PROCEEDINGS OF THE 9TH INTERNATIONAL CONFERENCE ON CONTROL, DYNAMIC SYSTEMS, AND ROBOTICS (CDSR'22)

June 02, 2022 - June 04, 2022 | Niagara Falls, Canada | Hybrid Conference

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WELCOME MESSAGE FROM THE CONFERENCE CHAIR

On behalf of the International Academy of Science, Engineering and Technology (International ASET Inc.), the organizing committee would like to welcome you to the 9th International Conference of Control, Dynamic Systems, and Robotics (CDSR'22).

CDSR'22 is aimed to become one of the leading international annual conferences in fields related to traditional and modern control and dynamic systems. This conference will provide excellent opportunities to the scientists, researchers, industrial engineers, and university students to present their research achievements and to develop new collaborations and partnerships with experts in the field.

CDSR is a series of international conferences held yearly.The 9th International Conference of Control, Dynamic Systems, and Robotics (CDSR'22) is going to be held in a hybrid format, i.e. in person as well as online.

In the ninth meeting of this conference, seven keynote speakers will share their expertise with the aim of exposing participants to a wide spectrum of applications, and to foster crosspollination of ideas and develop new research interests.In addition, approximately 26 papers will be presented from professors, students, and researchers across the world.

We thank you for your participation and contribution to the 9th International Conference of Control, Dynamic Systems, and Robotics (CDSR'22). We wish you a very successful and enjoyable experience.

Dr. Aparicio Carranza
Conference Chair
CDSR'22

Dr. Yang Shi
Conference Co-Chair
CDSR'22

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ABOUT CDSR'22

The 9th International Conference on Control, Dynamic Systems, and Robotics (CDSR'22) aims to become the leading annual conference in fields related to traditional and modern control and dynamic systems. The goal of CDSR'22 is to gather scholars from all over the world to present advances in the fields of control and dynamic systems and to foster an environment conducive to exchanging ideas and information. This conference will also provide an ideal environment to develop new collaborations and meet experts on the fundamentals, applications, and products of the mentioned fields.

These conferences focus on all aspects of control and dynamic systems. After successfully holding CDSR'14 to CDSR'21 in Canada, CDSR'22 is hosted in Niagara Falls- Canada as well this year. CDSR'22 is going to be held in a hybrid format, i.e. in person as well as online.

CDSR is an acronym for **C**ontrol, **D**ynamic, **S**ystems, and **R**obotics.

The proceedings is published in Ottawa, Canada.

All papers were peer-reviewed

The conference proceedings are published under an ISSN and ISBN number

Each paper is assigned a unique DOI number by Crossref

The conference proceedings are indexed by Scopus and Google Scholar

The proceedings are permanently archived in Portico (one of the largest community-supported digital archives in the world)

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SCIENTIFIC COMMITTEE

We would like to thank the following for accepting to act as a member of the Scientific Committee for the CDSR'22 Conference:

Scientific Committee Chairs

Dr. Aparicio Carranza

New York City College of Technology, USA
Conference Chair

Dr. Yang Shi

University of Victoria, Canada
Conference Co-Chair

Scientific Committee Members

- **Dr. Christos Anagnostopoulos,** University of Glasgow, UK
- **Dr. Nasser L. Azad,** University of Waterloo, Canada
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- **Dr. Nariman Sepehri,** University of Manitoba, Canada
- **Dr. Ning Sun,** Nankai University, China
- **Dr. Bin Wei,** University of Guelph, Canada
- **Dr. Jiangfan Yu,** The Chinese University of Hong Kong, Hong Kong

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PLENARY & KEYNOTE SPEAKERS

The keynote information for the 8th International Conference of Control, Dynamic Systems, and Robotics (CDSR'22) is as follows:

Plenary Speakers

Dr. John Doyle
California Institute of Technology, USA

Dr. Deepa Kundur
University of Toronto, Canada

Dr. Xinzhi Liu
University of Waterloo, Canada

Dr. Rodolphe Sepulchre
University of Cambridge, UK

Dr. Simon Yang
University of Saskatchewan, Canada

Keynote Speakers

Dr. Huazhen Fang
University of Kansas, USA

Dr. Behrad Khamesee
University of Guelph, Canada

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PLENARY SPEAKER

Titles: Universal Laws and Architectures and Their Fragilities

Dr. John Doyle, California Institute of Technology, USA

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John Doyle is the Jean-Lou Chameau Professor of Control and Dynamical Systems, Electrical Engineer, and BioEngineering at Caltech, and received the BS&MS in EE, MIT (1977), and PhD in Math, UC Berkeley (1984)). He was a consultant at Honeywell Systems and Research Center from 1976 to 1990.

Research is on mathematical foundations for complex networks with applications in biology, technology, medicine, ecology, neuroscience, and multiscale physics that integrates theory from control, computation, communication, optimization, statistics (e.g. Machine Learning). An emphasis on universal laws and architectures, robustness/efficiency and speed/accuracy tradeoffs, adaptability, and evolvability and large scale systems with sparse, saturating, delayed, quantized, uncertain sensing, communications, computing, and actuation.

For more information Please visit:

https://avestia.com/CDSR2022_Proceedings/files/speakers.html

Titles: Analytics-Driven Cyber-Physical Security for a Converged Smart Grid

Dr. Deepa Kundur, University of Toronto, Canada

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Deepa Kundur is Professor & Chair of The Edward S. Rogers Sr. Department of Electrical & Computer Engineering at the University of Toronto. A native of Toronto, Canada, she received the B.A.Sc., M.A.Sc., and Ph.D. degrees all in Electrical and Computer Engineering in 1993, 1995, and 1999, respectively, from the University of Toronto. Professor Kundur's research interests lie at the interface of cybersecurity, signal processing and complex dynamical networks. She is an author of over 200 journal and conference papers and is also a recognized authority on cyber security issues. She has served in numerous conference executive organization roles, and has participated on several editorial boards and federal government funding panels. She currently serves on the Advisory Board of IEEE Spectrum. Professor Kundur's research has received best paper recognitions at numerous venues including the 2015 IEEE Smart Grid Communications Conference, the 2015 IEEE Electrical Power and Energy Conference, the 2012 IEEE Canadian Conference on Electrical & Computer Engineering, the 2011 Cyber Security and Information Intelligence Research Workshop and the 2008 IEEE INFOCOM Workshop on Mission Critical Networks. She is a Fellow of the IEEE, a Fellow of the Canadian Academy of Engineering, and a Senior Fellow of Massey College.

PLENARY SPEAKER

Titles: Hybrid Formation Control of Multi-Agent Systems

Dr. Xinzhi Liu, University of Waterloo, Canada

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Xinzhi Liu received the B.S. degree in mathematics from Shandong Normal University in 1982 and the Ph.D. degree in applied mathematics from University of Texas at Arlington in 1988. He was a Post-Doctoral Fellow at University of Alberta from 1988 to 1990. Then he joined the Department of Applied Mathematics, University of Waterloo as an Assistant Professor, where he became an Associate Professor in 1994 and a Full Professor in 1997. He has authored or co-authored more than 400 journal articles, six research monographs, and 20 edited books. His current research interests include hybrid dynamical systems, multi-agent systems, complex dynamical networks, and infectious disease modeling.

Titles: Spiking Control Systems

Dr. Rodolphe Sepulchre, University of Cambridge, UK

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Rodolphe Sepulchre received the engineering degree (1990) and the PhD degree (1994), both from the Université catholique de Louvain, Belgium. He was a postdoctoral research associate at the University of California, Santa Barbara, from 1994 to 1996. He was then appointed at the Université de Liège in 1997. In 2013, he moved to Cambridge, UK, where he holds the control chair in the Department of Engineering and a professioral fellowship in Sidney Sussex College. He held visiting positions at Princeton University (2002-2003), the Ecole des Mines de Paris (2009-2010), California Institute of Technology (2018), and part-time positions at the University of Louvain (2000-2011) and at INRIA Lille Europe (2012-2013). He was the Petar Kokotovic Distinguished Visiting Professor of UCSB in 2019.

He is a fellow of IFAC (2020), IEEE (2009), and SIAM (2015). In 2008, he received the IEEE Control Systems Society Antonio Ruberti Young Researcher Prize. He was elected at the Royal Academy of Belgium in 2013. He is the recipient of the 2020 IEEE Axelby Best Paper Award. He is (co-) author of the monographs Constructive Nonlinear Control (1997, with M. Jankovic and P. Kokotovic) and Optimization on Matrix Manifolds (2008, with P.-A. Absil and R. Mahony).

PLENARY SPEAKER

Titles: Neuro-dynamics based Intelligent Control of Various Autonomous Robotic Systems

Dr. Simon Yang, University of Saskatchewan, Canada

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Prof. Simon X. Yang received the B.Sc. degree in engineering physics from Beijing University, China in 1987, the first of two M.Sc. degrees in biophysics from Chinese Academy of Sciences, Beijing, China in 1990, the second M.Sc. degree in electrical engineering from the University of Houston, USA in 1996, and the Ph.D. degree in electrical and computer engineering from the University of Alberta, Edmonton, Canada in 1999. Prof. Yang joined the School of Engineering at the University of Guelph, Canada in 1999. Currently he is a Professor and the Head of the Advanced Robotics and Intelligent Systems (ARIS) Laboratory at the University of Guelph in Canada.

Prof. Yang has diversified research expertise. His research interests include robotics, artificial intelligence, sensors and multi-sensor fusion, wireless sensor networks, intelligent control, machine learning, fuzzy systems, intelligent communication and transportation, and computational neuroscience. Prof. Yang he has been very active in various professional activities. He serves as the Editor-in-Chief of International Journal of Robotics and Automation, and an Associate Editor of IEEE Transactions on Cybernetics, IEEE Transactions of Artificial Intelligence, and several other journals. He has involved in the organization of many international conferences.

KEYNOTE SPEAKER

Titles: Unleash the Combined Power of Physics and Machine Learning for Advanced Battery Management

Dr. Huazhen Fang, University of Kansas, USA

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Huazhen Fang is an Associate Professor of Mechanical Engineering at the University of Kansas, where he joined in 2014 and has led the Information & Smart Systems Laboratory. He received his Ph.D., M.Sc., and B.Eng. from the University of California, San Diego (Mechanical Engineering, 2014), University of Saskatchewan, Canada (Mechanical Engineering, 2009), and Northwestern Polytechnic University, China (Computer Science, 2006), respectively. His research interests lie in modeling, control and estimation theory with application to energy management and cooperative robotics. He has received the 2019 National Science Foundation Faculty Early Career Award. He currently serve as an Associate Editor for Information Sciences, IEEE Transactions on Industrial Electronics, IEEE Open Journal of Control Systems, IEEE Open Journal of the Industrial Electronics Society, and on the IEEE Control Systems Society Conference Editorial Board.

Titles: Magnetic Levitation for Microrobotics and Micromanipulation

Dr. Behrad Khamesee, University of Waterloo, Canada

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Dr. Behrad Khamesee is a Professor in the Department of Mechanical and Mechatronics Engineering, University of Waterloo, Canada. He is the director of MagLev Microrobotics Laboratory and co-PI of the RoboHub state-of-the-art robotics facility at the University of Waterloo. His research interests and expertise include design, modeling, and control of advanced mechatronics systems, particularly microrobotic magnetic levitation and semi-active electromagnetic dampers for vehicles.

His research has resulted in 90 refereed Journal and conference papers, and his research group is a recipient of several best paper awards. His research group developed the world's smallest magnetically-levitated microrobot which is equipped with a gripper. Dr. Khamesee is involved in conferences program committees, has organized several sessions at international conferences, and is a technical reviewer for several IEEE Journals.

LIST OF PAPERS

The following papers were presented at the 8th International Conference on Control, Dynamic Systems, and Robotics (CDSR'22).

Robotics

Titles: Leader-Follower Formation with Second-Order Slide Mode Control for Differential-Drive Mobile Robots
Authors: Mario Ramirez-Neria, Jaime González-Sierra, Eduardo G. Martinez-Hernandez Rodrigo Ramirez-Juarez and Pablo Paniagua-Contro

Titles: Effects of the Link Lengths in the Design and Optimization of A 6 DOF Assistive Robot for Activities of Daily Living
Authors: Elias Muñoz, Md Samiul Haque Sunny, Javier Sanjuan, Ivan Rulik, Jaime Hernandez, Inga Wang, Mohammad H. Rahman

Titles: A Vision-based Object Detection and Localization System in 3D Environment for Assistive Robots' Manipulation
Authors: Md Ishrak Islam Zarif, Md Tanzil Shahria, Md Samiul Haque Sunny, Md Mahafuzur Rahaman Khan, Sheikh Iqbal Ahamed, Inga Wang, Mohammad H Rahman

Titles: Optimal Design of a Cable-driven Wrist Prosthetic Device
Authors: J.D. Sanjuan, Md Samiul Haque Sunny, Jawher Ghommam, Brahim Brahmi, Inga Wang, Mohammad H. Rahman

Titles: Robotics and Virtual Reality to Improve Functional Recovery in Stroke Patients
Authors: Carlos Omar López-López, Marío Ramirez-Neria, Pablo Paniagua-Contro, Isabel Bolivar-Tellería, Carlos Galvan-Duque, Eduardo G. Hernandez-Martinez

Titles: A Self-Driving Transport Vehicle Based on Fusion Camera and Radar
Authors: Jinane Mounsef, Muhieddin Amer

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Robotics

Titles: Battery Energy Maximization of a Solar Powered Unmanned Ground Vehicle in an Unknown Environment
Authors: Luke Strebe, Kooktae Lee

Titles: Optimal Gas Leak Localization and Detection using an Autonomous Mobile Robot
Authors: Geronimo Macias, Kooktae Lee

Titles: A New Compound Model-based Control (NCMC) of an Upper Limb Robot for Rehabilitation
Authors: Md Rasedul Islam, Mohammad Habibur Rahman

Control System and Applicarion

Titles: Magnetic Drive-Trains Pole-Slipping Inducements and Overload Speed Reduction
Authors: Xiaowen Liao, Chris Bingham, Tim Smith

Titles: A Model-Free Control System Based on the Sliding Mode Control with Automatic Tuning Using as On-Line Parameter Estimation Approach
Authors: Md Sariful Islam, Agamemnon Crassidis, Daniel Kaputa, Aashrita Mandalapu

Titles: An Improvement in Efficiency of Non-Conventional Energy Resources Using Green Computing
Authors: Ranjeet Singh

Titles: Raspberry Pi and White Cane Integration for Assisting the Visually Impaired
Authors: Aparicio Carranza, Anny Baez, Josue Hernandez, Harrison Carranza, Hossein Rahemi

Titles: Scaled Consensus Of Hybrid Multi-Agent Systems
Authors: Mana Donganont, Xinzhi Liu

Titles: Nonlinear State Estimation and Control of an Organic Rankine Cycle
Authors: Daniel Sieben, Jeff Pieper

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Modeling of Complex Systems

Titles: Continuous Appropriately-Oriented Collision Detection Algorithm for Physics-Based Simulations
Authors: Alexander Schock, Robert Langlois

Titles: Dynamic Modelling of the Standard Neonatal Patient Transport System using a Newton-Euler Based Formulation in the Roll Plane
Authors: Keely Gibb, Patrick Kehoe, Jason Hurley, Cheryl Aubertin, Kim Greenwood, Andrew Ibey, Stephanie Redpath, Adrian D. C. Chan, James R. Green, Robert G. Langlois

Titles: Design of a Sensorless Field Oriented Control Drive for Brushless DC Motors
Authors: Shanthar Rajinth, Chamil Abeykoon, Sanjeeva Maithripala

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SPONSORS

International ASET Inc. would like to thank the following sponsors for their support of CDSR'22:

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JOURNAL SPECIAL ISSUES

Selected articles from the coference will be published in one of the following journals after a secondary review process:

JMIDS - Journal of Machine Intelligence and Data Science
JBEB - Journal of Biomedical Engineering and Biosciences

These journals have adopted to the open-access model, meaning all free access to the journal's articles and content with no need for subscription. This ensures larger audience and therefore higher citations.

Users are allowed to read, download, copy, distribute, print, search, or link to the full texts of the articles in this journal without asking prior permission from the publisher or the author. This is in accordance with the BOAI definition of open access.

All published papers of JMIDS and JBEB will be submitted to Google Scholar. Additionally, they will be permanently archived in Portico (one of the largest community-supported digital archives in the world) and will be assigned unique DOIs.

These journals have been approved by the Committee on Publication Ethics (COPE). Please visit the following websites for the respected journals:

- JMIDS: https://jmids.avestia.com
- JBEB: https://jbeb.avestia.com

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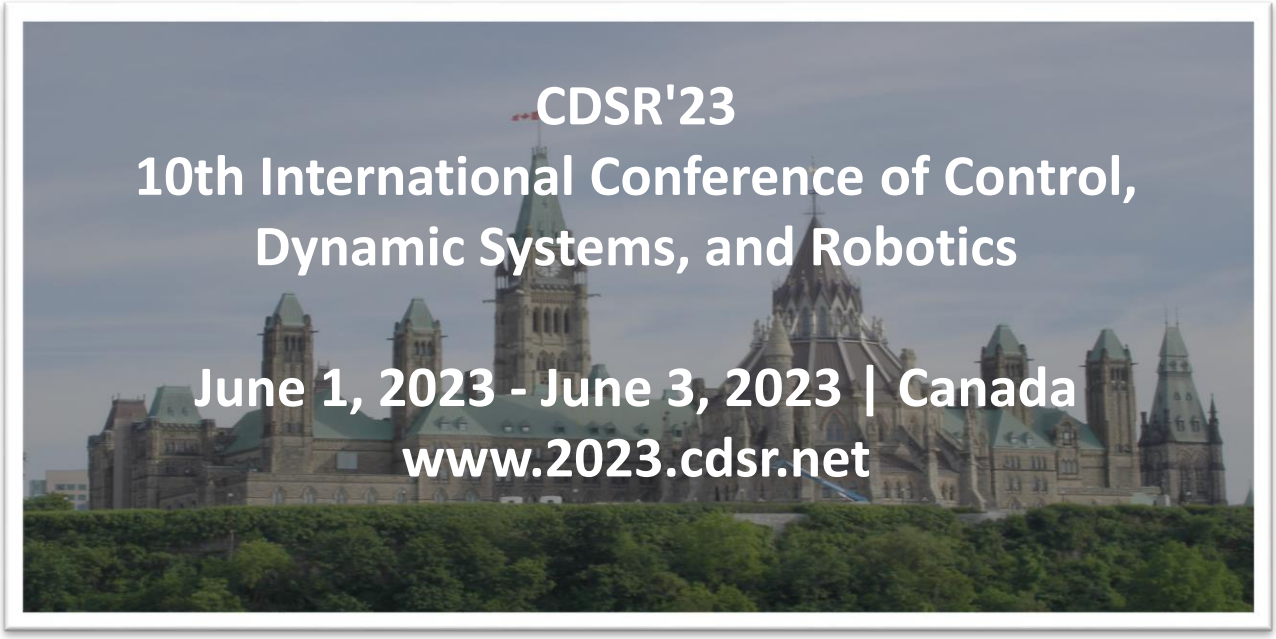
CDSR’23

The 10th International Conference of Control, Dynamic Systems, and Robotics (CDSR'23) will be held on June 01 - June 03, 2023 in Canada.



For inquiries and to obtain further information on the congress, please visit the website

You can also email info@cdsr.net or call us

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ETHICS & MALPRACTICE

At International ASET Inc., we take matters that relate to ethics in publishing very seriously. We believe that the peer-review publication process is a vital building block of academia, and its integrity must be maintained at all costs, which is why every article will be peer-reviewed by several experts in the field. Under peer-review, experts in the related fields are required to provide opinions and comments on the improvements of the submissions.

We are pleased to announce that Avestia Publishing (a publisher of International ASET Inc.) has been approved by the Committee on Publication Ethics (COPE). We are proud of our efforts towards abiding by the guidelines of ethics, integrity, and high standards in publishing.

Following are the ethics guidelines set by the organizers for the authors and the reviewers of the conference:

Scientific Committees

Scientific committees consisting of experts in the fields are established. The committees oversee the peer-review and publication process. To see the scientific committee members, please follow the link: Scientific Committee

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One or more reviewer, scientific committee member, or chair, (internal or external), are responsible for evaluating the relevance of the submitted manuscripts to the proceedings, technical and scientific merit, originally, and impact. These evaluations are to be carried out regardless of ethnicity, religion, gender, sexual orientation, political beliefs, and institutions. Successive to peer-review, the Chair has full authority and is solely responsible for the published content and the process thereof.

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Scientific committee member(s) and publishing staff may not disclose manuscripts or their content, directly or indirectly, to anyone other than individuals invited to review the manuscript (whether they accept or not), other reviewers of the same publications, and publishing staff.

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Scientific committee member(s) and publishing staff may not utilize the contents of submitted manuscripts whether accepted or rejected, directly or indirectly for their own research purposes without prior written consent by the authors.

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Reviewers

Contribution to Decisions

In order for final decisions to be made regarding acceptance or rejection of papers, we rely on peer-review. Peer-review is the process of experts in the field reading, understanding, and objectively commenting on submitted papers. Through peer-review, scholars give back to the academic and scientific community by helping the chair(s) make decisions regarding manuscripts.

Promptness

Reviewers should promptly notify the chair(s) if they are unable or unqualified to carry out their reviewing duties. Reviewers should do their best to provide the reviews to the chair(s) as promptly as possible, and within the designated time-frame.

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Invited reviewers should immediately inform the chair(s) in case of a conflict of interest based on competitive, collaborative, personal, family, and other relationships with the authors or people involved in the work.

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The paper being submitted for the proceedings should be based on clear objective, discussion, and references. The findings, data, and the arguments being used in the paper should be accurate. It is author's responsibility to guarantee the authenticity of the data in the paper.

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Only persons who have significantly contributed to the work and the manuscript can be named authors on a paper. These contributions include the idea/concept, design, experiments, evaluation, analysis, drafting or revision of the manuscript, and others. Authors must all have agreed to be named as such and for the manuscript to be submitted. Anyone who has contributed based on the above, but the level of contribution is not significant, may appear in the acknowledgement section of the manuscript.

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Authors are encouraged to share their data, software, or other sharable material online, provided copyright and ownership laws surrounding that particular project permit. Authors may also be asked to share such material with the chair(s), and/or reviewers, and must be willing to do so if asked.

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Conflicts of Interest

Authors must notify the chair(s) at the time of submission, if any factor outside the scope of the research has influenced any step of the work and manuscript writing. Examples of such factors include but are not limited to funding, grants, advisory and consultancy, stock ownership, current or past employment, and memberships, among others. All funding sources should be disclosed in the manuscript.

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If an author identifies a major error in a published paper, he/she must immediately inform the publisher. Regardless of whether a significant error is reported by the authors of the work or other readers, authors are obligated to take the necessary steps to correct the issue. It is decided on a case-by-case basis whether an erratum will be submitted to notify future readers of the error and correction, or whether the paper will be retracted. Unethical/plagiarism issues mostly result in a retraction, while unintended mistakes will mostly result in the publication of an erratum.

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ETHICS & MALPRACTICE

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Errata and Retractions

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Schedule:

This conference proceeding accompanies the conference, meaning a new proceedings will be published every year for the corresponding annual conference of this series.

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