including four plenary talks, six invited sessions, nine regular sessions, and two industrial sessions. All accepted papers will be published in IFAC-PapersOnLine.

IFAC CAMS is the annual event sponsored by the IFAC Technical Committee on Marine Systems (TC 7.2) bringing together scientists and industrial practitioners to discuss the technological advances in the areas of marine control, marine robotics, autonomous marine systems, and marine automation. IFAC CAMS has a long history started in 1989 in Kongens Lyngby (DK) and continued through a series of successful events hosted in Europe (Italy, Norway, Croatia, Germany, and the UK) and in the Far East (Japan and South Korea).

The 14th edition of IFAC CAMS aimed to provide a forum for the international academic and industrial community researching on marine control, automation and robotics to stimulate the much-needed discussion around both the pressing challenges of Decarbonization and the consolidating opportunities of Autonomy at Sea. The four plenary talks provided inspiring views from both academia and industry on these matters, discussing the needed socio-economic and technological frameworks to pursue the sustainable transformation of the marine and maritime industries. The four plenary lectures were: "Surface Ship Autonomy Coming of Age" by Mogens Blanke, professor at the Technical University of Denmark; "The Adaptation of Maritime Autonomy" by Margareta Holtensdotter Lützhöft, professor at Western Norway University of Applied Sciences; "Strategizing the Path to Zero" by Claus Winter Graugaard, Head of Onboard Vessel Solutions at the Mærsk Mc Kinney Møller Center for Zero Carbon Shipping; "Marine Surface and Aerial Robots: Past, Present and Future" by Stephanie Kemna, Research Manager at Maritime Robotics.



Stephanie Kemna presenting a industrial session at CAMS 22

The conference program featured an industrial day on September 15, where the stage was offered to Danish and international companies to inform about the industrial efforts in the areas of Decarbonization and Autonomous Marine Operations. The two high-profile industrial plenary lectures by Claus W. Graugaard and Stephanie Kemna led the industry-academia debate into the two industrial sessions "Technologies, Operations and Business Models for Zero Carbon Shipping" and "Autonomous Marine Robotics: Industrial State-Of-The-Art and Beyond". IFAC CAMS 2022 also introduced the Industry Talks submission format to further facilitate participation from industry. Although only two contributions were submitted and accepted for presentation, we see this format as a promising instrument to strengthen and increase industrial participation in future IFAC CAMS events. IFAC CAMS 2022 hosted 15 industrial presentations, and the NOC is thankful to all industrial speakers for their contributions.

The closing session of the conference hosted the award ceremony to honor the IFAC Young Author Award and IFAC CAMS 2022 Best Paper Award. PhD student Markus H. Iversflaten

from the Norwegian University of Science and Technology was the recipient of the IFAC Young Author Award for the paper entitled "Kinematic and Dynamic Control of Cooperating Underwater Vehicle-Manipulator Systems" co-authored with fellow PhD student Aurora Haraldsen and Prof. Kristin Y. Pettersen. The IFAC CAMS 22 Best Paper Award was presented to the paper "Dynamic Analysis and Performance Assessment of the Inertial Sea Wave Energy Converter (ISWEC) Device Via Harmonic Balance" by Fabio Carapellese, Edoardo Pasta, Nicolás Faedo, and Giuseppe Giorgi.

The NOC and the IPC chairs would like to extend their gratitude to the NOC and IPC members for their instrumental support in the organization of the conference, and to all conference delegates who contributed to make IFAC CAMS 22 a memorable event. See you at IFAC CAMS 2024!

Submitted by Roberto Galeazzi (DK), CAMS 22 NOC Chair

10th IFAC Symposium on Robust Control Design (ROCOND 2022)

30 August- 2 September 2022
Kyoto, JP (online)

The 10th IFAC Symposium on Robust Control Design (ROCOND 22) was held online from Kyoto, Japan. ROCOND is the main event sponsored by IFAC Technical Committee (TC) 2.5 - Robust Control, chaired by Mario Sznajier. Previous ROCONDs were held in Rio de Janeiro (1994), Budapest (1997), Prague (2000), Milan (2003), Toulouse (2006), Haifa (2009), Aalborg (2012), Bratislava (2015) and Florianopolis (2018). ROCOND 22 celebrated its 10th event. ROCOND 22 was going to be held in Kyoto, Japan, and be the first ROCOND held in Asia. However, the organizing committee made a decision to turn ROCOND 22 into an online symposium in view of international circumstances at that time.

ROCOND 22 was technically co-sponsored by the Society of Instruments and Control Engineers (SICE) and Japan Association of Automatic Control (JAAC), and supported by the Kyoto University Foundation and AISIN Corporation. Co-Sponsoring IFAC TCs include TC 1.1 - Modelling, Identification and Signal Processing, TC 1.2 - Adaptive and Learning Systems, TC 1.4 - Stochastic Systems, TC 1.5 - Networked Systems, TC 2.1 - Control Design, and TC 2.4 - Optimal Control.

In total, ROCOND 22 received 93 contributions, with authors from 26 different countries. Among submissions, 54 were contributed papers, 14 were invited track papers, ten were discussion contributions (six of which for invited tracks) and six were dissemination contributions. The remaining contribution items were related to the plenaries and the invited track proposals. Globally the number of submissions was less than initially expected based on the

good tradition of ROCOND Symposia but was fair enough considering the pandemic situation.



**Due to pandemic circumstances
ROCOND 22 took place online**

All the contributed and invited papers went through the rigorous review process managed by the program committee, and 52 regular and invited papers were accepted for being included in the program, which corresponds to an acceptance rate of 76%. 6 were withdrawn from the program by the authors. In addition, all submitted discussion and dissemination contributions were accepted in the program, all of which being fully in the scope of the symposium.

The program was structured in four parallel tracks each of which was composed of three sessions (one per day) with six presentations. 3 invited sessions were organized based on the submitted Open Invited Tracks:

- “Robust Methods in Aerospace: Applications and Academia-Industry Collaborations”
- “Advances in Automotive Control”
- “Recent Developments in Measurement and Control Applications for Agriculture and Forestry”

High quality plenary sessions contributed as well to strengthen this technical program. These presentations given by Giulia Giordano (University of Trento), Bénédicte Girouart (European Space Agency), Laurent Lessard (North-eastern University), Anders Rantzer (Lund University), and Toshiharu Sugie (Kyoto University) covered various aspects of robustness in control and had both a theoretical flavor and concrete implications in control applications.

The number of registrants, inclusive of invited plenary lecturers, was 126. All the plenary lectures were given live, each of which more than half of registrants attended in real time. For most contributions, live presentations were given. Pre-recorded videos were occasionally used, mainly due to unstable network connec-

tions. The Q&A part after each presentation had at least one of the authors for almost all the contributions and was very active even compared to face-to-face events!

The IFAC Young Author Award for the best paper of an author less than 30 years old at the time of the event was awarded at the closing ceremony. The IFAC Young Author Award Selection Committee, composed of Mirko Fiacchini, Yasumasa Fujisaki (Chair), Tobias Holicki, Masaaki Naga-hara, and Yasuaki Oishi, determined a shortlist of finalists from eight nominations, based on the gathered reviews and on their own reading of the papers:

- Samer Alsamadi for the paper Anti-Windup-Like Compensator Synthesis for Discrete-Time Quantized Control Systems by Samer Alsamadi, Francesco Ferrante, and Sophie Tarbouriech
- Jared Miller for the paper Facial Input Decompositions for Robust Peak Estimation under Polyhedral Uncertainty by Jared Miller and Mario Sznaiar
- Yanling Ding for the paper Bode Integral: A Unifier of Control-Relevant Integral Relations by Yanling Ding, Hui Peng, Junqi Ma, Shinji Hara, and Jie Chen
- Benjamin Voss for the paper Comparison of Fractional-Order and Integer-Order H-Infinity Control of a Non-Collocated Two-Mass Oscillator by Benjamin Voss, Michael Ruderman, Christoph Weise, and Johann Reger

Based on both the written paper and the oral presentation that was given by the nominee, a winner was selected: Jared Miller for the paper Facial Input Decompositions for Robust Peak Estimation under Polyhedral Uncertainty, authored by Jared Miller and Mario Sznaiar.

Last but not least, we express our gratitude to all the National Organizing Committee members and all the International Program Committee members, including the super helpful anonymous reviewers. Their extremely valuable voluntary work enabled ROCOND 22 to be a technically smooth and scientifically brilliant event.

Our thanks also go to all the authors, for their initial written contributions of course, but also for their presentations. We hope that the absence of direct in-life exchanges did not alter too much the scientific experience of the symposium. It for sure altered the possibilities of personal exchanges which are sources of future research collaborations, but hopefully these may be recovered very soon.

Submitted by: Yoshio Ebihara (JP),
ROCOND 22 IPC Chair

**21th IFAC Conference on
Technology, Culture &
International Stability
(TECIS 2022)**

**26- 28 October 2022
Prishtina, XK (hybrid)**

The 21st TECIS was organized by the Kosovo IFAC NMO and took place hybridly based in Prishtina from 26-28 October 2022. TECIS 2022 provided a forum for professionals, researchers, experts, and practitioners from industry, non-governmental organizations (NGOs) and academia to give an overview of the state of the art, to present new research results and to exchange ideas and experiences in the field of the role of control and automation technologies and its praxis in promoting international stability. A related goal of this conference was to propose new approaches in dealing with globalization effects, and investigating international system complexity and the management of knowledge in that context. Special emphasis in this TECIS event was given to Diversity and Inclusion organized by the working group of TC 9.5.

The 87 contributions prepared from 240 authors from 25 countries included five plenary talks, 23 open invited track papers and 59 regular papers. They covered a very broad field of subjects including Intelligent Systems and Applications, Innovation Management, AI and Applications, Control and Automation to improve Stability, Engineering Ethics, Cultural Effects, Knowledge Management and Intelligent Systems, Complex Adaptive Systems, Technology and Environmental Stability, Cost Oriented Automation (COA), Nanotechnologies and Biomedical Applications. The plenaries were presented by: Edmond Hajrizi (XK), Petros Groumpos (GR), Norbert Jesse (DE), Peter Kopacek (AT) and Larry Stapleton (IE).

Many students, mostly from local universities, attended the event. The Young Author Award was presented to the paper of Julia Linert (AT) for the contribution “Applications of Microfluidics and Nanotechnologies for Point-of-Care Devices” by the committee.

We are extremely grateful to the IPC for reviewing the papers, the NOC for the successful organization of the event and especially to all attendees for participating in and contributing to this virtual event and we hope that you enjoyed the familiar atmosphere which stimulated intensive and successful discussions.

Submitted by: Peter Kopacek (AT), TECIS 22
IPC Chair


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

Calendar of IFAC Conferences

Title	2023	Place	Further Information
12 th IFAC Symposium on Nonlinear Control Systems NOLCOS 2022	January 4 – 6	Canberra Australia	nolcos2022.com/ contact@nolcos2022.com
Conference on American Control Conference (in cooperation with IFAC) ACC 2023	May/June 31 – 02	San Diego, CA USA	acc2023.a2c2.org/
22 nd IFAC World Congress 2023	July 09 – 14	Yokohama Japan	ifac2023.org/
Conference on European Control Conference (in cooperation with IFAC) ECC 2023	July 13 – 16	Bucharest Romania	ecc23.euca-ecc.org/ ecc2023@euca-ecc.org
Title	2024	Place	Further Information
12 th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes SAFEPROCESS 2024	June 04 – 07	Ferrara Italy	
Conference on American Control Conference (in cooperation with IFAC) ACC 2024	July 08 – 12	Toronto Canada	
12 th IFAC Symposium on Advanced Control of Chemical Processes ADCHEM 2024	July 14 – 17	Toronto Canada	
8 th IFAC Conference on Nonlinear Model Predictive Control NMPC 2024	August 27 – 30	Kyoto Japan	
4 th IFAC Conference on Modelling, Identification and Control of Nonlinear Systems MICNON 2024	September 4 – 6	Lyon France	

The IFAC Calendar of Conferences is constantly updated as additional IFAC Conferences (Workshops, Symposia, and Conferences) are approved. Due to the Covid-19 pandemic some conferences have had date changes, cancellations, etc. since their initial approval. 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/>



Wishing Newsletter readers peace, health, and
happiness in 2023
and in the years to come!

Harald Albrecht, Elske Haberl, Dimitri Peaucelle & Katharina Willixhofer

Please note that our office will be closed over the holidays from 23 December 2022 through 8 January 2023