



PROCEEDINGS OF THE 6TH INTERNATIONAL CONFERENCE ON CONTROL, DYNAMIC SYSTEMS, AND ROBOTICS (CDSR'19)

June 6 - 7, 2019 | Ottawa, Canada

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ISBN: 978-1-927877-55-5 | 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 6th International Conference of Control, Dynamic Systems, and Robotics (CDSR'19).

CDSR'19 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'19 is a series of international conferences which are held yearly. These conferences focus on all aspects of traditional and modern control and dynamic systems. After the success of the fifth conference in Niagara falls, Canada, CDSR will remain in Canada and will host the sixth international conference.

In the sixth meeting of this conference, three 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 25 papers will be presented from professors, students, and researchers across the world.

We thank you for your participation and contribution to the 6th International Conference of Control, Dynamic Systems, and Robotics (CDSR'19). We wish you a very successful and enjoyable experience.

Dr. Mojtaba Ahmadi

*Conference Chair and Proceedings Editor
CDSR'19*

Dr. Goldie Nejat

*Conference Co-Chair
CDSR'19*

ABOUT CDSR'19

The International Conference on Control, Dynamic Systems, and Robotics (CDSR'19) aims to become the leading annual conference in fields related to traditional and modern control and dynamic systems. The goal of CDSR'19 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.

CDSR is a series of international conferences held yearly. These conferences focus on all aspects of control and dynamic systems. After successfully holding CDSR'14 to CDSR'18 in Canada, CDSR'19 is hosted in Canada as well this year.

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 congress proceedings is published under an ISSN and ISBN number
- Each paper is assigned a unique DOI number by [Crossref](#)
- The conference proceedings is indexed by [Scopus](#) and [Google Scholar](#)
- The proceedings is permanently archived in [Portico](#) (one of the largest community-supported digital archives in the world)

Google Scholar



Crossref

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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'21 Conference:

Scientific Committee Chairs



Dr. Mojtaba Ahmadi

Carleton University, Canada
Conference Chair



Dr. Goldie Nejat

University of Toronto, Canada
Conference Co-Chair

Scientific Committee Members

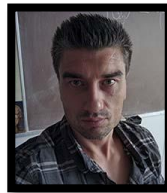
- **Dr. Mu-Song Chen**, Da-Yeh University, Taiwan
- **Dr. Naira Hovakimyan**, University of Illinois at Urbana-Champaign, USA
- **Dr. Rishad Irani**, Carleton University, Canada
- **Dr. Naser Mehrabi**, University of Washington, USA
- **Dr. Maurizio Porfiri**, New York University Polytechnic School of Engineering, USA
- **Dr. Mohammad Habibur Rahman**, University of Wisconsin Milwaukee, USA
- **Dr. Nariman Sepehri**, University of Manitoba, Canada
- **Dr. Dan Zhang**, York University, Canada
- **Dr. Meysar Zeinali**, Laurentian University, Canada
- **Dr. Lahouari Cheded**, King Fahd University of Petroleum and Minerals, Saudi Arabia

KEYNOTE SPEAKERS

The keynote information for the 6th International Conference of Control, Dynamic Systems, and Robotics (CDSR'19) is as follows:



Dr. Kaan Erkorkmaz
University of Waterloo,
Canada



Dr. Davide Spinello
University of Ottawa,
Canada



Dr. Howard Schwarz
Carleton University, Canada

KEYNOTE SPEAKER



Titles: Boosting Manufacturing through
Virtualization and Intelligence
Dr. Kaan Erkorkmaz, University of Waterloo, Canada

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Kaan Erkorkmaz obtained his bachelor's degree from Istanbul Technical University (1995) and his M.A.Sc. and Ph.D. from the University of British Columbia (1999, 2004). In 2004, he joined the University of Waterloo as an Assistant Professor, where he subsequently received promotion to the rank of Associate Professor (2009) and Professor (2015).

At Waterloo, Prof. Erkorkmaz established the Precision Controls Laboratory (UW/PCL) which conducts research on cutting mechanics, machine tool dynamics, virtual manufacturing, and high performance Computer Numerical Controls (CNC). UW/PCL has a successful record of technology co-development with, and transfer to, industry partners such as Pratt & Whitney Canada, Ontario Drive & Gear, and Danobat Group. Parallel to his research interests, Prof. Erkorkmaz' teaching activities at Waterloo include giving undergraduate and graduate level courses in the areas of manufacturing, precision engineering, and controls.



Titles: Multi-Agent Machine Learning for Mobile
Robots: A Reinforcement Learning Approach
Dr. Howard Schwarz, Carleton University, Canada

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Dr. Howard Schwarz received his BEng. degree in Civil Engineering from McGill University, and his MSc. and Ph.D. degrees from M.I.T., in Aerospace Engineering and Mechanical Engineering, respectively. He is currently Professor of Electrical and Computer Engineering at Carleton University. He served as Department Chairman of the Department of Systems and Computer Engineering, Carleton University from 2009 to 2013.

KEYNOTE SPEAKER



Titles: Distributed cooperative control and estimation with multi-agent robotic systems: stabilization notwithstanding unreliable communications, and optimization in evolving environments

Dr. Davide Spinello, University of Ottawa, Canada

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Davide Spinello received the B.Sc. And the Laurea degree in Environmental Engineering from the University of Rome “La Sapienza” in 2001 and 2005, respectively, and the PhD. in Engineering Mechanics from Virginia Tech in 2006, working under the supervision of Romesh Batra. From January 2007 to July 2009 he has been a Postdoctoral Fellow in the Autonomous Systems and Control Laboratory at Virginia Tech. In September 2009 he joined the Department of Mechanical Engineering at the University of Ottawa, where he teaches courses on control, dynamical systems, and continuum mechanics. His research interests include cooperative and distributed control and estimation, dynamical systems, continuum mechanics and distributed parameter systems, micro- and nanoelectromechanical systems, multi-physics systems, and numerical methods.

LIST OF PAPERS

The following papers were presented at the 6th International Conference on Control, Dynamic Systems, and Robotics (CDSR'19).

Man-Machine Interactions

Cooperative Citizen Science for Robot-Mediated Telerehabilitation

Authors: Roni Barak Ventura, Shinnosuke Nakayama, Preeti Raghavan, Oded Nov, Maurizio Porfiri

Simulation of Human Balance Impairment on a Biped Robot

Authors: Abdalla B Zreiba, Mojtaba Ahmadi, Ali Etemad

Interaction Control and Haptic Feedback for a Lower-limb Rehabilitation Robot with Virtual Environments

Authors: Nicholas Berezny, Dariush Dowlatshahi, Mojtaba Ahmadi

Robotics and Mechatronics

ASSESSMENT OF VISUAL SERVOING TECHNIQUES FOR TARGET LOCALIZATION

Authors: Khushali Saraiya, Dippal Israni, Parth Goel

On the Development of a Compliant Sensor Shell for use in Robot Safety

Authors: Colin Miyata, Mojtaba Ahmadi

Robotic Walkers for Children and Youth with Cerebral Palsy: A Review of Past Successes and Ongoing Advancement

Authors: Anna McCormick, Hana Alazem, Carolyn Hunt, Sarah Zaidi, Corrie Dixon

LIST OF PAPERS

Linear and Nonlinear Control

[A Model-Free Control Algorithm Based On The Sliding Mode Control Method With Applications to Unmanned Aircraft Systems](#)

Authors: Adarsh Sreeraj, Daniel Kaputa, Agamemnon Crassidis

[Singularities, Normal Forms, and Motion Planning for Non-holonomic Robotic Systems](#)

Authors: Krzysztof Tchon, Joanna Ratajczak

[Conjugate Gradient Approach for Linear Optimal Control of Damped Harmonic Oscillator](#)

Authors: Sie Long Kek, Sy Yi Sim, Wah June Leong, Chuei Yee Chan

[Integer and Fractional Approaches of a Pair of Car-Following Models](#)

Authors: Luis Enrique Abriz Morales, Oscar Alfonso Rosas Jaimes

[Short term predictions of preceding vehicle speeds for connected and automated vehicles](#)

Authors: Mehran Zamani Abnili, Nasser Lashgarian Azad

[Plasma State Control of Reactive Sputter Processes](#)

Authors: Christian Woelfel, Moritz Oberberg, Peter Awakowicz, Jan Lunze

[Data-based PID controller design for oscillatory systems using PICS method](#)

Author: Yinan Zhang, Thanh Tung Duong Huynh, Min-Sen Chiu

[Home Automation with Arduino for the Internet of Things \(IoT\)](#)

Authors: Aparicio Carranza, Danny Moonasar, Casimer DeCusatis, Harrison Carranza

[Supplying a Direct Current Electricity to the Isolated Dwellings through MPP Tracked PV System Based on Artificial Neural Network](#)

Authors: Hussain Attia

LIST OF PAPERS

Estimation and Identification

Adaptive Control of Satellite System using Kalman Estimates in the presence of Disturbance

Authors: Deepali Dube, Hiren Patel

An Energy-saving Model-based Air Balancing Method for the Ventilation System

Authors: Gang Jing, Wenjian Cai, Can Cui

Overlap Group Lasso for Variable Selection in Nonlinear Nonparametric System Identification

Authors: Changming Cheng, Er-wei Bai

Development of a Simulation Platform for Underwater Transportation using Two Hovering Autonomous Underwater Vehicles

Authors: Faheem Ur Rehman, Enrico Anderlini, Giles Thomas

Fiber-Optic Based, Force and Torque Compliant Sensing Calibration Strategies

Authors: Osama Al-Mai, Jacques Albert, Mojtaba Ahmadi

SPONSORS

International ASET Inc. would like to thank the following sponsors for their support of CDSR'19:



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JOURNAL PUBLICATION

Selected articles from the conference 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

The publication fee will be waived for papers that win the best paper award. Other attendees will receive a 25% discount towards the publication fee of the journal.

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, Microsoft Academic Search, Open J-Gate, Mendeley, Index Copernicus International, Academic Index, Mendeley, Primo Central, and Genomics JournalSeek for possible indexing. 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.

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](#)

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.

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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.

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.

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.

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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 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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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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Unethical/plagiarism issues mostly result in a retraction, while unintended mistakes will mostly result in the publication of an erratum.

ETHICS & MALPRACTICE

Publisher

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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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