

10th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes (SAFEPROCESS 2018) 29-31 August 2018 Warsaw, PL

The 10th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes (SAFEPROCESS 2018) was held from 29-31 August 2018 at the Warsaw University of Technology (Warsaw, PL). More information can be found on the website <http://safeprocess18.uz.zgora.pl/>.

The SAFEPROCESS symposium is a triennial meeting of IFAC and a major international gathering of leading experts in academia and industry from all over the world. It aims at strengthening the contact between academia and industry to build up new networks and cultivate existing relations. High-level speakers give talks on a wide spectrum of topics related to fault diagnosis, process supervision, safety monitoring and fault-tolerant control as well as state-of-the-art applications and emerging research directions. The symposium is also meant as a forum for young researchers, with the opportunity to present their scientific ambitions and work to an audience of international communities of technical diagnostics and control. The Young Author Award was won by Elinirina Irena Robinson (ONERA, FR).



Elinirina Irena Robinson, Young Author Award
winner at SAFEPROCESS 2018

Fault diagnosis and fault-tolerant control have developed into a major research area at the intersection of system and control engineering, applied mathematics and statistics or soft computing, as well as application fields such as mechanical, electrical, chemical and aerospace engineering. IFAC is recognized as playing a crucial role in this aspect by launching a triennial symposium dedicated to this subject.

SAFEPROCESS 2018 continued the successful series of symposia held in Baden-Baden (DE, 1991), Helsinki (FI, 1994), Hull (UK, 1997), Budapest (HU,

2000), Washington DC (US, 2003), Beijing (CN, 2006), Barcelona (ES, 2009), Mexico City (MX, 2012), and Paris (FR, 2015).

The symposium was sponsored by the International Federation of Automatic Control (IFAC) through the Technical Committee on Fault Detection, Supervision and Safety of Technical Processes-SAFEPROCESS, TC 6.4. It was also co-sponsored by IFAC TC 1.1: Modeling, Identification and Signal Processing, 4.2: Mechatronic Systems, 6.1: Chemical Process Control, 6.2: Mining, Mineral and Metal Processing, 6.3: Power and Energy Systems, 7.2: Marine Systems, 7.3: Aerospace, 7.4: Transportation Systems and 7.5: Intelligent Autonomous Vehicles.

SAFEPROCESS 2018 received 303 submissions, and each one was peer reviewed by three reviewers. From all submissions, 210 papers were accepted and included in the proceedings that will be published in the open access IFAC-PapersOnLine series hosted on Science Direct. Around 250 people attended the event.

The corresponding authors of the 210 accepted papers came from 36 countries, with the following distribution: 135 papers came from Europe, fifteen from Latin America, 43 from Asia, twelve from the US/Canada, one from Oceania, and four from Africa.

SAFEPROCESS 2018 was held along with the 29th International Workshop on Principles of Diagnosis (DX '18), held on 27-30 August 2018. DX is an annual event that started in 1989 and is rooted in the artificial intelligence (AI) community. This annual international workshop has been uniting researchers and practitioners with diverse backgrounds (AI, verification, software engineering, debugging, and others) in order to leverage research in the global context of diagnosis, that is, identifying the root causes for encountered issues. The DX Workshop series offers a forum to present current research and experience reports, exchange and discuss emerging ideas, as well as to debate current issues and envisioned future challenges.

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The IFAC Journals

Automatica

<http://www.journals.elsevier.com/automatica>

Control Engineering Practice

<http://www.journals.elsevier.com/control-engineering-practice>

Engineering Applications of Artificial Intelligence

<http://www.journals.elsevier.com/engineering-applications-of-artificial-intelligence>

Journal of Process Control

<http://www.journals.elsevier.com/journal-of-process-control>

Annual Reviews in Control

<http://www.journals.elsevier.com/annual-reviews-in-control>

Journal on Mechatronics

<http://www.journals.elsevier.com/mechatronics>

Nonlinear Analysis: Hybrid Systems

<http://www.journals.elsevier.com/nonlinear-analysis-hybrid-systems>

IFAC Journal of Systems & Control

<http://www.journals.elsevier.com/ifac-journal-of-systems-and-control>

IFAC-PapersOnLine

<http://www.journals.elsevier.com/ifac-papersonline>

The program of SAFEPROCESS 2018 included 25 regular and 13 invited sessions in five parallel tracks. It also featured three plenary talks:

- *Combining Data-Driven and Model-Based Methods to Improve Diagnosis of Complex Systems* by Prof. Gautam Biswas – Vanderbilt University (Nashville, TN, US)
- *Fault Diagnosis in the Automotive Industry* by Prof. Mattias Nyberg – KTH Royal Institute of Technology (Stockholm, SE)
- *Collaborative Fault Tolerant Control for Complex Industrial Processes: Present and Future* by Dr. Hong Wang – Pacific Northwest National Laboratory (Richland, WA, US)

and six semi-plenary talks:

- *Fault Tolerant Control Using Sliding Modes* by Prof. Christopher Edwards – University of Exeter (UK)
- *Fault Detection Diagnosis and Prognosis Towards Autonomous Health Management and Maintenance Optimization for Rail Vehicle Systems* by Prof. Gang Niu – Tongji University (CN)
- *The Art and Science of Distributed Fault Diagnosis* by Prof. Marios M. Polycarpou – University of Cyprus (Nicosia, CY)
- *Transformation of Business – IoT as the New Source of Innovation in Diagnosis and Control* by Dr. Lothar Seybold – RAFI GmbH (Berg, DE)
- *Integrated Fault Diagnosis and Fault-tolerant Control: A Perspective for Complex Systems* by Prof. Marcin Witczak – University of Zielona Góra (PL)
- *FDIR for Aerospace and Flight-critical Systems: Turning Theory into Practice* by Prof. Ali Zolghadri – University of Bordeaux (FR)

Submitted by: Prof. Vicenç Puig (IPC chair, ES) and Prof. Józef Korbicz (NOC chair, PL)

IFAC Code of Conduct Approved at IFAC Council 2018

The IFAC Code of Conduct was approved by the IFAC Council at their September 2018 meeting in Brazil. Wikipedia describes such codes as “a set of rules outlining the social norms, religious rules and responsibilities of, and or proper practices, for an individual.”

IFAC recognizes its role as a worldwide federation for promoting automatic control for the benefit of humankind. In agreement with and in implementation of the approved IFAC Mission and Vision, this document summarizes the commitment and obligation of IFAC to maintain ethical and professional standards in its academic and industrial activities. All activities within IFAC as well as volunteers acting on behalf of or for IFAC are to act in accordance with this Code of Conduct.

1) Honesty and Integrity: Activities conducted by IFAC shall always be fair, honest, transparent, and in accordance with the IFAC - Mission and Vision. That is, their main goal is to contribute to the promotion of the science and technology of control in the broadest sense. IFAC disapproves any actions which are in conflict with existing laws, are motivated by criminal intentions, or include scientifically dishonest practices such as plagiarism, infringement or falsification of results. IFAC will not only not retaliate against any person who reports violations of this principle, but rather encourage such reporting.

2) Excellence and Relevance: IFAC recognizes its responsibility to promote the science and technology of automatic control through technical meetings, publications and other means consistent with the goals and values defined in the IFAC - Mission and Vision. Further, IFAC has the responsibility to be a trusted source of publication material on automatic control renowned for its technical excellence. IFAC acknowledges its professional obligation towards employees, volunteers, cooperating or member organisations and companies, and further partners.

3) Sustainability: A major challenge in future automatic control is the development of modern techniques which reduce the ecological damage caused by technology to a minimum. IFAC acknowledges this fact and contributes to a solution by promoting the importance of automatic control and its impact on the society, and by advancing the knowledge in automatic control and its applications. IFAC disapproves any actions which are in conflict with the above philosophy, in particular those which have a negative impact on the environment.

4) Diversity and Inclusivity: IFAC is a diverse, global organisation with the goal to create a fruitful environment for people from different cultures dealing with automatic control in theory and practical applications. People shall be treated fairly, respectfully, and their human rights shall be protected. IFAC disapproves any harassment or bullying of or discrimination against people due to, e.g., gender, race, religion, disability, or political conviction in whatever form.

5) Compliance of Laws: The purpose of any action conducted by IFAC is to further the goals defined in IFAC's constitution and consequences thereof. Activities on behalf of IFAC cannot be in conflict with ethical principles or laws existing in countries where IFAC operates. This includes but is not limited to any form of bribery, corruption or fraud. IFAC disapproves unethical or illegal business practices which restrain competition such as price fixing or other kinds of market manipulation. Conflicts of interest are to be prevented if possible and revealed immediately whenever they occur. IFAC assures the protection of confidential information belonging to its member organisations and further partners.

Editor's Note: The full Wikipedia article explaining such codes can be found at: https://en.wikipedia.org/wiki/Code_of_conduct

From the IFAC President

Dear IFAC Friends and Colleagues,

IEEE has one. The Royal Statistical Society has one. And now, IFAC has one, too. A full professional Italian Barista coffee machine? Unfortunately, no (although – we don't know about IEEE or RSS). An intelligent robot that can clean our desks, handle all tasks and work through our to do lists? We wish. No, I am talking about a Code of Conduct. While at first sight, a Code of Conduct might seem less attractive than coffee machines or robots, a Code of Conduct, or in short CoC, is way more important. And it was about time that IFAC got one, too.

IFAC is a leading professional non-profit society in the field of automatic control. Towards the control community, this implies an obligation to act according to ethical and professional standards. And even more so, to provide rules to which individuals acting on behalf of IFAC can refer to.

Therefore, we have been developing an IFAC Code of Conduct over the past year, and Council has voted for its installation in Florianópolis, in September 2018. The document is printed alongside this column, and can also be accessed via the following link:

<https://www.ifac-control.org/about/ifac-code-of-conduct>.

The IFAC Code of Conduct is based on the Vision and Mission of IFAC together with IFAC's values:

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

In agreement with and in implementation of the above IFAC values, the IFAC Code of Conduct summarizes the commitment and obligation of IFAC to maintain ethical and professional standards in its academic and industrial activities. Starting immediately, all IFAC volunteers are bound to the CoC starting with the TC members and going to the IFAC officers, including the editorial board members of our journals as well as the organizing committee members of our many IFAC technical events.

IFAC stands firm in its determination to prevent unjust behavior or treatment, discrimination and harassment, scientifically dishonest practices, plagiarism and falsification, corruption or fraud, to name just a few points from the CoC. We want to encourage everyone to step up or speak up whenever we see behavior that is not aligned with these ethical standards. We think the spirit of IFAC is one of cooperation and collaboration, inclusivity and diversity, honesty and integrity. And with this spirit, we look forward to this new year 2019 and to the future of IFAC!

I also want to take this opportunity to wish all the readers of this column all the best for 2019, many great coffees, clean desks and email inboxes, exciting conversations, and fascinating encounters. I hope you all had a great start into 2019 already. Let's all push forward together, in a collaborative and cooperative fashion, in the many research directions within automatic control and all its application areas, to meet the societal challenges of tomorrow.

With warm regards from snowy Stuttgart,

Frank Allgöwer

American Control Conference 2018 (ACC 2018) 27-29 June 2018 Milwaukee, WI, US

The 2018 American Control Conference was held from 27-29 June 2018 at the Milwaukee Hilton City Center hotel and the Wisconsin Center convention center in Milwaukee, WI, USA. The annual American Control Conference is the flagship conference of the American Automatic Control Council (A²C²). A²C² is the IFAC National Member Organization (NMO) for the USA, and is sponsored by nine prominent professional societies with active control interests, namely the AIAA, AIChE, ASCE, ASME, IEEE, INFORMS APS, ISA, SCS, and SIAM. Program Chair Zongli Lin (US) oversaw careful review of 1,623 manuscripts by the sponsoring society conference editorial boards, from which 1,087 high-quality papers were chosen for the conference.

The ACC 2018 featured four plenary lectures, nine pre-conference workshops, six tutorial sessions, and twenty-two parallel sessions of contributed and invited paper presentations. On Tuesday night there was a welcoming reception in advance of the event held in the classic art deco Crystal Ballroom of the Milwaukee Hilton, and on Friday a memorable closing reception was held on the shores of Lake Michigan at the spectacular, Calatrava-designed Milwaukee Art Museum.

On Tuesday, nine well-attended workshops were presented at the Hilton. On Wednesday morning (27 June), activity moved across the street to the Wisconsin Center, where AACC President Richard Braatz (US) and IFAC President Frank Allgöwer (DE) welcomed the participants and formally opened the conference. The opening plenary talk was given by Rob Wood (US) of Harvard University, who described the obstacles that his research group is overcoming to create insect-sized flying robots. The audience was particularly captivated by the challenge of achieving stable flight under severe constraints of size, weight, power, and mechanical complexity. Miguel San Martin (US) of NASA Jet Propulsion Labs gave a Wednesday evening plenary talk describing the landing of the Curiosity rover on Mars. His gripping narrative put the rapt audience into the minds of JPL engineers, as they struggled with the seemingly intractable control problem of safely landing a car-sized rover, loaded with delicate instruments, on our sister planet. The focus of the talk then moved from Mars to Jupiter, and the even more daunting task of placing a lander on its moon Europa.

Thursday's plenary speaker was Emery Brown (US), of MIT and Harvard Medical School, who presented his work on modeling mental and physical state under anesthesia. His approach had a strong system engineering flavor, giving it a comfortable feel for an audience of control specialists. The talk gave an exciting and accessible view of how the perspectives of the

dynamics and control community may be applied to analyze an unfamiliar, non-engineering setting. The final plenary of the conference was given on Friday morning by 2017 Eckman Award winner Ketan Savla (US) of USC. The topic was once again a demanding control problem with far-reaching consequences, in this case the use of controls to create resilient, high-capacity civil infrastructure, specifically transportation systems.

The Thursday schedule included presentations of the 2018 A²C² awards. The prestigious Richard E. Bellman Control Heritage Award for distinguished career contributions to the theory or application of automatic control is the highest recognition for US-based control engineers and scientists. The 2018 Bellman Award was given to Masayoshi Tomizuka (US) of the University of California - Berkeley. The Control Engineering Practice Award is given to an individual or team to acknowledge significant contribution to the advancement of control practice. Andrew Alleyne (US) of the University of Illinois Urbana-Champaign was the 2018 recipient. The Donald P. Eckman Award is presented annually to an outstanding controls researcher under the age of 35. The 2018 awardee was Behrouz Touri (US) of the University of California - San Diego.

The John R. Ragazzini Education Award is given for outstanding contributions to automatic control education. The 2018 recipient was Frank Lewis of the University of Texas - Arlington (US). The 2018 O. Hugo Schuck Best Theory Paper went to Marius Schmitt, Chithrupa Ramesh, Paul Goulart, and John Lygeros for their paper "Convex, Monotone Systems are Optimally Operated at Steady-State." The O. Hugo Schuck Best Application Paper went to Luca Furieri, Thomas Stastny, Lorenzo Marconi, Roland Siegwart, and Igor Gilitschenski, for their paper, "Gone with the Wind: Nonlinear Guidance for Small Fixed-Wing Aircraft in Arbitrarily Strong Windfields." Five student authors were nominated for the award honoring the Best Student Paper of the 2018 ACC. The runners-up were Salar Fattahi, for the paper "Closed-Form Solution and Sparsity Path for Inverse Covariance Estimation Problem," Abolfazl Hashemifor the paper, "A Randomized Greedy Algorithm for Near-Optimal Sensor Scheduling in Large-Scale Sensor Networks," Lars Lindemann, for the paper, "A Polya Urn-Based Model for Epidemics on Networks," and Saehong Park, for the paper, "Controller Design Point Selection for Linearized Gain Scheduling." A blue-ribbon panel of distinguished controls researchers chose Erfan Nozari, for the paper, "Stability Analysis of Complex Networks with Linear-Threshold Rate Dynamics," as the best of this compelling group.

At the Thursday award ceremony, IFAC President Frank Allgöwer recognized new IFAC Fellows (2014-2017) Joao Hespanha (US), Francesco Bullo (US), and Munther Dahleh (US). The three Fellows received their Fellow pins and certificates.

At the Thursday banquet luncheon, Doug Lawrence (US), General Chair of the 2019 American Control Conference, extended a warm invita-

tion to attend next year's conference, which will be held from 10-12 July 2019 on the East Coast of the US, in the vibrant and historic city of Philadelphia, PA. All members of the control community are encouraged to reserve these dates, and plan to attend what will certainly be a wonderful meeting.



Jordan M. Berg (US)
ACC 2018 General Chair

Thanks for the great success of the 2018 ACC are due to the tireless and dedicated members of the Operating Committee, and to the delightful volunteers who were warm ambassadors of welcome and friendship at the registration desk and throughout the conference venue. Thanks also for the support of the generous gold, silver, and bronze sponsors, and to the officers and board of the A²C² for their patience and expert guidance.

Submitted by Jordan M. Berg
ACC 2018 General Chair

Who's Who in IFAC

Coordinating Committee Chair (CC) 8

Mustafa Khammash (CH), currently Professor of Control Theory and Systems Biology in the Department of Biosystems Science and Engineering at ETH Zürich (CH), is a systems and control theorist known for his work in robust control and its applications. He received his B.S. degree from Texas A&M University (College Station, TX, US) in 1986 and his Ph.D. from Rice University (Houston, TX, US) in 1990, both in Electrical Engineering. In 1990, he joined the engineering faculty of Iowa State University (Ames, IA, US) where he created the Dynamics and Control Program and led the control group until 2002 when he joined the engineering faculty at the University of California, Santa Barbara (UCSB, Santa Barbara, CA, US). At UCSB, he was the Director of the Center for Control,

IFAC is on social media!

Direct links to IFAC's presence on Facebook, LinkedIn, and Twitter can be found on the IFAC website.

In addition check out
the IFAC Blog at

<http://blog.ifac-control.org/>

Dynamical Systems and Computation from 2005 until 2011, when he joined ETH Zürich.



Over the last fifteen years, M. Khammash has been working at the interface of control theory, systems biology, and synthetic biology, where he and his group have developed novel theoretical and computational methods for the modeling, simulation, analysis, and control of biological systems, with a focus on stochastic systems. They have been using these methods to attain a deeper understanding of the interplay between dynamics, feedback, and randomness in biological networks in order to reverse engineer their complexity. More recently, the group has been developing novel analytical and experimental methods for the analysis and design of cybergenetic systems—control systems that are implemented either in silico or in vivo, and designed to steer the dynamic behavior of living cells with precision and robustness.

M. Khammash is the recipient of the European Research Council (ERC) Advanced Grant, the ETH Golden Owl Award, the ISU (Iowa State University) Young Engineering Faculty Research Award, the Iowa State Foundation Early Achievement in Research and Scholarship Award, and the Ralph Budd Best Engineering Ph.D. Thesis Award. He is a Fellow of the International Federation of Automatic Control (IFAC), a Fellow of the Institute of Electrical and Electronics Engineers (IEEE), and a Fellow of the Japan Society for the Promotion of Science (JSPS).

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Lars Eriksson (SE) is a full professor in Vehicular Systems at Linköping University (SE). He received the M.Sc. degree in Electrical Engineering 1995 and the PhD degree in Vehicular Systems in May 1999 both from Linköping University. During 2000 and 2001 he spent one year as a post doc in the Measurement and Control group at Swiss Federal Institute of Technology (ETH) in Zurich. Since then he has been employed at Vehicular Systems first as Assistant Professor, and then as Associate Professor and now as Full Professor.

L. Eriksson is currently managing the engine control laboratory at Vehicular Systems, a research group within the larger Dept. of Electrical Engineering at Linköping University. His research interests are modeling, simulation, control, and optimization of internal combustion engines for vehicle propulsion in general, but with a focus on downsizing and supercharging concepts for improved fuel economy. His contributions are in the areas of engine control, control oriented modeling of combustion engines, optimal control of hybrid electric

vehicles, EGR Control for Marine Diesel Engines, as well as model based optimization and control of emission after treatment systems. However, his research interest spans from the broad area of optimization and control of efficient and clean vehicle propulsion into the detailed control of in-cylinder processes, where his research was the first to demonstrate real-time control of the combustion timing using information obtained from the ion current. He has published one book, three book chapters, and more than 184 international peer reviewed conference and journal papers.

L. Eriksson and collaborators received the 2018 Rudolph Kalman Best Paper award from ASME's Dynamics Systems and Control division. He has also supervised and co-supervised thirteen PhD students, of which three have contributed with noteworthy results. The first was Andreas Thomasson, with the best performing controller for the Throttle Control Benchmark at the 2009 E-CoSM. The second was Martin Sivertsson, winner of the PHEV Control Benchmark at the 2012 E-CoSM. The third was Kraen Vodder Busk, who in 2018 received the talented industrial researcher award from Innovation Fund Denmark for his PhD thesis work.



L. Eriksson is also active in academic societies. He was Technical Committee chair for TC 7.1 (Automotive Control) from 2014-2017 and is currently a member of the IFAC Technical Board as the Coordinating Committee Chair of CC 7 (Transportation and Vehicle Systems). He is also Associate Editor for the IFAC journal Control Engineering Practice, and has served as Adjoint Technical Editor for several conferences such as for example the IFAC World Congresses in 2011, 2014, and 2017 and IFAC Advances in Automotive Control in 2007, 2010, 2013, 2016 IFAC E-CoSM 2006, 2009, 2012, 2015, 2018.

In addition he has also had the function of conference IPC Chair for IFAC E-CoSM in 2009, 2015, and 2018, as well as for IFAC AAC 2019, and SIMS 2015. Being active in the community and as the manager of the engine control laboratory L. Eriksson has also developed a well-established network of contacts with research groups in both academia and industry.

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TB Member (Congress Advisor)

Sandra Hirche (DE) holds the TUM Liesel Beckmann Distinguished Professorship and heads the Chair of Information-oriented Control in the Department of Electrical and Computer Engineering at Technische Universität München (DE) since 2013. She received the diploma engineer degree in Aeronautical and Aerospace Engineering in 2002 from the Technical University Berlin, Germany, and the Doctor of Engineering degree in Electrical and Computer Engineering in 2005 from the Technische Universität München, Munich, Germany. From 2005-2007 she has been a PostDoc fellow of the Japanese Society for the Promotion of Science at the Fujita Laboratory at Tokyo Institute of Technology, Japan. Prior to her present appointment she has been an Associate Professor at Technische Universität München.

Her main research interests include cooperative, distributed and networked control with applications in human-robot interaction, multi-robot systems, and general robotics. She has published more than 200 papers in international journals, books and refereed conferences. She has received multiple awards such as the Rohde & Schwarz Award for her PhD thesis, the IFAC World Congress Best Poster Award in 2005 and - together with students - the 2018 Outstanding Student Paper Award of the IEEE Conference on Decision and Control as well as Best Paper Awards of IEEE Worldhaptics and IFAC Conference of Manoeuvring and Control of Marine Craft in 2009. In 2013 she has been awarded with an ERC Starting Grant on the "Control based on Human Models".



S. Hirche is a member of the IFAC Technical Board and has been Co-Chair of the IFAC TC 1.5 "Networked Control Systems" from 2010-2017. She has served as IEEE Control System Society (CSS) Vice-President for Member Activities (2014/15), as Chair for Student Activities in the IEEE CSS (2009-2014), as Chair of the CSS Awards Subcommittee on "CDC Best Student-Paper Award" (2010-2014), and has been elected member of the Board of Governors of IEEE CSS (2010-2013).

She has been serving as Associate Editor for the "IEEE Transactions on Control of Network Systems" (2016-17), the "IEEE Transactions on Control Systems Technology" (2014-2017), the "IEEE Transactions on Haptics" (2011-2014), the journal "Nonlinear Analysis: Hybrid Systems" (2010-2014). S. Hirche has been Program Chair of the 2nd IFAC Conference on Cyber-physical and Human Systems 2018, General Co-Chair of the IEEE Worldhaptics 2017, and member of the organizing committee of the IEEE Conference on Decision and

Control 2010-2013. Since 2006 she regularly serves in the Program Committee of IEEE and ASME Conferences such as e.g. MSC, ECC, ADHS, NecSys, ICRA, IROS, Ro-Man, World-Haptics, Eurohaptics, HRI, and RSS.

TB Member (Congress Advisor)

Denis Dochain (BE) received his degree in Electrical Engineering in 1982 from the Université Catholique de Louvain (UCL), Belgium. He completed his Ph.D. thesis and a "thèse d'agrégation de l'enseignement supérieur" in 1986 and 1994, respectively, also at the Université Catholique de Louvain, Belgium. He has been CNRS associate researcher at the LAAS (Toulouse, FR) in 1989, and Professor at the Ecole Polytechnique de Montréal, CA in 1987-88 and 1990-92. D. Dochain has been with the FNRS (Fonds National de la Recherche Scientifique, National Fund for Scientific Research), Belgium since 1990. Since September 1999, he is Professor at the ICTEAM (Institute), Université Catholique de Louvain, Belgium, and Honorary Research Director of the FNRS. He has been an invited professor at Queen's University, Kingston, ON (CA) between 2002 and 2004. He is a full professor at the UCL since 2005.



D. Dochain is the Editor-in-Chief of the *Journal of Process Control*, senior editor of the *IEEE Transactions of Automatic Control* and associate editor of *Automatica*. He is active in IFAC since 1999 (roles have included Council member, Technical Board member, TC and CC chair, chair and presently member of the IFAC Publication Committee). He received the IFAC Outstanding Service Award in 2008 and is an IFAC Fellow since 2010.

His main research interests are in the field of nonlinear systems, thermodynamics based control, parameter and state estimation, adaptive extremum seeking control and distributed parameter systems, with application to microbial ecology, environmental, biological and chemical systems, and electrical and mechanical systems. He is the (co-)author of 4 books, more than 140 papers in refereed journals and 250 international conference papers.

TB Member (Congress Advisor)

Jun-ichi Imura (JP) is a professor of the Department of Systems and Control Engineering at Tokyo Institute of Technology (JP). He is also Vice-President for Teaching and Learning at Tokyo Institute of Technology since 2018.



He received the M. E. degree in Applied Systems Science, and the D.E. degree in Mechanical Engineering from Kyoto University (JP) in 1990 and 1995, respectively. He served as a Research Associate at the Department of Mechanical Engineering, Kyoto University from 1992 to 1996, and as an Associate Professor at Hiroshima University (JP) from 1996 to 2001, as an Associate Professor at Tokyo Institute of Technology from 2001 to 2004. From 1998 to 1999 he was a visiting researcher at the University of Twente (NL).

J. Imura's research interests include modeling, analysis, and control of hybrid systems, large-scale network systems, and nonlinear systems with applications to power grids, ITS, biological systems, industrial process systems, and so on. He co-authored four books (including three books in Japanese) and over 70 international journal papers and over 150 international conference papers. He was a semi-plenary speaker of MTNS 2012 and a recipient of Best Paper Awards from SICE (1994, 2005, 2007, 2010) and from IS-CIE (1991, 1998), etc. He is the Principal Investigator of Core Research for Evolutionary Science and Technology (CREST) program of Japan Science and Technology Agency (JST) (2012-2020).

J. Imura served as the general chair of the IFAC Conference on Analysis and Control of Chaotic Systems (2015) and IPC Chair of IFAC Conference on Analysis and Control of Chaotic Systems (2018). He is currently a member of IFAC Policy Committee (2014-) and IFAC Technical Board (2017-). He is also serving as the General Chair of the 22nd IFAC World Congress (July 2023, Yokohama, JP).

He has served as a member of IEEE CSS Board of Governors (2010, 2013, 2015-2017) and as Executive Director (General Affairs) of SICE (2011-2012). He also has served as an Associate Editor of *Automatica* (2009-2017), *Nonlinear Analysis: Hybrid Systems* (2011-2016), and *IEEE Transactions on Automatic Control* (2014-2016), and so on. He is a Fellow of SICE and a Senior Member of IEEE.

Introducing ACRS: Pakistan NMO in IFAC

Automatic Control Research Society (ACRS) is a new addition to IFAC. It became IFAC'S first Pakistani NMO, joining in 2018. Pakistan is a country with a thriving economy and over 200 million hardworking and fun-loving people.

With a rapidly growing mix of both agricultural and high-tech industry, a policy emphasis on higher education that has resulted in over two hundred universities and a demographic skewed toward youth and early professional age groups, Pakistan may rightly boast of one of the fastest growing R&D throughputs. The fast pace of academic R&D growth has given rise to high-tech research groups on the National Engineering Horizon.

Control Science, being active for the last half century, has grown into many control engineering applications in modern-day industry. Pakistan is no exception to these developments. Owing to the progressive national R&D scene, a large number of Pakistani control research groups have evolved in the last decade or so. To name a few, control groups have been actively working in Capital University of Science & Technology (CUST), Lahore University of Management Sciences (LUMS), Pakistan Institute of Engineering and Applied Sciences (PIEAS) and College of Electrical & Mechanical Engineering (EME). The theoretical areas being contributed to are: higher order sliding mode based control and estimation, nonlinear control theory, geometric control, linear parameter varying control and robust control. Similarly control applications are also being actively pursued such as automotive control, aerospace control, process control and irrigation control. Under the auspices of the above universities and other institutions, numerous control conferences and workshops have been held in Pakistan over the last several years, with international participation. In 2009, the first chapter of IEEE Control Systems Society (IEEE CSS) in Pakistan was formed, and in 2014, this chapter was awarded the Best Chapter Award from IEEE CSS.

Having accumulated to a critical mass, a group of Pakistani Control Researchers formed a local nexus in the name of Automatic Control Research Society (ACRS) in 2016. In 2018 ACRS joined IFAC as the first National Member Organization (NMO) representing Pakistan. ACRS is a nonprofit body registered under the laws of Pakistan. There are three informal chapters of the society working closely together, which are located in the megacity of Karachi, the cultural city of Lahore and Islamabad, Pakistan's capital.

Being of an academic origin, ACRS is deeply committed to the promotion of control science and its application to local industry as well as in local society at large. The society aims at providing a Pakistan-wide platform for Pakistani researchers to interact and contribute towards the advancement of control systems research in Pakistan. ACRS has the particular desire to interact with local industry for contributing

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positively to Pakistan's national development and subsequently the national economy. On the international scene, ACRS aspires to build strong ties with the IFAC community and hold international conferences and workshops under IFAC's auspices. The members of ACRS keenly look forward to playing an active role in technical committees and other activities within IFAC.

ACRS is an equal opportunity society inviting every control loving person into its ranks of membership without any prejudice or preconditions based on cast, creed or gender. In particular, there are already a few female members and special measures are being taken to increase the number and role of female members within ACRS. Currently, ground-breaking meetings of ACRS are being held with membership drive being the first priority. Five categories of ACRS membership have been established: Student, International, Associate, Regular, and Fellow Members. It is being planned that a first Annual National Control Workshop would be held in the first quarter of 2020.



Aamer Iqbal Bhatti (PK),
NMO representative of ACRS (Pakistan IFAC)

Currently I am serving as the president of ACRS, the Pakistani IFAC NMO. I am a Professor of Controls and Signal Processing in Capital University of Science & Technology, Islamabad. Dr. Abubakr from Lahore University of Management Sciences is Vice-Chair, Dr. Humayun Mirza from Comsats University Lahore is the Treasurer and Mr. Abdul Rehman Yasin from University of Lahore is the General Secretary.

On behalf of ACRS, we look forward to a start of an era of fruitful ties with IFAC.

Submitted by: Aamer Iqbal Bhatti (NMO representative/President ACRS, Pakistan IFAC NMO)

Editor's Note: To find out if your country has an IFAC NMO, or to get contact information for a particular NMO please see the full NMO list at:

<https://www.ifac-control.org/structure/nmo>

IFAC Major Awards: Extended Deadline for REFERENCES

IFAC Major Awards reference deadline extension: Please note that **reference forms** will now be accepted through 1 March 2019! There is no change in the 15 Feb. 2019 deadline for nominations!

<https://www.ifac-control.org/news/2020-major-medals-call-for-nominations>

The Harold Chestnut Control Engineering Textbook Prize: Call for Nominations

The Harold Chestnut Control Engineering Textbook Prize is presented at each triennial IFAC World 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. This prize was created in 1986 and renamed in 2002.

Each nomination has to be made by a nominator who is responsible for providing full and accurate information. Any person is eligible to serve as a nominator with the exception of members of the IFAC Council and the Harold Chestnut Control Engineering Textbook Prize Selection Committee (Chair: Henk Nijmeijer, Vice Chair: Anthony Rossiter, Members: Jie Chen, Rob Evans, Kristin Pettersen, Cristina Verde, Yutaka Yamamoto).

CALL FOR NOMINATIONS FOR THE HAROLD CHESTNUT CONTROL ENGINEERING TEXTBOOK PRIZE

The Harold Chestnut Control Engineering Textbook Prize Selection Committee of the International Federation of Automatic Control (IFAC) calls for nominations for the Triennial Harold Chestnut Prize.

The Prize is awarded to the author(s) of a control engineering textbook that has most contributed to the education of control engineers. The Prize, consisting of a monetary award and a certificate, will be presented at the Closing Ceremony of the 21st IFAC World Congress that will be held in Berlin, Germany in July 2020.

To be considered, nominations must relate to books that are:

1. written in one of the official IFAC languages¹, preferably in English; and
2. published between September 1, 2011 and July 31, 2017.

Nominations should include:

- a) A nomination letter that states the full title, name(s) and address of the author(s), name of the textbook, date of publication, and name and address of the publisher;
- b) Evidence of the contribution/s of the textbook to the education of control engineers; and
- c) Any additional information that may support

the Judging Process, as per the selection criteria listed below. It is important to note that only those book reviews in IFAC journals (*Automatica*, *Control Engineering Practice*, *Annual Reviews in Control*, *Engineering Applications of Artificial Intelligence*, *Journal of Process Control*, *Mechatronics*, *Nonlinear Analysis: Hybrid Systems*, *IFAC Journal of Systems and Control*) and journals of IFAC NMOs, as well as other reputable academic journals (e.g. *IEEE Transactions*) will be considered.

All nominations will be evaluated using the selection criteria:

- **Originality and innovation**
- **General content in terms of the topics covered**
- **Clear applications to real problems**
- **Style:**
 - Presentation, readability and clarity in relation to the content
- **Meeting educational objectives:**
 - Clear statement of what students should be able to do
 - Worked examples and exercises
 - Software support
 - Multi-disciplinary examples (cross-boundary applications of control)
 - Use by practicing engineers

To be considered, nominations must be received by close of business on 1 February 2020. All submissions should be sent via e-mail as a single PDF file containing all required information. If the Prize-winning textbook is written by more than one author, the monetary component of the Prize will be equally split among the authors with each author receiving a certificate. The winner(s) will be notified well in advance, to allow them to plan their attendance at the Award Ceremony to be held during the 21st IFAC World Congress in Berlin, Germany (12-17 July 2020).

Please submit nominations to:

Henk Nijmeijer, Chair, IFAC Harold Chestnut Control Engineering Textbook Prize Selection Committee
 Department of Mechanical Engineering
 Eindhoven University of Technology
 PO Box 513
 5600 MB Eindhoven,
 The Netherlands

h.nijmeijer@tue.nl

<https://www.ifac-control.org/awards/textbook-award>

Editor's Notes: The full list of current IFAC Council members (not eligible to serve as nominators) is available on the IFAC website at:

<https://www.ifac-control.org/structure/council>

¹**Article 15(a) of the IFAC Constitution states: For the purpose of discussions at technical meetings, the five languages of IFAC shall be English, French, German, Russian and Spanish.**

Calendar of IFAC Events

Title	2019	Place	Further information
12 th IFAC Symposium on Dynamics and Control of Process Systems, including Biosystems, DYCOPS 2019	April 23 – 26	Florianópolis Brazil	http://dycopscab2019.sites.ufsc.br/dycops.cab2019@gmail.com
3 rd IFAC Workshop on Control of Systems Governed by Partial Differential Equations, CPDE 2019	May 22 – 24	Oaxaca Mexico	http://www.smm.org.mx/eventos/cdps-cpde/smm@smm.org.mx
15 th IFAC Symposium on Large Scale Complex Systems LSS 2019	May 26 – 28	Delft Netherlands	https://sites.google.com/view/ifac15s19 M.W.Otte@tudelft.nl
SICE, ISCIE, JSME, IEEE, IFAC Conference on Asian Control Conference (in cooperation with IFAC) ASCC 2019	June 09 – 11	Kitakyushu, Fukuoka Japan	www.ascc2019.org/ ascc2019@ascc2019.org
IFAC Workshop on Control of Smart Grid and Renewable Energy Systems CSGRES 2019	June 10 – 12	Jeju Republic of Korea	http://csgres2019.com/ yilee@seoultech.ac.kr
9 th IFAC Symposium on Advances in Automotive Control AAC 2019	June 24 – 27	Orléans France	https://aac19.sciencesconf.org/ aac2019@univ-orleans.fr
Conference on European Control Conference (in cooperation with IFAC) ECC 2019	June 25 – 28	Naples Italy	http://ecc19.eu/ technical@ecc19.eu
1 st IFAC Workshop on Control of Transportation Systems WCTS 2019	June – July 30 – 01	Haifa Israel	https://wcts2019.net.technion.ac.il/ wcts2019@technion.ac.il
10 th IFAC Symposium on Intelligent Autonomous Vehicles IAV 2019	July 03 – 05	Gdansk Poland	http://www.konsulting.gda.pl/iav2019/ iav2019@konsulting.gda.pl
3 rd IFAC Workshop on Thermodynamic Foundations for a Mathematical Systems Theory, TFMST 2019	July 03 – 05	Louvain-la-Neuve Belgium	https://sites.uclouvain.be/tfmst2019/ denis.dochain@uclouvain.be
12 th IFAC Symposium on Advances in Control Education ACE 2019	July 07 – 09	Philadelphia, PA USA	https://ifac-ace2019.org/ e-mail: not yet available
12 th International Workshop on Robot Motion and Control RoMoCo 2019	July 08 – 10	Poznan Poland	http://romoco.put.poznan.pl/ piotr.mieszala@put.poznan.pl
Conference on American Control Conference (in cooperation with IFAC) ACC 2019	July 10 – 12	Philadelphia, PA USA	http://acc2019.a2c2.org/ e-mail: not yet available
16 th INSTICC et. all Conference on Informatics in Control, Automation and Robotics ICINCO 2019	July 29 – 31	Prague Czech Republic	http://www.icinco.org/ icinco.secretariat@insticc.org
13 th IFAC Workshop on Intelligent Manufacturing Systems IMS 2019	August 12 – 14	Oshawa Canada	http://www.ifacims2019.com/ Contact@IFACIMS2019.com
5 th IFAC Conference on Intelligent Control and Automation Sciences ICONS 2019	August 21 – 23	Belfast United Kingdom	http://www.qub.ac.uk/icons2019/ icons2019@qub.ac.uk

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

 Bundesministerium
Verkehr, Innovation
und Technologie

Calendar of IFAC Events

Title	2019	Place	Further information
21 st IFAC Symposium on Automatic Control in Aerospace ACA 2019	August 27 – 30	Cranfield United Kingdom	https://www.cranfield.ac.uk/events/events-2019/ifac-conference IFAC.Symposium@cranfield.ac.uk
9 th IFAC IEEE IFIP IFORS et al. Conference on Manufacturing Modelling, Management and Control MIM 2019	August 28 – 30	Berlin Germany	https://blog.hwr-berlin.de/mim2019/ mim2019@hwr-berlin.de
18 th IFAC Symposium on Control, Optimization and Automation in Mining, Mineral and Metal Processing MMM 2019	August 28 – 30	Stellenbosch South Africa	https://www.ifacmmm2019.org/ info@ifacmmm2019.org
11 th IFAC Symposium on Nonlinear Control Systems NOLCOS 2019	September 04 – 06	Vienna Austria	http://www.mechatronicsnolcos2019.org/contact@mechatronicsnolcos2019.org
8 th IFAC Symposium on Mechatronic Systems MECHATRONICS 2019	September 04 – 06	Vienna Austria	http://www.mechatronicsnolcos2019.org/contact@mechatronicsnolcos2019.org
7 th IFAC Symposium on System Structure and Control SSSC 2019	September 09 – 11	Sinaia Romania	http://www.ace.ucv.ro/sssc2019 sssc-tds@automation.ucv.ro
15 th IFAC Workshop on Time Delay Systems TDS 2019	September 09 – 11	Sinaia Romania	http://www.ace.ucv.ro/tds2019 sssc-tds@automation.ucv.ro
14 th IFAC Symposium on Analysis Design and Evaluation of Human Machine Systems, HMS 2019	September 16 – 19	Tallinn Estonia	https://cs.ttu.ee/hms2019/ secretariat-IFACHMS2019@ttu.ee
8 th IFAC Workshop on Distributed Estimation and Control in Networked Systems, NECSYS 2019	September 16 – 17	Chicago, IL (Wintrust Hall) USA	http://necsys2019.csl.illinois.edu/ e-mail: not yet available
12 th IFAC Conference on Control Applications in Marine Systems, Robotics, and Vehicles, CAMS 2019	September 18 – 20	Daejeon Republic of Korea	http://cams-wroco.org/ e-mail: not yet available
1 st IFAC Workshop on Robot Control WROCO 2019	September 18 – 20	Daejeon Republic of Korea	http://cams-wroco.org/ e-mail: not yet available
1 st IFAC Workshop on Control Methods for Water Resource Systems CMWRS 2019	September 19 – 20	Delft Netherlands	http://www.cmwrs2019.org/ e-mail: not yet available
5 th IFAC Symposium on Telematics Application TA 2019	September 25 – 27	Chengdu China	https://ifactelematics2019.swjtu.edu.cn/index.htm ifacta2019@swjtu.edu.cn
19 th IFAC Conference on Technology, Culture and International Stability TECIS 2019	September 26 – 28	Sozopol Bulgaria	http://www.tecis19.tu-plovdiv.bg/tecis@tu-plovdiv.bg
8 th IFAC/CACHE Conference on Foundations of Systems Biology in Engineering FOSBE 2019	October 14 – 19	Valencia Spain	http://fosbe2019.ai2.upv.es/ e-mail: not yet available
16 th IFAC/IEEE (Czechoslovakia Section) Conference on Programmable Devices and Embedded Systems PDES 2019	October 29 – 31	High Tatras Slovakia	http://pdes-conference.eu/19/index.php?page=home&lang=en alena.kozakova@stuba.sk
3 rd IFAC Workshop on Linear Parameter Varying Systems LPVS 2019	November 04 – 06	Eindhoven Netherlands	https://lpvs2019.tue.nl lpvs2019@tue.nl
15 th European Workshop on Advanced Control and Diagnosis ACD 2019	November 21 – 22	Bologna Italy	https://eventi.unibo.it/acd2019 acd2019@unibo.it

The IFAC Calendar of Events is constantly updated as additional technical events (Workshops, Symposia, and Conferences) are approved. The online complete version of the IFAC Calendar of Events is available at:

<https://www.ifac-control.org/events/>