



PROCEEDINGS OF THE 10th INTERNATIONAL CONFERENCE ON CONTROL, DYNAMIC SYSTEMS, AND ROBOTICS (CDSR 2023)

June 01, 2023 - June 03, 2023 | Carleton University, Ottawa, Canada

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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 10th International Conference of Control, Dynamic Systems, and Robotics (CDSR 2023).

CDSR 2023 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 10th International Conference of Control, Dynamic Systems, and Robotics (CDSR 2023) is going to be held in a hybrid format, i.e. in person as well as online.

In the tenth meeting of this conference, four plenary speakers and one keynote speaker 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 19 papers will be presented from professors, students, and researchers across the world.

We thank you for your participation and contribution to the 10th International Conference of Control, Dynamic Systems, and Robotics (CDSR 2023). We wish you a very successful and enjoyable experience.

Dr. Aparicio Carranza

*Conference Chair
CDSR 2023*

Dr. Yang Shi

*Conference Chair
CDSR 2023*

Dr. Hussein A. Abdullah

*Conference Co-Chair
CDSR 2023*

ABOUT CDSR 2023

The 10th International Conference on Control, Dynamic Systems, and Robotics (CDSR 2023) aims to become the leading annual conference in fields related to traditional and modern control and dynamic systems. The goal of CDSR 2023 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'22 in Canada, CDSR 2023 is hosted in Carleton University, Ottawa, Canada as well this year. CDSR 2023 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)

 Google Scholar



Crossref

Scopus



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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 2023 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



Dr. Hussein A. Abdullah
University of Guelph, Canada
Conference Co-Chair

Scientific Committee Members

- **Dr. Nasser L. Azad**, University of Waterloo, Canada
- **Dr. Gary M. Bone**, McMaster University, Canada
- **Dr. Lahouari Cheded**, King Fahd University of Petroleum and Minerals, KSA
- **Dr. Moojan Ghafurian**, University of Waterloo, Canada
- **Dr. Jan Huissoon**, University of Waterloo, Canada
- **Dr. Behrad Khamesee**, University of Waterloo, Canada
- **Dr. Veronika Magdanz**, University of Waterloo, Canada
- **Dr. Jeff Pieper**, University of Calgary, Canada
- **Dr. Emre Sariyildiz**, University of Wollongong, Australia
- **Dr. Nariman Sepehri**, University of Manitoba, Canada
- **Dr. Hamed Shamsavan**, University of Waterloo, Canada
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- **Dr. Simon Yang**, University of Guelph, Canada
- **Dr. Jiangfan Yu**, The Chinese University of Hong Kong, Hong Kong

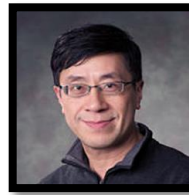
PLENARY & KEYNOTE SPEAKERS

The keynote information for the 8th International Conference of Control, Dynamic Systems, and Robotics (CDSR 2023) is as follows:

Plenary Speakers



[Dr. Clément Gosselin](#)
Université Laval, Canada



[Dr. Henry Leung](#)
University of Calgary,
Canada



[Dr. Robert Riener](#)
University of Zurich,
Switzerland



[Dr. Chris W. Zhang](#)
University of
Saskatchewan, Canada

Keynote Speaker



[Dr. Ali Etemad](#)
Queen's University, Canada

PLENARY SPEAKER



Titles: Design, Prototyping and Control of Low-Impedance Hybrid Robots for Intuitive Physical Human-Robot Interaction

Dr. Clément Gosselin, Université Laval, Canada

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Clément Gosselin received the B. Eng. degree in Mechanical Engineering from the Université de Sherbrooke, Québec, Canada, in 1985, and the Ph.D. degree from McGill University, Montréal, Québec, Canada in 1988. He was then a post-doctoral fellow at INRIA in Sophia-Antipolis, France in 1988–89. In 1989 he was appointed by the Department of Mechanical Engineering at Université Laval, Québec where he is a Full Professor since 1997. He held the Canada Research Chair in Robotics and Mechatronics at Laval from 2001 to 2021. He was a visiting researcher at the RWTH in Aachen, Germany in 1995, at the University of Victoria, Canada in 1996 and at the IRCCyN in Nantes, France in 1999. His research interests are kinematics, dynamics and control of robotic mechanical systems with a particular emphasis on the mechanics of grasping, the kinematics and dynamics of parallel manipulators and the development of human-friendly robots and haptic devices. His work in the aforementioned areas has been the subject of numerous publications in international journals and conferences as well as of several patents and two books. His publications have been cited more than 37000 times and he has an h-index of 98. He has directed many research initiatives, including collaborations with several Canadian and foreign high-technology companies and he has trained more than 130 graduate students. He is currently an Associate Editor of the Journal Mechatronics and a Senior Editor of the IEEE Robotics and Automation Letters.

Dr. Gosselin received several awards including the ASME DED Mechanisms and Robotics Committee Award in 2008, the ASME Machine Design Award in 2013 and the IFToMM Award of Merit in 2019. He was appointed Officer of the Order of Canada in 2010 for contributions to research in parallel mechanisms and underactuated systems. He is a fellow of the ASME, of the IEEE and of the Royal Society of Canada.

PLENARY SPEAKER



Titles: 3D Perception for Autonomous Driving

Dr. Henry Leung, University of Calgary, Canada

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Henry Leung is a professor of the Department of Electrical and Software Engineering of the University of Calgary. His current research interests include data analytic, information fusion, machine learning, signal and image processing, robotics, and internet of things. He has published over 350 journal papers and 250 refereed conference papers. Dr. Leung has been the associate editor of various journals such as the IEEE Circuits and Systems Magazine, International Journal on Information Fusion, IEEE Trans. Aerospace and Electronic Systems, IEEE Signal Processing Letters, IEEE Trans. Circuits and Systems, Scientific Reports. He has also served as guest editors for the special issue “Intelligent Transportation Systems” for the International Journal on Information Fusion and “Cognitive Sensor Networks” for the IEEE Sensor Journal. He is the editor of the Springer book series on “Information Fusion and Data Science”. He is a Fellow of IEEE and SPIE.

PLENARY SPEAKER



Titles: How Rehabilitation Robots Can Cooperate and Motivate

Dr. Robert Riener, University of Zurich, Switzerland

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Robert Riener is Full Professor for Sensory-Motor Systems at the Department of Health Sciences and Technology, ETH Zurich. He has been Assistant Professor for Rehabilitation Engineering at ETH Zurich since May 2003. In June 2006 he was promoted to the rank of an Associate Professor and in June 2010 to the rank of a Full Professor. As he holds a Double-Professorship with the University of Zurich, he is also active in the Spinal Cord Injury Center of the Balgrist University Hospital (Medical Faculty of the University of Zurich). Robert Riener studied mechanical engineering at TU München and University of Maryland, USA, from 1988 till 1993. He received the Dipl.-Ing. degree and the Dr. degree from the TU München in 1993 and 1997, respectively. In 1993 he joined the Institute of Automatic Control Engineering, where he has pursued research into neuroprosthetics. After postdoctoral work at the Centro di Bioingegneria, Politecnico di Milano from 1998 to 1999, he returned to the TU München, where he finished his Habilitation in the field of Biomechatronics about multi-modal VR applied to medicine in January 2003. Since his activity in Zurich Riener develops robots and interaction methods for motor learning in rehabilitation and sports.

PLENARY SPEAKER



Titles: A Design-thinker for Design of Soft Robots

[Dr. Chris W. Zhang, University of Saskatchewan, Canada](#)

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Wenjun Zhang received his Ph.D. degree in Mechanical Engineering and Design from the Delft University of Technology, The Netherlands, in 1994. He is currently a full professor of the Department of Mechanical Engineering in the University of Saskatchewan, Canada. His current research area is resilient robotics, soft robotics, computational design, mechatronics, and engineering informatics. He has published over 550 refereed technical publications, among which over 340 papers appear in refereed journals and over 220 papers in refereed conference proceedings, in a broad scope of fields, including design and mechatronics, manufacturing, robotics, informatics, and human-machine systems. He holds dozens of patents, including three US patents. His paper received the best journal paper award for 2012 by the IEEE Transactions on Neural Networks. His papers received top 25 hottest articles by Mechatronics in 2006 & 2005, by Expert Systems with Applications in 2011, by Microelectronics Journal. He has the google scholar H-index (61). He was highly cited authors by Elsevier (China) from 2015 to 2018 (inclusive). He was included in the top 2% world scientists by Stanford in 2020 – 2022. Dr. graduated over 38 PhD students and over 100 MS (thesis) students. He received 2012 Distinguished Graduate Supervisor Award by the University of Saskatchewan. He has served as a Senior Editor for the IEEE/ASME Transactions on Mechatronics, Associate Editor for several reputed journals including IEEE SMC – System, IEEE System Journal. He is an elected Fellow of Canadian Academy of Engineering, and a fellow of the American Society of Mechanical Engineers, and Senior member of IEEE. Dr. Zhang can be reached by email (chris.zhang@usask.ca).

KEYNOTE SPEAKER



Titles: Beyond Autonomous Driving:
Understanding People for Customized User
Experience

Dr. Ali Etemad, Queen's University, Canada

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Dr. Etemad is an Associate Professor in the Department of Electrical and Computer Engineering at Queen's University in Canada, where he also holds the title of Mitchell Professor in AI for Human Sensing and Understanding. He is a member of the Ingenuity Labs Research Institute and leads the Ambient Intelligence and Interactive Machines (Aiim) lab. His primary research interests lie in machine learning and deep learning, with a focus on human-centered applications using wearables, smart devices, and smart environments. Prior to joining Queen's, he worked in the industry for several years as a data scientist. His work has been published in top-tier venues such as CVPR, AAAI, ICCV, ECCV, ACM CHI, ICASSP, Interspeech, ICPR, T-PAMI, T-AFFC, and more. He has co-invented nine patents and delivered numerous invited talks at various events. Dr. Etemad serves as an Associate Editor for IEEE Transactions on Artificial Intelligence and has participated as a PC member/reviewer for several renowned conferences and journals, including NeurIPS, ICML, CVPR, ICLR, ICCV, ECCV, AAAI, ACII (senior PC), ICASSP, ISWC, and ICMI, among others. He has held leadership roles in multiple events, such as General Chair for the AAAI Workshop on Human-Centric Self-Supervised Learning (2022), Publicity Co-Chair for the European Workshop on Visual Information Processing (2022), and Industry Relations Chair for the Canadian Conference on AI (2019). Dr. Etemad's lab and research program have received funding from various organizations, including the Natural Sciences and Engineering Research Council (NSERC) of Canada, Ontario Centre of Innovation (OCI), Canadian Foundation for Innovation (CFI), and private sector partners.

LIST OF PAPERS

The following papers were presented at the 10th International Conference on Control, Dynamic Systems, and Robotics (CDSR 2023).

Robotics

Robotic Adaptive Algorithm for Solving Fit-up Variations in Welding at Industrial Scale

Authors: Ahmad Ashoori, Ringo Gonzalez, Soroush Karimzadeh, Mahyar Asadi

Estimation of Time-Varying Inertia of Aerial Manipulators Performing Manipulation of Unknown Objects

Authors: Chanhong Park, Alejandro Ramirez-Serrano, Mahdis Bisheban

Development of a Robotic Additive Manufacturing Framework for Fused Deposition Modeling: Technical Considerations

Authors: Pooyan Nayyeri, Habiba Bougherara, Kouros Zareinia

NDI/INDI Control Scheme for Tilt-rotorcraft Unmanned Aircraft Systems

Authors: Maryam Taherinezhad, Alejandro Ramirez-Serrano

LIST OF PAPERS

Posters Session

Low-Cost Distance Sensor Characterization of Ultrasonic and Infrared to Evaluate the “Reality Gap” in Robot System Simulation

Authors: Bryan Van Scoy, Tra Yen Nhu Phan, Lam Ha, and Peter Jamieson

Management of power in AC/DC Hybrid micro grids and harmonic analysis with and without D-STATCOM with different load condition

Authors: Ramesh Kumar, Rahul Sharma, Ashwani Kumar Sharma

Combining Genetic Algorithm and Artificial Neuro-molecular System for Rehabilitation Intelligent Robot: A Synergistic Approach

Authors: Jong-Chen Chen

LIST OF PAPERS

Virtual Session

[Control the Quadcopter using Hybrid Controller under the Disturbed Environment](#)

Authors: Sanjay Kumar, Lillie Dewan

[CD-Blink: An External Disk Drive Based Covert Channel](#)

Authors: Bradley Schlauder, Christopher Tremblay, Daryl Johnson

[Music-Based Covert Channel in the Lord of the Rings Online](#)

Authors: Jess Beckwith, Craig Gebo, Daryl Johnson

[Stability Robustness Analysis of Partial Feedback Linearization for a Class of Uncertain Discrete-Time Systems](#)

Authors: W. Alexander Baker Jr., Susan C. Schneider, Edwin E. Yaz, Yvonne I. Yaz

[Model-Free Sliding Mode Control in the Lateral and Direction Dynamics of an Aircraft](#)

Authors: Nicholas Hutson, Agamemnon Crassidis

[Market-Based Collaborative Exploration and Mapping of an Unknown Indoor Environment](#)

Authors: Mohammad Hossein Sarfi, Mahdis Bisheban

LIST OF PAPERS

Control Engineering

[Aerodynamic Properties Identification for Small-Size Wind Turbine Blade Airfoil Sections Using the CFD Method](#)

Authors: Saeid Fadaei, Robert G. Langlois, Fred F. Afagh

[Study of Energy Efficiency for Satellite Communication Subsystems by Differential Game](#)

Authors: Wei Wan, John M Cioffi, Yuanyuan Peng, Brenay S. Howard

[A Radial Basis Function Neural Network Approach to Filtering Stochastic Wind Speed Data](#)

Authors: Jiten Parmar, Jeff K Pieper

[First Order Dynamic Sliding Mode Control of a Wind Turbine with Optimized Tip Speed Ratio](#)

Authors: Nishanth Padmanabhuni, Jeff Pieper

[IoT and Cloud Computing Integration to Minimze Drunk Driving Accidents](#)

Harrison Carranza, Aparicio Carranza, Edwin Tito Nicholas Hutson, Agamemnon Crassidis

[Home Security System Controlled with Raspberry PI via Google Cloud](#)

Authors: Harrison Carranza, Aparicio Carranza, Faisal Tariq, Showmik Chowdhury

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JOURNAL PUBLICATION

Selected articles from the conference will be published in the following journal after a secondary review process:

[JMIDS - Journal of Machine Intelligence and Data Science](#)

This journal 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.

All published papers of JMIDS 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.

Please visit the following website for the respected journal:

- JMIDS: <https://jmids.avestia.com>

CDSR 2024

The 11th International Conference of Control, Dynamic Systems, and Robotics (CDSR 2024) will be held on June, 2024 in UAE.



For inquiries and to obtain further information on the congress, please visit the [website](http://www.2024.cdsr.net)

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

at: +1-613-834-9999

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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 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](#)

Equality and Decisions

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.

Confidentiality

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.

Conflicts of Interest

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.

ETHICS & MALPRACTICE

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.

Acknowledgment of Source

The reviewer should notify the chair(s) if they find any similarities in the paper being reviewed and any other work that has been published previously.

Confidentiality

Reviewers must not share the contents of the manuscripts they receive for review, regardless of their decision to review or contents of the review, directly or indirectly, with anyone other than the person who has assigned the review.

Fairness

Reviewers should review manuscripts fairly and objectively, with supporting evidence or arguments, regardless of personal feelings or biases.

Conflicts of Interest:

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.

ETHICS & MALPRACTICE

Authors

Reporting Standards

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.

Authorship

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.

Acknowledgement of Source

Acknowledgement to other's work being used in the paper must be given at all times. Authors of the paper should give comprehensive credit where it is necessary, by citing the work, they use for supporting their own research.

Accuracy, Originality, and Plagiarism

Authors should describe their work and the results of their work accurately and in full. The level of provided accuracy and detail should be such that a reader can replicate the work independently. Inaccurate, incomplete, fraudulent, and misleading statements are considered unacceptable and unethical. Direct or indirect use of other people's work is not allowed, unless properly cited. Previous works that have influenced the current work should also be cited. Presenting someone else's work as one's own is strictly prohibited and is considered plagiarism.

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ETHICS & MALPRACTICE

Dual Submissions

Submitting a manuscript to more than one venue (conference, journal, etc) simultaneously is not allowed. Presenting previously published work to be considered as a new submission, without a significant new interpretation or analysis, is prohibited.

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.

Animal and Human Subjects

Works involving human and/or animal subjects must ensure that the work has abided by institutional guidelines, and pre-approved by required bodies. Moreover, consent must be acquired from participants, and privacy of subjects must be ensured. All of the above must be specified with clear statements in the manuscript.

Hazardous Material

It should clearly be identified in the manuscripts if the works have involved hazardous chemicals and material, or devices that can be harmful.

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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.

ETHICS & MALPRACTICE

Publisher

Errata and Retractions

The publisher takes the necessary steps to prevent mistakes, academic and scientific misconduct, and unethical behavior, both intended and unintended. When mistakes are reported, the publisher works with chair(s) and authors to publish an erratum clarifying the issue. In cases where the mistakes are severe and significant, the paper might be retracted. If unethical behavior, plagiarism, academic and scientific misconduct, or other such activities are proven to have taken place by an author or authors, the publisher will retract the paper.

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This conference-proceedings is managed and operated by the International ASET (International Academy of Science, Engineering, and Technology) and Avestia Publishing (the publishing arm of ASET).

Schedule:

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

CONTACT US

For inquiries and to obtain further information on the conference, please visit our [website](#)
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