



8TH INTERNATIONAL CONFERENCE OF CONTROL, DYNAMIC SYSTEMS, AND ROBOTICS (CDSR'21)

May 23, 2021 – May 25, 2021 | Niagara Falls, Canada | Virtual Conference

CDSR'21

May 24

May 25

**OUR PROGRAM SCHEDULE IS BASED ON EASTERN TIME
(ET - OTTAWA TIME)**

CDSR'21

CDSR'21 Scientific Committee Chair



Dr. Aparicio Carranza

New York City College of Technology, USA
Conference Chair

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Dr. Yang Shi

University of Victoria, Canada
Conference Co - Chair

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MAY 24

ROOM 1

8:00 AM - 9:00 AM	Registrations
9:00 AM - 9:10 AM	Official Opening
	Dr. Aparicio Carranza, New York City College of Technology, USA
9:10 AM – 09:55 AM	KEYNOTE LECTURE
	<u>A Generic Model for Resilient Dynamic Systems</u> Dr. W.J. (Chris) Zhang, University of Saskatchewan, Canada
09:55 AM - 10:40 AM	KEYNOTE LECTURE
	<u>Throughput Optimization for Grant-Free Multiple Access with Multiagent Deep Reinforcement Learning</u> Dr. Vincent Wong, University of British Columbia, Canada
10:40 AM - 10:55 AM	Break

MAY 24

10:55 AM - 11:55 PM **Session**
Motion Control

11:55 AM - 12:25 PM **Lunch Break**

12:25 PM - 01:10 PM **High-Performance Micro Actuators with Applications**
Dr. Ridha Ben Mrad, University of Toronto, Canada

01:10 PM - 01:55 PM **Session**
Robotics I

KEYNOTE LECTURE

MAY 24 | 9:10 AM - 09:55 AM | SESSION CHAIR: DR. YANG SHI, UNIVERSITY OF VICTORIA, CANADA



Titles: A Generic Model for Resilient Dynamic Systems

Dr. W.J. (Chris) Zhang, University of Saskatchewan, Canada

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Dr. Zhang is a full professor at the University of Saskatchewan (Canada). Dr. Zhang received his Ph.D. from Delft University of Technology in 1994. His main research area is on human-machine systems, system science and engineering and their applications to manufacturing and service systems. Dr. Zhang has published over 300 papers in refereed journals or magazines and over 200 papers in refereed conference proceedings with his h-index of 55 (Google Scholar) and held over 10 patents. Dr. Zhang has been very active in editorial board work for several IEEE journals, including IEEE Transaction on Mechatronics (Senior Editor from 2019 to present), IEEE system journal, and IEEE SMC – system (present). Dr. Zhang is a fellow of Canadian Academy of Engineering (CAE), a fellow of ASME. Dr. Zhang was one of the most highly cited researchers in IEEE by Elsevier (China) in 2015 to 2018, respectively. Dr. Zhang developed the general knowledge model for systems called FCBPSS (F: function, C: context, B: behavior, P: principle, SS: state-structure). Dr. Zhang is one of the pioneer researchers in engineering resilience, particularly in manufacturing systems and robots.

KEYNOTE LECTURE

MAY 24 | 09:55 AM - 10:40 AM | SESSION CHAIR: DR. YANG SHI, UNIVERSITY OF VICTORIA, CANADA



Titles: Throughput Optimization for Grant-Free Multiple Access with Multiagent Deep Reinforcement Learning
[Dr. Vincent Wong, University of British Columbia, Canada](#)

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Vincent Wong is a Professor in the Department of Electrical and Computer Engineering at the University of British Columbia, Vancouver, Canada. His research areas include protocol design, optimization, and resource management of communication networks, with applications to the Internet, wireless networks, smart grid, fog computing, and Internet of Things. Currently, he is an executive editorial committee member of the IEEE Transactions on Wireless Communications, an Area Editor of the IEEE Transactions on Communications and IEEE Open Journal of the Communications Society, and an Associate Editor of the IEEE Transactions on Mobile Computing. Dr. Wong is a Fellow of the IEEE.

SESSION

MOTION CONTROL

MAY 24 | 10:55 AM - 11:55 AM | SESSION CHAIR: DR. W.J. (CHRIS) ZHANG, UNIVERSITY OF SASKATCHEWAN, CANADA & DR. VINCENT WONG, UNIVERSITY OF BRITISH COLUMBIA, CANADA

Titles: Consistent Control Framework for Ambidextrous Robot Arm Using MANFIS Controller

CDSR 101

Time: 10:55 - 11:10

Presenter: Dr.Mashood Mukhtar, Brunel University London, UK

Authors: Mashood Mukhtar, Dhayaa Khudher, Tatiana Kalganova

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Titles: Physics-driven Locomotion Planning Method for Multilegged Robots

CDSR 106

Time: 11:10 - 11:25

Presenter: Fei Zhang, Beihang University, China

Authors: Fei Zhang, Yang Yu

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Titles: Attitude Task Allocation and Control in a Swarm of Magnetically Controlled CubeSats

CDSR 110

Time: 11:25 - 11:40

Presenter: Salman Ali Thepdawala, Skolkovo Institute of Science and Technology, Russian Federation

Authors: Ahmed Mahfouz, Nourhan Abdelrahman, Salman Ali Thepdawala,

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Titles: Preliminary Trajectory Design for Cis-Lunar Libration Point Mission

CDSR 114

Time: 11:40 - 11:55

Presenter: Salman Ali Thepdawala, Skolkovo Institute of Science and Technology, Russian Federation

Authors: Salman Ali Thepdawala

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KEYNOTE LECTURE

MAY 24 | 12:25 PM - 01:10 PM | SESSION CHAIR: DR. APARICIO CARRANZA, NEW YORK CITY COLLEGE OF TECHNOLOGY, USA



Titles: High-Performance Micro Actuators with Applications

Dr. Ridha Ben Mrad, University of Toronto, Canada

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Professor and Director, Mechatronics and Microsystems Design Laboratory, University of Toronto. He also serves since 2015 as Chief Research Officer and Associate Scientific Director of Mitacs and member of the Executive Team. He is also Chair of the Mitacs Research Council. Mitacs is a national organization that funds innovation across Canada. He is also a Co-founder and currently President and CTO of Sheba Microsystems Inc. a Toronto manufacturer of microactuators for miniature cameras for the smart phone, automotive and action camera markets.

He joined the University of Toronto in 1997, having previously held positions at the National Research Council of Canada, and the Ford Research Laboratory in Dearborn, Michigan. Ridha received a PHD in Mechanical Engineering from the University of Michigan, Ann Arbor in 1994. His research led to a number of patents and inventions including 30+ international patents, more than 300 refereed research publications and a number of technology licenses to industry. He received numerous teaching, research and professional awards including the Connaught Innovation Award in 2013 and in 2014. His recent activities include being Associate Editor of the Journal of Mechatronics (2015-current), serving on the Steering Committee of the IEEE Journal on Micro Electro Mechanical Systems (2010-current) and being a member of the IEEE IES Publication Committee (2013-current). He was in the recent past the founding Director of the Robotics and Mechatronics Institute and Associate Chair, Research of Mechanical and Industrial Engineering at the University of Toronto.

SESSION

ROBOTICS I

MAY 24 | 01:10 PM - 01:55 PM | SESSION CHAIR: DR. MASHOOD MUKHTAR, BRUNEL UNIVERSITY LONDON, UK

Titles: Deep Learning-based Robot Control using Recurrent Neural Networks and Adaptive Sliding Mode Control

CDSR 113

Time: 01:10 - 01:25

Presenter: Raj Sureshbhai Patel, Laurentian University, Canada

Authors: Raj Sureshbhai Patel

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Titles: Integration and Control of a MEMS Optical Phased Array Scanner

CDSR 304

Time: 01:25 - 01:40

Presenter: Tarek Mohammad, University of Toronto, Canada

Authors: Tarek Mohammad, Siyuan He, Ridha Ben Mrad

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Titles: Kalman-filter-based Accurate Trajectory Tracking and Fault-Tolerant Control of Quadrotor

CDSR 302

Time: 01:40 - 01:55

Presenter: Rajamani Doraiswami, The University of New Brunswick, Canada

Authors: Rajamani Doraiswami, Lahouari Cheded, Marius Brinkmann

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MAY 25

9:00 AM - 9:45 AM **KEYNOTE LECTURE**

[An Overview and Performance Evaluation of an EPON-based 5G RAN Architecture enabled by Distributed Network Control Management](#)
Dr. Syed R. Zaidi, Bronx Community College, USA

9:45 AM - 10:30 AM **KEYNOTE LECTURE**

[Pushing Intelligence at the Edge: Edge-centric Inferential Analytics](#)
Dr. Christos Anagnostopoulos, University of Glasgow, UK

10:30 AM - 10:45 AM **BREAK**

10:45 AM - 11:35 AM **SESSION**

[Linear and Nonlinear Control](#)

11:35 AM - 12:05 PM **Lunch Break**

12:05 PM - 12:50 PM **SESSION**

[Robotics II](#)

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KEYNOTE LECTURE

MAY 25 | 9:00 AM - 9:45 AM | SESSION CHAIR: DR. APARICIO CARRANZA, NEW YORK CITY COLLEGE OF TECHNOLOGY, USA



Titles: An Overview and Performance Evaluation of an EPON-based 5G RAN Architecture enabled by Distributed Network Control Management
[Dr. Syed R. Zaidi, Bronx Community College, USA](#)

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Syed Rashid Zaidi received the M.S., M.Phil. and Ph.D. degrees in Electrical Engineering from City University of New York, NY, USA. He is currently Assistant Professor & Program Director of Cybersecurity & Networking Technology and Electronic Engineering Technology in The Department of Engineering, Physics & Technology of the Bronx Community College of The City University of New York. His research areas are Fiber Optics Communications, LTE, WiMAX, 5G, and next generation wireless networks and cybersecurity. He has received numerous awards, a recent one is a prestigious grant award from the U.S. Department of Education to update the Cybersecurity program and build the latest industrial-standard lab.

KEYNOTE LECTURE

MAY 25 | 9:45 AM - 10:30 AM | SESSION CHAIR: DR. APARICIO CARRANZA, NEW YORK CITY COLLEGE OF TECHNOLOGY, USA



Titles: Pushing Intelligence at the Edge:
Edge-centric Inferential Analytics

[Dr. Christos Anagnostopoulos, University of Glasgow, UK](#)

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Dr Christos (Chris) Anagnostopoulos is an Associate Professor in Distributed and Pervasive Computing, School of Computing Science, University of Glasgow. His expertise is in the areas of context-aware large-scale distributed data systems and in-network information processing. He has received funding for his research by the EC/H2020, UK EPSRC and the industry. He is an author of over 150 refereed scientific journals/conferences. Chris is leading the Essence: Pervasive & Distributed Computing Lab within the Knowledge and Data Engineering Systems Group (IDA Section). Before joining Glasgow, Chris was an Assistant Professor at Ionian University and University of Athens. He has held postdoctoral positions at University of Glasgow and University of Athens in the area of mobile and context-aware computing. He holds a BSc, MSc, and PhD in Computing Science, University of Athens. He has served as a Programme Committee member and Session Chair in more than 20 international conferences in Computing Science, been Editorial Board member in Applied Intelligence and Distributed Sensor Networks journals, Guest Editor in special issues (Sensors and Machine Learning & Cybernetics journals), and Senior Editor in Open Computer Science. He has been a MSCA Fellowship Supervisor in University of Glasgow, is an Associate Fellow of the HEA and member of ACM, IEEE and IEEE STC.

SESSION

LINEAR AND NONLINEAR CONTROL

MAY 25 | 10:45 AM - 11:35 AM | SESSION CHAIR: DR. SYED R. ZAIDI, BRONX COMMUNITY COLLEGE, USA

Titles: Passive Control Strategy for Multi-Tethered Tetrahedral Formation for Multipoint Scientific Measurements in LEO

CDSR 111

Time: 10:45 - 11:00

Presenter: Basel Omran, Skolkovo Institute of Science and Technology, Russia

Authors: Basel Omran, Dmitry Pritykin

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Titles: A New Strategy for Obtaining the Pointing Stability of Stabilized Platforms

CDSR 200

Time: 11:00 - 11:15

Presenter: Mohammad Sadegh Mirzajani Darestani, Islamic Azad University of Arak, Iran

Authors: Mohammad Sadegh Mirzajani Darestani , Parviz Amiri

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Titles: A Laboratory Method for Obtaining two Degrees of Freedom

Gyroscopic Stabilizer Transfer Function

CDSR 201

Time: 11:15 - 11:20

Presenter: Mohammad Sadegh Mirzajani Darestani, Islamic Azad University of Arak, Iran

Authors: Mohammad Sadegh Mirzajani Darestani, Seyed Zeynolabedin Moussavi, Parviz Amiri

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Titles: Optimal Load-Aware Task Offloading in Mobile Edge Computing

CDSR 301

Time: 11:20 - 11:35

Presenter: Odysseas Polycarpou, University of Glasgow, UK

Authors: Odysseas Polycarpou, Christos Anagnostopoulos, Kostas Kolomvatsos

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SESSION

ROBOTICS II

MAY 25 | 12:05 PM - 12:50 PM | SESSION CHAIR: DR. CHRISTOS ANAGNOSTOPOULOS,
UNIVERSITY OF GLASGOW, UK

Titles: Accurate Target Tracking: A New Kalman Filter Residue-Based Approach Applied To a Nonlinear Multivariable Control System

CDSR 303

Time: 12:05 - 12:20

Presenter: Rajamani Doraiswami, University of New Brunswick, Canada

Authors: Rajamani Doraiswami, Lahouari Cheded, and Sreeraman Rajan

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Titles: Plane Detection Based Object Recognition for Augmented Reality

CDSR 305

Time: 12:20 - 1:35

Presenter: Harrison Carranza, Vaughn College of Aeronautics and Technology, USA

Authors: Aparicio Carranza, Juan Estrella, Syed R. Zaidi, Harrison Carranza

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Titles: New Kalman Filter Residue-Based Identification and Soft Sensor Design for Accurate Trajectory Tracking with a Fault-tolerant Robot

CDSR 306

Time: 12:35 - 12:50

Presenter: Rajamani Doraiswami, University of New Brunswick, Canada

Authors: Rajamani Doraiswami, Lahouari Cheded, Eduardo Jair Tito Mamani, Pamela Giselle Villarroel, Paul Gerardo Cori Mamani, Paulo Roberto Loma Marconi, Claudio Cesar Carlos Olivares, Justo Franz Choque Choque, Layde Aydee Cruz Torrico, Layde Aydee Cruz Torrico

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