ISARC-CSCE/CRC-MOC 2025

MONTREAL, CANADA

July 28-31, 2025

Hosted by Center for Innovation in Construction and Infrastructure Engineering and Management (CICIEM)

Decarbonizing the Construction Industry

WELCOME MESSAGE

On behalf of the Local Organizing Committee (LOC), it is our great pleasure to welcome you to ISARC-CSCE/CRC-MOC 2025, hosted by the *Centre for Innovation in Construction and Infrastructure Engineering and Management* (CICIEM) at Concordia University in Montreal.

Planning of this event began more than two years ago, when we successfully bid to host the *International Symposium on Automation and Robotics in Construction* (ISARC 2025), through a competitive process organized by the *International Association for Automation and Robotics in* Construction (IAARC). Then, we decided to augment this event by adding two additional conferences:

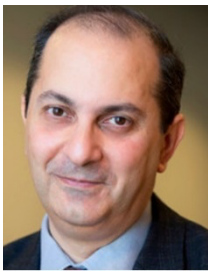
- *CSCE Construction Specialty Conference / Construction Research Congress* (CSCE/CRC 2025) supported by the *Canadian Society of Civil Engineers* (CSCE) and *American Society of Civil Engineering* (ASCE), respectively, and
- *Modular and Offsite Construction Summit* (MOC 2025).

Since then, our team has worked diligently to coordinate these co-located conferences, designing them to complement and cross-reference each other. A unified registration system was introduced, allowing participants to submit papers to any of the three conferences under a single registration. The outcome has been outstanding: 453 papers have been accepted for presentation at this joint event.

We are excited to welcome about 500 participants from academia, industry, and government, representing 30 countries, to share knowledge and perspectives on pressing issues such as sustainable construction, infrastructure management, digital twins, robotics and automation in construction, artificial intelligence, and modular construction. The overarching theme of the event is "Decarbonizing the Construction Industry."

The scientific quality of the program is a direct result of the dedication and expertise of the scientific committee of each conference. All submitted papers underwent a rigorous peer-review process, ensuring high academic and professional standards. Beyond the technical sessions, we hope this event provides valuable opportunities for networking, collaboration, and exchange of innovative ideas that will shape the future of construction.

We extend our heartfelt thanks to our sponsors, volunteers, and all participants for their contributions in making this event a reality. We wish you a productive conference and a memorable stay in Montreal.



Amin Hammad
Chair of the LOC

Osama Moselhi
Honorary Chair

Mohamed Al-Hussein
Chair of MOC

Mazdak Nik-Bakht
Chair of CSCE/CRC

SCHEDULE OVERVIEW

Pre-Conference Day (Monday, July 28) Schedule Overview

Time	Activity					
8:30 - 10:00	**Registration & Breakfast**					
	EV-2nd floor (near EV-2.260)					
	CSCE Construction Grad Students Colloquium	**ISARC Hackathon**	**ISARC Workshops**			**Meetings**
10:00 - 12:00	Colloquium Training: 3Minute Thesis Presentation *Concordia GradProSkills*	Training session (Process Mining) by: **Celonis**	**Workshop 1: Digitalization, Automation, and Robotics (focused on Building Renovation)** Dr. Kepa Iturralde Ms. Danya Liu	**Workshop 2: Bridging digital design and digital fabrication in modern construction** Dr. Qian Chen Dr. Ming Shan Dr. Benjamin Dillenburger Dr. Rongbo Hu	**Workshop 3: The Future of Civil Engineering with Generative AI** Dr. Hongjo Kim	**CSCE Taskforce Meeting** *Future of Canadian residential construction*
	EV-2.260	EV-2.184	EV-3.309	EV-1.605	EV-1.615	EV-11.119
12:00 - 1:00	**Lunch Break**					
	EV-2nd floor (near EV-2.260)					
1:00 - 3:00	**Workshop** *Securing R&D Positions (Academia & Industry)* Dr. Tarek Salama Dr. Moe Roghabadi Dr. Amirhossein Hehdipoor Dr. Arash Hosseini	**1:00 - 2:00 |** Introducing the problem and clarifying expectations **2:00 - 5:00 |** Task completion **5:00 - 6:00 |** Presentation	**Workshop 4: Future-Proofing Construction Professionals: Technology in Education vs. Education for Technology** Dr. Nazila Roofigari-Esfahan	**Workshop 5: BIM-based Automated Code Checking & Automated Scan-to-BIM** Dr. Jong Won Ma Dr. Thomas Czerniawski Dr. Bonsang Koo	**Workshop 6: Architecture, Engineering & Construction at the Forefront of Climate Action and Innovation** Mr. Franc Mouwen	**CSCE/CRC Taskforce Meeting** *Canada-US collaboration*
	EV-2.260		EV-3.309	EV-1.605	EV-1.615	EV-11.119
3:30 - 6:00	AACE MONTREAL SECTION Colloquium Competition: AACEI 3MT+1					
	LB-4th SPACE	EV-2.184				
6:00-8:00	**Welcome Reception**					
	GN, Room E-104					

ISARC Schedule Overview (MB 9th and 2nd floors)

ISARC 2025

Tuesday, July 29

7:15-8:00	8:00-9:45	9:45-10:15	10:15-12:00	12:00-1:30	1:30-3:30	3:30-4:00	4:00-6:00
Breakfast H-Mezzanine	Plenary 1-1 H-110	Coffee break MB Atrium MB 3rd floor MB 9th floor	ISARC-1-1, MB-9.A ISARC-1-2, MB-9.B ISARC-1-3, MB-9.C ISARC-1-4, MB-9.D ISARC-1-5, MB-9.EFG ISARC-1-6, MB-2.430 ISARC-1-7, MB-2.435	Lunch LB Atrium	**Best paper keynotes Plenary talks** MB-9.ABCD	Coffee break MB Atrium MB 3rd floor MB 9th floor	ISARC-1-8, MB-9. A ISARC-1-9, MB-9. B ISARC-1-10, MB-9.C ISARC-1-11, MB-9.D ISARC-1-12, MB-9.EFG ISARC-1-13, MB-2.430 ISARC-1-14, MB-2.435

Wednesday, July 30

7:15-8:00	8:00-9:45	9:45-10:15	10:15-12:00	12:00-1:30	1:30-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-6:00	6:00-11:00
Breakfast H-Mezzanine	Plenary 2-1 H-110	Coffee break MB Atrium MB 3rd floor MB 9th floor	ISARC-2-1, MB-9.A ISARC-2-2, MB-9.B ISARC-2-3, MB-9.C ISARC-2-4, MB-9.D ISARC-2-5, MB-9.EFG ISARC-2-6, MB-2.430 ISARC-2-7, MB-2.435	Lunch LB Atrium	**Plenary talks** MB-9.ABCD	Coffee break MB Atrium MB 3rd floor MB 9th floor	**Tucker-Hasegawa** MB-9.ABCD	Poster Session		Reception and Gala Dinner Montreal Convention Centre

Thursday, July 31

7:15-8:00	8:00-9:45	9:45-10:15	10:15-12:00	12:00-1:30	1:30-5:30
Breakfast H-Mezzanine	Plenary 3-1 H-110	Coffee break MB Atrium MB 3rd floor MB 9th floor	ISARC-3-1, MB-9.A ISARC-3-2, MB-9.B ISARC-3-3, MB-9.C ISARC-3-4, MB-9.D ISARC-3-5, MB-9.EFG ISARC-3-6, MB-2.430 ISARC-3-7, MB-2.435	Lunch LB-Atrium	Technical trip

CSCE/CRC Schedule Overview (MB 2nd and 3rd floors)

Tuesday, July 29

7:15-8:00	8:00-9:45	9:45-10:15	10:15-12:00	12:00-1:30	1:30-3:30	3:30-4:00	4:00-6:00
Breakfast H-Mezzanine	Plenary 1-1 H-110	Coffee break MB Atrium MB 3rd floor MB 9th floor	CSCE/CRC-1-1, MB-3.210 CSCE/CRC-1-2, MB-3.270 CSCE/CRC-1-3, MB-3.435 CSCE/CRC-1-4, MB-3.430 CSCE/CRC-1-5, MB-3.445 CSCE/CRC-1-6, MB-2.130 CSCE/CRC-1-7, MB-2.445	Lunch LB-Atrium	**CRC ExCOM Business Meeting** MB-1.210	Coffee break MB Atrium MB 3rd floor MB 9th floor	CSCE/CRC-1-8, MB-3.210 CSCE/CRC-1-9, MB-3.270 CSCE/CRC-1-10, MB-3.435 CSCE/CRC-1-11, MB-3.430 CSCE/CRC-1-12, MB-3.445 CSCE/CRC-1-13, MB-2.130 CSCE/CRC-1-14, MB-2.445

Wednesday, July 30

7:15-8:00	8:00-9:45	9:45-10:15	10:15-12:00	12:00-1:30	1:30-3:30	3:30-4:00	4:00-5:00	5:00-6:00	6:00-11:00
Breakfast H-Mezzanine	Plenary 2-1 H-110	Coffee break MB Atrium MB 3rd floor MB 9th floor	CSCE/CRC-2-1, MB-3.210 CSCE/CRC-2-2, MB-3.270 CSCE/CRC-2-3, MB-3.435 CSCE/CRC-2-4, MB-3.430 CSCE/CRC-2-5, MB-3.445 CSCE/CRC-2-6, MB-2.130 CSCE/CRC-2-7, MB-2.445	Lunch LB-Atrium	**CSCE Construction Division Meeting** MB-1.210	Coffee break MB Atrium MB 3rd floor MB 9th floor	**Halpin Keynote** MB-1.210		Reception and Gala Dinner Montreal Convention Centre

Thursday, July 31

7:15-8:00	8:00-9:45	9:45-10:15	10:15-12:00	12:00-1:30	1:30-3:00
Breakfast H-Mezzanine	Plenary 3-1 H-110	Coffee break MB Atrium MB 3rd floor MB 9th floor	CSCE/CRC-3-1, MB-3.210 CSCE/CRC-3-2, MB-3.270 CSCE/CRC-3-3, MB-3.435 CSCE/CRC-3-4, MB-3.430 CSCE/CRC-3-5, MB-3.445 CSCE/CRC-3-6, MB-2.130 CSCE/CRC-3-7, MB-2.445	Lunch LB-Atrium	CSCE/CRC-3-8, MB-3.210 CSCE/CRC-3-9, MB-3.270 CSCE/CRC-3-10, MB-3.435 CSCE/CRC-3-11, MB-3.430 CSCE/CRC-3-12, MB-3.445 CSCE/CRC-3-13, MB-2.130 CSCE/CRC-3-14, MB-2.445

1:30-5:30
Technical trip

MOC Schedule Overview (MB 5th floor)

Tuesday, July 29

7:15-8:00	8:00-9:45	9:45-10:15	10:15-12:00	12:00-1:30	1:30-2:55	3:30-4:00
Breakfast H-Mezzanine	Plenary 1-1 H-110	Coffee break MB Atrium MB 3rd floor MB 9th floor	MOC-1-1, MB-5.215	Lunch LB-Atrium	MOC-1-2, MB-5.215	Coffee break MB Atrium MB 3rd floor MB 9th floor

DETAILED SCHEDULE

Pre-Conference Day (Day 0): Monday, July 28

ISARC 2025 Workshops

Workshop 1 | **Monday, July 28, 10:00 a.m. – 12:00 p.m.** | **Room: EV-3.309**

Dr. Kepa Iturralde
Junior-Professor
Chair of Digital Transformation in Construction
Institute of Construction Management
Faculty of Civil and Environmental Engineering
University of Stuttgart

University of Stuttgart

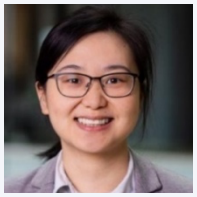
Ms. Danya Liu
Research Associate
Chair of Engineering Geodesy
TUM School of Engineering and Design
Technical University of Munich

Digitalization, Automation and Robotics in Construction (focused on Building Renovation)

The talk will introduce digital, automated and robotic technologies in construction, with a special focus on Building Renovation. The lack of personnel and the growing complexity of the construction sector requests an improvement of the processes in order to meet performance and efficiency parameters. Moreover, the existing building stock needs to be maintained, upgraded and renovated. Recently, research projects such as AMALTEA, ENSNARE, HEPAHAESTUS and BERTIM have developed specific tools to address some of the aforementioned topics. The participants will learn how these tools were and are being developed. Finally, the Online Building Modelling tool will be shown, and the participants will get familiarized with it.

- 60 mins: Digitalization, Automation and Robotics in Construction focused on Building Renovation (Dr. Kepa Iturralde)
- 30 mins: Online building modeling (Ms. Danya Liu)

Workshop 2 — Monday, July 28 , 10:00 a.m. – 12:00 p.m. — Room: EV-1.605



Dr. Qian Chen
Assistant Professor
The University of British Columbia (Okanagan)

Dr. Ming Shan (Charmaine) Ng
Professor
Kyoto Institute of Technology

Dr. Benjamin Dillenburger
Professor
ETH Zurich

Dr. Rongbo Hu
Researcher
Kajima Technical Research Institute Singapore

Lean or not? Match-Making of Lean Concepts in Automation in Construction

This workshop explores how design-to-production decisions and management principles impact fabrication and construction processes in terms of efficiency, safety, and production workflows. Participants will engage in workflow mapping and digital modeling to understand the relationship between design inputs, factory optimization, and robotic fabrication in construction. Based on the state-of-the-art prefabrication technologies and the Microfactory case study, participants will formulate groups to analyze what went wrong and develop best-practice solutions for digital design-digital fabrication workflows, factory virtual commissioning of production line planning for efficient off-site production and innovative business models for robotic construction. Participants will design a more effective digital and robotic fabrication implementation framework to scale the adoption of digital and automation tools that fit the current practice in the construction industry. Through the workshop, participants will understand the real-world constraints in automated fabrication and material flows for industrial construction projects.

Agenda: 5 mins: Introduction to the advanced practices in design for robotic fabrication and optimized production processes to achieve mass customization in building projects. 10mins: lean game. 15 mins: Kajima research presentation. 10 mins: Microfactory presentation. 30 mins: Group activity - using color-coded post-it notes to map the as-it designs workflows, data processing, factory operations, logistics and construction activities. 30 mins: Group presentations and discussion on the workflow bottlenecks & efficiency challenges, and propose kaizen workflows for improvement. 10 mins: Summary and lessons learnt.

Workshop 3 — Monday, July 28, 10:00 a.m. – 12:00 p.m. — Room: EV-1.615

Dr. Hongjo Kim
Assistant Professor
Dept. Civil and Environmental Engineering
Yonsei University

The Future of Civil Engineering with Generative AI

Generative AI is reshaping the landscape of civil engineering by enabling new paradigms in automation, safety, and design. In this workshop, Dr. Hongjo Kim will introduce cutting-edge applications of generative AI tailored to the needs of the construction and infrastructure sectors. Drawing from recent research and development at Yonsei University, the session will cover: (1) Foundation Model for Vision Data Generation: Automating training data creation for computer vision models in construction environments. (2) Multimodal AI for Construction Safety Monitoring: Leveraging large multimodal models to analyze and predict safety risks in complex construction scenarios. (3) AI-driven Construction Safety Chatbot: A domain-specific conversational agent designed to enhance on-site safety awareness and training. (4) Generative AI for Structural Report Review: Using AI to assist in reviewing and understanding structural calculation reports. (5) The workshop will also explore the broader implications of integrating generative AI into civil engineering practices, discussing challenges, future directions, and real-world deployment strategies.

Workshop 4 — Monday, July 28, 1:00 – 3:00 p.m. — Room: EV-3.309

Dr. Nazila Roofigari-Esfahan
Associate Professor of Smart Construction, Myers-Lawon School of Construction
Associate Director, Center for Innovation in Construction Safety, Health and Well-being (IC-SAFE)
Virginia Tech

Future-Proofing Construction Professionals: Technology in Education vs. Education for Technology

This workshop explores the evolving relationship between technology and construction education, posing a critical question: Are we using technology to enhance education, or are we educating students to thrive in a technology-driven industry? Through interactive discussions and practical examples, participants will examine innovative teaching strategies, emerging tools such as VR, digital twins, and AI, and the pedagogical shifts needed to prepare the next generation of construction professionals. The session aims to inspire educators and industry leaders to rethink traditional approaches and collaboratively shape a future-ready construction workforce.

Workshop 5 — Monday, July 28, 1:00 – 3:00 p.m. — Room: EV-1.605

Dr. Bonsang Koo
Professor
SEOULTECH

Dr. Thomas Czerniawski
Applied ML Scientist
Integrated Projects

Dr. Jong Won Ma
Assistant Professor
Concordia University

BIM-Based Automated Code Checking & Automated Scan-to-BIM

This workshop is organized in two-folds: (1) BIM-based automated code checking & (2) as-built BIM generation using Scan-to-BIM technology. The first part presents an overview of a Korean government-sponsored initiative aimed at automating code compliance through Building Information Modeling (BIM). It highlights the motivation and challenges involved in translating engineering codes into computer-interpretable rules, developing formal ontologies to represent their dependencies, and extending the IFC schema to apply these rules to relevant BIM elements.

The second part of the workshop explores the strategic, technical, and operational aspects of launching an automated Scan-to-BIM product in industry. With the increasing demand for accurate digital representations of existing buildings and infrastructure, machine learning (ML) provides an opportunity for massive operational efficiencies. This session features demonstrations of BIMIT First Draft, an automated Scan-to-BIM product developed by Integrated Projects, along with the development case-study. We will explore topics including ideal timing and positioning for considering ML, the criteria for automation, necessary hardware, and dataset requirements. Furthermore, we will discuss the human element–what expertise is needed, how to evaluate progress, manage risks, and decide when to pivot or persevere. In addition to practical application, the session provides foundational knowledge and principles behind Scan-to-BIM, including the raw point cloud acquisition and pre- & post-processing steps to automate the as-built BIM generation.

Workshop 6	Monday, July 28, 1:00 – 3:00 p.m.	Room: EV-1.615

Mr. Franc Mouwen
European Innovation Council (EIC)
Program Manager for architecture/engineering/construction

European Innovation Council

Architecture, Engineering & Construction at the Forefront of Climate Action and Innovation

The European Innovation Council (EIC) supports entrepreneurial-driven innovation to bridge the gap between breakthrough technologies and market adoption. Franc Mouwen, EIC Programme Manager for Architecture, Engineering & Construction, presents this workshop on recent EIC-driven efforts to advance the AEC industry, considering its green and digital transitions. As the EU's second-largest sector, construction faces major challenges—emissions, waste, digitalisation, and labour shortages among them. Addressing these requires rethinking how we design, fabricate, and use materials.

In 2023, the EIC launched a Challenge to cut emissions, material use, and waste on the demand side by deep digitalisation of the construction workflow. In 2024, the focus shifted to supply-side innovations for decarbonising cement and concrete. The currently open 2025 Challenge targets onsite collaborative robotics to enable industrialised, offsite fabrication and efficient assembly. This workshop explores the sector's innovation ecosystem, key challenges, and how EIC-funded projects and startups are shaping the path forward.

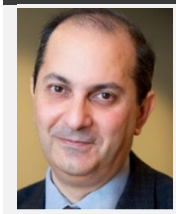
Welcome Reception

- Day and time: Monday, July 28, 6:00-8:30 p.m.
- Location: The Grey Nuns Residence by Concordia University, Room E-104
- Address: 1190 Guy St., Montreal, Quebec, H3H 2L4

Day 1: Tuesday, July 29

Opening Session

8:00-9:00 a.m. Room: H.110



Dr. Amin Hammad
Chair of LOC

Dr. Osama Moselhi
Honorary Chair

Ms. Marie-Andrée Mauger
Mayor of Verdun

Mr. Jean Boulet
Quebec Minister of Labor

Dr. Tim Evans
Concordia VP, Research, Innovation, and Impact

Dr. Hyoungkwan Kim
President of IAARC

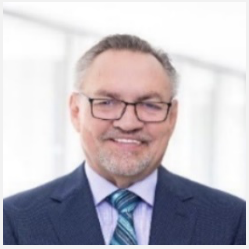
Dr. Jiansong Zhang
Chair of ISARC 2025 Technical Committee

Dr. Mazdak Nik-Bakht
Chair of CSCE/CRC 2025

Dr. Mohamed Al-Hussein
Chair of MOC 2025

General Keynote

9:00-9:45 a.m. Room: H.110



Mr. Michel Charron
Vice President (Construction Projects), Hydro-Québec

Bio: Michel Charron was appointed as Hydro-Québec Vice President – Construction Projects in 2024. As such, he is responsible for all construction projects that Hydro-Québec must carry out to achieve the objectives set out in its Action Plan 2035 while also contributing to Québec's decarbonization and prosperity. He also oversees activities related to the environment and real estate. Before joining Hydro-Québec, Mr. Charron worked at Rio Tinto Alcan, and subsequently at Rio Tinto, for 17 years, where he held executive positions with a focus on developing large-scale projects and operating major industrial facilities in Québec, Canada and abroad. From 2016 to 2019, he was Managing Director of the Oyu Tolgoi copper mine project in Mongolia, ensuring that the multibillion-dollar investments in the project yielded the expected benefits for the company and the local economy. From 2022 to 2024, he oversaw Rio Tinto's projects in the Americas, Europe and French- speaking Africa. Michel Charron holds a Bachelor of Applied Science in Chemical Engineering from the University of Ottawa and completed executive training programs at Queen's University and McGill.

Title: Driving Innovation Through Hydro-Québec's Project Mission

Hydro-Québec, the largest integrated hydroelectricity provider in North America, unveiled its ambitious *Action Plan 2035* last year. With planned investments of over $200 billion over a 10-year period to support the energy transition toward a decarbonized and prosperous Québec, the company will launch major projects to enhance its transmission capacity, optimize production, diversify its energy mix, and ensure service quality. Given the scale of this undertaking, Hydro-Québec is reviewing and optimizing its practices to create favorable conditions for the successful execution of these projects, while aiming to minimize risks to health, safety, and the environment. As part of his presentation, Michel Charron, Vice President - Construction Projects at Hydro-Québec, will highlight the central role of innovation in this approach. He will demonstrate how Hydro-Québec's practices address the challenges faced by both internal teams and the broader construction industry in achieving the 2035 targets. Through concrete examples of ongoing asset maintenance and development projects, he will present Hydro-Québec's latest advancements, particularly in automation, robotics, standardization, and drone technology.

Day 2: Wednesday, July 30

General Keynotes

8:00-8:35 a.m. Room: H.110

Ms. Sandra Martel
Chief Executive Officer, The Jacques Cartier and Champlain Bridges Incorporated

Bio: A graduate in civil engineering from Université de Sherbrooke, Sandra Martel first worked in building design and then research and development in Université de Sherbrooke's Faculty of Engineering. She went on to work at Expertech and Bell Canada, where she held many positions in business process, staff management, and project management to implement new technologies and execute work reorganization projects. Ms. Martel joined The Jacques Cartier and Champlain Bridges Incorporated in 2006 and held many positions in areas such as engineering, planning, information technology, and asset planning. She has served as Chief Executive Officer of the Corporation since 2019. Ms. Martel has also sat on the board of directors of the Université de Sherbrooke Foundation since 2019. In 2019, she was appointed ambassador of Université de Sherbrooke's Faculty of Engineering.

Title: Recap of the deconstruction of the original Champlain Bridge
Deconstructing a major 3.4-kilometre, 6-lane traffic structure without resorting to blasting and while upholding sustainable development principles, was a major challenge that JCCBI was eager to tackle. Despite the scale of this historic task, JCCBI boldly took on this challenge and aimed to go the extra mile. Because even though JCCBI's team knew the bridge had to be taken down, they wanted to leave the community with many tangible ways to remember this iconic structure. One of the project's most important legacies has been the sustainable development and environmental protection measures that minimized the project's impact and maximized its benefits. In addition to keeping thousands of pieces of the Champlain Bridge from ending up at the bottom of the St. Lawrence River, JCCBI aimed at maximizing material reuse, implementing compensation projects, in addition to advancing infrastructure knowledge through several research projects. Plus, now that the bridge is gone, JCCBI has come up with another lasting legacy to the community which includes the development of the freed-up land as public space. How about time and budget? JCCBI's CEO Sandra Martel will share her organization's keys to success.

8:35-9:10 a.m. Room: H.110

Dr. Carl Haas
University Research Chair, University of Waterloo

Bio: Carl Haas is a University Research Chair at the University of Waterloo in Canada. He has a BASc degree in Systems Design Engineering from Waterloo and graduate degrees from CMU in Pittsburgh in Civil Engineering. He has experience in modularization, supply chain management, construction productivity, craft training, and digitalization of design and construction processes. His broader research interests include AI, human-robotic systems, and the circular economy in the built environment. Numerous industry and government partnerships support his research. As Chair of the Department of Civil and Environmental Engineering at Waterloo between 2017 and 2022, he led rapid growth and renewal of staff, faculty, students and physical plant, including a new Architectural Engineering undergraduate program launched in 2018. He is a Fellow of the Royal Society of Canada, the Canadian Academy of Engineering, the American Society of Civil Engineers, and the US National Academy of Construction.

Title: A Canadian Construction Automation and Robotics Roadmap
Productivity in Canada's construction industry must be improved sustainably to address urgent threats to our well-being. Automation and robotics play a key role in construction productivity gains. Prioritizing resource allocation for construction automation and robotics requires a roadmap. Canada's National Research Council (NRC) sponsored the development of such a roadmap through the autumn of 2024 and the winter and spring of 2025, based on workshops, interviews, research, broad consultation and synthesis. In this presentation, several key elements of the roadmap are shared: (1) Canada's construction productivity challenge, (2) how automation and robotics improve productivity, (3) past successes and failures, and what we have learned about implementation impediments and means to overcome them, (4) opportunity identification and prioritization, (5) why construction is different than manufacturing, ship building and comparable industries, (6) how a solutions pipeline could work in Canada and who will participate, (7) suggestions for an R&D program to support a solutions pipeline, and (8) potential partnerships within and beyond Canada. This roadmap complements and fits within the scope of a broader Roadmap to Transform the Canadian Construction Industry through Research and Innovation.

9:10-9:45 a.m. Room: H.110

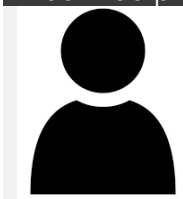
Dr. Simaan AbouRizk
Distinguished University Professor in the Department of Civil and Environmental Engineering and Dean of the Faculty of Engineering at the University of Alberta

Bio: Simaan AbouRizk, PhD, Peng is a Distinguished University Professor and Dean of the Faculty of Engineering at the University of Alberta. A global leader in construction engineering and management, he is internationally recognized for pioneering work in simulation, project planning, productivity, and risk analysis. Since joining the University of Alberta in 1990, Dr. AbouRizk has led transformative initiatives in research and education. He founded the Hole School of Construction Engineering and later established the Engineering Research Chair program to strengthen university-industry collaboration. As Dean, he has spearheaded interdisciplinary research centres and expanded experiential learning through the Engineering Experiential and Professional Education portfolio. His work has earned numerous accolades, including the King Charles III Coronation Medal, Queen Elizabeth II Platinum Jubilee Medal, NSERC Steacie Fellowship, and multiple awards from ASCE, CSCE, and APEGA. He is a fellow of the Royal Society of Canada, the Canadian Academy of Engineering, and the National Academy of Construction (USA). Dr. AbouRizk also founded SMA Consulting Ltd. and DRAXware Inc., applying cutting-edge technology to real-world challenges. Through his academic and entrepreneurial leadership, he continues to bridge research and practice, advancing engineering innovation and workforce development.

Title: Advancing Construction Research Through Strategic Industry-Academic Partnerships
This presentation explores strategies for developing productive, sustainable research partnerships between academia and industry, with a focus on the Construction Engineering and Management discipline. Drawing on decades of experience, the speaker traces the evolution of university-industry collaborations that helped establish the Hole School of Construction Engineering, emphasizing the integration of business process automation, advanced computing, simulation modeling, and artificial intelligence. The presentation highlights the significant impact of these partnerships on academic growth and recognition, while advocating for a purposeful, inclusive, and forward-looking approach to research collaboration. It underscores the importance of addressing real-world challenges, embedding students in industry-engaged research, and fostering a culture of collaboration within academic institutions. A consistent emphasis on computer simulation as a research theme served not as a constraint but as a catalyst—deepening engagement and driving innovation. Illustrative examples of these initiatives will be presented, along with a discussion of the critical role played by NSERC partnership programs in enabling success.

ISARC Tucker-Hasegawa Award Keynote

4:00-4:30 p.m. Room: MB 9.ABCD



To be announced during the session

ASCE Daniel Halpin Award Keynote

4:00-5:00 p.m. Room: MB 1.210

Dr. Jiansong Zhang
Purdue University

Bio: Dr. Jiansong Zhang is an Associate Professor of Construction Management Technology at Purdue University. He is the "Father of Invariant Signatures in AEC". He is the founder and director of Automation and Intelligent Construction (AutoIC) Lab, which develops scientific theories/methods and advanced technologies to support construction engineering and management, construction automation, and sustainable & resilient built environment. He is also the founder and director of Digital Twin and Robotic Automation Center for Knowledge Sharing, Entrepreneurship, and Research (DigiTRACKER) at Purdue. Dr. Zhang's research resulted in 170+ refereed journal and conference publications, multiple U.S. patents (some provisional), 10+ technology disclosures, multiple published datasets and technical reports, and tens of conference talks. Dr. Zhang is recognized as an National Science Foundation (NSF) Division of Civil, Mechanical and Manufacturing Innovation (CMMI) Panel Fellow and has served as an NSF panelist many times for proposal reviews at different programs such as CMMI, IIP, FW-HTF, and DUE. Dr. Zhang is currently serving as the Technical Committee Chair of ISARC 2025.

Title: Unlocking Universal BIM Interoperability: The Power of Invariant Signatures in AEC.
Existing research efforts to address the lack of BIM interoperability have been heavily focused on standardization and semantic modeling. These standard methods do not fully address the underlying problem and still depend on the computer models involved. In this talk, I will introduce the concept of invariant signatures of architecture, engineering, and construction (AEC) objects, its discovery and application in solving BIM interoperability problem in a radically different approach from the existing efforts that are focused on data schema standardization and/or term-based semantics of AEC objects. Invariant signatures of an AEC object are defined as a set of intrinsic properties (e.g., geometry, location, material) of the object that distinguish it from other objects, and they do not change with software implementation, modeling decisions, and/or language and cultural contexts. An interdisciplinary approach involving geometry theorems, computer algorithms, and material mechanics was employed to explore and quantify these intrinsic properties. Successes in applying invariant signatures to different BIM interoperability scenarios will be introduced.

Gala Reception and Dinner

- Day and time: Wednesday, July 30, 6:00-11:00 p.m.
- Location: Montreal Convention Centre, room 710 on the 7th floor
- Address: 159, rue Saint-Antoine West, Montréal, QC, H2Z 1H2

Address

How to go to the Gala Dinner?

Day 3: Thursday, July 31

General Keynote

8:00-8:35 a.m. Room: Hall H.110

Dr. Zoubeir Lafhaj
Professor at Centrale Lille Institute, France

Bio: Dr. Zoubeir Lafhaj is a full professor at the Centrale Lille Institute and a researcher at the LaMcube Research Centre, where he leads a team specialising in industrial construction. His work focuses on Construction 4.0, 3D printing, Lean Construction, and supply chains. He also explores the application of digital technologies to construction sites. Drawing on his close collaboration with industry, Dr. Lafhaj headed the Construction 4.0 Chair (2017–2023), which is accredited by two ministries and the Hauts de France Region. He initiated the Master's programme in Lean Construction Modular 4.0 and teaches at Centrale Lille, as well as in Hong Kong, Singapore, Morocco, Tunisia, Canada and Japan. He is the author of five books and over 200 scientific articles and has supervised 36 doctoral and 17 postdoctoral students. He organised the IGLC31, ISARC2024 and EuGLC2025 global conferences in Lille, and the SASBE2025 conference is coming soon. He is an active member of the IAARC and an expert reviewer for several international journals. As a former Dean of International Relations (2008–2015), he led Centrale Lille's strategy within the Erasmus Mundus networks and dual degree programmes. He is the president and founder of the French Institute for Lean Construction (IFCL), which was established in 2021 to promote Lean culture in France.

Title: When industry takes over construction – French strategy and examples of results

The construction sector is vital to the French economy as a whole. The real estate sector accounts for around 10% of French GDP and 8% of employment (2.1 million employees in 2015), which is in line with the European average. The revitalisation, modernisation and innovation of the sector are essential to the health of the French economy as a whole. Prof. Lafhaj will talk about the emergence of new technologies for construction in France, the use of which will improve quality in this sector, including building renovation, low carbon and climate constraints. Examples of innovations for the restoration of Notre Dame de Paris will be provided. Innovation also requires a change in attitude towards the act of building. To date, many stakeholders are dissatisfied with the volume of construction waste, delays and cost overruns, insufficient and inconsistent quality, low return on investment (ROI) and the considerable amount of rework leading to numerous complaints and defects. Scientific research conducted at the Centrale Lille research laboratory offers tools to significantly reduce these problems. These approaches require substantial improvements in the economic, social, technological, managerial and environmental performance of construction, infrastructure and engineering projects.

General Industry Plenary Session: Innovation and Sustainability

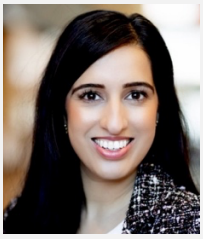
8:35-9:45 a.m. Room: H.110

Nhung Nguyen
CEO
Horizon Legacy

Federico Pensa
Vice-President of Technology
Fayolle Canada Inc.

Title: *Fayolle Vision on Construction Technology*

Ian Landry
Managing Director, Engineering Excellence
Hatch



Prabh Banga
Vice President, Sustainability
Aecon Group Inc.

Tony Bégin
Vice President, Sales and Preconstruction
Canam Group Inc.

Vincent Melanson
Manager Innovation & AI
Pomerleau

Technical Trip to Beauharnois Hydropower Station

- Date and time: Thursday, July 31, 1:30 – 5:30 p.m.
- Registration is required (Maximum number is 70 people)
- Registration fee: $30 (transportation, water and snacks).
- 40 km from downtown Montréal.
- Length of the tour: About 90 min. (2:45 – 4:15 p.m.)
- Tentative schedule:
  - 1:30 pm: Departure from Concordia.
  - 2:30 pm: Arrival to Beauharnois station.
  - 2:45 pm: Detailed presentation at the interpretation center (about 45 min).
  - 3:30 pm: A guided tour, including visiting one of the turbine shafts (about 45 min).
  - 4:30 pm: Return to Concordia.
  - 5:30 pm: Arrival to Concordia.
- Cloth: Flat, closed-toe shoes are required. In case of rain, dress appropriately and bring an umbrella.
- The temperature inside the generating station can vary significantly from the outdoor temperature. In summer, if it is 25°C outside, it can reach 35°C inside the generating station.
- Visitors aged 18 and over must present identification (driver's license, health insurance card, or passport).
- Only children above six years old can attend.

ISARC Detailed Schedule

Tuesday, July 29

7:15-8:00	**Breakfast** (Hall Building Mezzanine)						
8:00-9:45	**Opening Session and General Keynote**						
Room	Hall H.110						
Chair	Amin Hammad						
8:00-9:00	**Opening Session**						
9:00-9:45	**General Keynote**						
	Driving Innovation Through Hydro-Québec's Project Mission *Michel Charron*						
9:45-10:15	**Coffee break** (MB Atrium, MB-3, MB-9)						
10:15-12:00	**ISARC-1-1** **Sensing systems & data infrastructures (1)**	**ISARC-1-2** **Automated/robotic machines, devices, and end-effectors (1)**	**ISARC-1-3** **Automated/robotic machines, devices, and end-effectors (2)**	**ISARC-1-4** **Automated/robotic machines, devices, and end-effectors (3)**	**ISARC-1-5** **Automated/robotic machines, devices, and end-effectors (4)**	**ISARC-1-6** **Automated/robotic machines, devices, and end-effectors (5)**	**ISARC-1-7** **Automated/robotic machines, devices, and end-effectors (6)**
Room	**MB-9.A**	**MB-9.B**	**MB-9.C**	**MB-9.D**	**MB-9.EFG**	**MB-2.430**	**MB-2.435**
Chair	Faridaddin Vahdatikhaki	Kareem Mostafa	Ibukun Awolusi	Masato Ishikawa	Hyoungkwan Kim	Ci-Jyun Liang	Justin Yeoh
10:15-10:30	**Algorithm development for automatic detection of progressive damage in tunnel cross-sectional geometry** Christopher Joseph Nuñez Varillas, Marck Steewar Regalado Espinoza	**Case study: Robotic Underwater Inspection of Concrete Dam Face Prior to Refurbishment** Frédéric Nadeau, Marion Nourry, Guillaume Boivin, Eric Boudreault, Carmin Drolet	**Safe Reinforcement Learning for Objects Manipulation in Safety-Critical Coordinated Tasks** Fawad Khan, Wei Feng, Zhiyong Wang, Tianlun Huang, Liu Xiao, Asad Ali Shahid, Weijun Wang	**BIM-Driven Robotic Disassembly for Resource Recovery in End-of-Life Buildings** Jeehoon Kim, Christopher Rausch	**Exploring Extreme 3D Printed Clay Overhangs with Integrated Active Hot Air Drying System on Robotic Arm** Mohamed Abdelaziz, Ilija Vukorep, Deena El-Mahdy	**Automation of the Pneumatic Caisson Method - Optimization of Excavation Using the Greedy Algorithm -** H. Harada, K. Ishikawa, T. Terui, Y. Inagawa, K. Nakamura, S. Tachibana, S. Tsugawa, K. Nagahama, K. Terada	**Robot-to-Human Construction Tool Handover Grasp Prediction for 6-DOF Robotic Arm with Parallel Gripper** Yu Lun Kuo, Guan Yong Xiong, Jacob J Lin, Ci Jyun Liang
10:30-10:45	**Improved Information Extraction from Bridge Inspection Reports using Fine-tuned Generative Pre-trained Transformers** Abdelhady Omar, Osama Moselhi	**Robotized tower crane: Simulation and high-level action planning system** Mohammad Reza Kolani, Stavros Nousias, André Borrmann	**Design and Development of a Remote User Interface for Multi-Robot On-site Construction Inspection** Juan Carlos Cruz Rivera, Mohsen Navazani, Ibukun Awolusi, Ao Du, Jiannan Cai	**Drone-Assisted Progress and Quality Tracking for Surface Finishing in Construction** Tianyu Ren, Houtan Jebelli	**SatAOI: Delimitating Area of Interest for Swing-Arm Troweling Robot for Construction** Jia-Rui Lin, Shaojie Zhou, Peng Pan, Ruijia Cai, Gang Chen	**GPU-Accelerated Collision-Free Path Planning for Multi-Axis Robots in Construction Automation** Ilija Vukorep, Rolf Starke, Arastoo Khajehee, Nicolas Rogeau, Yasushi Ikeda	**Real-time 3D Perception System of Construction Equipment for Autonomous Mobile Robots** Duho Chung, Seunghun Im, Yohan Kim, Hyoungkwan Kim
10:45-11:00	**Pole-Shaped Object Extraction from LiDAR Point Clouds of Roads** Danesh Shokri, Shirin Malihi, Saeid Homayouni, Christian Larouche, Heidar Rastiveis, Ioannis Brilakis	**Automated Decision-Making Tool for Optimal Long-Term Scheduling of MRR Strategies: A Case Study on Bridges** Mohammed Alsharqawi, Saleh Abu Dabous, Tarek Zayed	**Reinforcement Learning with Vision-based State Estimation for Generalized Robotic Assembly** Mark Trovinger, Leonel Giacobbe, Tanner Grantham, Chuangchuang Sun, Jingdao Chen	**Advanced Sensor Integration for Enhanced Flight Control in UAV-Based Construction Automation** Tianyu Ren, Xiayu Zhao, Houtan Jebelli	**Automated Helmet Detection in Construction Sites using UWB and Machine Learning** Amir Shahbazi Ojghaz, Sayeh Bayat, Farnaz Sadeghpour	**CoNav Chair: Design of a ROS-based Smart Wheelchair for Shared Control Navigation in the Built Environment** Yifan Xu, Qianwei Wang, Jordan Lillie, Vineet Kamat, Carol Menassa	**Investigating the Evolving Robot-Building Relationship via a Past-Present-Prospect Model** Junjie Chen, Wilson Lu
11:00-11:15	**One-Shot Indoor Positioning Using 360-Degree Photos** Daeyoung Gil, Ghang Lee	**Parameterized Optimization of 3D Printed Concrete Beams** Gokul Santhosh S, Benny Raphael, Manu Santhanam	**Enhancing Robotic Vision through Deep Learning Techniques: From Detection to Construction** Yusuf Aykin, Hans Sachs, Nikolai Gerzen	**Path tracking of bucket edge using a hydraulic excavator with a built-in angular velocity controller** D. Endo, G. Yamauchi, T. Hashimoto, Y. Tsutsumi, S. Yamamoto, K. Furuuchi, S. Imura	**Human-Inspired Inverse Reinforcement Learning for Autonomous Excavator Operations in Lunar Environments** Minguk Kim, Youngjib Ham	**Exploring Cognitive Load and Task Complexity in Dynamic Tracking Tasks: Insights for Construction Workflows** Amira Eltahan, Gaang Lee, Farook Hamzeh	**Evaluation Framework for Indoor Localization Systems in the AEC Environment** Lukas Fritzsche, Rolf Paul Julian Starke, Benjamin Felbrich, Ilija Vukorep

11:15-11:30	**Real-time Multimodal Sensing System for Additive Construction by Extrusion: Integrating thermal, depth and RGB data** Y. Cai, J. A. Hartell, A. Aryal	**New collision avoidance algorithm approach based on social sciences** Shuntaro Tamura, Masahide Horita	**Adaptive Kinematic and Dynamic Control for Hexapod Robots in Complex Construction Environments** Xiayu Zhao, Houtan Jebelli	**Enhancing Robotic Path Planning in Industrialized Construction: A Novel Benchmarking Approach** Amirpooya Shirazi, Aladdin Alwisy	**Advanced Vision-guided Robotic Tying with 6-DoF Rebar Pose Estimation** Mi Liu, Jingjing Guo, Lu Deng, Xiaoyi Lyu, Linzhen Nie	**Remote Physical Control for Upgrading Heavy Construction Equipment** Meta Soy, Jiaming Fu, Yifu Wu, Jiansong Zhang, Dongming Gan, Jin Wei-Kocsis, Byung-Cheol Min	**Path planning for LiDAR equipped UGV considering coverage and efficiency in building inspection** Yun Cao, Ying Lo, Cheng Zhang
11:30-11:45	**Automated defect detection in clay printing** Patricia Peralta, Thamer Al-Zuriqat, Mahmoud Noufal, Kay Smarsly	**Evaluation of an Autonomous Driving Dumper using a Robot Evaluation Framework** T. Bernhard, Y. Huang, A. Fischer, C. Brosque, J. Fottner	**Senser Fusion and Hierarchical Inspection Strategy for Aerial-Ground Multi-robot System** Xiayu Zhao, Tianyu Ren, Yizhi Liu, Houtan Jebelli	**Dynamics Model of an Excavator in an Open Source Physical Simulator for Developing Autonomous Construction** T. Abe, Y. Matsusaka, D. Endo, G. Yamauchi, T. Hashimoto	**Multi-dimensional Mapping of Confined Areas using a Hexapod Robot with Integrated Sensor Data and SLAM** Zhong Wang, Qipei Mei, Gaang Lee, Thomas Bock, Vicente A. González	**LLM-PCPP: A novel robot prioritized coverage path planning approach for complex environments** Zhaofeng Hu, Ci-Jyun Liang	**Mixed Reality Based Teleoperation System for Prefabricated Building Assembly** Haoran Wang, Shunjie Gu, Zuoqing Yang, Zeren Tao, Qilei Sun
11:45-12:00	**Robust Pipeline for Facade Geometry Estimation Using AprilTags and Digital Imaging** Aravind Srinivasaragavan, Danya Liu, Kepa Iturralde, Christoph Holst	**Ultra Low Delay and Resilient Multi-channel Video Encoder for Efficient Remote Construction** Y. Nakajima, Y. Hontama, K. Shibairi, Y. Jitsuta, D. Endo, G. Yamauchi, T. Hashimoto, H. Itoh	**Dynamic Hand-Signal Recognition and Prediction Framework for Crane Operations Using Deep Learning** Zhihao Wei, Ghulam Muhammad Ali, Xinming Li	**The Development of a Low Code-based Planning Interface System for Coordinated Work of Multiple Construction Machines** Sheng Lian, Fumiya Matsushita, Ryosuke Yajima	**Vision-Guided Camera Pose Estimation for Robotic Rebar Tying** Shaopeng Xu, Huiguang Wang, Xiaoyi Lv, Lu Deng, Bo Jin, Jingjing Guo	**Paraphrasing-Based Data Augmentation for Responsible Personnel Classification in Crane Accidents** Deokyeong Kim, Leila Kosseim, Hongjo Kim, Jong Won Ma	**Interface Management of Robots in Construction: A Case Study of Overhead Drilling Robot** Zhida Zhang, Mi Pan, Sujuan Zhang, Quan Sun
12:00-1:30	**Lunch** (LB Atrium)						
1:30-3:30	**ISARC Best Paper, Keynotes, and Plenary talks**						
Room	**MB-9-ABCD**						
Chair	**Hyoungkwan Kim**						
1:30-2:05	**Best paper: GPR-Former: Context-Aware Moisture Detection** Kevin Lee, Chen Feng						
2:05-2:29	**keynote 1: Semantic-based behavioral decision-making method for construction robots in worker-robot collaboration** Xiao Lin, Hongling Guo, Ziyang Guo						
2:29-2:53	**keynote 2: Dynamic Analysis of a Six-Cable Parallel Robot for Automated Panelized Building Retrofits** Yifang Liu, Nolan Hayes, Diana Hun, Bryan Maldonado						
2:53-3:11	**Plenary talk 1: Neural Network-Based Estimation of Rebar Deflection for Robotic Rebar Installation of Vertical Structures** Hongjie Cai, Rongbo Hu, Ser Tong Quek, Soungho Chae, Justin K.W. Yeoh						
3:11-3:30	**Plenary talk 2: Mobility-added multi tool end-effector for picking and nailing applications in robotic timber assembly** Mauricio Arredondo-Soto, Paolo Pancho-Ramirez, Rafiq Ahmad						
3:30-4:00	**Coffee break** (MB Atrium, MB-3, MB-9)						
4:00-6:00	**ISARC-1-8 Automated/robotic machines, devices, and end-effectors (7)**	**ISARC-1-9 Construction management techniques (1)**	**ISARC-1-10 Construction management techniques (2)**	**ISARC-1-11 Decarbonizing the Construction Industry (1)**	**ISARC-1-12 Decarbonizing the Construction Industry (2)**	**ISARC-1-13 Human factors & human-system collaboration (1)**	**ISARC-1-14 Information modeling techniques (1)**
Room	**MB-9.A**	**MB-9.B**	**MB-9.C**	**MB-9.D**	**MB-9.EFG**	**MB-2.430**	**MB-2.435**
Chair	**Iturralde-Lerchundi Kepa**	**Robyn Phipps**	**S. M. Jamil Uddin**	**Aryan Hojjati**	**Sahar Mirzaie**	**Hongjo Kim**	**Markus König**
4:00-4:15	**Integration of a real-time orientation measurement system for a real-time evaluator (RTE) to measure the position and orientation of crane-lifted components** Balaji Selvakumar, Nolan W Hayes, Yifang Lui, Bryan P Maldonado, Mengjia Tang, Diana Hun	**SVR and GA Aided Lean Six Sigma Method for Planning in Modular Construction** Angat Bhatia, Osama Moselhi, Sang Hyeok Han	**Automating Weekly Construction Activity Progress Reporting: Leveraging AI-Driven Workflows** Eyob Mengiste, Muammer Semih Sonkor, Zihao Zheng, Samuel A. Prieto Ayllón, Borja García de Soto	**How good are the best practices in carbon reduction? UK highway sector case studies** Jinying XU, Kristen MacAskill	**Transforming Construction Waste into Resources for 3D Printed Concrete** Ekaterina Kravchenko, Muhammad Huzaifa Raza, Svetlana Besklubova, Georgy Lazorenko	**A Framework for Real-Time Estimation of Human Activity Intensity in Indoor Environments** Moein Younesi Heravi, Youjin Jang, Inbae Jeong, Israt Sharmin Dola	**A Mixed Reality Dataset for Deep Learning-Based Classification of MEP Systems** Boan Tao, Jiajun Li, Frédéric Bosché

4:15-4:30	**Advancing Automated Building Inspection: A BIM and GSD Integrated Framework for UAV Applications** Emadaldeen Benshaaban, Po-Han Chen, . Shahinuzzaman	**Tailored Visual-Language Solutions for Comprehensive Hazard Identification on Construction Sites** Qihua Chen, Xianfei Yin	**RAG-Enhanced Safety Information Retrieval for Construction: Integration of Large Language Models with Domain-Specific Information** Xianxiang Zhao, Advik Mehta, Falak Sethi, Brian Gue, Qipei Mei, Lingzi Wu	**Data Collection Challenges in Waste Diversion Assessment: A Building Demolition Case Study** Seungah Suh, Alyssa Roy, Sophia Lee, Sophia Shelton, Christopher Rausch	**Evaluating the Carbon Neutrality of Concrete Recycling Using CO2 Capture Technologies from Cement Production** Svetlana Besklubova, Ekaterina Kravchenko, Muhammad Huzaifa Raza, Ray Y. Zhong	**Understanding Cognitive Impacts of Robots in Worker- Robot Collaboration in Modular Construction** Yifan Wang, Xiaoyu Hou, Bo Xiao, Shane T. Mueller	**Automated Generation of Inspection Reports for Construction Operations** Hassan Bardareh, Osama Moselhi
4:30-4:45	**Structuring Motion-Based Communication as a Language for Robotics: Analysis with Dense Optical Flow** Nicholas Albergo, Jeongbin Hwang, Doyun Lee, Kevin Han	**Implementation of the Cybersecurity Incident Severity Scale (CISS) to Assess Cyber Incidents in the Construction Sector** Dongchi Yao, Bharadwaj R. K. Mantha, Borja García de Soto	**How Reliable Are Large Language Models? Zero-Shot Detection of Construction Hazards** Nishi Chaudhary, S M Jamil Uddin, Mahzabin Tamanna, Alex Albert, Abdur Rahman Shahid	**Enhancing Circular Construction Through Structural Steel Reuse: Case Study of Champlain Bridge** Dina Abouhelal, Amin Hammad	**Advancing Circular Economy in the Built Environment: A Framework for User-Centered Software Tool Development** Sai Karthik Vakkanthula, Mazdak Nik-Bakht	**Understanding the Impact of an Active Exoskeleton System on Vigilance Level of Workers During Common Repetitive Construction Tasks** Amit Ojha, Yogesh Gautam, Houtan Jebelli, Abiola Akanmu	**The Artificial Intelligence (AI) Impact on Construction Project Management** Kwame Amoah
4:45-5:00	**Autonomous Construction Robot with Telescopic Arm for Drywall Panel Installation** Ayshin Bagherzadeh, Vahid Dolatkhah, Omid Valinezhad, Mohammad Javad Haghi, Amin Mirfakhar	**A Case Study on Applying Machine Learning on Blockchain (MLOB) for Modular Integrated Construction Inspections** Zhiming Dong, Weisheng Lu	**Video-Based Productivity Monitoring of Worker and Large-Scale Object Interactions in Construction Sites** Mik Wanul Khosiin, Jacob J. Lin, Eko Andi Suryo, Kartika Puspa Negara, Ismiarta Aknuranda, Chuin-Shan Chen	**Design for Circular Disassembly of High-Performance Facade Systems** Naomi Galina Grigoryan, Alexandros Loutsioli Daskalakis	**A Comprehensive Framework for Evaluating Blockchain-Based Systems: Embodied Carbon Management in Construction Industry** Ka Lin Kuan, Helen Hoi Ling Kwok, Jack Chin Pang Cheng, Kai Lung Hui, Alexis Kai Hon Lau	**Transforming Construction Robotics Education with Virtual Reality: Analyzing Student Presence and Self-Efficacy** Amit Ojha, Yuming Zhang, Houtan Jebelli	**Modeling Cooling Tower Fan Speed Using Symbolic Regression** Mohamed Kandil, Gary Chang, J.J. McArthur
5:00-5:15	**Personalized Emotion-Adaptive Robot Control Strategy for Human-Robot Collaboration in Construction** Francis Baek, Leyang Wen, Gunwoo Yong, SangHyun Lee	**Blockchain-based Framework for Securing Construction Worker Certification and Task Authorization** J. Jeong, L. Kumi, Jaemin Jeong, H. Mun, M. Kim, S. Yun, J. Son, M. Gu, M. Song, J. Hwang	**Fuzzy-Chaos Framework for Understanding and Enhancing Labour Productivity in Complex Construction Environments** Elyar Pourrahimian, Diana Salhab, Aminah Robinson Fayek, Farook Hamzeh	**Enhancing IFC Models for Circular Design: Validation of Required Information through an IDS Framework** Lukas Guntermann, Philipp Hagedorn, Markus König	**A Comprehensive Approach for Automated Anomaly Detection and Enhancement of EPC Datasets for Decarbonization** Sahar Mirzaie, Zhihao Zhang	**Enabling human-robot collaboration in unstructured construction environment through sharing control: Classification, Challenges, and Future Trends** G. Wang, C. Zhu, H. Chu, A. Mahamadu, V. M. Pawar	**Unsupervised Multimodal Learning for Fault Detection of Fan Coils Units Using Building Automation System Data** Chin Choy Chai, JJ McArthur
5:15-5:30	**Adjustments and Assembly of a Novel Robotic End-effector for Construction Automation** Megan Rudo, Jiansong Zhang	**A Critical Review of Supervised and Reduced-Dataset Vision-Based Construction Activity Recognition Methods** Ali Ghelmani, Amin Hammad	**Enhancing Data Management Efficiency in Precast Concrete Manufacturing Through a Custom Database Solution** Alaa Abu Nokta, Mohammad Darwish, Mohamed Al-Hussein	**Reducing Carbon Emissions in 3D Printed RCC Slabs** Abhishek Patel, Benny Raphael	**Feasibility of Reusing Prefabricated Panels from an Embodied Energy and Economics Perspective** Mikael Gilbert, Khalegh Barati, Xuesong Shen	**Personalized and Adaptive Virtual Reality Training for Physically Coupled Robots in Construction** Y. Zhang, A. Ojha, S. Shayesteh, H. Jebelli	**Automated segmentation and analysis of point clouds of pier foundations using Pier Inspection and Evaluation Report (PIER)** A. Turki, N. W Hayes, B. Selvakumar, B. Maldonado, D. Hun
5:30-5:45	**Towards Agent: LLM-based Framework for Robotic Construction by Leveraging IFC** Song Du, Yan Gao, Wei Tong, Yiwei Weng	**Utilization of Artificial Intelligence in HAZOP Studies and Reports** Ehab Elhosary, Osama Moselhi	**Construction Information System by Measuring, Processing, and Utilizing 3D Data Oriented Toward Digital Twin** Satoshi Kubota, Aika Yamaguchi	**Cost and environmental value stream assessment of 3D printing and traditional construction: A futuristic perspective** M. H. Raza, S. Besklubova, E. Kravchenko, R. Y. Zhong	**Harnessing Digital Twin Technology for Construction Site Management** Ahmad AL Ayoubi, Ashtarout Ammar	**Cognitive Load-Aware Virtual Reality Training Platform for Safe Drone Operations in Construction** Yuming Zhang, Houtan Jebelli	**Comparing Few-Shot Learning with LLMs for Efficient Text Classification in Road Maintenance Applications** V. K. Reja, C. Y. {Fergus} Mok, A. Pal, I. Brilakis
5:45-6:00	**A Synthetic Data Generation Pipeline for Point-Cloud-Based Rebar Segmentation** Tao Sun, Yingtong Luo, Yi Shao	**Proposal of a Benchmark Indicator for Automated Construction Technology** Genki Yamauchi, Taro Abe, Daisuke Endo, Takeshi Hashimoto, Keiji Nagatani	**Development of an assessment matrix for evaluating public participation procedures** Jonathan Matthei, Leon Streyl, Philip Balcar, Peter Bohnenkamp, Sven Mackenbach, Katharina Klemt-Albert				

Wednesday, July 30

7:15-8:00	**Breakfast** (Hall Building Mezzanine)						
8:00-9:45	**General Keynotes**						
Room	Hall H.110						
Chair	Mohamed Al-Hussein						
8:00-8:35	**Recap of the deconstruction of the original Champlain Bridge** *Sandra Martel*						
8:35-9:10	**A Canadian Construction Automation and Robotics Roadmap** *Carl Haas*						
9:10-9:45	**Advancing Construction Research Through Strategic Industry-Academic Partnerships** *Simaan AbouRizk*						
9:45-10:15	**Coffee break** (MB Atrium, MB-3, MB-9)						
10:15-12:00	**ISARC-2-1** **Information modeling techniques (2)**	**ISARC-2-2** **Information modeling techniques (3)**	**ISARC-2-3** **Information modeling techniques (4)**	**ISARC-2-4** **Information modeling techniques (5)**	**ISARC-2-5** **Information modeling techniques (6)**	**ISARC-2-6** **Information modeling techniques (7)**	**ISARC-2-7** **Information modeling techniques (8)**
Room	**MB-9.A**	**MB-9.B**	**MB-9.C**	**MB-9.D**	**MB-9.EFG**	**MB-2.430**	**MB-2.435**
Chair	Kwame Amoah	Patricia Njideka Kio	Junxiang Zhu	Svetlana Besklubova	Frédéric Bosché	Bo Xiao	Olugbenro Ogunrinde
10:15-10:30	**Unified Network-Based Representation of BIM Models for Embedding Semantic, Spatial, and Topological Data** Jin Han, Xin-Zheng Lu, Jia-Rui Lin	**On-site Semantic Mapping and Waypoint Planning for Autonomous Aerial Bridge Monitoring** Yohan Kim, Sunwoong Paik, Hyoungkwan Kim	**Application of BIM Technology to Soil Layer Risk Analysis for Enhanced Accuracy and Informed Decision-Making in Geotechnical Engineering** Wen-Yi Wang, I-Chen Wu	**DSCformer: A Dual-Branch Network Integrating Enhanced Dynamic Snake Convolution and SegFormer for Crack Segmentation** Kaiwei Yu, I-Ming Chen, Jing Wu	**Automated assembly sequence planning and scheduling in precast building projects using reinforcement learning** Ajay Kumar Agrawal, Yang Zou, Hongyu Jin, Mohammed Abdelmegid, Vicente Gonzalez	**Automated Site Extraction for Scan-to-BIM Progress Monitoring in Road Network Construction** Ziang Jiang, Xuesong Shen, Khalegh Barati, James Linke	**Efficient Camera Pose Estimation Approach for Infrastructure Inspection** Anas Adeeb Alsharo, Max Midwinter, Chul Min Yeum
10:30-10:45	**A Framework for Physics-aware Warm Mix Asphalt Construction Planning Tool** Qinshuo Shen, Faridaddin Vahdatikhaki, Seirgei Miller, Andre Doree	**IFC Schema Extension for BIM-based Automated Code Checking of Korean Design Standards for Bridges** Wonbok Lee, Youngsu Yu, Bonsang Koo, Bonghyuck Choi, Seunghwan Lee	**Developing Computer Vison-based Digital Twin for Vegetation Management Near Power Distribution Networks** Fardin Bahreini, Mazdak Nik-Bakht, Amin Hammad, Mohamed Gaha	**3D Full-body Pose Estimation of Construction Machines Using Deep Neural Network and Stereo Vision** Han Luo, Mingzhu Wang, Peter Kok-Yiu Wong, Pak Him Leung, Jingyuan Tang, Jack C.P. Cheng	**Assessing the Efficacy of Virtual Reality Site Visits to Enhance Remote Learning Experiences for Civil and Construction Engineering Students** Samira Mirhasani, Jared Bosch, Joseph Louis	**A Digital Twin-based Indoor Environmental Quality Monitoring and Alert System for Off-Site Construction Facilities** Sena Assaf, Mohamed Assaf, Xinming Li, Ahmed Bouferguene, Mohamed Al-Hussein	**Deep Point Cloud Building Envelope Segmentation (DeeP-CuBES) using Deep Learning** Balaji Selvakumar, Yifang Liu, Nolan W. Hayes, Diana Hun, Bryan P. Maldonado
10:45-11:00	**Influence of Composition and Processing Parameters on the Fatigue Strength of Steel** Soheila Kookalani, Gozde Ozturk, Hamidreza Alavi, Erika Parn, Ioannis Brilakis	**Integration of Vision Platforms: Generating a Unified 3D Digital Map for Real-time Construction Site Monitoring** Jaemin Shin, Philgu Kim, Jeongwoon Choi, Yonghoon Cho, Gitaek Lee, Seokho Chi	**EA-YOLOv8: An Enhanced Crack Segmentation Algorithm for Infrastructure Maintenance** Feiyu Chen, Jinghui Qin, Jianyu Yin, Xianfei Yin	**Online data acquisition and building modelling for building renovation** Danya Liu, Kepa Iturralde, Christoph Holst	**Bayesian Networks for data contextualization in Digital Twins of complex civil infrastructures** Leonardo Binni, Anna Brunetti, Fabrizio Gara, Berardo Naticchia	**Analysis and Simulation of Pile Driving Construction Equipment** Laszlo Kovacs, Eric Karpman, Marek Teichmann, Jozsef Kovecses	**Development of a Hand-Arm Vibration Syndrome (HAVS) Detection Tool for Construction Workers** S M Jamil Uddin, Abdur Rahman Shahid, Mohd Farhan Israk Soumik, Ziyu Jin
11:00-11:15	**Digital construction of mortar-joint stone masonry walls** Qianqing Wang, Jingwen Wang, Stefana Parascho, Katrin Beyer	**Indoor Comfort Assessment Based on Digital Twin Platform** Chia Ying Lin, I-Chen Wu	**Falling Objects/Debris Detection System Using Surveillance Camera at Construction Site** Songyuan Zheng, Meta Soy, Jinwoong Lee, Kyubyung Kang, Jiansong Zhang, Emad Elwakil	**Simulation-based Integrated Transportation Planning in Panelized Construction** Ahmed Zaalouk, Mohammed Sadiq Altaf, SangHyeok Han	**Integrating BIM with Photogrammetry to prepare infrastructure digital twin: A road example** Khalil Ahmed Bin Mushtaq, Uzair Manzoor, Muhammad Usman Hassan, Jamal Farooqi, Almas Riaz, Muhammad Fawad, Qian Chen	**Development of Auto Route System for MEP (Mechanical, Electrical and Plumbing) Design in Construction** Youngseo Hwang, Kenneth Sungho Park, Sungkon Moon	**Framework for Acoustic Comfort Analysis in Digital Twins** Hossein Pouresmaeeliasiabar, Ali Motamedi

11:15-11:30	**Ontology-driven LLM framework for knowledge graph in smart buildings** Sebastien Gerin, Laurent Joblot, Nisrine Makhoul, Frederic Merienne	**Towards the Automation of Last Planner System ®** Michael Awe, Avleen Malhi, Nicholas Mavengere, Marcin Budka, Bhargav Dave	**Integrating Spatial Proximity and Visual Feature Similarity for Crew Group Detection in Construction Site** Cheng-Yun Tsai, Jacob J. Lin, Ci-Jyun Liang	**Automated Extraction of Structural Elements and Section Views from Bridge Drawings Using Deep Learning** Hakan Bayer, Markus König	**Large Language Models in Construction Bidding: Opportunities and Risks of Algorithmic Collusion** Chan Heo, Moonseo Park, Changbum Ryan Ahn	**P2P: Point Cloud to Panel Layout Optimization** Nisha Deborah Philips, Yifang Liu, Nolan W. Hayes, Diana Hun, Bryan P. Maldonado	**A Two-Phase AI-Driven Approach to Automated Construction Planning Using Small Language Models for Activity Sequencing and Missing Task Prediction** A. K. Singh, A. Pal, S. Hsieh
11:30-11:45	**Integrating Ontology and LLMs for Diagnosis and Repair of Concrete Surface Defects** Fardin Bahreini, Amin Hammad	**Optimizing Structure from Motion Parameters for Volume Estimation of Construction and Demolition Waste** Ashwani Jaiswal, Nikhil Bugalia, Quang Phuc Ha	**Building Component Segmentation-oriented Indoor Localization using BIM-based Synthetic Data Generation and Deep Learning** Haomiao Zhao, Yifeng Sun, Chi Chiu Lam, Junxiang Zhu, Mi Pan, Mun On Wong	**Proof-of-Concept Framework of Integrating AI-based LLM Reasoning into BIM Workflows for Design Automation** Jinwu Xiao, Cansu Coskun, Soowon Chang, Kyubyung Kang, Deniz Besiktepe	**Computer Vision based Automated Timber Structural Defect Detection Framework** Afia Rasool, Qipei Mei, Rafiq Ahmad	**Pixel-Based Rust Severity Classification on Steel Surfaces Using HSI Features and Machine Learning Techniques** Shahinuzzaman, Po-Han Chen, Emadaldeen Benshaaban	**Non-Productive Time Reduction in Off-Site Construction: A Predictive Analytics Approach Using Deep Learning** Xue Chen, Weining Zeng, Runcong Liu, Ahmed Bouferguene, Mohamed Al-Hussein
11:45-12:00	**Vision Transformer based Local Physical Fatigue Assessment using Electromyography (EMG) Signals for Construction Worker Health Monitoring** Yogesh Gautam, Yuming Zhang, Amit Ojha, Houtan Jebelli	**Developing a Digital Twin-based Framework for Construction Fire Hazard Recognition Training** Kexin Liu, Mohamed Sabek, Gaang Lee, Max Kinateder, Vicente A. Gonzalez	**Construction Industry Vision Alberta Dataset (CIVAD): Developing a Comprehensive Object Detection Dataset for Diverse Construction Applications** M. Sabek, Q. Mei, G. Lee, A. Golabchi, V. Gonzalez	**Towards Remote Construction Site Analysis: From Laser Point Clouds to Virtual Reality Applications** Trevor Elliott Neece, Alessandro Fascetti	**Crack Detection and Segmentation for Bridges Using State-of-the-Art Deep Learning Methods: Single-Stage vs. Two-Stage Detectors** Ahmed Assad, Mohamad Bo Arki, Miray Sweid, Amin Hammad	**Vision-based Segmentation, Measurement, and Pose Estimation in Modular Integrated Construction** Yuanyang Qi, Xiao Li, Ruiqi Jiang	**Using Large Language Model Embeddings for AI Model Training to Improve Preservation of Building Semantics** Suhyung Jang, Ghang Lee, Jaekun Lee, Hyunjun Lee
12:00-1:30	**Lunch** (LB Atrium)						
1:30-3:30	**ISARC Plenary talks**						
Room	**MB-9-ABCD**						
Chair	**Gaang Lee**						
1:30-1:50	**Plenary talk 3: Tracking algorithm for hazardous area in construction sites using PTZ cameras** Jaehwan Seong, Hyung-soo Kim, Hyung-Jo Jung						
1:50-2:10	**Plenary talk 4: Roadmap for Exoskeleton Adoption in the Construction Industry: Leveraging Standard Tests and Minimum Criteria** Malcolm Dunson-Todd, Mazdak Nik-Bakht, Amin Hammad						
2:10-2:30	**Plenary talk 5: Feasibility of an EEG-based dynamic suboptimal cognitive monitoring for field neuroergonomics** Eren {M.} Shahrokhi, S. Nizam Ahmed, Gaang Lee, SangHyun Lee						
2:30-2:50	**Plenary talk 6: Slate detection in orthophotos of building roof panels** Jiajun Li, Frédéric Bosché, Chris Xiaoxuan Lu, Lyn Wilson, Boan Tao						
2:50-3:10	**Plenary talk 7: A Large Language Model as an Assistant for Software-Independent Structural Analytical Model Review and Editing** Justin S. Lee, Ghang Lee						
3:10-3:30	**Plenary talk 8: Learning-based 6 DOF Camera Pose Estimation Using BIM-generated Virtual Scene for Facility Management** Thai-Hoa Le, Ju-Chi Chang, Wei-Yi Hsu, Tzu-Yang Lin, Ting-wei Chang, Jacob J. Lin						
3:30-4:00	**Coffee break** (MB Atrium, MB-3, MB-9)						
4:00-4:30	**ISARC Tucker-Hasegawa Keynote**						
Room	**MB-9-ABCD**						
Chair	**Frédéric Bosché**						
4:30-5:00	**Poster session (MB 9th floor lounge)**						
	Development of an assessment matrix for evaluating public participation procedures Jonathan Matthei, Leon Streyl, Philip Balcar, Peter Bohnenkamp, Sven Mackenbach, Katharina Klemt-Albert	**Proposal of a Benchmark Indicator for Automated Construction Technology** Genki Yamauchi, Taro Abe, Daisuke Endo, Takeshi Hashimoto, Keiji Nagatani	**A Synthetic Data Generation Pipeline for Point-Cloud-Based Rebar Segmentation** Tao Sun, Yingtong Luo, Yi Shao				
5:00-6:00	**Free time**						
6:00-11:00	**Reception and Gala Dinner** (Montreal Convention Centre)						

Thursday, July 31

7:15-8:00	**Breakfast** (Hall Building, Mezzanine)						
8:00-9:45	**General Keynote and Industry Plenary Session**						
Room	Hall H.110						
Chair	Mazdak Nik-Bakht						
8:00-8:35	**General Keynote**						
	When industry takes over construction – French strategy and examples of results ***Zoubeir Lafhaj***						
8:35-9:45	**Industry Plenary Session:** ***Innovation and Sustainability in Construction***						
9:45-10:15	**Coffee break** (MB Atrium, MB-3, MB-9)						
10:15-12:00	**ISARC-3-1** **Sensing systems & data infrastructures (2)**	**ISARC-3-2** **Automated/robotic machines, devices, and end-effectors (8)**	**ISARC-3-3** **Technology management and innovation**	**ISARC-3-4** **Automated/robotic machines, devices, and end-effectors (9)**	**ISARC-3-5** **Human factors & human-system collaboration (2)**	**ISARC-3-6** **Information modeling techniques (9)**	**ISARC-3-7** **Information modeling techniques (10)**
Room	**MB-9.A**	**MB-9.B**	**MB-9.C**	**MB-9.D**	**MB-9.EFG**	**MB-2.430**	**MB-2.435**
Chair	Ahmed Assad	Houtan Jebelli	Abdelhady Omar	Amir Mehdipoor	Lynn Shehab	Alessandra Corneli	Qipei (Gavin) Mei
10:15-10:30	**Integrated Framework for Scaffold Monitoring: From Point Cloud Acquisition to Safety Verification** Juhyeon Kim, Duho Chung, Jeehoon Kim, Hyoungkwan Kim	**A Proposed Strategy for Automating Intermeshed Steel Connection Assembly using Robotics** Miftahur Rahman, Samuel Adebayo, David Hester, Daniel McPolin, Karen Rafferty, Ibukun Awolusi, Debra F. Laefer	**Cybersecurity Resilience in the Construction Industry** Borja García de Soto	**A Validation Study of the Four-Pick Point Design Method of a Mobile Crane Rigging Assembly with Over Six Pick Points** Ramy Kheir, Sang Hyeok Han, Ashutosh Bagchi	**Quantitative Analysis of the Relationship between Worker's Visual Attention and Drone Flight Conditions** Wei Han, Liqun Xu, Mahfuza Maisha Mouri, Wei-Yin Loh, Fei Dai, Zhenhua Zhu	**Deep Learning for Automated Crack Recognition: Insights, Challenges, and Future Directions** Ghodsiyeh Rostami, Po-Han Chen, Mahdi S. Hosseini	**Feature Sensitivity Analysis for Enhanced HVAC Fault Detection and Diagnosis** Arash Hosseini Gourabpasi, Farzad Jalaei, Mazdak Nik-Bakht
10:30-10:45	**Practical Considerations for Implementing Autonomous UAV Video Collection of Multiple Outdoor Construction Activities** Yusheng Huang, Amin Hammad	**Robot-Assisted 3D Scene Reconstruction Using Fixed FOV LiDAR-Based Depth Camera** Vincent J.L. Gan	**BIM-Based Public Participation: Insights and Lessons Learned form a Case Study** Jonathan Matthei, Maximilian Friedhelm Heinrich Christ, Sven Mackenbach, Katharina Klemt-Albert	**Interoceptive Robots for Convergent Shared Control in Collaborative Construction Work** Xiaoshan Zhou, Carol Menassa, Vineet Kamat	**Design considerations of ergonomic human-robot collaboration (EHRC) for modular construction manufacturing** Yonglin Fu, Weisheng Lu	**Development of a Petrochemical Plant Pipe Counting Method Based on Improved Mask R-CNN and Transformer** Rong-Lu Hong, Jin-Bin Im, Sang-Jun Park, En-Lian Zhang, Nomgon Ochirsuren, Young-Gun Beak, Shin-Hyun Kang, Seong-Won Chung, Cheol-Su Lee, Seunghyeon Wang, Ju-Hyung Kim	**MAP: A Versatile Platform for Predictive Algorithms in Construction and Beyond** Ramyani Sengupta, Emad Elwakil, Yi Jiang
10:45-11:00	**Human Pose Estimation Using Automated Multi-Camera Calibration** Israt Sharmin Dola, Inbae Jeong, Youjin Jang, Moein Younesi Heravi	**Adaptive Hazard Zone Model for Improved Safety in Highway Work Zones** Ayenew Yihune Demeke, Moein Younesi Heravi, Israt Sharmin Dola, Inbae Jeong, Youjin Jang	**Efficient RAG for Construction in Low-Resource Language** Kichang Choi, Seungwon Baek, Jongwon Ma, Hongjo Kim	**Advances in the Development of a Custom End Effector for Construction Automation** Dax Pimentel, Mario Cervantes, Jiansong Zhang, Luis C Félix-Herrán	**Towards AI-based Optimization of human-centered and robot-assisted construction processes** Anne-Sophie Saffert, Jonas Wiederer, Simon K. Hoeng, Thomas Linner, Mathias Obergriesser, Patrick Neumann	**Are Open-Vocabulary Models Ready for Detection of MEP Elements on Construction Sites** Abdalwhab Bakheet Mohamed Abdalwhab, Ali Imran, Sina Heydarian, Ivanka Iordanova, David St-Onge	**A Regional Investigation of Near-Zero Energy Buildings: Assessing the Impact of PV Integration and Building Design** Elsayed Salem, Emad Elwakil, Ashraf Salem

11:00-11:15	**3D Measurement System for Soil Loading by an Autonomous Backhoe using OPERA** Takayoshi Hachijo, Yutaro Fukase, Takashi Yokoshima, Yuki Miyashita, Shunsuke Kimura, Masanori Suzuki, Yuichiro Kasahara, Tomoya Kouno, Koshi Shibata, Ryo Kurazume, Daisuke Endo, Genki Yamauchi, Takeshi Hashimoto	**Demonstration of a robotic system for remote control of the end-hose during concrete pumping** Mathias Haage, Robert Larsson	**Assessment Framework for 3D Concrete Printing Technology in Alignment with Construction 5.0 Criteria** Imtiaz Iqbal, Svetlana Besklubova, Tala Kasim	**Transformer-based Multi-resolution Fast 3D Reconstruction for Structural Damage Detection** Hui Zuo, Tao Sun, Hao Xie, Xiao Ma, Nima Shirzad-Ghaleroudkhani, Qipei Mei	**A framework for computer vision-based real-time asphalt pavement property monitoring** Dongying Wang, Qinshuo Shen, Faridaddin Vahdatikhaki, Seirgei Miller, Andre Doree	**Automatic Reconstruction of Aligned Indoor Building and Façade Elements from Point Cloud Data** Mudan Wang, Yuandong Pan, Anson, T.K. Chan, Sven Auerswald, Seyedehmaedeh Aghili, Ioannis Brilakis	**Signals vs. Videos: Advancing Motion Intention Recognition for Human-Robot Collaboration in Construction** Chenchu, Charan Gajjala; Kim, Kinam; Lu, Gao; Din, Zia Ud Kim, Dr. Kinam
11:15-11:30	**Automated Inspection Methodology of Wall Rebar Spacing and Diameters Using Laser Scanning** Philgu Kim, Jungyeon Kim, Jeongwoon Choi, Seokho Chi	**Scaled-down Simulation and Analysis of On-site Robotic Fabrication and Construction** Raymond Xu, Luka Morita, Parmida Khosravian, Anas Itani	**Knowledge-Based Systems in the Era of Large Language Models: A Case Study in Fire Safety Management** Dilan Durmus, Shabtai Isaac, Alessandro Carbonari, Alberto Giretti	**Development of a Fall Detection and Safety Communication System Using Small Language Models** Malithi Mithsara, Abdur Shahid, Ning Yang, Jamil Uddin, Rahul Biswas	**Effects of Visual Fidelity on Task Performance and Mental Workload in IVEs** Jin-Bin Im, Rong-Lu Hong, Jae-Ho Jang, Enlian Zhang, Seung-Hye Shin, Moonboo Joo, Ki-Won Lee, Kang-Moo Lee, Kyung-Ho Lee, Seo-Young Park, Ju-Hyung Kim	**Deployment for Additive Construction through Digital Platforms: Gananoque Project as a Case Study** Pablo Salvador Banda Pérez, Ioulios Georgiou, Patricio Emanuel Carrasco Pérez, Romanella Soria, Zayed Elbadri, Daniel Cantor, Nhung Nguyen	**Non-Fiducial Augmented Reality Assisted Construction Installation** Jeffrey Kim, Darren Olsen
11:30-11:45	**LiLoc – Defect Image Localization in Laser Scans** Patrick Herbers, Lisa von Rössing, König Markus	**Adaptive Fractal Quadtree Approach for Efficient Drone-Based Construction Site Safety Inspection** Marvin Cheng, Ci-Jyun Liang, Hugo Camargo	**Mixed Reality-based Digital Twinning of Building Circularity: A Co-Design Approach for Sustainable Buildings** Bo Su, Muhammad Fawad, Qian Chen, Marek Salamak	**Design Optimization of Steel Structures with Reused Components Using Generative Design** Golnaz Mirzaei, Amin Hammad, Faraeen Homayounfard	**Automated Image Dataset Generation Using Web Scraping and Large Multimodal Models for Construction Applications** Shrouk Gharib, Osama Moselhi	**Less is Better: A Comparative Analysis of Guidance Methods for Long-Context Window-Based Legal Interpretation** Jaekun Lee, Ghang Lee	**Performance Evaluation Model to Enhance Life Cycle Productivity in Modular and Off-Site Construction: A Process-Oriented Approach** Babak Manouchehri, Sanghyeok Han, Fuzhan Nasiri
11:45- 12:00	**Next-Generation Stretchable EDA Sensors with Ag-NP Fractals for Motion Artifact-Free Physiological Sensing in Dynamic Environments** Yogesh Gautam, Houtan Jebelli	**From BIM to Autonomous Navigation: Using BIM Models to Enable Autonomous Navigation and Localization in Construction Environments** Jörg Husemann, Maximilian Kunz, Marcel Suiker, Karsten Berns	**Web Based Security Assessment of Open Source CAD tools using ZED Attack Proxy (ZAP) scanner** Abdul Shakir, Bharadwaj R. K. Mantha	**BIM-FM interoperability: integrating existing FM platform with visualization of IFC models** Andressa Oliveira, José Granja, Pedro Machado, Ali Motamedi, Miguel Azenha	**Evaluation of Flight Parameters in UAV-Based 3D Reconstruction for Rooftop Infrastructure Assessment** Nicholas Chodura, Melissa Greeff, Joshua Woods	**Process Coordination and Automation in Modular Construction Supply Chain Using Smart Contract and RPA** Ningshuang Zeng, Xuling Ye, Shiqi Chen, Yan Liu, Markus König, Qiming Li	
12:00-1:30	**Lunch** (LB Atrium)						
1:30-5:30	**Technical trip**						

CSCE/CRC Schedule

Tuesday, July 29

7:15-8:00	**Breakfast** (Hall Building Mezzanine)						
8:00-9:45	**Opening Session and General Keynote**						
Room	Hall H.110						
Chair	Amin Hammad						
8:00-9:00	**Opening Session**						
9:00-9:45	**General Keynote**						
	Driving Innovation Through Hydro-Québec's Project Mission *Michel Charron*						
9:45-10:15	**Coffee break** (MB Atrium, MB-3, MB-9)						
10:15-12:00	**CSCE/CRC-1-1** **XR & Immersive Technologies in AEC (1)**	**CSCE/CRC-1-2** **Built Environment Decarbonization Strategies**	**CSCE/CRC-1-3** **Digital Twins & BIM for Infrastructure & Construction (1)**	**CSCE/CRC-1-4** **Built Environment Resilience**	**CSCE/CRC-1-5** **Construction Efficiency & Process Optimization (1)**	**CSCE/CRC-1-6** **Modular, Offsite, and Industrialized Construction**	**CSCE/CRC-1-7** **Socio-technical Issues in Construction**
Room	**MB-3.210**	**MB-3.270**	**MB-3.435**	**MB-3.430**	**MB-3.445**	**MB-2.130**	**MB-2.445**
Co-Chairs	Vicente A. Gonzalez Hamed Mozaffari	Jenn McArthur Aryan Hojjati	Ali Motamedi Farzad Jalaei	Ahmed Bouferguene Joseph Louis	Sang Hyeok Han Sadaf Montezari	Ivanka Iordanova Remi Charron	Yasmeen Essawy Xinming Li
10:15-10:30	**Immersive Safety: Revolutionizing Construction Training with Virtual Reality and Behavioral Insights** Mohamed Sabek, Baseel Ammar, Farook Hamzeh, Vicente Gonzalez-Moret	**Early Design Parameters Influencing Decarbonization of Modular and Off-site Construction: A Systematic Review** Q. Al Wasiew, M. Rahman, Md. R. I. Chowdhury, S. H. Han, Sungkon Moon	**AI-Supported Real-Time Schedule Updating and Maintenance in 4D BIM** Larin Jaff, Sahej Garg, Gursans Guven	**Enhancing resilience to coastal hazards: an analysis of resources, tools, and processes to improve land use decision-making in the United States** Sean Murphy, Chih-Shen Cheng, Juhyeon Kim, Fernanda Leite	**Using Lean Principles to Optimize the Delivery Process of Façade Engineering** Marie Belle Georges, Issam Srour, Hicham Abou Ibrahim	**A Framework for Assessing Organizational Workforce Maturity to Enhance Off-Site Construction** R. Khatri, A. Mehdipoor, R. Khoteja, N. Tamara Odo, B. Searle, J. Rankin, A. Thompson	**Evaluation of residents' participation intention in smart community construction using hybrid CRITIC- fuzzy Comprehensive evaluation model** Enyang Hao, Kim Dirks, Minh Kieu
10:30-10:45	**Evaluating the Impact of Immersive Embodied Interaction on Stress and Learning in Construction Education** S. Anjum, S. Cheon, C. Nnaji, K. Rambo-Hernandez, Y. Abraham and A. Akanmu	**Simulation and Optimization of Carbon Footprint for Construction Earthworks** Tayseir Hegazy, Ibrahim Abotaleb, Sherif Fakher and Ahmed Ezeldin	**Evaluating the Usability and Learning Impact of HoloLens 2 in Revit Education: A Case Study in Digital Graphics II** Mohsen Foroughi Sabzevar and Masoud Gheisari	**Estimation of Road Widths to Infer Disaster Response Vehicular Mobility in Alleys Using GIS-based Road Polygon Data** Suyeon Shin, Joonwon Lee, Minji Choi, Taeyoon Kim and Sungjoo Hwang	**Conceptual Model for Enhancing Construction Productivity through Real-Time Physiological Monitoring and Fuzzy Hybrid Modeling** Elyar Pourrahimian and Aminah Robinson Fayek	**A Novel Framework for Developing a Dynamic Survey Dashboard: Case Study of a Self Assessment and Planning Survey for Off-Site Construction Facilities** S. Assaf, T. Zelele, S. Razavialavi, A. Hojjati, S. Ahn, A. Bouferguene, M. Al-Hussein, J. Hwang	**Application of a Sankey Diagram to Migration Patterns of Construction and Engineering Workforce** Rachel Mosier, Tulio Sulbaran, Olugbenro Ogunrinde and Jared Burgoon
10:45-11:00	**Analysis of Excavator Operators' Situational Awareness in Construction Sites Under Immersive Virtual Environment** Young Beom Ju, Md Samdani Azad and Minji Choi	**Carbon Footprint Assessment Model for Sustainable Construction Site.** Yara Mounir, Ibrahim Abotaleb, Sherif Fakher and Ahmed Samer Ezeldin	**Beyond Data: Conceptualizing Human-Centric Digital Twins for The Future of Construction** Lynn Shehab, Gaang Lee and Farook Hamzeh	**A STAKEHOLDER VALUE-DRIVEN FRAMEWORK FOR EVALUATING RESILIENCE STRATEGIES** Hang Ren, Lu Zhang, Andrew McCoy, N. Emel Ganapati, Tanyel Bulbul, Ruichuan Zhang and Travis Whetsell	**Systematic Literature Review on the Integration of Lean Management and Sustainable Development in Modular Off-Site Construction** Helia Rasouli, Silvio Melhado and Ivanka Iordanova	**Advancing The Industrialization of Construction: Overcoming Barriers and Unlocking Benefits for a Sustainable Future** Ralph Tayeh, Fopefoluwa Bademosi and Magdalena Kowalczyk	**The Significance of Project Manager Competencies in Recruitment: A Means of Supporting Success in the Construction Industry** Suzana Trac, Hamid Zaman and Xinming Li

11:00-11:15	**Iterative Enhancement of AR-based Task Assistance System for Construction Workers: Insights from Comparative User Study and Thematic Interview Analysis** Xiang Yuan, Qipei Mei and Xinming Li	**What are the technical and regulartory tools to achieve decarbonization of the construction industry in Canada?** Adrien Dupire and Claudiane Ouellet-Plamondon	**Evaluating the Impact of Building Information Modeling (BIM) on Project Performance in the Built Asset Industry: Development of an information processing index** Omar Maher and Erik Poirier	**Comparative Analysis of Photogrammetry and Lidar Data: Topography Generation for Flood Risk Mitigation** Chih-Shen Cheng and Fernanda Leite	**Towards a Standardized Framework for Measuring Productivity in the Canadian Construction Industry: A Systematic Literature Review** Ansh Kasundra, Amirhossein Mehdipoor, Ahmed Niaz, Muhammad Fawad, Qian Chen and Alexandra Thompson	**Stakeholders Integration in Offsite Construction Supply Chain: Flows and Relationships for Different Project Delivery Methods** E. Ketema Tadesse, A. Zaalouk, S. Jun Ahn, A. Hojjati, A. Mehdipoor, H. Sanghyeok and F. Mafakheri	**Analysis of the Characteristics of Construction Site Complaints and Their Relationship with Surrounding Spatial Information: A Case Study of Seoul** Moobin Kim and Youngcheol Kang
11:15-11:30	**Exploring Low-Cost Marker-Based Augmented Reality for Electrical Design Communication in Small Construction Firms** Asmau Ikhuoria, Zia Din and Siyuan Song	**Simulation-Based Multi-Objective Optimization for the Decarbonization of Bored Piles** Tayseir Hegazy, Berlant Arab and Yasmeen Essawy	**Creating Data Mapping and Naming Conventions for Enhanced OpenBIM-LCA Interoperability** Farnaz Jalaei, Vafa Rostamiasl, Ahmad Jrade, Farzad Jalaei, Arash Hosseini Gourabpasi, S. J. Eirdmousa and R. Rostaminikoo	**A Combined Framework for Assessing Bridge Resilience against Seismic Hazards Using the Analytical Hierarchy Process** Kaoutar Zellat, Mohamed Naim Issad, Mohamed Cherif Djemai and Mahmoud Bensaibi	**A Lean-Based Approach to Streamline Production and Reduce Waste in Precast Concrete Panel Manufacturing** A. Abu Nokta, Mahdis Mazhari, Mahsa Honari Kalateh, Mohamed Al-Hussein, Ahmed Hammad and Farook Hamzeh	**Graph-based Generative Model for Multi-System Design Synthesis of Industrialized Homebuilding** Hisham Said and Melika Ketabforoush	**I Can Reach My Full Potential with a Little Help from My Friends: Understanding Construction Project Team Dynamics and Performance Through Personality Profiling** C. Limberg, A. Rademacher, A. Hanna
11:30-11:45	**Eye-tracking-based Risk Perception Prediction for Adaptive Hazard Recognition Training** M. Rezaeiashtiani, M. Lee, A. Golabchi, V. Gonzalez-Moret, N. Ahmed and G. Lee	**Carbon Tax Act: An Effective Mitigation Tool for South Africa** Jon-Dylon Petersen, Opeoluwa Akinradewo and Hendri Du Plessis	**Standardizing whole-building lifecycle assessment (wbLCA) Benchmarking framework facilitated by adopting Open BIM for Canadian building sector** F. Jalaei, A. H. Gourabpasi and D. Mehran	**Comparing Overhead Power Distribution Lines Hardening Strategies Using SWOT Analysis** Ahmed Khedr and Amin Hammad	**Identification of Construction Labor Productivity Factors (CLP) in Mass Timber Building Projects** Nawaf Alotaibi and Ingrid Arocho	**Standardization of certain aspects of light wood-frame prefabrication for multi-storey residential buildings** C. Esslinger, I. Iordanova and C. Carbone	**Real Estate Market Dynamics in New Cairo: A Geospatial Perspective Using Spatial Autocorrelation** Raghda Moharram, Khaled Nassar and Yasmeen Essawy
11:45-12:00		**Carbon Tax Act Effect on the Built Environment: Lessons from South Africa** Jon-Dylon Petersen, Opeoluwa Akinradewo, Christopher Amoah		**Assessing the Impact of Climate Change on Bridge Scour Risks in New York State** Samaneh Gholitabar and Alexis Torres	**Self-Evaluation of Single and Multi-Agent LLMs as Assistants in Inspection Reporting Workflows** Shun-Hsiang Hsu, Yoonhwa Jung, Junryu Fu and Mani Golparvar-Fard	**Scaling Off-site Construction: A Roadmap for Sustainable and Affordable Housing Solutions at a Regional Level** B. Searle, N. Odo, J. Rankin	**Advancing Technology Adoption in Northern Construction: Overcoming Challenges for Sustainable Growth** Sudhansu Majumdar and Rajeev Ruparathna
12:00-1:30	**Lunch** (LB Atrium)						
1:30-3:30	**CRC ExCOM Business Meeting**						
Room	**MB-1-210**						
3:30-4:00	**Coffee break** (MB Atrium, MB-3, MB-9)						
4:00-6:00	**CSCE/CRC-1-8 Contracting & Legal Issues**	**CSCE/CRC-1-9 Construction Planning & Project Management (1)**	**CSCE/CRC-1-10 Sustainable Built Environment (1)**	**CSCE/CRC-1-11 Occupational Health and Safety (1)**	**CSCE/CRC-1-12 Automation & digitalization in Construction (1)**	**CSCE/CRC-1-13 Infrastructure Systems & Asset Management (1)**	**CSCE/CRC-1-14 AI and Robotics in Construction (1)**
Room	**MB-3.210**	**MB-3.270**	**MB-3.435**	**MB-3.430**	**MB-3.445**	**MB-2.130**	**MB-2-445**
Co-Chairs	**Silvio Melhado** **Sadaf Montezari**	**Sedat Akkaya** **Arash Hosseini**	**C. Ouellet-Plamondon** **Habio Feng**	**Abdelhady Omar** **Vafa Rostamiasl**	**Cheng Zhang** **Kaiwen Chen**	**Tarek Salama** **S. Madeh Piryonesi**	**Farid Vahdati** **Jun Ahn**
4:00-4:15	**Exploring Dispute Resolution Mechanisms in Large-Scale Design-Build Transportation Infrastructure Projects in the U.S.** Jung Hyun Lee and Baabak Ashuri	**Impacts Identification of Supplier Reliability on Project Duration in Heavy Industrial Construction Supply Chain Using Discrete Event Simulation** Beixuan Dong, Chenghao Zhou, Brian Gue, Xinming Li and Lingzi Wu	**Lean Construction in the Digital Age: Optimizing Processes, Reducing Waste, and Driving Sustainable Project Outcomes** Mohammed Alsharqawi, Thomas Heath, Nilkanth Panchal, Anushka Chawla and Bridget Sacke	**Privacy Policies of Wearable Devices for Worker Safety and Health Monitoring in Construction** Chinedu Okonkwo, Amanda Betancourt, Ibukun Awolusi and Oluwafemi Akanfe	**Predicting the Indirect Cost of Construction Projects in Egypt: An Artificial Neural Network Approach** Aya Effat, Ossama A. Hosny and Elkhayam M. Dorra	**Data Acquisition and Analysis for Offshore Gas Pipelines Condition Assessment Model** Fadi Mosleh, Tarek Zayed and Mohammed El-Abbasy	**Improving machine utilization in off-site construction using computer vision methods** Xue Chen, Weining Zeng, Runcong Liu, Ahmed Bouferguene and Mohamed Al-Hussein

4:15-4:30	**Benefits And Challenges of Programmatic Approaches to Alternative Contracting Methods in Highway Infrastructure Projects** N. Le, D. Tran, C. Harper and R. Sturgill	**Machine Learning Models for Estimating Construction Costs of Conventional and Accelerated Bridge Construction Methods** Hadil Helaly, Khaled El-Rayes and Ernest-John Ignacio	**Building Efficiency: A Comparative Analysis of Sustainable Building Materials and Existing Green Energy Technologies – A Simulation-Based multi-Climate Approach** E. Kennedy, Y. Cai, J. A. Hartell and A. Aryal	**Evaluating Safety Engagements and Near-Miss Incidents in Construction: An Ethnographic Case Study** Ali Esmail, John Gambatese and Abdulaziz Alotaibi	**Automated Evaluation of Urban Environmental Quality Using Streetscape Images Considering Component Relationships and Attributes** Youngseo Shim, Meesung Lee, Taeyoon Kim and Sungjoo Hwang	**Limitations of Reliability Indices in Practical Water Distribution System Applications: Bridging the Gap Between Theory and Practice** Fadi Mosleh, Rebecca Dziedzic and Osama Moselhi	**Comparative Analysis of Different Machine Learning Models for Sewer Pipe Defects Detection: Faster-RCNN, Single Shot Detector (SSD) and YOLOv8** Monica Rajbhandari, Ahmed Bouferguene and Mohamed Al-Hussein
4:30-4:45	**Effect of Bundling on Project Costs** K. Joseph Shrestha, David Iyiola and Mohammad Uddin	**Spatial Dependencies in Construction Cost Prediction: A Multi-Source Spatial Lag Analysis of Project Locations and Material Supply Networks** Raghda Moharram, Khaled Nassar and Yasmeen Essawy	**Transforming Canada's Housing Stock: A Comprehensive Categorization of Sustainable Retrofit Strategies for Residential Buildings** Basil Khan, Mehdi Ghobadi, Kartik Patel and Rajeev Ruparathna	**Enhancing Safety Risk Management in CM/GC Contracts: A Comparative Analysis of AIA A133-2019 and ConsensusDocs 500 with a Structured Checklist Framework** Ali Esmail, John Gambatese and Emmanuel Njemanze	**Developing a Deep Learning Model Framework to Automate Speed-Limit Signs Detection and Recognition for iRAP Elements** Zakariya Gadi, Rebecca Dziedzic and Luis Amador	**Towards Predictive Modeling of Time to Sewer Pipe Failure: A Preliminary Exploratory Study Combining Statistical Analysis and AI Techniques** J. Yang, T. Zayed, X. Liu, D. Arimiyaw, M. Nashat and A. Ibrahim	**Large Language Model and Synthetic Dataset based Occupant Clothing Insulation Recognition** Rui Li and Haibo Feng
4:45-5:00	**Implementation Of Quality Control Plans For Alternative Contracting Methods In Highway Projects** Phuong Nguyen and Daniel Tran	**Physics-Based Simulation for Construction Sequence Planning** Mohammad Rezaul Karim and Yasser Mohamed	**Drivers and Barriers in Implementing Verified Carbon-neutral Building Products** Asmau Ikhuoria, Jonathan Torres, Catherine Callaway and Zia Din	**Reducing Workers' Back, Shoulder, and Leg Stresses Using Low-Cost Wearables** Ahmed Attalla, Omar Attalla, Fam Saeed, Bassam A. Tayeh and Tarek Hegazy	**Automated Inferences on Walking Barriers Based on Human Bipedal Keypoint Detection Using CCTV Video Data** Taeyoon Kim, Siyeon Kim and Sungjoo Hwang	**A Review of Artificial Intelligence Applications in Utility Investigation for Highway Projects** Haidy Ghali and Jennifer Shane	**Event Graph Optimization for Request for Information (RFI) with Hierarchical Reinforcement Learning and Human Feedback** S. Ahmadinasab, Y. Zhao, Y. Li, S. Sahyoun, M. Nik-Bakht, H. Ge, Y. Zeng and J. Yan
5:00-5:15	**Understanding Cost Impacts to Large Construction Programs via Change Order Analysis** Eric Klein and Daniel Weeks	**Elevating Construction Progress Monitoring: A Comprehensive UAV-Based System for Long-Term Outdoor Construction Site Mapping** D. Mao, Y. Lin, Y. Song Hu, M. Gupta, M. Lou, F. Jalaei, S. Razavialavi, A. Ebadi, A. Wong, Y. Chen	**Creating Self-Sustainable Landscapes to meet SITES Standards** Jourdan Friedlander, Patricia Kio and Yi Luo	**A Validation Framework for Construction Workers' Unsafe Behavior Mitigation Measure Using Agent-Based Modeling and Emprically Trained Large Language Models** Jeonghyeun Chae, Youngcheol Kang and Wonkyoung Seo	**Conceptual Framework for Automating Constructability Analysis in Construction Projects** Amira Saleh, Lingzi Wu and Vicente Gonzalez	**Misconceptions and Misuses of Data in Infrastructure Asset Management** S. Madeh Piryonesi	**Adopting Artificial Intelligence within an Architecture Firm: A Case Study** Erik A. Poirier, Ali Motamedi, Sébastien Frenette and Florence Lamothe
5:15-5:30	**Identifying Best Practices In Financial Modeling For Public-Private Partnership (P3) Projects** Pooja Basnet and Pramen P. Shrestha	**Optimizing Production Scheduling for Decarbonization in Off-Site Construction** Mizanoor Rahman, Md. Rakibul Islam Chowdhury, Qudrati Al Wasiew, Sungkon Moon and Sang Hyeok Han	**An Outline Process for Evaluating the Energy Performance of Green Certified Buildings - A Review of Case Studies** Thelma Morgan, Patricia Kio, Chimay Anumba, Edmund Amoyaw-Brown and Donna Cohen	**Plantar Pressure Distribution During Stooping by Novice Roofers: Effects of Slope Angles Across Foot Zones and Machine Learning-Based Classification** Rujan Kayastha, Krishna Kisi and Anandi Dutta	**Defect Detection of 3D Geometric Volume for Salvaged Masonry Units** Jing Zhang, Carl Haas, Chul Min Yeum and David Correa	**Identifying Lead Service Lines Using Data Mining Techniques** Inas Abuawad, Ayda Azarian, Ehab Elhosary, Mennatallah Hammam, Niuosha Hedaiaty Marzouny and Mazdak Nik-Bakht	**Generative Adversarial Imitation Learning to Train Rebar-Tying Agents for Agent-Based Simulation** Yusheng Huang and Amin H
5:30-5:45	**Using Public Bid As Benchmark: A Fair And Transparent Approach To Managed Public-Private Competition** Sadegh Asgari, Farzane Asgari and Julius Chang	**Automated Master Scheduling for Supply Chain Management in Panelized Construction** Ahmed Zaalouk, Mohammed Sadiq Altaf and Sanghyeok Han	**Risk-Based Screening Tool for Selecting Existing Seattle Commercial Office Buildings for Conversion to Multifamily Residential** C. Vasudeva, H. W. Lee and S. Dermisi	**Enhancing Job Hazard Analysis Knowledge Retrieval Through Knowledge Graphs and Large Language Models** Abbey Dale Abellanosa, Estacio Pereira, Lianne Lefsrud and Yasser Mohamed	**The Making of the International Space Station (ISS): Implications for Construction Robotics and Automation** Aram Pirayesh, Kereshmeh Afsari, Jonathan Showalter and Venus Azamnia	**Exploring the use of technologies for inspection of highway construction projects** Duc Nguyen and Daniel Tran	**Automated Heavy Machinery Recognition Using state-of-the-art deep learning methods** Ahmed Assad, Yousef Albkoor, Awrad Abdullah, Shaikhah Alateeqi and Ahmed Bouferguene

5:45-6:00	**Performance Analysis of Water/Wastewater Design Build Projects by Contract Types and Procurement Methods** Pooja Basnet and Pramen P. Shrestha	**A Comparative Analysis of Time Sensitivity Measures in Complex Construction Projects for Enhanced Execution** Amairani Salazar and Mohamed Abdelraheem	**Assessing the impact of prefabrication on the carbon footprint of multi-story residential construction** A. Baghdoud, L. Gondim de Almeida Guimarães and I. Iordanova	**Spatial Variability in Global Structure Collapse: Two-Decade Comparative Analysis of Fatalities and Injuries** O. Ogunrinde, O. Oyeyipo, M. Knapp, R. Ojelabi and K. I. Gartoumi	**A Review of Autonomous Technologies for Advancing Sustainable Built Environments** Hayoung Kim and Soowon Chang	**Understanding the Societal Impacts of Water Distribution Failures: Implications for Capital Planning and Operations** Joseph Toland, Kareem Mostafa, Laurie Baise and Lauryn Spearing	**Developing a Fit-for-Purpose Best Practice Knowledge Handbook using Generative AI** Gongfan Chen, Michael Pedraza, Roya Albaloul, Alex Albert and Edward Jaselskis

Wednesday, July 30

7:15-8:00	**Breakfast** (Hall Building Mezzanine)						
8:00-9:45	**General Keynotes**						
Room	Hall H.110						
Chair	Mohamed Al-Hussein						
8:00-8:35	**Recap of the deconstruction of the original Champlain Bridge** ***Sandra Martel***						
8:35-9:10	**A Canadian Construction Automation and Robotics Roadmap** ***Carl Haas***						
9:10-9:45	**Advancing Construction Research Through Strategic Industry-Academic Partnerships** ***Simaan AbouRizk***						
10:00-10:30	**Coffee break** (MB Atrium, MB-3, MB-9)						
10:15-12:00	**CSCE/CRC-2-1 Project Delivery Methods**	**CSCE/CRC-2-2 Circular Economy & Resource Efficiency (1)**	**CSCE/CRC-2-3 Infrastructure Systems & Asset Management (2)**	**CSCE/CRC-2-4 Life Cycle Assessment in Construction**	**CSCE/CRC-2-5 AI and Robotics in Construction (2)**	**CSCE/CRC-2-6 Occupational Health and Safety (2)**	**CSCE/CRC-2-7 Automation & digitalization in Construction (2)**
Room	**MB-3.210**	**MB-3.270**	**MB-3.435**	**MB-3.430**	**MB-3.445**	**MB-2.130**	**MB-2.445**
Co-Chairs	**Farook Hamzeh** **Gursans Guven**	**Jeff Rankin** **Yunping Liang**	**Rajeev Ruparathna** **Po-Han Chen**	**Zoubeir LAFHAJ** **Aryan Hojjati**	**Ali Motamedi** **Remi Charron**	**Jee Woong Park** **Kartik Patel**	**Erik Poirier** **Arash Hosseini**
10:15-10:30	**Risk-Based Comparison of Collaborative Delivery Methods in Canadian Construction: Progressive Design Build, Integrated Project Delivery and Project Alliancing** M. Hammam, O. Moselhi and S. Alkass	**Impact of Substitution of Portland Cement by Untreated Dredged Sediments on Concrete Properties** Manassée Foksou Tchilia, Victor Brial and Claudiane Ouellet-Plamondon	**Deep Learning-based Detection of Structural Components and Data from Legacy Engineering Drawings** Farhan Tanvir Nabil and Gursans Guven	**Embodied Carbon Optimization for Residential Building Design through Strategic Low-carbon Material Configurations** Zhifan Liu and Haibo Feng	**Automated Culvert Inspection Using Computer Vision: Advancing Infrastructure Safety with Deep Learning and Dataset Optimization** Pouria Mohammadi, Sadegh Asgari and Abbas Rashidi	**Examining Safety Behaviors of Highway Construction Workers** Steven Stennett and Daniel Tran	**Optimum Crew Scheduling and Visualization for Scattered Repetitive Projects Using ARC-GIS** Fam Saeed and Tarek Hegazy
10:30-10:45	**Progressive Design-Build Opportunities and Challenges: A Literature Review** Malek Alazzam, Amelia Celoza and Keith Molenaar	**FastQTO for Circular Construction: A Database-Driven Framework for Rapid Quantity Takeoff for End-of-Life Decision-Making** Rafaela Orenga Panizza, Saikarthik Vakkanthula, Aida Mollaei and Mazdak Nik-Bakht	**Enhancing Neighborhood-Specific Mobility Self-Efficacy in Older Adults: A Wearable-Based Urban Crowdsensing Approach** Ghanim Saqib, Allyson Jones and Gaang Lee	**Integrating Life Cycle Assessment in Space Layout Planning for Minimizing the Embodied Carbon Emissions of Modular Buildings – Identification of Influencing Factors** L. Rafati Sokhangoo, M. Nik-Bakht, S. Hyeok Han, A. Mehdipoor, A. Hojjati and J. Ha Hwang	**Labor-Driven Analysis of the Economic Impact of Robotics-Based Manufacturing on Industrialized Construction** Aladdin Alwisy, Zachary Delaney, Feral Foskett and Maria Watson	**Conceptual Trust-Based Acceptance Model for Evaluating the Adoption of Wearable Sensing Devices for Construction Safety and Health Monitoring** Amanda Betancourt, Chinedu Okonkwo and Ibukun Awolusi	**Review of the policy context surrounding the digital transformation of the public construction industry in France and Quebec** Victoria Lerognon, Erik Poirier, Elodie Hochscheid and Gilles Halin

10:45-11:00	**Decision-Support tool for Selecting the Best Delivery Method in Sustainable Construction Projects** N. Moghimi, M. Honari Kalateh, A. Mohamed, D. Alnakdali, M. Itani, J. Munoz, A. Hammad and F. Hamzeh	**Transition to a Circular Economy in Off-site Construction: Perspectives on Economic Viability** Azadeh Soofypour, Jun Ahn, Aryan Hojjati, Amirhossein Mehdipoor, Mazdak Nik-Bakht and Sang Hyeok Han	**Analyzing the Spatial Dynamics of Urban Road and Transit Networks: Integrating Space Syntax and Spatial Autocorrelation for Pedestrian Accessibility** Safinaz Eldawody, Raghda Moharram, Khaled Nassar and Yasmeen Essawy	**Sustainable Parking Infrastructure: Comparing Building Envelopes Across Renewable Energy-Integrated Parking Prototypes** Zahra Al-Shatnawi and Caroline Hachem-Vermette	**Automated Detection of Safety Harness Usage Using Computer Vision Techniques to Prevent Fall Accidents Among Construction Workers** Mingi Kang, Md Samdani Azad and Minji Choi	**Analyzing Significant Keywords Relationships in Construction Safety Based on OSHA's Accident Reports** Byungju Jeon and Hyun Woo Lee	**An LLM-Based Framework with Retrieval-Augmented Generation for Building Code Interpretation** Fan Yang, Yiru Hou and Jiansong Zhang
11:00-11:15	**Investigating Integrated Project Delivery as a Strategy to Improve Nuclear Power Plant Construction Performance** Lauren Welker, Awad Hanna, Erin Rice and Ben Lindley	**A Quantitative Assessment of Government's Intervention Policies to Support Circular Economy in Construction** Mazdak Nik-Bakht, Azadeh Soofypour and Farid Sharifi	**From equitable access to equitable usage – moving towards data-driven, evidence-based cycling assets management** Kewei Ren, Chun-Hsing Ho and Yunping Liang	**Automated Life Cycle Analysis Tool for Bridge Design: A User-Friendly Model for Sustainability** Vafa Rostamiasl, Ahmad Jrade, Abdallah Al Refa'i and Jieying Zhang	**Evaluating a BIM-Driven Robotic Manufacturing Framework for Off-Site LGS Wall-Frame Assembly: A Virtual Design and Construction Approach** S. Metvaei, K. Aghajamali, S. Aghajamali, Q. Chen and Z. Lei	**Prompt Engineering Taxonomy for AI-Enhanced Construction Safety Analysis: Identifying and Categorizing Fall from Height Accidents** U. Ray, S. Chang and J. Park	**Current DOTs Efforts Toward Digital Delivery Workflow for Seamless Data Exchange** Helen Ghali and Roy Sturgill
11:15-11:30	**Streamlining Construction Projects: Criteria for Delivery Method Selection** Awad Hanna, Jack Morrison and Erin Rice	**A SWOT Analysis for Utilizing Second-Use Wood as a Resource for Engineered Wood Products** Amr Allam, Rafaela Orenga Panizza, Azadeh Soofypour and Mazdak Nik-Bakht	**Current Practices of Implementing Quality Control Plans in Managing Quality Assurance Programs in Highway Construction Projects** Phuong Nguyen and Daniel Tran	**Developing an Information Delivery Framework for OpenBIM-LCA Integration to Enhance Data Interoperability During the Design and Construction of Sustainable Buildings** R. Rostaminikoo, S. Jalilzadeh Eirdmousa, A. Jrade, A. Hosseini Gourabpasi, F. Jalaei, F. Jalaei and V. Rostamiasl	**An Artificial Intelligence Framework to Predict the Financial Performance of Contractors in Egypt** Omar Magdy, Ossama Hosny and Ibrahim Abotaleb	**Enhancing Individual Fall Risk Assessment by Monitoring Physical and Physiological Responses Through Wearable Inertial Measurement Unit and Electrodermal Activity Sensors** Hoonyong Lee, John Sohn, Jesse Jacobs and Sanghyun Lee	**Enhancing Request for Information (RFI) Process in Construction through Digitalization and Automation** Limon Paul Joy, Sahar Sahyoun, Jiahui Wang, Md Sakib Ullah Sourav, Yiheng Zhao, Jun Yan, Hua Ge, Yong Zeng and Mazdak Nik-Bakht
11:30-11:45	**Exploring Integrated Project Delivery Through the Lens of Innovation Diffusion Theory: Its Role in Evolving Organizational Practices** A. J. Arar, E. Poirier, S. Staub-French, M. Gakwaya and S. Rankohi	**BIM-based Automated Quantification of Material Reusability Potentials in Building Renovation Projects.** Norjan Karim, Hyun Jeong Koo and Beatriz C. Guerra	**Employing GPT and NeRF for Intelligent Robotic-Controlled Building Envelope Inspections** Ahmad Gholizadeh Lonbar, Yining Wen, Kaiwen Chen and Hongsheng He	**Comprehensive Life Cycle Assessment of Building Materials: Comparison of Hybrid Steel/Timber Structure with Reduced Timber Structure** Abdulrahman Sati, Thomas Froese and Mohammed A. Alsati	**A Systematic Data-Driven Framework for Integrating AI and Robotics in Construction** Heung Jin Oh, Soowon Chang and Sanguk Han	**A Structured Roadmap to Safety Excellence: Implementing Leading Indicators in Construction** Hamidreza Golabchi and Yasser Mohamed	**From Text to Meaning: Evaluating Semantic Approaches for rule interpretation in Automated Rule Compliance Checking** Esmaeil Naderi and Erik Poirier
11:45-12:00	**Understanding a Decade of Change in Project Delivery Systems and Their Impact on Project Performance** L. Welker, A. Hanna, V. Morse and B. Lindley	**Critical Drivers for Circular Economy Adoption in Construction Megaprojects: A Fuzzy Synthetic Evaluation Approach** A. Ibrahim, Z. Lafhaj, T. Zayed and M. Nashat	**Understanding Key Factors Influencing Hydrogen Sulfide Emissions in Sewer Systems** Mohamed Nashat, Tarek Zayed, Abdelazim Ibrahim and Jingchao Yang	**Spatio-Temporal Life Cycle Analysis for Enhanced Carbon Emission Management in Building Construction** Fatma Hosny, Saleh Abu Dabous, Rami Al-Ruzouq and Abdallah Shanableh	**AI-Driven Optimization of Wind-Resistant Shear Wall Layouts in High-Rise Buildings** A.G. Khedr, Tim K.T. Tse and Jize Zhang	**Evaluating the Impact of Exoskeletons on Muscle Fatigue under Time Pressure** Kyra Martindale, Sharjeel Anjum, Chukwuma Nnaji and Ashrant Aryal	**Unlocking Digital Construction Management Software to Support Cash Flow and Profitability Analysis** Soroush Abbaspour and Mazdak Nik-Bakht
12:00-1:30	**Lunch (LB Atrium)**						
1:30-3:30	**CSCE Construction Division Meeting**						
Room	MB-1-210						
3:30-4:00	**Coffee break** (MB Atrium, MB-3, MB-9)						
4:00-5:00	**ASCE Daniel Halpin Award Keynote**						
Room	MB-1-210						
Chair	Mazdak Nik-Bakht						
	Unlocking Universal BIM Interoperability: The Power of Invariant Signatures in AEC *Jiansong Zhang*						

5:00-6:00	**Free time**
6:00-11:00	**Reception and Gala Dinner** (Montreal Convention Centre)

Thursday, July 31

7:15-8:00	**Breakfast** (Hall Building, Mezzanine)
8:00-10:00	**General Keynote and Industry Plenary Session**
Room	Hall H.110
Chair	Mazdak Nik-Bakht
8:00-8:35	**General Keynote**
	When industry takes over construction – French strategy and examples of results ***Zoubeir Lafhaj***
8:35-9:45	**Industry Plenary Session:** ***Innovation and Sustainability in Construction***
9:45-10:15	**Coffee break** (MB Atrium, MB-3, MB-9)

10:15-12:00	**CSCE/CRC-3-1 Equity, Diversity, and Inclusion in Construction**	**CSCE/CRC-3-2 Construction Materials and Technologies**	**CSCE/CRC-3-3 Construction Efficiency & Process Optimization (2)**	**CSCE/CRC-3-4 Sustainable Built Environment (2)**	**CSCE/CRC-3-5 Infrastructure Systems & Asset Management (3)**	**CSCE/CRC-3-6 Training and Education in Construction**	**CSCE/CRC-3-7 Digital Twins & BIM for Infrastructure & Construction (2)**
Room	**MB-3.210**	**MB-3.270**	**MB-3.435**	**MB-3.430**	**MB-3.445**	**MB-2.130**	**MB-2.445**
Co-Chairs	**Shahin Karimi** **Angat Pal Singh Bhatia**	**Ahmed Soliman** **Jong won ma**	**Tarek Salama** **Mohammed Alsharqawi**	**Jenn McArthur** **Jun Ahn**	**Sara Rankohi** **Kaiwen Chen**	**Farnaz Sadeghpour** **Sedat Akkaya**	**Po Han Chen** **Vafa Rostamiasl**
10:15-10:30	**Exploring Awareness, Knowledge, and Interest in Energy Equity Among Undergraduate Students** Wooyoung Jung, Siyeon Kim and Soowon Chang	**Benefits and Barriers in the Implementation of Mass Timber for Multistory Building Projects: Case Study Insights** Maryam Kouhirostami and Vineeth Dharmapalan	**Towards Efficient Offsite Manufacturing in Modular Construction: Determining Decision Factors and Research Needs** Moaaz Elkabalawy, Md. Rakibul Islam Chowdhury, Jong Won Ma and Sanghyeok Han	**Automated Extraction and Analysis of Greenhouse Gas Emissions in Canadian Construction Project Procurement** Y. Wu, D. Sobh, N. Sylvia Gulemye, A. Sanchez Aguirre, A. Hammad, V. A. Gonzalez and F. Hamzeh	**Evaluating the Benefit of Using AI to Predict the Values of BCI and Cost of Bridge Infrastructures Under the Impact of Climate Change in Ontario** Olatunji St Victor and Ahmad Jrade	**From Theory to Construction: Rethinking Task Complexity and Cognitive Load** Amira Eltahan, Gaang Lee and Farook Hamzeh	**Developing a Framework to Integrate Accessibility Design Guidelines into OpenBIM Workflow for an Age-In-Place Home Design** Farnaz Jalaei and Ahmad Jrade
10:30-10:45	**Incorporating Diversity, Equity, and Inclusion in Infrastructure Performance Evaluation** Kareem Mostafa and Tarek Hegazy	**Predictive Modeling of Resistivity Curves for use as Quality Assurance Testing of Ready-Mix Concrete** Evan Kennedy, Yilin Cai, Julie Ann Hartell and Ashrant Aryal	**Adapting Principles from Total Quality Management (TQM) to Construction Projects** Mohammed Alsharqawi, Chukwuebuka Samuel, Jolomi Eresanara and Majed Mouazen	**Qualitative Evaluation of the Drivers and Barriers of Sustainable Construction Practices in Canada: A Case Study** Shahrzad Monshet and Thomas Froese	**Quantifying the Impact of Highly Corrosive Environments on Budgets and Infrastructure Condition at Air Force Bases** Justin Weber, Benjamin Knost, Daniel Weeks and Ryan Howell	**Prevalent Factors Affecting Workers in Industrialized Construction: Towards Human-Centric Construction Manufacturing** S. Assaf, D. Anyaco, A. Bouferguene and M. Al-Hussein	**Conceptual Framework for Digital Twins and Virtual Commissioning in Industry 5.0 Industrialized Construction** Ricardo Gallopp Ramirez, Isabelle Southern, Aladdin Alwisy and Raja R. A. Issa
10:45-11:00	**Assessing the Impact of Housing Characteristics and Multimodal Accessibility on Social Vulnerability in the City of Detroit** H. J. Koo, V. Demetracopoulou and M. Atilola	**Multi-criteria Evaluation of CLT Floor Assemblies: Life Cycle Impacts, Acoustic Performance, Structural Efficiency, and Reuse** Ashley Juraschka, Mathew Song, Joyce Kim, Carl Haas, Aryan Hojjati, Jun Ahn and Mehdi Ghobadi	**A Literature Review on Global Construction Productivity Measurement: A Cross-Sectoral Approach** A. Niaz, A. Mehdipoor, A. Kasundra, M. Fawad, Q. Chen and A. Thompson	**Best Practices in Building Systems (BPiBS): Advancing Knowledge Mobilization through Road Mapping** M. Prince, W. Leung, A. Dekin, T. Froese, P. Mukhopadhyaya, R. Kumar and E. Girgis	**Risk-Based Prioritization of Water Main Replacements under Climate Change Scenarios** Melica Khashei, Fatemeh Boloukasli, Niuosha Hedaiaty Marzouny and Rebecca Dziedzic	**Student and Educator Perceptions Toward Generative AI in Architecture, Engineering, Construction Education** Wooyoung Jung and Namgyun Kim	**Beyond Common Data Environments: A Framework for Integrated Information Environments in the Built Asset Industry** Neda Rezaei and Erik Poirier

11:00-11:15	**US Community Water System Equity: An Analysis of Monitoring and Reporting Violations of the Safe Drinking Water Act** A. Iuorio, D. Sunter, D. Carroll, C. Khalaf, L. Titan and L. Spearing	**Mass Timber Projects in North America: An Exploratory Analysis** Matthew Ju and Hisham Said	**Developing KPIs and measurement processes to assess the impact of innovation in the construction industry: current practices and challenges** S. M. E. Tabatabaee, L. G. de Almeida Guimarães, I. I. and E. Poirier	**Optimizing Embodied Carbon Emissions in the Life Cycle of Modular Construction to Achieve Carbon Reduction** Xiaohan Wu, Yue Teng, Geoffrey Qiping Shen and Chung-Lam Ng	**Regional Variations in Pipeline Longevity: Insights from a Spatial and Survival Analysis Approach** Lemlem Asaye, Chau Le, Ying Huang, Trung Le, Harun Pirim, Om Prakash Yadav and Tuyen Le	**Sustainability Engagement and Career Aspirations Among Underrepresented Engineering Students: Insights From a Comparative Analysis** P. Babon-Ayeng, S.E. Jung, K. Cheng and W. Jung	**Assessing the Effectiveness of BIM in Achieving Compliance with NECB Energy Efficiency Pathways** Zahra Naghshzan and Erik Poirier
11:15-11:30	**Pathways to Leadership: Analyzing Career Trajectories of Asian American Leaders in the Construction Industry** Jonathan Ma, Dongyang Zhen and Qingbin Cui	**Enhancing Structural Efficiency: A Comparative Study of Evolutionary Optimization in Shallow Foundation Design** Kareem Abdelhady, Bassel Abdelshahid, Hoda Elshemy, Ossama Hosny, Ahmed Elhakeem and Yasmeen Essawy	**Optimizing DFMA Implementation in On-Site Construction: A Decision-Making Framework** Amirhossein Mehdipoor, Sadaf Montazeri and Ivanka Iordanova	**Business model evaluation of Renewable Energy Community in Multi Unit Residential Building in Canada net metering, considering the regulatory framework, ownership and organizational structure** Z. K. Moraveji, Y. Liang and U. Eicker	**Investigating Sewer Corrosion Drivers Using Quantitative Modeling** Mohamed Nashat, Tarek Zayed, Abdelazim Ibrahim and Jingchao Yang	**Identifying Trends in Construction Technology Through Student Internship Experiences** David Ras, James Vigar, Anne Anderson and Jung Hyun Lee	**Current Status of Digital Twins in the AEC Industry and Opportunities in Construction Project Management from a Literature Review and a Quebec Perspective** Jorge Mauricio Ramirez Velasquez and Ivanka Iordanova
11:30-11:45			**A Graph-Based Framework for Analyzing Bidding Competition in Design-Bid-Build Highway Construction Contracts** Muhammad Ali Moriyani, Chau Le, Tuyen Le and Tung Le	**Advancing Sustainable Construction: A Framework for Assessing Reusability of Construction and Demolition Waste** G. Kampstra, S. C. Hidalgo, N. Biswas, E. Tam and R. Ruparathna		**Addressing the Impacts of an Inexperienced Workforce to Improve Project Delivery** Amelia Celoza and Malek Alazzam	**The life cycle of timber construction enhanced with digital twin (DT), BIM, and robotics technologies** Meta Soy, Hosam Hegazy and Jiansong Zhang
11:45- 12:00				**Optimizing HVAC Operations in Office Spaces: A Sensor-Fusion Approach for Zone-Level Occupancy Prediction** A. S. Cruz, M. Z. Siddique, M. Ouf, M. Nik-Bakht, P. Paquette and S. Lupien			
12:00-1:30	**Lunch** (LB Atrium)						
1:30-3:00	**CSCE/CRC-3-8 Automation & digitalization in Construction (3)**	**CSCE/CRC-3-9 XR & Immersive Technologies in AEC (2)**	**CSCE/CRC-3-10 Circular Economy & Resource Efficiency (2)**	**CSCE/CRC-3-11 Construction Planning & Project Management (2)**	**CSCE/CRC-3-12 Occupational Health and Safety (3)**		
Room	**MB-3.210**	**MB-3.270**	**MB-3.435**	**MB-3.430**	**MB-3.445**		
Co-Chairs	**Erik Poirier** **Cheng Zhang**	**Vicente A. Gonzalez** **Mohammed Alsharqawi**	**Ahmed Assad** **Remi Charron**	**S. Madeh Piryonesi** **Youngcheol Kang**	**Sang Hyeok Han** **Krishna Kisi**		
1:30-1:45	**Path planning penalty-based optimization for mobile cranes** Boshen Lin, Ahmed Bouferguene and Mohamed Al-Hussein	**Adapting Content Generation Knowledge from Diverse Fields to Construction: A Systematic Review on Content Generation in Extended Reality Based Training** Y. Wu, G. Lee, Q. Mei, C. Mourgues and V. A. Gonzalez	**Business Models of Digital Marketplaces for Enabling Circularity in the Construction Sector** S. Vakkanthula, Atefeh Hesarbani, Soroush Abbaspour, Amr S Allam and Mazdak Nik-Bakht	**Using Shapley Additive Explanations to Explore Features Affecting Expenditure Cash Flow Patterns** Frederick Chung, Minsoo Baek, Jung Hyun Lee and Baabak Ashuri	**Adjustments for Improved REBA and RULA Methods Based on Postural Sway Analysis** Jiale Zhu and Xinming Li		

1:45-2:00	**Applications of Computer Vision in Production Planning and Control System for Modular and Offsite Construction: Trends, Challenges, and Opportunities** M.R.I. Chowdhury, M. Rahman, M. Elkabalawy, Q. Al Wasiew, E. Rahman, S.H. Hyeok. and S. Moon	**A Five-Year Analysis of Industry and Academia Expectations in Virtual Design and Construction Education** Ralph Tayeh and Fopefoluwa Bademosi	**Optimizing the Reverse Supply Chain for Deconstructed Steel Building Components** Hosna Ghorab and Amin Hammad	**Development of Parametric Cost Prediction Models for Legislative Infrastructure Improvement Projects** K. Joseph Shrestha, Pritom Paul and Mohammad Uddin	**Ergonomic Risk Assessment in Manual Construction Demolition Using Pose Estimation and REBA Analysis** Chonnapat Opanasopit, Joseph Louis, Vineeth Dharmapalan and Ziyu Jin		
2:00-2:15	**Automating Construction Scheduling with AI: A Comparative Study of BIM and Non-BIM Approaches** C. Burden, E. Katsimpalis, B. Adey and C. Haas	**Evaluating the influence of using Augmented Reality and Virtual Reality during the design and construction of projects** S. Jalilzadeheirdmousa, R. Rostaminikoo and A. Jrade	**Towards Circular Construction: End-of-Life Scenario Analysis of Steel Structures Using Sustainable Life Cycle Approach** Dina Abouhelal and Amin Hammad	**Development of Cost Adjustment Tool to Improve Accuracy of Preliminary Cost Estimates** K. Joseph Shrestha, Mohammad Uddin, Jacob Fielden, Pritom Paul and David Iyiola	**Supporting Construction Worker Well-Being with a Multi-Agent Conversational AI System** Fan Yang and Jiansong Zhang		
2:15-2:30	**Automating Sustainability Assessment in Construction Contracts Using Machine Learning** Mohamed Sabek, Baseel Andres Ammar, Ahmed Hammad, Farook Hamzeh and Vicente Gonzalez-Moret	**MetaModular: A System to Achieve Collaborative Planning Decisions in Modular Construction Projects Using Metaverse Technology** Mohamed Assaf, Sena Assaf, Yuxuan Zhang, Mohamed Al-Hussein and Xinming Li	**Analysing Cause-and-Effect Relationships of Circular Economy Factors in Construction Megaprojects Using Fuzzy DEMATEL** Abdelazim Ibrahim, Tarek Zayed, Zoubeir Lafhaj and Mohamed Nashat	**Trust Between Contractors and Owners and Its Impact on The Perception of Open Book Policy: Establishing A Research Model for Future Empirical Analysis** Hyeonju Wang and Youngcheol Kang	**Biomechanical Analysis of Stability and Fall Risk in Novice Roofers Working on Sloped Surfaces: Investigating the Role of Base of Support, Center of Pressure, and Center of Gravity** S. Acharya, R. Kayastha, S. R. Gautam, T. S. U. Mahmud, K. Kisi and A. Pokharel		
2:30-2:45	**Multi-dimensional Semantic Enrichment method for Automated Code Compliance Checking of Building Fire Protection based on BIM and Knowledge Graph** Yu Chen, Liu Jiang and Zeyu Pan	**Advancing Construction Engineering Education Through Extended Reality Technology: A Systematic Review** Saleh Abu Dabous, Fatma Hosny, Bharadwaj R. K. Mantha, Maher Omar and Tarek Merabtene	**Carbon Benefit of Modular Mass Timber: A Study on The Horizontal Elements.** Michael Ayiku, Arezou Sadoughi and Justus Waceke	**Optimizing Deep Foundation: A Tactical Planning Model for Pile Installation** Omar Ammar, Mohannad Mahran, Khaled Nassar and Yasmeen Essawy			
2:45-3:00	**Advancement of construction contract analysis with Natural Language Processing and Large Language Models: A Literature Review** Meta Soy, Tianru Zhao, Hosam Hegazy, Jiansong Zhang and Emad Elwakil	**Augmented Reality (AR) in the Manufacturing Phases of Off-Site Construction Projects** Amirhossein Mehdipoor, Sadaf Montazeri and Ivanka Iordanova		**Optimizing Multiple-Resource Leveling in Multiple Projects Using Shuffled Frog Leaping Algorithm** Abdelazem Hashim, Marwa Ehab, Ossama Hosny, Ahmed Elhakeem and Yasmeen Essawy			

MOC Detailed Schedule

Tuesday, July 29

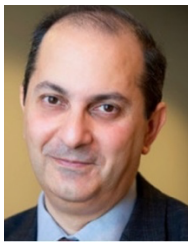
7:15-8:00	**Breakfast (Hall Building, Mezzanine)**
8:00-9:45	**Opening Session and General Keynote**
Room	Hall H.110
Chair	Amin Hammad
8:00-9:00	**Opening Session**
9:00-9:40	**General Keynote**
	Driving Innovation Through Hydro-Québec's Project Mission ***Michel Charron***
9:45-10:15	**Coffee break** (MB Atrium, MB-3, MB-9)
10:15-12:00	**MOC-1-1**
Room	**MB-5.215**
Chair	**Tarek Salama**
10:15-10:30	**Comparative Study of YOLO Architectures for Automated Wood Defect Detection** Sara Baghdadi, Djamel Eddine Touil, George Nader, Ahmed Bouferguene, Mohamed Al-Hussein and Simaan Abourizk
10:30-10:45	**Cable-Driven Parallel Robot for Module Facade Seam Sealing in Modular Construction: Static Workspace Analysis** Chen Qian, Xiao Li, Chen Song and Qianru Du
10:45-11:00	**A Data-Driven Framework for Automated Generation of PC component Trailer Arrival Times: Integrating Work Interruptions Simulation and Duration Prediction** Eunbeen Jeong, Junyoung Jang, Seulbi Lee and Tae Wan Kim
11:00-11:15	**Decarbonization of Modular Construction and LEED v5 Certification** Tarek Salama, Arezou Sadoughi, Jason Miller, Mohammed Alsharqawi and Yousif Sawa
11:15-11:30	**Research Trends in Affordable Modular Housing** Pedram Moussavi, Jin Ouk Choi and Jeewoong Park
11:30-11:45	**Interdependence between factors influencing the selection of project delivery systems and modular construction** Salma Hadj Kacem, Gabriel Jobidon and Ivanka Iordanova
11:45-12:00	**Navigating Barriers to the Adoption and Scalability of Modular Construction in Ethiopia** Tadesse Ayalew Zelele, Muluken Tilahun Desbalo, Ahmed Bouferguene and Mohamed Al-Hussein
12:00-1:30	**Lunch (LB Atrium)**
1:30-2:45	**MOC-1-2**
Room	**MB-5.215**
Chair	**Ahmed Bouferguene**
1:30-1:45	**Enhancing Thermal Comfort and Energy Efficiency in Buildings Using Artificial Intelligence: A Systematic Literature Review** Assia Boutabba, Wassim Albalkhy, Zoubeir Lafhaj, Johan Roussel, Pascal Yim,Thomas Danel
1:45-2:00	**Building Planning Capacity in the Offsite Construction Industry: Introducing the Theory of Constraints for Process Optimization** William Correa Vergara, Diana Ramirez, Ahmed Bouferguene and Mohamed Al-Hussein
2:00-2:15	**Activity Sequencing Optimization in Petroleum Projects Using Simulation Modelling** Safinaz Eldawody, Yassmine Essawy and Khalid Nassar
2:15-2:30	**Barriers and Potential Solutions to the Adoption of Modular and 2 Offsite Construction: A Review** Ayda Aghlmand Azarian, Ahmed Bouferguene, Mohamed Al-Hussein, Seyedreza Razavialavi, Jun Ahn, Amirhossein Mehdipoor, Aryan Hojjati, Joon Ha Hwang, Dena Shamsollahi and Osama Moselhi
2:30-2:45	**A rapid literature review of environmental performance of offsite building construction industry** Tadesse Zelele, Dena Shamsollahi, Xue Chen, Seyed Razavialav, Aryan Hojjati, Ahn Jun, Amir Medipoor, Ahmed Bouferguene, Mohammed Al-Hussein and Osama Moselhi
3:35-4:00	**Coffee break** (MB Atrium, MB-3, MB-9)

MAP AND MAIN LOCATIONS

Pre-Conference Day (Monday)	**Conference Days** (Tuesday, Wednesday, Thursday)
Workshops: EV-1.605, EV-1.615, EV-3.309 **Taskforce meetings**: EV-11.119 **Hackathon:** EV-2.184 **Colloquium:** EV-2. 260, 3M+1: LB 4th Space **Welcome reception:** GN-E-104	**Plenary Sessions:** Hall, H.110, MB-1.210, MB-9.ABCD **Parallel Sessions** MB, 2nd floor (ISARC and CSCE/CRC) MB, 3rd floor (CSCE/CRC) MB, 5th floor (MOC) MB, 9th floor (ISARC) **Breakfasts:** Hall Mezzanine **Coffee breaks:** MB Atrium, 3rd, and 9th floors **Preparation, LOC, and Volunteers rooms:** MB, 3rd floor

Tunnels (can be used in case of heavy rain)

LOCAL ORGANAZING COMMITTEE



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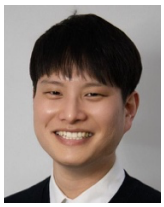

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Concordia University

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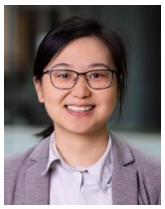

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University of British Columbia

Gursans Guven Isin
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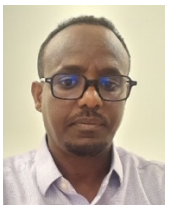

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University of Alberta

Fardin Bahreini
Concordia University

Golnaz Mirzaei
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PRACTICAL INFORMATION

- **Wi-Fi Access**

Network: **ConcordiaGuest** Access code: **WAC-isarc25** (case sensitive)	Instruction on Connecting to ConcordiaGuest wireless network

- **Mobile Conference Assistant**

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- **ISARC Proceedings**

- **Montreal's Tourist Attractions**

The website of Tourism Montreal (www.mtl.org/en) has plenty of details about Montreal's tourist attractions, including places to visit, events, nightlife, etc.

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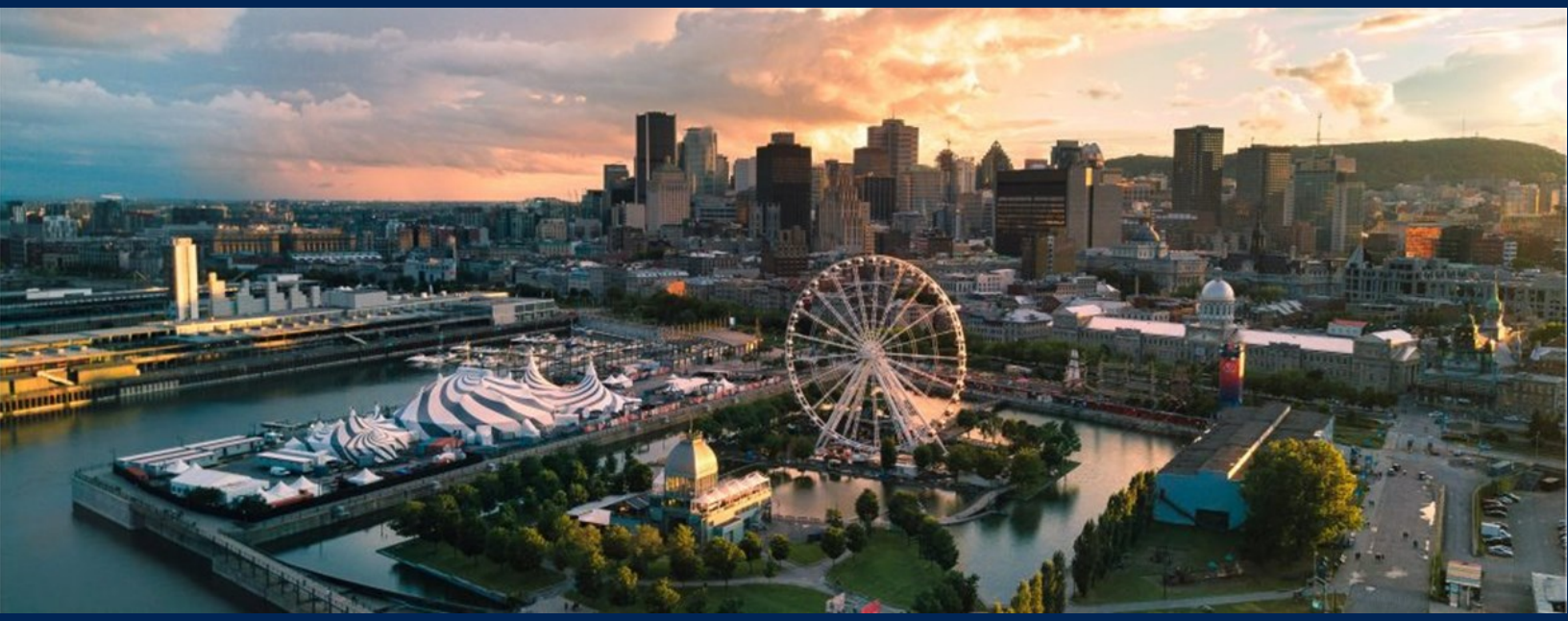

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