

# Conference Agenda

## ISARC 2024: 41st International Symposium on Automation and Robotics in Construction

Date: Monday, 03/June/2024

8:30am	<b>Inagural ceremony</b>
-	Location: <b>Room A</b>
9:15am	Chair: <b>Wassim AlBalkhy</b> Prof. Zoubeir Lafhaj (Local Organizer Welcome Speech - 20 min), Prof. Hyoungkwan Kim (IAARC Welcome Speech - 15 min), and Prof. Vicente A. Gonzalez (ISARC 2024 report - 10 min)
9:15am	<b>Keynote 1 Local Organiser</b>
-	Location: <b>Room A</b>
9:45am	Chair: <b>Wassim AlBalkhy</b> Prof. Thomas Bock - Keynote talk: "Robot Revolution"
9:45am	<b>Keynote 1 IAARC (Best Paper)</b>
-	Location: <b>Room A</b>
10:15am	Chair: <b>Wassim AlBalkhy</b>
	<b>9:45am - 10:05am</b>
	<b>Information modeling techniques</b>
	<b>CrackGauGAN: Semantic Layout-based Crack Image Synthesis for Automated Crack Segmentation</b>
	<b>Honghu Chu, <u>Weiwei Chen</u>, Lu Deng</b>
10:15am	<b>Break morning D1</b>
-	Location: <b>Hall</b>
10:45am	
10:45am	<b>Plenary 1 IAARC</b>
-	Location: <b>Room A</b>
11:05am	Chair: <b>Frédéric Bosché</b>
	<b>10:45am - 11:00am</b>
	<b>Sensing systems &amp; data infrastructures</b>
	<b>Computer Vision as Key to an Automated Concrete Production Control</b>
	<b><u>Max Coenen</u>, Maximilian Meyer, Dries Beyer, Christian Heipke, Michael Haist</b>
11:05am	<b>Plenary 2 IAARC</b>
-	Location: <b>Room A</b>
11:25am	Chair: <b>Frédéric Bosché</b>
	<b>11:05am - 11:20am</b>
	<b>Construction management techniques</b>
	<b>Investigating the Neural Correlates of Different Levels of Situation Awareness and Work Experience</b>
	<b>Yanfang Luo, JoonOh Seo, Sogand Hasanzadeh</b>
11:25am	<b>Plenary 3 IAARC</b>
-	Location: <b>Room A</b>
11:45am	Chair: <b>Frédéric Bosché</b>
	<b>11:25am - 11:40am</b>
	<b>Automated/robotic machines, devices, and end-effectors</b>
	<b>Inline image-based reinforcement detection for concrete additive manufacturing processes using a convolutional neural network</b>
	<b>Lukas Johann Lachmayer, Lars Dittrich, Robin Dörrie, Harald Kloft, Annika Raatz, Tobias Recker</b>
11:45am	<b>Lunch D1</b>
-	Location: <b>Hall</b>
1:00pm	

1:00pm  
-  
2:35pm

**Parallel Track 1 IAARC: Information Modeling Techniques - Session 1**

Location: **Room A**  
Chair: Lingzi Wu

1:00pm - 1:10pm

Information modeling techniques  
**Interpretable Machine Learning Approaches for Assessing Maximum Force in Fiber-Reinforced Composites**  
Soheila Kookalani, Erika Parn, Ioannis Brilakis

1:10pm - 1:20pm

Information modeling techniques  
**An OpenBIM-based Framework for Lifecycle Management of Steel Reinforcement**  
Mingkai Li, Yuhan Liu, Boyu Wang, Jack Cheng

1:20pm - 1:30pm

Information modeling techniques  
**A Digital Twin Based Approach to Control Overgrowth of Roadside Vegetation**  
Varun Kumar Reja, Diana Davletshina, Mengtian Yin, Ran Wei, Quentin Felix Adam, Ioannis Brilakis, Federico Perrotta

1:30pm - 1:50pm

Q/A Session  
**Q/A session 15 min (D101)**  
V G

1:50pm - 2:00pm

Information modeling techniques  
**Bridging the Annotation Gap: Innovating Sewer Defects Detection with Weakly Supervised Object Localization**  
Jianyu Yin, Xianfei Yin, Yifeng Sun, Mi Pan

2:00pm - 2:10pm

Information modeling techniques  
**Extracting roof sub-components from orthophotos using deep-**

**Parallel Track 2 IAARC: Information Modeling Techniques - Session 1**

Location: **Room B**  
Chair: Ming Shan Ng

1:00pm - 1:10pm

Information modeling techniques  
**Removal of Construction Machinery Occlusion using Image Segmentation and Inpainting for Automated Progress Tracking**  
Ahmet Bahaddin Ersoz, Onur Pekcan

1:10pm - 1:20pm

Information modeling techniques  
**Context-Adaptive CCTV Pan-Tilt-Zoom method for Personal Protective Equipment Detection**  
Seokhwan kim, Minwoo Jeong, Minkyu Koo, Taegeon Kim, Hongjo Kim

1:20pm - 1:30pm

Information modeling techniques  
**Smart Passive Mixed Reality-Based Construction Inspection Framework**  
Boan Tao, Jiajun Li, Frédéric Bosché

1:30pm - 1:50pm

Q/A Session  
**Q/A session 15 min (D106)**  
V G

1:50pm - 2:00pm

Information modeling techniques  
**Unveiling Building Façade Deterioration: A Drone-Powered Deep Learning Approach for Seamless Tile Peeling Detection**  
Ngoc-Mai Nguyen, Minh-Tu Cao, Wei-Chih Wang

2:00pm - 2:10pm

Information modeling techniques  
**A Graph Neural Network Approach to Conceptual Cost Estimation**  
Hao Liu, Jack C.P. Cheng, Chimay J. Anumba

**Parallel Track 3 IAARC: Robotization of renovation in construction - Session 1**

Location: **Room C**  
Chair: LAURE DUCOULOMBIER

1:00pm - 1:10pm

**Robotization of renovation in construction**  
**Assessing the Viability of Robotic Disassembly of Building Components for Resource Recovery**  
Christopher Rausch, Seungah Suh, Nikiforos Repousis, Nathan Titterington, Han Nguyen

1:10pm - 1:20pm

**Robotization of renovation in construction**  
**Robotic platform for the (semi-) automated assembly of façade panels**  
Christoph Heuer, Aaron Lentes, Zhongqian Zhao, Sigrid Brell-Cokcan

1:20pm - 1:30pm

**Robotization of renovation in construction**  
**Enhanced Precision in Built Environment Measurement: Integrating AprilTags Detection with Machine Learning**  
Shengtao Tan, Aravind Srinivasaragavan, Kupa Iturralde, Christoph Holst

1:30pm - 1:50pm

Q/A Session  
**Q/A session 15 min (D111)**  
V G

1:50pm - 2:00pm

**Robotization of renovation in construction**  
**Automating the Tower Crane: Integrating the Development and Simulation of Path Planning and Trajectory Tracking of Tower Crane in ROS Framework**  
Muhammad Muddassir, Mohamed A. A. Abdelkareem, Tarek Zayed, Zoubeir Lafhaj

**learning -based semantic segmentation**  
Jiajun Li, Boan Tao, Frédéric Bosché,  
Chris Xiaoxuan Lu, Lyn Wilson

2:10pm - 2:20pm

Information modeling techniques  
**A Step from Virtual to Reality: Investigating the Potential of a Diffusion-Based Pipeline for Enhancing the Realism in Synthetic Construction Imagery**  
Sina Davari, Ali TohidiFar, Daeho Kim

2:20pm - 2:35pm

Q/A Session  
**Q/A session 15 min (D102)**  
V G

2:10pm - 2:20pm

Information modeling techniques  
**Automatic Assessment of Leanness of Construction Contract Provisions: A Proof-of-Concept**  
Ramesh Balaji, Sivakumar KS, Murali Jagannathan, Venkata Santosh Kumar Delhi

2:20pm - 2:35pm

Q/A Session  
**Q/A session 15 min (D107)**  
V G

2:00pm - 2:10pm

Robotization of renovation in construction  
**Development of Robotics for Building Exterior Inspection: A Literature Review**  
Tianxi Chen, Mi Pan, Thomas Linner, Honghao Zhong

2:10pm - 2:20pm

Robotization of renovation in construction  
**Cable-Driven Parallel Robot (CDPR) for Panelized Envelope Retrofits: Feasible Workspace Analysis**  
Yifang Liu, Rui Zhang, Nolan Hayes, Diana Hun, Bryan Maldonado

2:20pm - 2:35pm

Q/A Session  
**Q/A session 15 min (D112)**  
V G

1:00pm - 3:00pm

**IAARC BOD General Assembly**  
Location: **Room D**  
Chair: Hyoungkwan Kim

2:35pm - 3:00pm

**Break afternoon D1**  
Location: **Hall**

3:00pm - 5:25pm

**Parallel Track 1 IAARC: Information Modeling Techniques - Session 2**  
Location: **Room A**  
Chair: Bharadwaj R. K. Mantha

3:00pm - 3:10pm

Information modeling techniques  
**Integration of Construction Progress Monitoring Results using AI Image Recognition from Multiple Cameras onto a BIM**  
Chang-Cheng Hsieh, Hung-Ming Chen, Wan-Yu Chen, Ting-Yu Wu

3:10pm - 3:20pm

Information modeling techniques  
**Transformer-based Pavement Crack Tracking with Neural-PID Controller on Vision-guided Robot**  
Jianqi Zhang, Xu Yang, Wei Wang, Ioannis Brilakis, Hainian Wang, Ling Ding

**Parallel Track 2 IAARC: Construction Management Techniques - Session 2**  
Location: **Room B**  
Chair: Rongbo Hu

3:00pm - 3:10pm

Construction management techniques  
**Case study on the applicability of a construction site layout planning system**  
Jiyu Shin, Jongwoo Cho, Tae Wan Kim

3:10pm - 3:20pm

Construction management techniques  
**Discrete Event Simulation to Predict Construction Equipment Emissions on a Digital Twin Platform**  
Kepeng Hong, Alexandros Apostolidis, Jochen Teizer

**Parallel Track 3 IAARC: Services and business applications / Industry & Short Papers & Technology management and innovation - Session 2**  
Location: **Room C**  
Chair: Yang Zou

3:00pm - 3:10pm

Services and business applications / Industry & Short Papers  
**Research on an Open Source Physical Simulator for Autonomous Construction Machinery Development**  
Daisuke Endo, Yosuke Matsusaka, Genki Yamauchi, Takeshi Hashimoto

3:10pm - 3:20pm

Services and business applications / Industry & Short Papers

<p>3:20pm - 3:30pm</p> <p>Information modeling techniques</p> <p><b>Toward shotcrete process simulation to support robotic operation</b></p> <p><u>Mohammad Reza Yazdi Samadi</u>, Ralf Waspe, Christian Schlette</p>	<p>3:20pm - 3:30pm</p> <p>Construction management techniques</p> <p><b>Performance Evaluation of Genetic Algorithm and Particle Swarm Optimization in Off-Site Construction Scheduling</b></p> <p>Mizanoor Rahman, Sang Hyeok Han</p>	<p>Development of an Educational Package for a Construction Robots Simulator</p> <p><u>Ci-Jyun Liang</u>, Cheng-Hsuan Yang, Liang-Ting Tsai, Bruce Alton</p>
<p>3:30pm - 3:50pm</p> <p>Q/A Session</p> <p><b>Q/A session 15 min (D103)</b></p> <p>V G</p>	<p>3:30pm - 3:50pm</p> <p>Q/A Session</p> <p><b>Q/A session 15 min (D108)</b></p> <p>V G</p>	<p>3:20pm - 3:30pm</p> <p>Services and business applications / Industry &amp; Short Papers</p> <p>Collaborative R&amp;D and Mutual Utilization of Construction Robotics in the Construction RX Consortium</p> <p><u>Hiroshi Tabai</u></p>
<p>3:50pm - 4:00pm</p> <p>Information modeling techniques</p> <p><b>A Framework of Integrating HBIM and GIS for Automated Fire Risk Assessment of Heritage Buildings</b></p> <p><u>Yutong Qiao</u>, Chi Chiu Lam, Mun On Wong, Yujin Xu</p>	<p>3:50pm - 4:00pm</p> <p>Construction management techniques</p> <p><b>Developing a novel application to digitalize and optimize construction operations using low-code technology</b></p> <p>Eder Martinez, Louis Pfister, Felix Stauch</p>	<p>3:30pm - 3:50pm</p> <p>Q/A Session</p> <p><b>Q/A session 15 min (D113)</b></p> <p>V G</p>
<p>4:00pm - 4:10pm</p> <p>Information modeling techniques</p> <p><b>3D reconstruction of a bridge with concrete damage classification using deep learning</b></p> <p>Christopher Joseph Núñez Varillas, Marck Steewar Regalado Espinoza, Luis Mario Huaypar Acurio, Antonio Stefano Bedon Rosario, Jordan Antony Romaní Chavez, Oscar Manuel Solis Garcia, Karol Maricruz Agreda Estela, Micaela Anthoaneth Cardenas Contreras</p>	<p>4:00pm - 4:10pm</p> <p>Construction management techniques</p> <p><b>GPT-based Logic Reasoning for Hazard Identification in Construction Site using CCTV Data</b></p> <p>Dai Quoc Tran, <u>Yuntae Jeon</u>, Minsoo Park, Seunghee Park</p>	<p>3:50pm - 4:00pm</p> <p>Technology management and innovation</p> <p><b>Motives and Barriers for Offsite and Onsite Construction 3D Printing</b></p> <p>Wassim AIBalkhy, Elias Hernandez Valera, Dorra Karmaoui, Zoubeir Lafhaj, Thomas Linner, Syrine Ayadi, Reda Zerrari, Assia Boutabba</p>
<p>4:10pm - 4:20pm</p> <p>Information modeling techniques</p> <p><b>Point Cloud-based Computer Vision Framework for Detecting Proximity of Trees to Power Distribution Lines</b></p> <p>Fardin Bahreini, <u>Amin Hammad</u>, Mazdak Nik-Bakht</p>	<p>4:10pm - 4:20pm</p> <p>Construction management techniques</p> <p><b>Adopting Automation in Premanufacturing: A Two-Mode Network Analysis on Factors and Roles in Iran and North America's Construction Industry</b></p> <p>Amirhossein Babaei Ravandi, Tamer El-Diraby</p>	<p>4:00pm - 4:10pm</p> <p>Technology management and innovation</p> <p><b>BIM Model View Definition (MVD) for disassembly planning of buildings</b></p> <p>Benjamin Sanchez Andrade, Srijeet Halder, Ranjith K. Soman, OK-Youn Yu</p>
<p>4:20pm - 4:40pm</p> <p>Q/A Session</p> <p><b>Q/A session 15 min (D104)</b></p> <p>V G</p>	<p>4:20pm - 4:40pm</p> <p>Q/A Session</p> <p><b>Q/A session 15 min (D109)</b></p> <p>V G</p>	<p>4:10pm - 4:20pm</p> <p>Technology management and innovation</p> <p><b>Customer Satisfaction in Construction Robots: A Multi-Stakeholder Perspective</b></p> <p><u>Siwei Chang</u>, Tai Wai Kwok, Ching-Wei Chang, Yixing Yuan, Juhao Su</p>
	<p>4:40pm - 4:50pm</p>	<p>4:20pm - 4:40pm</p>

<p><b>4:40pm - 4:50pm</b></p> <p>Information modeling techniques</p> <p><b>Reinforcement Learning for Smart Mobile Factory Operation in Linear Infrastructure projects</b></p> <p>Jianpeng Cao, Irfan Čustović, Ranjith Soman, Daniel Hall</p>	<p>Construction management techniques</p> <p><b>Assessing the Financial Dynamics of Modular Offsite Building Projects</b></p> <p>Hisham Said, Tarek Salama, Anthony Gude</p>	<p>Q/A Session</p> <p>Q/A session 15 min (D114)</p> <p>V G</p>
<p><b>4:50pm - 5:00pm</b></p> <p>Information modeling techniques</p> <p><b>Semantic annotation of images from outdoor construction sites</b></p> <p>Layan Farahat, Ehsan Rezazadeh Azar</p>	<p><b>4:50pm - 5:00pm</b></p> <p>Construction management techniques</p> <p><b>Virtual Reality-based Blockchain Application for Optimized Collaborative Decisions of Modular Construction</b></p> <p>Mohamed Assaf, Rafik Lemouchi, Mohamed Al-Hussein, Xinming Li</p>	<p><b>4:40pm - 4:50pm</b></p> <p>Technology management and innovation</p> <p><b>PESTEL Analysis of Factors Influencing the Demand and Supply of Modular Construction: Perspectives from Hong Kong</b></p> <p>Yidan Zhang, Wei Pan, Mi Pan</p>
<p><b>5:00pm - 5:10pm</b></p> <p>Information modeling techniques</p> <p><b>Structural design in the era of digital twins. A case study</b></p> <p><u>Hector Posada</u>, Rolando Chacón, Carlos Ramonell</p>	<p><b>5:00pm - 5:10pm</b></p> <p>Construction management techniques</p> <p><b>Enabling Construction Automation: Implementing Radio Frequency Communication Infrastructure on Construction Sites</b></p> <p>Victoria Jung, Sigrid Brell-Cokcan</p>	<p><b>4:50pm - 5:00pm</b></p> <p>Technology management and innovation</p> <p><b>Digital Transformation, Sustainability and Construction 5.0</b></p> <p>Ming Shan Ng, Thomas Bock, Fabian Kastner, Silke Langenberg</p>
<p><b>5:10pm - 5:25pm</b></p> <p>Q/A Session</p> <p><b>Q/A session 15 min (D105)</b></p> <p>V G</p>	<p><b>5:10pm - 5:25pm</b></p> <p>Q/A Session</p> <p><b>Q/A session 15 min (D110)</b></p> <p>V G</p>	<p><b>5:00pm - 5:10pm</b></p> <p>Technology management and innovation</p> <p><b>Human-Robot Partnership: An Overarching Consideration for Interaction and Collaboration</b></p> <p>Jingshuo Yu, Qian Chen, Samuel Antonio Prieto Ayllon, Borja Garcia de Soto</p>
		<p><b>5:10pm - 5:25pm</b></p> <p>Q/A Session</p> <p><b>Q/A session 15 min (D115)</b></p> <p>V G</p>

Date: Tuesday, 04/June/2024

8:30am	<b>Keynote 2 Local Organiser</b>		
-	Location: <b>Room A</b>		
8:55am	Chair: <b>Zoubeir Lafhaj</b>		
	Prof. Mohamed Al-Hussein - Keynote talk: "Automated Technologies for Offsite Construction from Lab to Commercialization"		
8:55am	<b>Keynote 3 Local Organiser</b>		
-	Location: <b>Room A</b>		
9:20am	Chair: <b>Zoubeir Lafhaj</b>		
	Prof. Farzad Rahimian - Keynote talk: "Integrated BIM, Blockchain, and Multimodal Data-Driven Digital Twins for AEC Industry Digitalization"		
9:20am	<b>Keynote 4 Local Organiser</b>		
-	Location: <b>Room A</b>		
9:45am	Chair: <b>Zoubeir Lafhaj</b>		
	Prof. Jongwon Seo - Keynote talk: "Introduction of Korean Society of Automation and Robotics in Construction"		
9:45am	<b>Keynote 2 IAARC</b>		
-	Location: <b>Room A</b>		
10:15am	Chair: <b>Zoubeir Lafhaj</b>		
	<b>Automated/robotic machines, devices, and end-effectors</b>		
	<b>Safe Operations of Construction Robots on Human-Robot Collaborative Construction Sites</b>		
	<b>Marvin H. Cheng, Ci-Jyun Liang, Elena G. Dominguez</b>		
10:15am	<b>Break morning D2</b>		
-	Location: <b>Hall</b>		
10:45am			
10:45am	<b>Plenary 4 IAARC</b>		
-	Location: <b>Room A</b>		
11:05am	Chair: <b>Borja García de Soto</b>		
	<b>Information modeling techniques</b>		
	<b>Partial Personalization for Worker-robot Trust Prediction in the Future Construction Environment</b>		
	<b>Woei-Chyi Chang, Nestor Gonzalez Garcia, Behzad Esmaeili, Sogand Hasanzadeh</b>		
11:05am	<b>Plenary 5 IAARC</b>		
-	Location: <b>Room A</b>		
11:25am	Chair: <b>Borja García de Soto</b>		
	<b>Information modeling techniques</b>		
	<b>Automatic Quality Inspection of Rebar Spacing Using Vision-Based Deep Learning with RGBD Camera</b>		
	<b>Songyue Wang, Lu Deng, Jingjing Guo, Mi Liu, Ran Cao</b>		
11:25am	<b>Plenary 6 IAARC</b>		
-	Location: <b>Room A</b>		
11:45am	Chair: <b>Borja García de Soto</b>		
	<b>Automated/robotic machines, devices, and end-effectors</b>		
	<b>Optimization of prefabricated component installation using a real-time evaluator (RTE) connection locating system</b>		
	<b>Nolan W Hayes, Bryan P Maldonado, Mengjia Tang, Peter Wang, Diana Hun</b>		
11:45am	<b>Lunch D2</b>		
-	Location: <b>Hall</b>		
1:00pm			
1:00pm	<b>Parallel Track 1 IAARC: Information Modeling Techniques - Session 1</b>	<b>Parallel Track 2 IAARC: Automated/robotic machines, devices, and end-effectors - Session 1</b>	<b>Parallel Track 3 IAARC: Information Modeling Techniques - Session 1</b>
-	Location: <b>Room A</b>	Location: <b>Room B</b>	Location: <b>Room C</b>
2:35pm	Chair: <b>Vicente Gonzalez</b>	Chair: <b>Yang Zou</b>	Chair: <b>Markus König</b>
	<b>1:00pm - 1:10pm</b>	<b>1:00pm - 1:10pm</b>	<b>1:00pm - 1:10pm</b>
	<b>Information modeling techniques</b>	<b>Information modeling techniques</b>	<b>Information modeling techniques</b>

**Accelerating Indoor Construction Progress Monitoring with Synthetic Data-Powered Deep Learning**

Mathis Baubriaud, Stéphane Derrode, René Chalon, Kevin Kernn

1:10pm - 1:20pm

Information modeling techniques

**Single-Stage Spatiotemporal Activity Recognition of Excavators: A Case Study**

Ali Ghelmani, Ghazaleh Torabi, Amin Hammad, Chen Chen

1:20pm - 1:30pm

Information modeling techniques

**Development of an immersive digital twin framework to support infrastructure management: a case study of bridge asset health monitoring**

Muhammad Fawad, Marek Salamak, Qian Chen, Kalman Koris

1:30pm - 1:50pm

Q/A Session

Q/A session 15 min (D201)

V G

1:50pm - 2:00pm

Information modeling techniques

**BIM and IPA - Excerpt of an automated assessment system for an autodidactic teaching concept**

Christian Heins, Gregor Grunwald

2:00pm - 2:10pm

Information modeling techniques

**Flat and Level Analysis Tool (FLAT) for real-time automated segmentation and analysis of concrete slab point clouds**

Nolan W Hayes, Bryan P Maldonado, Mengjia Tang, Diana Hun

2:10pm - 2:20pm

Information modeling techniques

Automated/robotic machines, devices, and end-effectors

**Fast-Pixel-Matching Algorithm for Automated Shear Stud Welding Based on the Integration of 2D Drawings and Structured Light Cameras**

Huiguang Wang, Lu Deng, Ran Cao, Jingjing Guo

1:10pm - 1:20pm

Automated/robotic machines, devices, and end-effectors

**Implementation of a Robotic Manipulator End effector for Construction Automation**

Aarón Borgo, Arturo Ruiz, Jiansong Zhang, Luis C Félix-Herrán

1:20pm - 1:30pm

Automated/robotic machines, devices, and end-effectors

**Low center-of-gravity movement robotic arm with kinematic optimization algorithm for on-site construction**

Ruiqi Jiang, Xiao Li

1:30pm - 1:50pm

Q/A Session

Q/A session 15 min (D206)

V G

1:50pm - 2:00pm

Automated/robotic machines, devices, and end-effectors

**System integration of construction planning and robots for a joint civil engineering and robotics course**

Ryosuke Yajima, Fumiya Matsushita, Keiji Nagatani, Kazumasa Ozawa

2:00pm - 2:10pm

Automated/robotic machines, devices, and end-effectors

**Development of Autonomous Robots for Construction**

Takayoshi Hachijo, Shunsuke Igarashi, Taku Tani, Masahiro Indo

**Automating Construction Safety Inspections using Robots and Unsupervised Deep Domain Adaptation by Backpropagation**

Vimal Velusamy Bharathi, Samuel Prieto, Borja Garcia de Soto, Jochen Teizer

1:10pm - 1:20pm

Information modeling techniques

**From Unstructured Data to Knowledge Graphs: An Application for Compliance Checking Problem**

Ankan Karmakar, Chintan Patel, Venkata Santosh Kumar Delhi

1:20pm - 1:30pm

Information modeling techniques

**Towards Automated Physics-Based Modeling: Fusion of Construction Equipment Data for Efficient Simulation**

Liqun Xu, Dharmaraj Veeramani, Zhenhua Zhu

1:30pm - 1:50pm

Q/A Session

Q/A session 15 min (D211)

V G

1:50pm - 2:00pm

Information modeling techniques

**Reinforcement Learning-Enhanced Path Planning for Mobile Cranes in Dynamic Construction Environments: A Virtual Reality Simulation Approach**

Rafik Lemouchi, Mohamed Assaf, Ahmed Bouferguene, Mohamed Al-hussein

2:00pm - 2:10pm

Information modeling techniques

**Automated Decision Support System Based on Quantification of Defective Tubular Steel Temporary Materials for Quality Circles**

**Evaluation of Mapping Computer Vision Segmentation from Reality Capture to Schedule Activities for Construction Monitoring in the Absence of Detailed BIM**

Juan D. Nunez-Morales, Yoonhwa Jung, Mani Golparvar-Fard

2:20pm - 2:35pm

Q/A Session

**Q/A session 15 min (D202)**

V G

2:10pm - 2:20pm

Automated/robotic machines, devices, and end-effectors

**Autonomous Data Acquisition of Ground Penetrating Radar (GPR) Using LiDAR-based Mobile Robot**

Amr Eldemiry, Muhammad Muddassir, Tarek Zayed

2:20pm - 2:35pm

Q/A Session

**Q/A session 15 min (D207)**

V G

James Mugo Njoroge, Seojoon Lee, Kyuhyup Lee, Junsung Seol, Younghee Chang, Soonwook Kwon

2:10pm - 2:20pm

Information modeling techniques

**Towards autonomous shotcrete construction: semantic 3D reconstruction for concrete deposition using stereo vision and deep learning**

Patrick Schmidt, Dimitrios Katsatos, Dimitrios Alexiou, Ioannis Kostavelis, Dimitrios Giakoumis, Dimitrios Tzovaras, Lazaros Nalpantidis

2:20pm - 2:35pm

Q/A Session

**Q/A session 15 min (D212)**

V G

1:00pm  
-  
3:00pm

**Posters Session**

Location: **Room P**

Chair: Slim REBAI

Construction management techniques

**Towards Automation in 5s – Classification and Detection of Images from Construction Sites**

Viral Makwana, Ganesh Devkar

Construction management techniques

**Analysis of XES and OCEL Data Schemas: Towards Multidimensional Process Mining of Intertwined Construction Processes**

Araham Jesus Martinez Lagunas, Mazdak Nik-Bakht

Information modeling techniques

**Automated Inspection Report Generation Using Multimodal Large Language Models and Set-of-Mark Prompting**

Hongxu Pu, Xincong Yang, Zhongqi Shi, Nan Jin

Human factors & human-system collaboration

**REBAPose -A Computer vision based Musculoskeletal Disorder Risk Assessment Framework**

Sivakumar K S, Nikhil Bugalia, Benny Raphael

Construction management techniques

**Correlations between linear or nonlinear heart rate variability parameters and physical fatigue scores among construction workers**

Shahnawaz Anwer, Waleed Umer, Maxwell Fordjour Antwi-Afari, Imran Mehmood, Mohammed Abdul-Rahman, Arnold Yu Lok Wong, Heng Li



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Construction management techniques

**Comparative Analysis of Cognitive Agreement between Human Analysts and Generative AI in Construction Safety Risk Assessment**

Unmesa Ray, Cristian Arteaga, [Jee Woong Park](#)

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Services and business applications / Industry & Short Papers

**UAV for sticking markers in the built environment**

Wen-Shuo Hsu, Soroush Fazeli, [Kepa Iturralde](#), Christoph Holst

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Information modeling techniques

**Assisting in the identification of ergonomic risks for workers: a large vision-language model approach**

[Chao Fan](#), Qipei Mei, Xinming Li

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Technology management and innovation

**3D Printing vs. Traditional Construction: Cost Comparisons from Design to Waste Disposal Stages**

[Svetlana Besklubova](#), Muhammad Huzaifa Raza, Ray Y. Zhong, Miroslaw J. Skibniewski

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Information modeling techniques

**Knowledge Graph-based Deconstruction Planning of Building's Products**

Amr Allam, Mazdak Nik-Bakht

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Human factors & human-system collaboration

**Developing Joint-level Scoring Models Tailored to Whole-body Ergonomic Assessment of Construction Workers**

Zirui Li, Yantao Yu, Qiming Li

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Technology management and innovation

**Predicting Indicators of Design Quality for Cast-in-Place Reinforced Concrete Structures Using Machine Learning**

Leonardo Garcia-Bottia, [Daniel Castro-Lacouture](#)

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Technology management and innovation

**A Generic 3D Printing Life Cycle Assessment (LCA) Framework for AEC Applications**

Bharadwaj R. K. Mantha, Ala Sati, Fatma Hosny, Mohamed Abdallah, Saleh Abu Dabous

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Sensing systems & data infrastructures

**Virtual Construction Equipment Sensor for Determining Soil Stiffness during Compaction**

[Maximilian Schöberl](#), Michael Schneider, Claus Lechner, Johannes Fottner

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Construction management techniques

**Developing Time-Cost & Storage Optimization Model for a Construction Project – A Linear Programming Approach**

Prasanna Venkatesan Ramani, Shivaram Kandasamy, Anshul Gupta, Sugeerthi MS

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Automated/robotic machines, devices, and end-effectors

**A Framework and Cyber-Physical System Architecture for Cloud-Based Construction Monitoring with Autonomous Quadrupeds**

Aras Maqsoodi, Javier Irizarry

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Technology management and innovation

**Justification of Construction 4.0 maturity model with a case study of a data-driven façade company**

Orsolya Heidenwolf, Dr. Ildikó Szabó

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Construction management techniques

**Prototype development of an automated 3D shop drawing generation tool for reinforcement work**

Kanae Miyaoka, Fumiya Matsushita, Kazumasa Ozawa

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Construction management techniques

**The Effect of Material Handling Strategies on Time and Labour Fatigue in Window Manufacturing**

Omar Azakir, Fatima Alsakka, Mohomad Al-Hussein

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Automated/robotic machines, devices, and end-effectors

**Development of Mobile Inspection Robot for Concrete Wall Surface and Strength Estimation Considering Coarse Aggregate by Small Diameter Drill**

Momoe Terata, Fumihiko Inoue

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Information modeling techniques

**Development of Online Course for Open Infra Built Environment Information Model**

Annika Kemppainen, Tanja Kolli, Rauno Heikkilä

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Services and business applications / Industry & Short Papers

**Analysis of openBIM Adoptions and Implementations: Global Perspectives and Canadian Industry Adoption**

Farzad Jalaei, Saman Davari, Yasir Sultan, Claudia Cozzitorto, Erik Poirier, Arash Shahi

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Information modeling techniques

**Integration of BIM and RFID-Sensing Technology for Automated Progress Monitoring in Modular Construction**

Maggie Y Gao, Chengjia Han, Yaowen Yang, Robert L.K. Tiong

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Human factors & human-system collaboration

**Enhancing Human-Robot Teaming in Construction through the Integration of Virtual Reality-Based Training in Human-Robot Collaboration.**

**Adetayo Onososen, Innocent Musonda, Christopher Dzuwa**

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Automated/robotic machines, devices, and end-effectors

**Integrating Automation into Construction Site: A System Approach for the Brick Cutting Use Case**

**Cinzia Slongo, Vincenzo Orlando, Dietmar Siegele, Dominik T. Matt**

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Construction management techniques

**Impact of Technology Use on Time Needed for Information Retrieval for Frontline Supervisors in the Construction Industry**

**Bassam Ramadan, Hala Nassereddine, Timothy Taylor, Paul Goodrum**

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Services and business applications / Industry & Short Papers

**Evaluating Site Scanning Methods: An Assessment System for Quantitative Comparison and Selection**

**Maria Mortazavi, Bin Wu, Sofie Steinbrenner, Shervin Haghsheno**

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Human factors & human-system collaboration

**Interpretation Conflict in Helmet Recognition under Adversarial Attack**

**He Wen, Simaan AbouRizk**

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Technology management and innovation

**A Bibliographic Multi Theme Review of Cybersecurity, AEC and 3D Printing: Learnings and Way Forward for the AEC Industry**

**Bharadwaj R. K. Mantha, Jannatul Tashfia, Jannatul Tabassum, Saleh Abu Dabous**

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Construction management techniques

**Digital Info Screen - A Visual Management Tool for Construction Workers**

**Markku Kiviniemi, V. Paul C. Charlesraj, Marja Liinasuo, Pekka Siltanen, Kari Rainio**

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Human factors & human-system collaboration

**Enhancing Decision-Making for Human-Centered Construction Robotics: A Methodological Framework**

**Marc Schmailzl, Anne-Sophie Saffert, Merve Karamara, Thomas Linner, Friedrich Anton Eder, Simon Konrad Hoeng, Mathias Obergruesser**

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Technology management and innovation

**Analogizing in Construction and Education Research: A Case Study**

**Ronie Navon, Yoram M Kalman**

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Information modeling techniques

**Scan-to-BIM: Unlocking current limitations through Artificial Intelligence**

Maxime Queruel, Stefan Bornhofen, Aymeric Histace, Laure Ducoulombier

2:35pm

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3:00pm

3:00pm

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5:25pm

Break afternoon D2

Location: **Hall**

**Parallel Track 1 IAARC: Automated/robotic machines, devices, and end-effectors- Session 2**

Location: **Room A**

Chair: Kepa Iturralde

**3:00pm - 3:10pm**

Automated/robotic machines, devices, and end-effectors

**Shape Control of Guide Frame to Avoid Obstacles for Tunnel Inspection System by Manual Operation**

Fumihiro Inoue, Momoe Terata

**3:10pm - 3:20pm**

Automated/robotic machines, devices, and end-effectors

**Component pose reconstruction using a single robotic total station for panelized building envelopes**

Mengjia Tang, Nolan W. Hayes, Bryan P. Maldonado, Diana Hun

**3:20pm - 3:30pm**

Automated/robotic machines, devices, and end-effectors

**Assessment of Traditional and Robotic Approaches to Interior Construction Layout: A Framework and Comparative Study**

Catherine Caputo, Ashtarout Ammar, Ashley Johnson

**3:30pm - 3:50pm**

Q/A Session

**Q/A session 15 min ( D203)**

V G

**3:50pm - 4:00pm**

Automated/robotic machines, devices, and end-effectors

**Parallel Track 2 IAARC: Construction Management Techniques - Session 2**

Location: **Room B**

Chair: Qipei (Gavin) Mei

**3:00pm - 3:10pm**

Construction management techniques

**Impacts of Multi-skills on Project Productivity and Completion Time: A Building Renovation Case Study**

Muhammad Atiq Ur Rehman, Sharfuddin Ahmed Khan, Amin Chaabane

**3:10pm - 3:20pm**

Construction management techniques

**Integrating the AR-QR Code Approach with Positioning and Orientation Sensors to Facilitate Deploying Drawings Information on Job Sites**

Mohsen Foroughi Sabzevar, Masoud Gheisari, L.James Lo

**3:20pm - 3:30pm**

Construction management techniques

**The Role of Large Language Models for Decision Support in Fire Safety Planning**

Dilan Durmus, Alberto Giretti, Ori Ashkenazi, Alessandro Carbonari, Shabtai Isaac

**3:30pm - 3:50pm**

Q/A Session

**Q/A session 15 min (D208)**

V G

**3:50pm - 4:00pm**

Construction management techniques

**Understanding Professional Perspectives about AI Adoption in**

**Parallel Track 3 IAARC: Information Modeling Techniques & Automated/robotic machines, devices, and end-effectors - Session 2**

Location: **Room C**

Chair: Jiansong Zhang

**3:00pm - 3:10pm**

Information modeling techniques

**Training and Generating Apartment Plan Graphic Images for Commercial Uses**

Taesik Nam, Youngchae Kim, Sumin Chae, Youngjin Yoo, Jin Kook Lee

**3:10pm - 3:20pm**

Information modeling techniques

**Effect of Missing Data on Machine-Learning Algorithms for Real-time Safety Monitoring in Scaffolds**

Laura Alvarez, Mahendra Ghimire, Jee Woong Park

**3:20pm - 3:30pm**

Information modeling techniques

**Digital Twin in Prefabricated Construction – Approaches, Challenges and Requirements**

Veerakumar Rangasamy, Jyh-Bin Yang

**3:30pm - 3:50pm**

Q/A Session

**Q/A session 15 min (D213)**

V G

**3:50pm - 4:00pm**

Information modeling techniques

**Exploring Digital Twin platforms across industries**

Amin Khoshkenar, Hala Nassereddine

**Development of automated transport system**

Shunsuke Igarashi, Yuji Kinoshita, Taku Tani, Takayoshi Hachijo, Masahiro Indo

4:00pm - 4:10pm

Automated/robotic machines, devices, and end-effectors

**Automated As-built 3D Reconstruction Using Quadruped Robot and 3D LiDAR Sensor**

Vincent J.L. Gan, Difeng Hu, Ruoming Zhai, Yushuo Wang

4:10pm - 4:20pm

Automated/robotic machines, devices, and end-effectors

**Enhancing UAV Efficiency in Bridge Inspection through BIM-based Flight Planning and Image Quality Assurance**

Feng Wang, Yang Zou, Enrique del Rey Castillo, James B.P. Lim

4:20pm - 4:40pm

Q/A Session

**Q/A session 15 min (D204)**

V G

4:40pm - 4:50pm

Automated/robotic machines, devices, and end-effectors

**MPC-Based Proactive Swing Attenuation for Double-Pendulum Overhead Cranes**

Juhao Su, Shichen Sun, Ching-Wei Chang, Siwei Chang

4:50pm - 5:00pm

Automated/robotic machines, devices, and end-effectors

**Reinvent reinforced concrete with robotics and 3D printing**

Jean-François Caron, Nicolas Ducoulombier, Léo Demont, Victor de Bono, Romain Mesnil

5:00pm - 5:10pm

**the Construction Industry: A Survey in Germany**

Diego Cisterna, Franz-Ferdinand Gloser, Eder Martínez, Svenja Lauble

4:00pm - 4:10pm

Construction management techniques

**State of the Art Review of Technological Advancements for Safe Tower Crane Operation**

Avi Raj, Jochen Teizer

4:10pm - 4:20pm

Construction management techniques

**A Delay Liquidated Damages (DLD) Mitigation Model based on Earned Schedule (ES) and Earned Value Management System (EVMS) concepts**

So-Won Choi, Eul-Bum Lee

4:20pm - 4:40pm

Q/A Session

**Q/A session 15 min (D209)**

V G

4:40pm - 4:50pm

Construction management techniques

**Impact of Integrated Supply Chain Platforms on Construction Project Management**

Giovanni Zenezini, Giulio Mangano, Gabriel Castelblanco

4:50pm - 5:00pm

Construction management techniques

**Automated Construction Site Safety Monitoring Using Preidentified Static and Dynamic Hazard Zones**

Kepeng Hong, Jochen Teizer

5:00pm - 5:10pm

Construction management techniques

**Innovative standardized cost data structure: application on price list document for estimating public tendering**

4:00pm - 4:10pm

Information modeling techniques

**Underground Utility Network Completion based on Spatial Contextual Information of Ground Facilities and Utility Anchor Points using Graph Neural Networks**

Yuxi Zhang, Hubo Cai

4:10pm - 4:20pm

Automated/robotic machines, devices, and end-effectors

**Double-Pendulum Tower Crane Trolley Trajectory Planning: A Parameter Based Time-Polynomial Optimization**

Shichen Sun, Juhao Su, Yu Hin NG, Ching-Wei Chang

4:20pm - 4:40pm

Q/A Session

**Q/A session 15 min (D214)**

V G

4:40pm - 4:50pm

Automated/robotic machines, devices, and end-effectors

**Advancements and Future Visions in Earthmoving Swarm Technology**

Mikko Sakari Hiltunen, Rauno Kalle Heikkilä

4:50pm - 5:00pm

Automated/robotic machines, devices, and end-effectors

**A construction robot path planning method based on safe space and worker trajectory prediction**

Xiaotian Ye, Hongling Guo, Ziyang Guo, Zhubang Luo

5:00pm - 5:10pm

Automated/robotic machines, devices, and end-effectors

Automated/robotic machines, devices, and end-effectors

**Unified framework for mixed-reality assisted situational adaptive robotic path planning enabled by 5G networks for deconstruction tasks**

**Chu Han Wu, Marit Zöcklein, Sigrid Brell-Cokcan**

**5:10pm - 5:25pm**

Q/A Session

**Q/A session 15 min (D205)**

V G

**Jacopo Cassandro, Chiara Gatto, Antonio Farina, Claudio Mirarchi, Alberto Pavan**

**5:10pm - 5:25pm**

Q/A Session

**Q/A session 15 min (D210)**

V G

**Factors Leading to Reduced Construction Productivity in Unmanned Construction**

**Genki Yamauchi, Takeshi Hashimoto, Mitsuru Yamada, Shinichi Yuta**

**5:10pm - 5:25pm**

Q/A Session

**Q/A session 15 min (D215)**

V G

**Date: Wednesday, 05/June/2024**

8:30am	<b>Tucker-Hasegawa Award's Lecture</b>		
-	Location: <b>Room A</b>		
8:45am	Chair: <b>Zoubeir Lafhaj</b>		
8:45am	<b>Keynote 5 Local Organiser</b>		
-	Location: <b>Room A</b>		
9:15am	Chair: <b>Zoubeir Lafhaj</b>		
9:15am	Prof. Miroslaw J. Skibniewski - Keynote talk: "Smart contracts for automated supply chains in disaster recovery projects"		
-	Location: <b>Room A</b>		
9:45am	Chair: <b>Zoubeir Lafhaj</b>		
9:45am	Prof. Osama Moselhi - Keynote talk: "Automation and Digital Transformation in Construction: An Overview"		
-	Location: <b>Room A</b>		
10:15am	Chair: <b>Zoubeir Lafhaj</b>		
	<b>Information modeling techniques</b>		
	<b>Pre-trained language model based method for building information model to building energy model transformation at metamodel level</b>		
	<b>Zhichen Wang, Mario Bergés, Burcu Akinci</b>		
10:15am	<b>Break morning D3</b>		
-	Location: <b>Hall</b>		
10:45am			
10:45am	<b>Plenary 7 IAARC</b>		
-	Location: <b>Room A</b>		
11:05am	Chair: <b>Hyoungkwan Kim</b>		
	<b>Human factors &amp; human-system collaboration</b>		
	<b>Effects of Visual Prompts in Human-machine Interface for Construction Teleoperation System</b>		
	<b>Yeon Chae, Samraat Gupta, Youngjib Ham</b>		
11:05am	<b>Plenary 8 IAARC</b>		
-	Location: <b>Room A</b>		
11:25am	Chair: <b>Hyoungkwan Kim</b>		
	<b>Information modeling techniques</b>		
	<b>Zero-shot Learning-based Polygon Mask Generation for Construction Objects</b>		
	<b>Taegeon Kim, Minkyu Koo, Jeongho Hyeon, Hongjo Kim</b>		
11:25am	<b>Plenary 9 IAARC</b>		
-	Location: <b>Room A</b>		
11:45am	Chair: <b>Hyoungkwan Kim</b>		
	<b>Sensing systems &amp; data infrastructures</b>		
	<b>Integration of laser profiler feedback into FIM for additive manufacturing in construction</b>		
	<b>Simon Espinosa, Martin Slepicka, André Borrmann</b>		
11:45am	<b>Lunch D3</b>		
-	Location: <b>Hall</b>		
1:00pm			
1:00pm	<b>Parallel Track 1 IAARC: Human factors &amp; human-system collaboration - Session 1</b>	<b>Parallel Track 2 IAARC: Sensing systems &amp; data infrastructures - Session 1</b>	<b>Parallel Track 3 IAARC: Information modeling techniques - Session 1</b>
-	Location: <b>Room A</b>	Location: <b>Room B</b>	Location: <b>Room C</b>
2:35pm	Chair: <b>Bharadwaj R. K. Mantha</b>	Chair: <b>Ci-Jyun Liang</b>	Chair: <b>Shabtai Isaac</b>
	<b>1:00pm - 1:10pm</b>	<b>1:00pm - 1:10pm</b>	<b>1:00pm - 1:10pm</b>
	<b>Human factors &amp; human-system collaboration</b>	<b>Sensing systems &amp; data infrastructures</b>	<b>Information modeling techniques</b>

**Assessing the Impact of AR-Assisted Warnings on Roadway Worker Stress Under Different Workload Conditions**

Fatemeh Banani Ardecani, Amit Kumar, Omidreza Shoghli

1:10pm - 1:20pm

Human factors & human-system collaboration

**Worker-Centric Path Planning: Simulating Hazardous Energy to Control Construction Safety Using Graph Theory**

Kilian Speiser, Jochen Teizer

1:20pm - 1:30pm

Human factors & human-system collaboration

**Experimental Evaluation of Exoskeletons for Rebar Workers Using a Realistic Controlled Test**

Malcolm Dunson-Todd, Mazdak Nik-Bakht, Amin Hammad

1:30pm - 1:50pm

Q/A Session

**Q/A session 15 min (D301)**

V G

1:50pm - 2:00pm

Human factors & human-system collaboration

**Digital Twin-based Instructor Support System for Excavator Training**

Faridaddin Vahdatikhaki, Leon olde Scholtenhuis, Andre Doree

2:00pm - 2:10pm

Human factors & human-system collaboration

**Fit Islands: Designing a Multifunctional Exergame to Promote Healthy Aging for Chinese Older Adults**

Zixin Shen, Rongbo Hu, Dong Wan, Ami Ogawa, Thomas Bock

**VL-Con: Vision-Language Dataset for Deep Learning-based Construction Monitoring Applications**

Shun-Hsiang Hsu, Junryu Fu, Mani Golparvar-Fard

1:10pm - 1:20pm

Sensing systems & data infrastructures

**Automated Defect Inspection in Building Construction with Multi-Sensor Fusion and Deep Learning**

Juhyeon Kim, Jeehoon Kim, Yulin Lian, Hyoungkwan Kim

1:20pm - 1:30pm

Sensing systems & data infrastructures

**Towards Efficient Construction Monitoring: An Empirical Study on Action Recognition Models**

Sudheer Kumar Nanduri, Venkata Santosh Kumar Delhi

1:30pm - 1:50pm

Q/A Session

**Q/A session 15 min (D306)**

V G

1:50pm - 2:00pm

Sensing systems & data infrastructures

**Preliminary Study on Enhancing Detection of Concrete Bridge Surface Spalling by Infrared Thermography**

Ching-Wei Chen, Hui-Ping Tserng, En-Wei Chiang

2:00pm - 2:10pm

Sensing systems & data infrastructures

**Variable Speed Limits Control for Smart Work Zone with Connected Vehicles**

Shuming Du, Saiedeh Razavi, Harith Absulsattar

2:10pm - 2:20pm

Sensing systems & data infrastructures

**Development of 3D Digital-Twin System for Remote-Control Operation in Construction**

Yoshihito Mori, Masaomi Wada

1:10pm - 1:20pm

Information modeling techniques

**Exploring the Potential of Reinforcement Learning in Pipe Spool Scheduling in Industrial Projects**

Mohamed EIMenshawy, Lingzi Wu, Brian Gue, Simaan AbouRizk

1:20pm - 1:30pm

Information modeling techniques

**Current State and Trends of Point Cloud Segmentation in Construction Research**

Samuel A. Prieto, Eyob T. Mengiste, Uday Menon, Borja Garcia de Soto

1:30pm - 1:50pm

Q/A Session

**Q/A session 15 min (D311)**

V G

1:50pm - 2:00pm

Information modeling techniques

**Monitoring of 3D concrete printing quality through multi-view RGB-D images**

Ahmed Magdy Ahmed Zaki, Marco Carnevale, Hermes Giberti, Christian Schlette

2:00pm - 2:10pm

Information modeling techniques

**Robust High-Precision LiDAR Localization in Construction Environments**

Andrew Alexander Yarovoi, Pengyu Mo, Yong Kwon Cho

2:10pm - 2:20pm

Information modeling techniques



<p>2:35pm - 3:00pm 3:00pm - 5:25pm</p>	<p>2:10pm - 2:20pm</p> <p>Human factors &amp; human-system collaboration</p> <p><b>Use of robotics to coordinate health and safety on the construction site</b></p> <p>Fabian Dornik, Niels Bartels</p> <hr/> <p>2:20pm - 2:35pm</p> <p>Q/A Session</p> <p><b>Q/A session 15 min (D302)</b></p> <p>V G</p>	<p><b>Development of a Prototype Data-system Integration Platform for As-Built Inspection</b></p> <p>Fumiya Matsushita, Kanae Miyaoka, Bumpei Miyazaki, Masamiki Matsubara, Kazumasa Ozawa</p> <hr/> <p>2:20pm - 2:35pm</p> <p>Q/A Session</p> <p><b>Q/A session 15 min (D307)</b></p> <p>V G</p>	<p>Buildability assessment of 3D printed concrete elements through computer vision</p> <p>Shanmugaraj Senthilnathan, Benny Raphael</p> <hr/> <p>2:20pm - 2:35pm</p> <p>Q/A Session</p> <p><b>Q/A session 15 min (D312)</b></p> <p>V G</p>
<p><b>Break afternoon D3</b> Location: <b>Hall</b></p>			
	<p><b>Parallel Track 1 IAARC: Human factors &amp; human-system collaboration &amp; Technology management and innovation- Session 2</b></p> <p>Location: <b>Room A</b> Chair: Gaang Lee</p> <p>3:00pm - 3:10pm</p> <p>Human factors &amp; human-system collaboration</p> <p><b>The Influence of an Immersive Multisensory Virtual Reality System with Integrated Thermal and Scent Devices on Individuals' Emotional Responses in an Evacuation Experiment</b></p> <p><u>Xiaolu Xia</u>, Nan Li, Jin Zhang</p>	<p><b>Parallel Track 2 IAARC: Sensing systems &amp; data infrastructures &amp; Information modeling techniques- Session 2</b></p> <p>Location: <b>Room B</b> Chair: Eder Martinez</p> <p>3:00pm - 3:10pm</p> <p>Sensing systems &amp; data infrastructures</p> <p><b>Acoustic Signal-Based Excavator Fault Detection Using Deep Learning Method</b></p> <p>Yuhan Zhou, Zhen Lin Foo, Yong Zhi Koh, Ker-Wei, Justin Yeoh</p>	<p><b>Parallel Track 3 IAARC: Construction management techniques - Session 2</b></p> <p>Location: <b>Room C</b> Chair: Yelda Turkan</p> <p>3:00pm - 3:10pm</p> <p>Construction management techniques</p> <p><b>A Proposed Framework to Implement Advanced Work Packaging (AWP) with the Support of Blockchain</b></p> <p>Slim Rebai, Zoubeir Lafhaj, Olfa Hamdi, Wassim AIBalkhy, Rateb Jabbar, Hamdi Ayech, Ahmed Moukhafi, Mohammed Chadli, Pascal Yim</p>
	<p>3:10pm - 3:20pm</p> <p>Human factors &amp; human-system collaboration</p> <p><b>Envisioning Extraterrestrial Construction and the Future Construction Workforce: A Collective Perspective</b></p> <p>Amirhosein Jafari, Yimin Zhu, Suniti Karunatillake, Jennifer Qian, Shinhee Jeong, <u>Ali Kazemian</u>, Andrew Webb</p>	<p>3:10pm - 3:20pm</p> <p>Sensing systems &amp; data infrastructures</p> <p><b>UAV Thermography for Building Energy Audit: Comparing Image Acquisition Strategies</b></p> <p>Cheng Zhang, Yang Zou, Johannes Dimiyadi, Vicente A. Gonzalez</p>	<p>3:10pm - 3:20pm</p> <p>Construction management techniques</p> <p><b>Construction worker fatigue load management using IoT heart rate sensing system</b></p> <p>LunWang Wu, HuiPing Tserng, XiuZhen Huang</p>
	<p>3:20pm - 3:30pm</p> <p>Human factors &amp; human-system collaboration</p> <p><b>Trends, Challenges, and Opportunities in Assistive and Robotic Kitchen Technologies for Aging Society: A Scoping Review</b></p>	<p>3:20pm - 3:30pm</p> <p>Sensing systems &amp; data infrastructures</p> <p><b>NeRF-Con : Neural Radiance Fields for Automated Construction Progress Monitoring</b></p> <p><u>Yuntae Jeon</u>, Almo Senja Kulinan, Dai Quoc Tran, Minsoo Park, Seunghee Park</p>	<p>3:20pm - 3:30pm</p> <p>Construction management techniques</p> <p><b>Evaluation of effect of different safety training styles on mental workloads using electroencephalography</b></p> <p><u>Peng Liu</u>, Chengyi Zhang</p>
	<p>3:30pm - 3:50pm</p> <p>Q/A Session</p>	<p>3:30pm - 3:50pm</p> <p>Q/A Session</p>	<p>3:30pm - 3:40pm</p> <p>Construction management techniques</p>

**Rongbo Hu**, Ami Ogawa, Borja García de Soto, Thomas Bock

3:30pm - 3:50pm

Q/A Session

**Q/A session 15 min (D303)**

V G

3:50pm - 4:00pm

Human factors & human-system collaboration

**Guiding Visual Attention in Remote Operation: Meaning, Task and Object in Post-Disaster Scenarios**

Xiaoxuan Zhou, Xing Su

4:00pm - 4:10pm

Human factors & human-system collaboration

**Conceptualizing Digital Twins in Construction Projects as Socio-Technical Systems**

Mohammed Abdelmegid, Algan Tezel, Carlos Osorio Sandoval, Zigeng Fang, William Collinge

4:10pm - 4:20pm

Human factors & human-system collaboration

**Coupled Risk Assessment of Construction Workers' Unsafe Behaviors in Human-Robot Interactions**

Jing Lin, Qinyuan Li, Runhe Zhu, Yuhang Cai, Longhui You, Lewen Zou, Siyan Liu

4:20pm - 4:40pm

Q/A Session

**Q/A session 15 min (D304)**

V G

4:40pm - 4:50pm

Human factors & human-system collaboration

**Enhancing Public Engagement in Sustainable Systems through Augmented Reality**

**Q/A session 15 min (D308)**

V G

3:50pm - 4:00pm

Sensing systems & data infrastructures

**Identification of Factors and Metrics to Compare Vision Based Data Acquisition Devices**

Aakar Garg, Megha S Pradeep, Koshy Varghese

4:00pm - 4:10pm

Sensing systems & data infrastructures

**Robotic IoT-Enabled 1D Line Scanner Integration for 3D Point Cloud Data Processing**

Emre Ergin, Sven Stumm, Sigrid Brell-Cokcan

4:10pm - 4:20pm

Sensing systems & data infrastructures

**Instance Segmentation of Exterior Insulation Finishing System using Synthetic Datasets**

Mingyun Kang, Sebeen Yoon, Juho Han, Sanghyeon Na, Taehoon Kim

4:20pm - 4:40pm

Q/A Session

**Q/A session 15 min (D309)**

V G

4:40pm - 4:50pm

Information modeling techniques

**Exploring Self-Supervised GPR Representation Learning for Building Rooftop Diagnostics**

Kevin Lee, Wei-Heng Lin, Bilal Sher, Talha Javed, Sruti Madhusudhan, Chen Feng

4:50pm - 5:00pm

Information modeling techniques

**Adaptive Geological Uncertainty Modeling in Excavation**

Hannu Juola, Sara Johansson, Olof Friberg, Rauno Heikkilä

**SafeSense: Real-time Safety Alerts for Construction workers**

Sivakumar K S, Vishnu Sivan, Grigary Antony

3:40pm - 4:00pm

Q/A Session

**Q/A session 20 min (D313)**

V G

Yu-Chen Lee, Abdullah Alsuhaibani,  
Chih-Shen Cheng, Fernanda Leite

5:00pm - 5:10pm

4:50pm - 5:00pm

Human factors & human-system  
collaboration

**Virtual Construction Safety  
Training System: How Does it  
Relate to and Affect Users'  
Emotions?**

Fan Yang, Jiansong Zhang

Information modeling techniques

**Planning of Formwork  
Accessories in a BIM-based  
Aluminum Formwork Layout  
Planning System**

Guan-Yong Xiong, Tzong-Hann Wu,  
Shang-Hsien Hsieh, Kuan-Yi Chen,  
Budy Setiawan, Wen-Tung Chang

5:00pm - 5:10pm

Technology management and  
innovation

**A Safety Framework to Assess  
Autonomous Construction and  
Mining Equipment**

Cynthia Brosque, Bibhrajit Halder

5:10pm - 5:20pm

Q/A Session

**Q/A session 15 min (D310)**

V G

5:10pm - 5:25pm

Q/A Session

**Q/A session 15 min (D305)**

V G