



PROCEEDINGS OF THE 11TH INTERNATIONAL CONFERENCE ON CONTROL, DYNAMIC SYSTEMS, AND ROBOTICS (CDSR 2024)

June 10, 2024 - June 12, 2024 | Chestnut Conference Centre
University of Toronto, Toronto, Canada

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ISBN: 978-990800-36-8 | ISSN: 2368-5433

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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 11th International Conference of Control, Dynamic Systems, and Robotics (CDSR 2024).

CDSR 2024 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 11th International Conference of Control, Dynamic Systems, and Robotics (CDSR 2024) is going to be held in a hybrid format, i.e. in person as well as online.

In the tenth meeting of this conference, one plenary speaker and three 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 23 papers will be presented from professors, students, and researchers across the world.

We thank you for your participation and contribution to the 11th International Conference of Control, Dynamic Systems, and Robotics (CDSR 2024). We wish you a very successful and enjoyable experience.

Dr. Aparicio Carranza

Conference Chair

CDSR 2024

Dr. Miguel Bustamante

Conference Co-Chair

CDSR 2024

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ABOUT CDSR 2024

The 11th International Conference on Control, Dynamic Systems, and Robotics (CDSR 2024) aims to become the leading annual conference in fields related to traditional and modern control and dynamic systems. The goal of CDSR 2024 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'23 in Canada, CDSR 2024 is hosted in Toronto, Canada as well this year. CDSR 2024 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



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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 2024 Conference:

Scientific Committee Chairs



Dr. Aparicio Carranza
New York City College of Technology, USA
Conference Chair



Dr. Miguel Bustamante
Vaughn College of Aeronautics and Technology, USA
Conference Co-Chair

Scientific Committee Members

- **Dr. Gary M. Bone**, McMaster University, Canada
- **Dr. Mohsin Jamil**, Memorial University of Newfoundland, Canada
- **Dr. Behrad Khamesee**, University of Waterloo, Canada
- **Dr. Henry Leung**, University of Calgary, Canada
- **Dr. Hui Lin**, University of Rhode Island, USA
- **Dr. Veronika Magdanz**, University of Waterloo, Canada
- **Dr. Jeff Pieper**, University of Calgary, Canada
- **Dr. Andre Rosendo**, Worcester Polytechnic Institute, USA
- **Dr. Emre Sariyildiz**, University of Wollongong, Australia
- **Dr. Nariman Sepehri**, University of Manitoba, Canada
- **Dr. Hamed Shahsavan**, University of Waterloo, Canada
- **Dr. Ning Sun**, Nankai University, China
- **Dr. W.J. (Chris) Zhang**, University of Saskatchewan, Canada

PLENARY & KEYNOTE SPEAKERS

The keynote information for the 9th International Conference of Control, Dynamic Systems, and Robotics (CDSR 2024) is as follows:

Plenary Speakers



[Dr. Dan Zhang](#)
York University, Canada

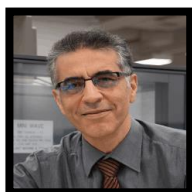
Keynote Speaker



[Dr. Kaan Erkorkmaz](#)
University of Waterloo,
Canada



[Dr. Michael Greenspan](#)
Queen's University, Canada



[Dr. Farrokh Janabi-Sharifi](#)
Toronto Metropolitan
University, Canada

PLENARY SPEAKER



Titles: Innovation Design and Applications of Robotic Manipulators in Intelligent Manufacturing System

Dr. Dan Zhang, York University, Canada

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Professor Dan Zhang is a Chair Professor of Intelligent Robotics and Automation at the Hong Kong Polytechnic University. He received his PhD in Mechanical Engineering from Laval University, Canada in 2000. He was a Kanefff Professor and Tier 1 York Research Chair in Advanced Robotics and Mechatronics in the Department of Mechanical Engineering at York University. Dr. Zhang was a Canada Research Chair in Advanced Robotics and Automation, was a founding Chair of the Department of Automotive, Mechanical and Manufacturing Engineering with the Faculty of Engineering & Applied Science at Ontario Tech University. He received his Ph.D. in Mechanical Engineering from Laval University, Canada, in June 2000. Dr. Zhang's research interests include: synthesis and optimization of parallel and hybrid mechanisms; generalized parallel mechanisms research; reconfigurable robots; micro/nano manipulation and mems devices (e.g., sensors); rescue robots; smart biomedical instruments (e.g., exoskeleton robots and rehabilitation robotics); AI/robotics/autonomous systems; Aerial and Underwater Robotics and Artificial Intelligence for Robotics. Dr. Zhang has published 254 journal papers and 190 conference papers, 12 books, 9 book chapters and numerous other technical publications. Dr. Zhang has served as a General Chair for 67 International Conferences and delivered 117 keynote speeches. Dr. Zhang is listed as the World's Top Two Percent Researchers by Stanford's Standardized Citation Indicators in 2020, 2021, 2022, and 2023. Dr. Zhang is a Fellow of the Canadian Academy of Engineering (CAE), a Fellow of the Engineering Institute of Canada (EIC), a Fellow of American Society of Mechanical Engineers (ASME), and a Fellow of Canadian Society for Mechanical Engineering (CSME), a Senior Member of Institute of Electrical and Electronics Engineers (IEEE), and a Senior Member of SME.

KEYNOTE SPEAKER



Titles: N/A

Dr. Kaan Erkorkmaz, University of Waterloo, Canada

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N/A

KEYNOTE SPEAKER



Titles: The “Key” to Robot Vision: Learned Keypoints for 6DoF Pose Estimation
Dr. Michael Greenspan, Queen’s University, Canada

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Michael Greenspan is a professor with the Department of Electrical and Computer Engineering, and the School of Computing, at Queen’s University, Kingston, Canada. Dr. Greenspan’s research investigates problems of computer vision and robotics, with a focus on the development of machine learning-based pose estimation methods for industrial applications, including manufacturing and mining. Dr. Greenspan has over 150 refereed publications, including five patents, and he has served on the technical and program committees of over 200 international conferences in the fields of computer vision and robotics. He is a founding member of Ingenuity Labs Research Institute, was an Academic Resident at Seiko Epson Corporation, and has served as Visiting Professor at University of Coimbra, Portugal. Dr. Greenspan holds membership in the Professional Engineers of Ontario, the IEEE Computer Society, and the IEEE Robotics and Automation Society. He has been the recipient of the Premier’s Research Excellence Award, the Canadian Image Processing and Pattern Recognition Society Young Investigator’s Award, and a number of Best Paper and Favorite Professor Awards.

KEYNOTE SPEAKER



Titles: Aerial Manipulation: Perspectives and Challenges

Dr. Farrokh Janabi-Sharifi, Toronto Metropolitan University, Canada

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Farrokh Janabi-Sharifi is a Professor of Mechanical, Industrial, and Mechatronics Engineering and the Director of Robotics, Mechatronics and Automation Laboratory (RMAL) at Toronto Metropolitan University (TMU). Professor Janabi-Sharifi received a PhD degree in Electrical and Computer Engineering from the University of Waterloo, Canada in 1995. He was an NSERC postdoctoral fellow and lecturer in the Center for Intelligent Machines and Department of Electrical and Computer Engineering of McGill University between 1995 and 1997. Later, he joined TMU's Department of Mechanical, Industrial, and Mechatronics Engineering in 1997 where he is currently the founding director of the Mechatronics Engineering Program. He was also a founding member of graduate programs at TMU including Mechanical Engineering and Biomedical Engineering Programs. His research interests span intelligent optomechatronic systems with the focus on image-guided control and learning of robots, medical robots, and autonomous aerial systems. He has published significantly in the above areas with more than 250 peer reviewed journal and conference articles, a few books, and several patents in his track record. He has been a visiting professor in KAIST (Daejeon, Korea); IRISA-INRIA (Rennes, France); and Technical University of Munich (Munich, Germany). He has also been organizer and co-organizer of several international conferences on optomechatronic systems control. Dr. Janabi-Sharif has been specialty chief editor of Frontiers in Manufacturing Technology-Automated Systems, and a technical editor of several journals including IEEE/ASME Transactions on Mechatronics, International Journal of Optomechatronics, Journal of Robotics, Automation. Dr. Janabi-Sharifi is a member of the Professional Engineers Ontario (PEO), founding member of International Society for Optomechatronics (ISOM), Senior Member of Institute of Electrical and Electronics Engineers (IEEE), Senior Member of the Society of Manufacturing Engineers (SME), Fellow of the Canadian Society for Mechanical

LIST OF PAPERS

The following papers were presented at the 11th International Conference on Control, Dynamic Systems, and Robotics (CDSR 2024).

Virtual Session

[Curve Tracking of Nonlinear Dynamic System Using Linear State-Space Model](#)

Authors: Sie Long Kek, Wah June Leong, Cynthia Mui Lian Kon

[The Dynamics of Deterrence in Maritime Diplomacy; Control Analysis of Naval Responses in Seas and the Pros and Cons of an Optimal Path](#)

Authors: Rouzbeh Aghaiebeiklavasani, Gholam Reza Rokni Lamouki

[Optimizing 3D Printing Materials and Parameters for Robotics & Artificial Intelligence Applications](#)

Authors: Frank J. Chen

[Advanced Exercise Classification with a Hybrid CNN-GRU Model: Utilising IMU Data from Cell Phones](#)

Authors: Jing Zhang, Meng Cheng Lau, Ziping Zhu

[Multicriteria State Estimate Feedback PID Controller with Regional Eigenvalue Assignment via Linear Matrix Inequalities](#)

Authors: Timothy A. Goodwin, Susan C. Schneider, Edwin E. Yaz

[Dynamic Analysis of a Head-On Sedan Automobile Collision](#)

Authors: Cade Joseph Koschnik, Md Rasedul Islam

[Optimising Facial Expression Recognition: Comparing ResNet Architectures for Enhanced Performance](#)

Authors: Haoliang Sheng, MengCheng Lau

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Virtual Session

Stackelberg Differential Game Analysis of Energy Efficiency for Satellite Communication Subsystems

Authors: Wei Wan, Yuanyuan Peng, John M Cioffi, Kalia T. Glover

Embedded Sensors in Intelligent Robots Achieving Performance Enhancement

Authors: Frank J. Chen, Zhiyue Lei, Norman J. Chen

Model-Free Sliding Mode Control for Coupled Square and Non-Square MIMO Systems

Authors: Agamemnon Crassids, Aashrita Mandalapu, Joshua Coleman

Stabilization of a Class of Discrete-Time Nonlinear Stochastic Systems Using Static Output Feedback

Authors: Justin Kennah, Edwin E. Yaz, Susan C. Schneider

A Comprehensive Analysis of LDA, SVM, and Neural Network Algorithms in Multiclass Myoelectric Identification of Limb Movements

Authors: Furkan Evcı, Ahmet Efekaan Efe, Erhan İlhan Konukseven

LIST OF PAPERS

Robotics & Artificial Intelligence

Mixed Reality Platform for Operation of Robots in Academy and Industry Environment

Authors: Joel Arango-Ramirez, Malinali M. Perez-Sanchez, Mario Ramirez-Neria, Eduardo G. Hernández-Martinez

Quanser Self Driving Car Trajectory Tracking by employing a Bicycle's Model

Authors: Alejandro Martínez-Valdez, Mario Ramirez-Neria, Jaime González-Sierra

Design and Control of the Omnidirectional Robot for Floor Polishing Tasks

Authors: Javier Vega-Gutiérrez, Mario Ramírez-Neria, Rodrigo Ramírez-Juárez, Axel Becerril-Velasco, Alejandro Martínez Valdez

Geometric Control of a Quadrotor with Attitude Control on Unit Circles

Authors: Man Chun Chung, Mahdis Bisheban, Jeff Pieper

A Visually Assistive Guidance System for Visually Impaired Pedestrians Passing Crosswalks

Authors: Chi-Cheng Cheng, Cheng-Che Tsai

LIST OF PAPERS

Control Engineering

Data-Driven Adaptive Control, For Unknown Non-Affine Nonlinear Systems with Varying Control Direction.

Authors: Miriam Flores-Padilla, Chidentree Treesatayapun

PID Control Position of a Linear Actuator

Authors: Carolina Martínez-Valadez, Daniela Renee Colin-Tinoco, Rodrigo Ramírez-Juárez, Mario Ramírez-Neria

Design of a Haptic Device with Variable Stiffness Actuation Mechanism for Finger Rehabilitation

Authors: Arash Basirat Tabrizi, Jeremy Catania, Baiqian Qi, Kourosh Zareinia

Trajectory Tracking of Gantry Crane Differential Flatness Control

Authors: Rodrigo Ramírez-Juárez, Mario Ramírez-Neria, Alberto Luviano-Juárez

The Use of Vibrotactile Haptic Feedback for a Neurosurgical Virtual Reality Training System

Authors: Jonah Boutin, Jafer Kamoopuri, Reza Faieghi, Joon Chung, Sandrine de Ribaupierre, Roy Eagleson

SPONSORS

International ASET Inc. would like to thank the following sponsors for their support of CDSR 2024:



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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 2025

The 12th International Conference of Control, Dynamic Systems, and Robotics (CDSR 2025) will be held on July 14, 2025 - July 16, 2025 at Imperial College London Conference Center, London, United Kingdom.



For inquiries and to obtain further information on the congress, please visit the [website](http://www.2025.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.

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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.

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.

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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.

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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.

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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.

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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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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.

Reporting of Mistakes, Errata, and Retractions

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

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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.

CONTACT US

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