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29 July Monday	Al	Specialist LLMs Incorporating Domain Knowledge Repository into Large Language Models for Question-Answering of Construction Laws and Regulations in China	Room
9:45 a.m.	275	Zhou, Shenghua; wang, hongyu; Cheng, Xiaohan; li, dezhi*; chen, zhengyi; Wei, Ran; Ng, S. Thomas	
10:00 a.m.	409	Generative Pre-trained Transformers (GPT)-based Automated Building Regulatory Information Transformation. Yang, Fan*; Zhang, Jiansong; Duong, Long	Grand
10:15 a.m.	178	Cause Discovery from Defects Complaint Texts Using Retrieval Augmented Generation by Chaining a Large Language Model with a Knowledge Graph	Station 3
10.15 a.111.	1/0	Jeon, Kahyun*; Lee, Ghang; Kim, Yonghan; Lim, Jiyoung GPT4-Vision Multimodal Model-Powered Query-Answering Chatbot for Bridge PDF Drawings	
10:30 a.m.	265	Soy, Meta*; Zhang, Jiansong	
	Al	Al in Building Energy Management	
11:00 a.m.	583	Automated Thermal Anomaly Detection through Deep Learning-based Semantic Segmentation of Building Envelope Images Mirzabeigi, Shayan*; Razkenari, Mohamad; Crovella, Paul	
11:15 a.m.	445	Are Transformers Effective for Time Series Anomaly Detection? — A Case Study in Building Energy Management	
		Gu, Yueyan; Wang, Xuan; Jazizadeh, Farrokh* CityTFT: A Temporal Fusion Transformer based Twin Model for Urban Building Energy Modeling	Grand Station 3
11:30 a.m.	447	Dai, Ting-Yu*; Niyogi, Dev; Nagy, Zoltan	
11:45 a.m.	478	A Markov decision process-based method to generate strategies for automated updating of building energy models Wang, Zhichen*; Bergés, Mario; Akinci, Burcu	
	Al	Data-driven Infrastructure Operations	
2:00 p.m.	273	Identification and Geolocation of Pavement Marking Issues Based on Artificial Intelligence and Mobile Phone Kuang, Biao; Chen, Jianli*; Hu, Yuqing	
2:15 p.m.	169	Spatial-temporal Estimation of Settlement in Foundation Work Based on Deep Learning	
2.15 p.iii.	109	Yang, Chen*; Wang, Chen; Fan, Jian-sheng	
2:30 p.m.	198	Deep Learning-based Surface Defect Detection: Three-class Segmentation Ji, Donghoon; Turkan, Yelda*; Calvi, Paolo	Grand
2:45 p.m.	558	Scenarios Adaptive Building Defect Inspection by Active and Incremental Learning	Station 3
	450	Wen, Yining; Chen, Kaiwen*; Bao, Jingwei Few-Shot Learning for Key Information Extraction from Bridge Inspection Reports	
3:00 p.m.	150	Xiong, Wen; Wang, Yuchen; Zhu, Yanjie*; Cai, C.S.	
3:15 p.m.	186	Analysis of Roadside Features on Rural Road-Departure Crashes and its Severity: A Computer Vision Approach Subedi, Abhishek K*; Rashidi, Abbas; Markovic, Nikola	
	Al	Application of Language Models	
3:45 p.m.	395	Leveraging Large Language Models to Assist Bridge Element Visual Inspections Yuan, Chenxi*; Topçu, Onur Kaan; Lee, Felix H.	
4:00 p.m.	349	Large Language Model-based data-driven framework for digital transformation in construction industry	
4.00 p.iii.	343	Ma, Ruiyang*; Shen, Geoffrey Qiping; Lou, Peiliang; Wang, Ming Prompt-based Virtual Assistant Framework for Construction Working Method Specifications	 Grand
4:15 p.m.	239	He, Chuanni; Liu, Min*; He, Weilin	Station 3
4:30 p.m.	132	Standard-Driven Chinese Knowledge Extraction in Highway Domain using Machine Learning and NLP Approach Loh, Ching Wah; Zhang, Xiao-Bing; Lin, Jia-Rui; Hu, Zhen-Zhong*	
4.45	C00	aice.AEC-Bench: A Multidisciplinary Multilevel Chinese Evaluation Benchmark for Large Language Models in AEC	
4:45 p.m.	600	Liang, Chen*; Yan, Shen; Guo, Qianyu; Sun, Jiawei; Cheng, Fei; Liu, Zhengjie; Xiao, Weifang; Wang, Meng; Wang, Haofen; Zhao, Xianzhong	
30 July Tuesday	Al	ML in Construction Management	
Jo July 1 1 1 2 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Using Data Mining Algorithms to Identify Critical Patterns Among Various Performance Indicators of Bundled Projects Delivered under The Construction	
9:45 a.m.	79	Manager/General Contractor (CM/GC) Project Delivery Method Assaf, Ghiwa; Assaad, Rayan*	
10:00 a.m.	592	Predicting Project Contingency in the Construction Industry Using Machine Learning Algorithms	 Grand
10.00 a.iii.	392	Charbel, Ghadi; Assaad, Rayan*; Lyssikatos, John; Karaa, Fadi	····· Station 3
10:15 a.m.	203	Dynamic work package sizing and scheduling under uncertainties using hierarchical reinforcement learning zhang, nianmin*; LI, Xiao	
10:30 a.m.	33	Integrating Sensor-Empowered Federated Learning and Smart Contracts for Automatic Flood Risk Management	
	Al	Chen, Gongfan*; Alsharef, Abdullah; Jaselskis, Edward Environmental Quality Predictive Modeling	
11:00 a.m.	114	Deep Learning and Meteorological Data for Indoor Environmental Quality Prediction	
		Lee, Min Jae*, Zhang, Ruichuan Toward Generalized CO2 Prediction in Educational Buildings	
11:15 a.m.	492	Meimand, Mostafa; Jazizadeh, Farrokh*	Grand
11:30 a.m.	57	Predictive Learning for Air Pollution at Construction Sites Using Multimodal Data Zhang, Ruichuan*; Chen, Bin; Krall, Jenna	Station 3
11:45 a.m.	599	Monitoring Traffic-Related Air Pollution (TRAP) through calibrated low-cost sensors	
11.43 8.111.		Liu, Ying-Ru*; Hsiao, Ta-Chih; Chang, Po-Kai ; Chen, Albert	
2.00	AI	Computer Vision-based Operations Integrating Image Enhancement, Classification, and Segmentation for Supporting Automated Underwater Infrastructure Inspection and Maintenance	
2:00 p.m.	504	Talamkhani, Saeed; Liu, Kaijian*	
2:15 p.m.	218	Integrating deep learning and real-time GNSS localization for GIS-based traffic sign management Sun, Yifeng; Zhao, Haomiao; Lam, Chi Chiu; Wong, Mun On*; Liang, Haoyang; Kou, Kun Pang	
2:30 p.m.	213	Vision-based Module Positioning and Alignment Approach in Modular Integrated Construction	
		Jiang, Ruiqi; LI, Xiao* Establishing a computer vision-based object detection database for modular construction quality monitoring	Grand Station 3
2:45 p.m.	195	yanggongjie, xiao*; Chi, Hung-Lin	
3:00 p.m.	441	Text-enhanced Label-efficient Automated Bridge Defects Semantic Segmentation from Inspection Images Wang, Shengyi*; El-Gohary, Nora	
3:15 p.m.	501	Automated Image Segmentation for Detecting Defects in Brick-Wall Surfaces	
> b	AI	Huang, Yuxiang*; El-Gohary, Nora Application of Generative Models	
3:45 p.m.	314	A Review of Synthetic Data Generation Methods for Machine Learning Models in Construction	
3.43 p.m.	514	Golazad, SeyedeZahra*; Mohammadi, Abbas; Rashidi, Abbas	
4:00 p.m.	412	Evaluating Generative Adversarial Network (GAN) Models for Generating Images of Defective Façades Kiper, Beyza*; Dey, Nilay ; Azad, Aditya; Ergan, Semiha	
4:15 p.m.	510	Generative Model-based Data Augmentation Approach for Supporting Maintenance Decision-Making	Grand
		Chen, Qiyang*; El-Gohary, Nora Constrained Diffusion Model for Interoperable Floor Plan Generation	Station 3
4:30 p.m.	69	Zhang, Haolan*; Zhang, Ruichuan	
4:45 p.m.	380	An Approach for Domain-Informed Generative Architectural Design Park, Keundeok*; Ergan, Semiha	
		Intelliegnt Transportation	
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9:45 a.m.	AI 73	An Empirical Analysis of Secure Federated Learning for Autonomous Vehicle Applications Mia, Md Jueal*; Amini, M. Hadi	
	•	An Empirical Analysis of Secure Federated Learning for Autonomous Vehicle Applications Mia, Md Jueal*; Amini, M. Hadi Optimizing Urban Charging Infrastructure for Electric Vehicles: A Data-Driven Approach to Boost Adoption and Reduce Costs	 Cross
9:45 a.m. 10:00 a.m.	73 318	An Empirical Analysis of Secure Federated Learning for Autonomous Vehicle Applications Mia, Md Jueal*; Amini, M. Hadi	Grand Station 3
9:45 a.m.	73	An Empirical Analysis of Secure Federated Learning for Autonomous Vehicle Applications Mia, Md Jueal*; Amini, M. Hadi Optimizing Urban Charging Infrastructure for Electric Vehicles: A Data-Driven Approach to Boost Adoption and Reduce Costs Hu, Hongyu*; Zhao, Dong Fine-Grained FHWA-13 Vehicle Classification: A Two-Stage Vision-Based Approach Integrating Semantic and Geometric Features with Verification Scheme Lu, Linjun; Dai, Fei*	
9:45 a.m. 10:00 a.m.	73 318	An Empirical Analysis of Secure Federated Learning for Autonomous Vehicle Applications Mia, Md Jueal*; Amini, M. Hadi Optimizing Urban Charging Infrastructure for Electric Vehicles: A Data-Driven Approach to Boost Adoption and Reduce Costs Hu, Hongyu*; Zhao, Dong Fine-Grained FHWA-13 Vehicle Classification: A Two-Stage Vision-Based Approach Integrating Semantic and Geometric Features with Verification Scheme	
9:45 a.m. 10:00 a.m. 10:15 a.m.	73 318 112	An Empirical Analysis of Secure Federated Learning for Autonomous Vehicle Applications Mia, Md Jueal*; Amini, M. Hadi Optimizing Urban Charging Infrastructure for Electric Vehicles: A Data-Driven Approach to Boost Adoption and Reduce Costs Hu, Hongyu*; Zhao, Dong Fine-Grained FHWA-13 Vehicle Classification: A Two-Stage Vision-Based Approach Integrating Semantic and Geometric Features with Verification Scheme Lu, Linjun; Dai, Fei* Performance Evaluation of Real-Time Object Detection for Electric Scooters Chen, Dong*; Hosseini Aliabad, Seyed Arman; Smith, Arik; Nikkhah, Amir Farzin; Heydarian, Arsalan; Shoghli, Omid; Campbell, Brad Visual Scene Inference	
9:45 a.m. 10:00 a.m. 10:15 a.m.	73 318 112 509	An Empirical Analysis of Secure Federated Learning for Autonomous Vehicle Applications Mia, Md Jueal*; Amini, M. Hadi Optimizing Urban Charging Infrastructure for Electric Vehicles: A Data-Driven Approach to Boost Adoption and Reduce Costs Hu, Hongyu*; Zhao, Dong Fine-Grained FHWA-13 Vehicle Classification: A Two-Stage Vision-Based Approach Integrating Semantic and Geometric Features with Verification Scheme Lu, Linjun; Dai, Fei* Performance Evaluation of Real-Time Object Detection for Electric Scooters Chen, Dong*; Hosseini Aliabad, Seyed Arman; Smith, Arik; Nikkhah, Amir Farzin; Heydarian, Arsalan; Shoghli, Omid; Campbell, Brad	
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9:45 a.m. 10:00 a.m. 10:15 a.m. 10:30 a.m. 11:00 a.m.	73 318 112 509 Al 197 179	An Empirical Analysis of Secure Federated Learning for Autonomous Vehicle Applications Mia, Md Jueal*; Amini, M. Hadi Optimizing Urban Charging Infrastructure for Electric Vehicles: A Data-Driven Approach to Boost Adoption and Reduce Costs Hu, Hongyu*; Zhao, Dong Fine-Grained FHWA-13 Vehicle Classification: A Two-Stage Vision-Based Approach Integrating Semantic and Geometric Features with Verification Scheme Lu, Linjun; Dai, Fei* Performance Evaluation of Real-Time Object Detection for Electric Scooters Chen, Dong*; Hosseini Aliabad, Seyed Arman; Smith, Arik; Nikkhah, Amir Farzin; Heydarian, Arsalan; Shoghli, Omid; Campbell, Brad Visual Scene Inference Open Vocabulary Multimodal Model (OVMM)-based Zero-Shot Method for Obtaining Broader Semantic Information from Construction Site Images LI, Haotian*; Tang, Llewellyn Prediction of Visual Quality of Streetscape Images Using Computer Vision lee, meesung*; hwang, sungjoo	Station 3
9:45 a.m. 10:00 a.m. 10:15 a.m. 10:30 a.m.	73 318 112 509 AI 197	An Empirical Analysis of Secure Federated Learning for Autonomous Vehicle Applications Mia, Md Jueal*; Amini, M. Hadi Optimizing Urban Charging Infrastructure for Electric Vehicles: A Data-Driven Approach to Boost Adoption and Reduce Costs Hu, Hongyu*; Zhao, Dong Fine-Grained FHWA-13 Vehicle Classification: A Two-Stage Vision-Based Approach Integrating Semantic and Geometric Features with Verification Scheme Lu, Linjun; Dai, Fei* Performance Evaluation of Real-Time Object Detection for Electric Scooters Chen, Dong*; Hosseini Aliabad, Seyed Arman; Smith, Arik; Nikkhah, Amir Farzin; Heydarian, Arsalan; Shoghli, Omid; Campbell, Brad Visual Scene Inference Open Vocabulary Multimodal Model (OVMM)-based Zero-Shot Method for Obtaining Broader Semantic Information from Construction Site Images LI, Haotian*; Tang, Llewellyn Prediction of Visual Quality of Streetscape Images Using Computer Vision	Station 3

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9:45 a.m.	559	Towards Digital Twins: Technology and Challenges in Bridge Information Modeling (BIM)	
	+	Hatami, Afshin*; Rosti, Firouz; Mabrich, Alex Exploring Digital Twin Applications: A Comprehensive Review and Future Directions through Maturity Models in the AECO Industry	-
10:00 a.m.	506	Elkabalawy, Moaaz A*; Zeynolabedini , Shima ; Han, SangHyeok O; Ma, Jong Won	Grand
10:15 a.m.	249	Towards Trustworthy Road Digital Twins: A State-of-the-art Review Lu, Linjun*; PAN, YUANDONG; Brilakis, Ioannis	Station 4
10:30 a.m.	605	Infrastructure Digital Twins: A Definition	
	BIM	Vick, Steven; Serano, Matthew; Mulholland, Sean M* Digital Twins in Action	
		Developing Digital Twins for Real-Time Bridge Structural Health Monitoring by Integrating Scan-to-BrIM Remote Sensing Technologies, Photogrammetry-based 3D	
11:00 a.m.	82	Scanning, Finite Element Modeling, and IoT Sensing Hu, Xi; Assaad, Rayan*; Ravishankar, Sanjay; Prakash, Saadhika; Lin, Jayden	
11:15 a.m.	535	Digital Twin Technologies in Predictive Maintenance: Enabling Transferability via Sim-to-Real and Real-to-Sim Transfer Ma, Sizhe*; Flanigan, Katherine; Bergés, Mario	- Grand
	+	Advancing Sound Level Localization through Innovative Integration and Fusion of Remote Sensing and Reality Captured LiDAR-based Digital Twins, Auditory Devices,	Station 4
11:30 a.m.	85	and IoT Technologies Poudel, Oscar; Assaad, Rayan*	
11:45 a.m.	386	Digital Twins in Construction: Leveraging Point Cloud Data and BIM for Monitoring Project Schedule	-
11.45 d.m.	BIM A	Alavi, Hamidreza*; WANG, MUDAN; Wang, Guangming; Kookalani, Soheila; Mathew, Alwyn; Brilakis, Ioannis Point Cloud Instance Segmentation	
2:00 p.m.	136	3D Instance Segmentation of Indoor Scenes Based on Point Cloud Neural Networks	
		Wang, Hongxu*; JiePeng, Liu; Chen, Tianze; Liu, Pengkun; Li, DongSheng; Zhou, Junwen A Deep Learning-Driven Framework for Efficient and Robust 3D Instance Segmentation	
2:15 p.m.	137	Chen, Tianze*; Wu, 91196010; Wang, Hongxu; JiePeng, Liu; Liu, Pengkun; Li, Dongsheng; Qi, Hongtuo	· -
2:30 p.m.	256	Complex Instance Segmentation in Point Clouds with Images and 3D Models Hu, Zhiqi*; PAN, YUANDONG; Brilakis, Ioannis; Borrmann, Andre	Grand
2:45 p.m.	172	Automated SCAN-to-BIM with Point Cloud Instance Segmentation and Large Language Model Knowledge Enhancement	Station 4
2.00	200	Liu, Pengkun; JiePeng, Liu; Wang, Hongxu; Chen, Tianze; Li, Dongsheng* Deep-learning Model for Multi-scale Construction Object Detection from 3D Sparse LiDAR	-
3:00 p.m.	208	Zhang, Mingyu; WANG, Lei; HAN, Shuai*	
3:15 p.m.	96	Leveraging Spatial Orientation of Extruded Profiles for Point Cloud Instance Segmentation and Instance Enrichment in Structural Systems Noichl, Florian*; Braun, Alex; Borrmann, André	
	BIM A	Inference in Point Clouds	
3:45 p.m.	270	An Integrated Solution for Automatic 3D Object-based Information Retrieval WEN, YA*; WANG, MUDAN; Ariyachandra, Mahendrini; Wang, Guangming; Brilakis, Ioannis; Xiao, Lizhao	_
4:00 p.m.	404	Object-level Temporal Change Detection on Construction Sites with 3D Deep Learning Models Rugg, Jeffrey; Chen, Jingdao*; Gugssa, Mikias W; Wang, Jun	•
4:15 p.m.	317	Experimental Evaluation of Building Façade Extraction Algorithm Using 3D Synthetic Point Clouds	Grand
4.15 p.III.	517	Han, Sisi*; Bai, Yong; Jiang, Yuhan Few-shot Bridge Component Recognition Using Point Cloud Data Based On Large-scale CV Model	Station 4
4:30 p.m.	297	CUI, Na*; JiePeng, Liu; Zeng, Yan	
4:45 p.m.	398	Bike Lane Width Estimation on LiDAR Point Cloud Using Dimensionality Reduction and Weakly Supervised Learning Wei, Chialing*; Gupta, Mohit; Eiris, Ricardo; Czerniawski, Thomas	
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30 July Tuesday	BIM	BIM Specialty Tools Testing the learning capabilities of Reinforcement Learning towards automated clash resolution	
9:45 a.m.	170	Harode, Ashit*; Thabet, Walid	
10:00 a.m.	324	Analyzing Attributes and Objectives of MEP Buildability Issue Descriptions: A Comparison of VR and non-VR Girgin, Simge*; Fruchter, Renate; Fischer, Martin	Grand
10:15 a.m.	121	Graph-based change propagation across BIM design software applications	Station 4
		Wang, Zijian*; Ying, Huaquan; Nyberg, Kim; Sacks, Rafael Virtual Design and Construction Time Study Schema Development	
		virtual besign and construction time study scrienta bevelopment	
10:30 a.m.	415	Borjigin, Orgil; Wu, Lingzi; Dossick, Carrie S*	
	BIM	Reality Capturing	
10:30 a.m.		Reality Capturing Preservation of Heritage Buildings through Digitization - Reality Capture of the Old Faithful Inn; An Overview of the Process, Potentials and Challenges. Olorunnishola, Ayoola; Zhang, Chengyi*; Kumar, Danish; Liu, Peng; Denzer, Anthony	
	BIM	Reality Capturing Preservation of Heritage Buildings through Digitization - Reality Capture of the Old Faithful Inn; An Overview of the Process, Potentials and Challenges.	 Grand
11:00 a.m.	BIM 321	Reality Capturing Preservation of Heritage Buildings through Digitization - Reality Capture of the Old Faithful Inn; An Overview of the Process, Potentials and Challenges. Olorunnishola, Ayoola; Zhang, Chengyi*; Kumar, Danish; Liu, Peng; Denzer, Anthony A Systems Framework for Examining Laser Scanning Adoption in Geometric Quality Assessment of Offsite Construction XU, Jiayi*; LIU, XINQI; Pan, Wei A 3D modeling approach based on UAV-captured low-light images	 Grand Station 4
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11:00 a.m. 11:15 a.m. 11:30 a.m. 11:45 a.m. 2:00 p.m. 2:15 p.m.	BIM 321 290 230 603 BIM 215 278	Reality Capturing Preservation of Heritage Buildings through Digitization - Reality Capture of the Old Faithful Inn; An Overview of the Process, Potentials and Challenges. Olorunnishola, Ayoola; Zhang, Chengyi*; Kumar, Danish; Liu, Peng; Denzer, Anthony A Systems Framework for Examining Laser Scanning Adoption in Geometric Quality Assessment of Offsite Construction XU, Jiayi*; LIU, XINQI; Pan, Wei A 3D modeling approach based on UAV-captured low-light images LIANG, Zhaolun*; LI, Haojia; WU, Hao; WONG, Kok Yiu; LIN, Fangzhou; LIANG, Zhenyu; CHENG, Jack Chin Pang Volume Estimation of Landslide Debris on Roadways Using UAVs and Structure from Motion Opanasopit, Chonnapat*; Louis, Joesph Digital Twins in Action Framework for Automated Assembly Quality Assessment of DfMA Modules using Augmented Reality-enabled Digital Twin (ARDT) LI, ZHIGANG*; Liang, Yuanchang; Chua, David K H Automated generation of geometric digital twin of roof for building retrofitting WANG, MUDAN*; WEN, YA; PAN, YUANDONG; Wang, Guangming; Alavi, Hamidreza; Kookalani, Soheila; Brilakis, Ioannis TailorAlert: Large Language Model-Based Personalized Alert Generation System for Road Infrastructure Management with Digital Twins Luo, Peihang*; Parn, Erika; Kookalani, Soheila; Brilakis, Ioannis A Framework of Managing Non-emergency Civic Services based on Digital Twinning and Crowdsourcing	
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9:45 a.m.	8	Earle, Gabriel*; Katsimpalis, Emmanouil; Byers, Brandon; Haas, Carl; Adey, Bryan; De Wolf, Catherine	
10:00 a.m.	572	Using Biophilic Illusions to Promote Nature Connectedness and Occupant Wellbeing in the Built Environment	Brighton
		Altaf, Basma*; Billington, Sarah Feasibility and Implications: Integrating Zero-Emission Vehicles into Power Grid in California	Brighton Room 1
10:15 a.m.	547	Talakoob, Amir; Hooshmand, Hooman ; Mohammadpour, Atefeh *	
10:30 a.m.	582	Prototype-wise Sensitivity Analysis of Urban Building Energy Simulation Surrogate Modeling Accuracy	
	R&S	Pan, Xiyu; Mohammadi, Neda; Taylor, John E.*; Xu, Yujie; Hong, Tianzhen Urban Design & Planning	
11:00 a.m.	234	Unifying Multi-Sector Stakeholder Value Systems in Resilience Planning through Reinforcement Learning and Network Analysis	
11.00 a.m.	234	Ren, Hang; Zhang, Lu*; Whetsell , Travis; Ganapati, N. Emel	
11:15 a.m.	228	Aligning early building design with urban planning requirements and sustainability indicators Maibaum, Jonas*; Napps, Daniel; König, Markus	Brighton
11:30 a.m.	167	Developing a data ecosystem of city-level digital twin for urban management use cases	Room 1
11.30 a.m.		Yan, Jiayi*; Lu, Qiuchen; Li, Nan; Pitt, Michael; Lin, Xuhui	
11:45 a.m.	173	Automated mass building dilapidation assessment by triangulating panoptic learnt defects with urban footprint Huang, Zihan*; Chen, Junjie; Lu, Weisheng	
	R&S	Infrastructure Systems	
2:00 p.m.	418	Link Prediction and Navigability of Multiplex Energy Networks	
		Kazim, Muhammad; pirim, harun*; Le, Chau; Le, Trung; Yadav, Om Leveraging Graph Attention Network Model for Adaptive Spatial Planning of Social Infrastructure	
2:15 p.m.	212	Guo, Ziyi; Wang, Yan*; Hao, Haiyan	
2:30 p.m.	540	Adaptive Sensing Reconfiguration for Cost-Effective Multi-Damage Monitoring of Civil Infrastructure	Duimbaaa
		Liu, Kaijian*; Xue, Ronghuan; Agha, Mohsen Leveraging Emerging Flood Modeling Methods and Infrastructure Designs for Land-Use Analysis: A Case Study in the Southeast Texas Region	Brighton Room 1
2:45 p.m.	97	Murphy, Sean*; Cheng, Chih-Shen; Passalacqua, Paola; Leite, Fernanda	
3:00 p.m.	500	Multi-source and multimodal data fusion for lifeline infrastructure resilience assessment and early warning Jin, Yunqiao; Duan, Tianle; Zhang, Hua; Li, Qingchun; Zhu, Jin*	
		Probabilistic Modeling of Infrastructure Reliability	
3:15 p.m.	586	Frank, Timothy*; Ankney, Alexander; Miller, Jacob; Watson, Bevan; Kim, Kayla; Henigin, Garrett; Mulholland, Sean M	
	R&S	Energy Management - Buildings, Occupants, and Infrastructure	
3:45 p.m.	95	Techno-economic analysis of building energy retrofits: integrating occupant behavior impacts Shu, Lei*; Dong, Zhao	
4·00 ~ ~	 577	Unveiling New Insights into Building Energy-saving Behavior: A Synthesis of the Theory of Planned Behavior and Stimulus-Organism-Response Framework	
4:00 p.m.	577	Gu, Zeyang; Wang, Qi*; Liu, Bingsheng; Li, Ling; Huo, Tengfei	
4:15 p.m.	158	Optimizing Building Energy Use Reduction: Integrating HVAC systems and Building Envelope through Sensitivity Analysis Xu, Chang*; Shu, Lei; Zhao, Dong	Brighton Room 1
4:20 n m	390	Advancing Power System Resilience: A Hybrid Empirical and Network Theory-Based Approach Using Historical Failure Data	1100111 1
4:30 p.m.	390	Moriyani, Muhammad Ali*; Le, Dr. Chau; Le, Dr. Trung; Yadav, Dr. Om Prakash; pirim, harun	
4:45 p.m.	63	Towards Unveiling the Interplay of Occupant Health, Comfort and Building Energy Consumption Brun, Antonin*; Awada, Mohamad; Becerik-Gerber, Burçin	
30 July Tuesday	R&S	Disaster and Climate Resilience	
9:45 a.m.	163	Development of A Gamified Training Platform for Improved Disaster Preparedness and Response in Developing Countries Thomas, Laura; Wang, Lufan*	
40.00		Short-term Disaster Impacts on Transportation Infrastructures: A Review of Emerging Technologies and Approaches	
10:00 a.m.	590	Dong, Beixuan; Wu, Lingzi; Li, Xinming*	Brighton
 			
10:15 a.m.	411	Using Low-Cost Consumer Grade Drones and Automated Image Analysis to Evaluate Disaster Recovery Progress	Room 1
		Perrucci, Daniel V*; Buitrago, German	
10:15 a.m. 10:30 a.m.	41	Perrucci, Daniel V*; Buitrago, German Automating Scenario Generation for Infrastructure Resilience in the Built Environment Luo, Linchao*; Cheng, Chih-Shen; Leite, Fernanda	
	41	Perrucci, Daniel V*; Buitrago, German Automating Scenario Generation for Infrastructure Resilience in the Built Environment Luo, Linchao*; Cheng, Chih-Shen; Leite, Fernanda Accessibility	
	41	Perrucci, Daniel V*; Buitrago, German Automating Scenario Generation for Infrastructure Resilience in the Built Environment Luo, Linchao*; Cheng, Chih-Shen; Leite, Fernanda	
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10:30 a.m.	41 R&S	Perrucci, Daniel V*; Buitrago, German Automating Scenario Generation for Infrastructure Resilience in the Built Environment Luo, Linchao*; Cheng, Chih-Shen; Leite, Fernanda Accessibility Estimating Spatial Accessibility of Public Chargers for Electric Vehicles Through Integrating Spatial Correlation and Dynamic Demand Factors Xie, Yuzheng*; Ji, Wenying Exploring Annotation Automation for Urban Landscape Accessibility Assessment Based on Simulated Neurophysiological Data Zhou, Xiaoshan*; Menassa, Carol C; Kamat, Vineet	 Brighton
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10:30 a.m. 11:00 a.m. 11:15 a.m.	41 R&S 266 360 53 142	Perrucci, Daniel V*; Buitrago, German Automating Scenario Generation for Infrastructure Resilience in the Built Environment Luo, Linchao*; Cheng, Chih-Shen; Leite, Fernanda Accessibility Estimating Spatial Accessibility of Public Chargers for Electric Vehicles Through Integrating Spatial Correlation and Dynamic Demand Factors Xie, Yuzheng*; Ji, Wenying Exploring Annotation Automation for Urban Landscape Accessibility Assessment Based on Simulated Neurophysiological Data Zhou, Xiaoshan*; Menassa, Carol C; Kamat, Vineet A Shared Autonomy based Wheelchair Navigation Stack considering User Preference and Control Xu, Yifan*; Wang, Qianwei; Kamat, Vineet; Menassa, Carol C Toward data-driven urban walkability: developing an empirical understanding of walking behavior and urban form Shoji, Kanaha*; Sonta, Andrew	 Brighton
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10:30 a.m. 11:00 a.m. 11:15 a.m. 11:30 a.m. 11:45 a.m. 2:00 p.m.	41 R&S 266 360 53 142 R&S 229 331	Perrucci, Daniel V*; Buitrago, German Automating Scenario Generation for Infrastructure Resilience in the Built Environment Luo, Linchao*; Cheng, Chih-Shen; Leite, Fernanda Accessibility Estimating Spatial Accessibility of Public Chargers for Electric Vehicles Through Integrating Spatial Correlation and Dynamic Demand Factors Xie, Yuzheng*; Ji, Wenying Exploring Annotation Automation for Urban Landscape Accessibility Assessment Based on Simulated Neurophysiological Data Zhou, Xiaoshan*; Menassa, Carol C; Kamat, Vineet A Shared Autonomy based Wheelchair Navigation Stack considering User Preference and Control Xu, Vifan*; Wang, Qianwei; Kamat, Vineet; Menassa, Carol C Toward data-driven urban walkability: developing an empirical understanding of walking behavior and urban form Shoji, Kanaha*; Sonta, Andrew Civil Infrastructure Intelligent Bridge Preservation Planning Leveraging Multi-Source Knowledge He, Weilin; He, Chuanni*; Liu, Min Evaluating Participant Gains in Federated Learning: A Case Study of Culvert Condition Prediction in Utah Mohammadi, Pouria*; Asgari, Sadegh; Rashidi, Abbas	 Brighton
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10:30 a.m. 11:00 a.m. 11:15 a.m. 11:30 a.m. 11:45 a.m. 2:00 p.m. 2:15 p.m. 2:30 p.m. 2:45 p.m.	41 R&S 266 360 53 142 R&S 229 331 336 454 561 65	Perrucci, Daniel V*; Buitrago, German Automating Scenario Generation for Infrastructure Resilience in the Built Environment Luo, Linchao*; Cheng, Chih-Shen; Leite, Fernanda Accessibility Estimating Spatial Accessibility of Public Chargers for Electric Vehicles Through Integrating Spatial Correlation and Dynamic Demand Factors Xie, Yuzheng*; Ji, Wenying Exploring Annotation Automation for Urban Landscape Accessibility Assessment Based on Simulated Neurophysiological Data Zhou, Xiaoshan*, Menassa, Carol C; Kamat, Vineet A Shared Autonomy based Wheelchair Navigation Stack considering User Preference and Control Xu, Yifan*; Wang, Qianwei; Kamat, Vineet; Menassa, Carol C Toward data-driven urban walkability: developing an empirical understanding of walking behavior and urban form Shoji, Kanaha*; Sonta, Andrew Civil Infrastructure Intelligent Bridge Preservation Planning Leveraging Multi-Source Knowledge He, Weilin; He, Chuanni*; Liu, Min Evaluating Participant Gains in Federated Learning: A Case Study of Culvert Condition Prediction in Utah Mohammadi, Pouria*; Asgari, Sadegh; Rashidi, Abbas Temporal and Spatial Dynamics of Pipeline Incident Frequencies and Causes: Implications for Risk Management Asaye, Lemlem Abebaw*; Le, Dr. Chau; Le, Dr. Trung; Yadav, Dr. Om Prakash; Le, Robert Examining the Characteristics of Public Response to Unforeseen Cascading Fuel Shortage: A Human Mobility-based Study Rahman, Md Ashiqur; Zhu, Runhe* Real-time chiller optimization in industrial plants based on data-driven load forecast with domain knowledge Lu, Siliang*; Liu, Pengkun Enhancing the Safety, Sustainability, and Efficiency of Airport Operations through Data-Driven Trajectory-Based Simulation and Optimization Wang, Yanyu; Xiong, Ruoxin; Tang, Pingbo*; Wang,	Brighton Room 1
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29 July Monday HCI Human-Building Interaction 9:45 a.m. Enhancing Human-Building Interaction by Integrating Wearable Physiological Sensors, Augmented Reality, and Smart IoT-enabled Sensing Dev Indoor Environment Experience Mohammadi, Mohsen; Assaf, Ghiwa; Assaad, Rayan*; Albeaino, Gilles 10:00 a.m. 491 LLM-Based Building Energy Management Assistants He, Tianzhi; Jazizadeh, Farrokh* 10:15 a.m. 26 A Framework for Investigating Smart Building and Occupant Behavior through Eye-Tracking Technology Han, Jinmog; Mo, Yunjeong* 10:30 a.m. 594 Towards Real-Time Occupant Behavior Monitoring System: A Preliminary Study on Integrating BIM, IoT Sensors, and BAS Chung, Jihoon*; Shelden, Dennis; Karlicek, Bob HCI Human Robot Collaboration ChatGPT Based Multimodal Virtual Reality Interface to Support Collaborative Human-Robot Construction Work	Room
Mohammadi, Mohsen; Assaf, Ghiwa; Assaad, Rayan*; Albeaino, Gilles 10:00 a.m. 491 LLM-Based Building Energy Management Assistants He, Tianzhi; Jazizadeh, Farrokh* 10:15 a.m. 26 A Framework for Investigating Smart Building and Occupant Behavior through Eye-Tracking Technology Han, Jinmog; Mo, Yunjeong* Towards Real-Time Occupant Behavior Monitoring System: A Preliminary Study on Integrating BIM, IoT Sensors, and BAS Chung, Jihoon*; Shelden, Dennis; Karlicek, Bob HCI Human Robot Collaboration ChatGPT Rased Multimodal Virtual Reality Interface to Support Collaborative Human-Robot Construction Work	
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Chung, Jihoon*; Shelden, Dennis; Karlicek, Bob HCI Human Robot Collaboration ChatGPT Based Multimodal Virtual Reality Interface to Support Collaborative Human-Robot Construction Work	
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Park, Somin*; Menassa, Carol C; Kamat, Vineet Gaze-enhanced and LLM-enabled System for Intuitive Human-Robot Collaboration	
11:15 a.m. 131 Liang, Xiaoyun; Cruz Rivera, Juan C; Cai, Jiannan*; Li, Shuai	Brighton
11:30 a.m. Advanced Semantic Understanding in Human-Robot Collaboration Using Fast-SAM You, Hengxu; Xu, Fang; Du, Eric*	Room 3
11:45 a.m. 106 Grounding Large Language Models in Robot Control: Facilitating Human-Robot Collaboration in Construction	
Zhao, Xiayu; Jebelli, Houtan*	
HCI Human Robot Collaboration Revolutionizing Human-Robot Collaboration in Construction: An Empirical Inquiry into the Role of Advanced Multi-finger Haptic Feedback wit	hin Immersive
2:00 p.m. 36 Environments	
Shayesteh, Shayan; Jebelli, Houtan* Haptic Augmentation System for Soft Object Manipulation in Construction Robot Teleoperation	
2:15 p.m. 162 Uthai, Thanakon; Zhou, Tianyu; Ye, Yang; You, Hengxu; Du, Eric*	
2:30 p.m. A mutual-cognitive human-robot collaboration framework to improve ergonomics in industrialized construction Fu, Yonglin*; Lu, Weisheng	Brighton
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3:00 p.m. 231 Scenario-based Human-Hobbit Collaboration (Intel Hamework for Collistraction Safety HSK Management lin, peng*; Zeng, Ningshuang; Li, Qiming; Nübel, Konrad	
3:15 p.m. Balancing Workload Assignment: A Parametric Approach to Standardizing Human-Robot Tasks in Industrialized Construction	
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withers, Jeremy W.*; Buibui, Tanyei	
4:00 p.m. Voice-assisted Al-Chatbot for Construction: Speech-to-Text Deep Learning Transformer trained with Synthetic Datasets Voice-assisted Al-Chatbot for Construction: Speech-to-Text Deep Learning Transformer trained with Synthetic Datasets Jung, Yoonhwa*; Golparvar-Fard, Mani	
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4:15 p.m. 88 Smart Cities Mohammadi, Mohsen; Assaf, Ghiwa; Assaad, Rayan*; Chang, Aichih (Jasmine); Albeaino, Gilles	Room 3
4:30 n m Wearable Technologies in Construction: Balancing Benefits, Privacy, and Security Concerns for Systematic Integration	
Znou, Wei; Esmaeili, Benzad; Hasanzaden, Sogand* Cognitive Impact of Augmented Reality in Teleoperation Environments	
4:45 p.m. 598 AN, MINGI*; Park, Moonseo; Ahn, Changbum	
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30 July Tuesday HCI Human Technology Interaction Out Care 100 Deciphering Al Decision-Making: A Generalizable Framework of Human-Al Misalignment	l
Du, Eric*; Ye, Yang; You, Hengxu; Wu, Jiahao; Sun, Bowen	
Identification of challenges and benefits of different human-technology interaction modalities for human-centered development of technology in	
Halder, Srijeet*; Afsari, Kereshmeh	Brighton Room 3
10:15 a.m. Impact of Four-legged Robot Proxemics on Risk Perception and Situational Awareness Among Construction Individuals Albeaino, Gilles*; Jeelani, Idris; Gheisari, Masoud; Issa, Raja R. A.	
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Al Data-driven Methods for Built Environment Investigating Role of Personal Factors in Shaping Responses to Active Shooter Incidents using Machine Learning	
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3:45 p.m. Enhancing data security and screening equity in construction recruitment via Blockchain-based automatic digital resume generation with BIM Dong, Yaxian; Hu, Yuqing*; Zhan, Zijun; Doe, Daniel Mawunyo; Han, Zhu	and Ai techniques
4:00 n m 579 Utilizing Large Language Models for Data Extraction from Construction Contracts: a Pathway to Generating Blockchain-Based Smart Contracts	
Moayyed, Erfan*; Anumba, Chimay Improving Data and Process Management for Digital Twins: A Smart Contract-Driven Solution Integrating CDE and Blockchain for the Construct	ction Industry Brighton
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4:15 p.m. /5 Ye, Xuling*, Liu, Liu; König, Markus	
4:15 p.m. /5 Ye, Xuling*; Liu, Liu; König, Markus 4:30 p.m. 345 A Work Package-based Carbon-Reduction-Incentive Payment System Using Blockchain	
4:15 p.m. 75 Ye, Xuling*; Liu, Liu; König, Markus 4:30 p.m. 345 A Work Package-based Carbon-Reduction-Incentive Payment System Using Blockchain WANG, Juan*; LI, Xiao Enhancing User-Participatory Processes in Road Payement Defect Management through Blockchain Integration	······
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2.15 p.m. 22 Okunola, Akinwale Samuel, Adolabi, Adedeji, Akanmu, Abosede A*; Jebelli, Houtan 2.15 p.m. 22 Understanding the Impact of an Exoselection System On Metabolic Cost of Workers During Common Repetitive Construction Tasks Ojha, Amit; Gautam, Yogesh; Zhao, Xiayu; Shariffronia, Ali; Jebelli, Houtan* 2.30 p.m. 529 Effect of Acthe Back-Support Exoselection on Muscular Loading Uning Construction Work Afolabi, Adedeji; Okunola, Akinwale Samuel; Yusuf, Anthony O, Akammu, Abosede A*; Jebelli, Houtan 3.00 p.m. 487 Assessment of a Passive Boulder-Support Exoselection for a Smulated Overhead Construction Work Afolabi, Adedeji; Yusuf, Anthony O, Akammu, Abosede A*; Jebelli, Houtan 3.15 p.m. 164 A Triangulated Study on Carperners' Adoption of Exoselection for a Smulated Overhead Construction Work Afolabi, Adedeji; Yusuf, Anthony O, Akammu, Abosede A* 3.15 p.m. 31 Gautam Construction Work Afolabi, Adedeji; Yusuf, Anthony O, Akammu, Abosede A* 4.10 p.m. 322 Retrieved Construction Work Afolabi, Adedeji; Yusuf, Anthony O, Akammu, Abosede A* 4.10 p.m. 322 Manual Retrieved Construction Work Afolabi, Adedeji; Yusuf, Anthony O, Akammu, Abosede A* 4.10 p.m. 322 Manual Retrieved Augustian for Agramma Construction Worker Well-being 4.10 p.m. 322 Manual Retrieved Augustian for Agramma Interface on occupant well-being; A estimated Overhead Construction Worker Well-being 4.10 p.m. 322 Manual Retrieved Augustian for Methods Agramma Me	11:15 a.m. 11:30 a.m.	437 152	Li, Fangxiao*; Leicht, Robert Intelligent "Wingman": Enhancing Visual Awareness in Robotic Construction Processes Xu, Jia; Dixit, Manish; Wang, Xi* Developing Process Models for Semi-Autonomous Construction Robot Assessment Wang, Ziyi*; Leicht, Robert Rethinking building design for an era of mass robotization: A robot-minded space planning analysis enabled by IFC-represented RoboAvatar	Ellwood
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3:15 p.m. 164 A Triangulated Study on Carpenters' Adoption of Exoskeletons in the Northwest Indiana and Chicago Area Zhang, Cheng*, Cardamone-Rayner, Raphael Sak B Built Environment Well-being 3:45 p.m. 31 Retrieval Augmented Generation (RAG) based Personalized Feedback for Construction Worker Well-being Gautam, Yogesh; Jebelli, Houtan* 7 January 1988 4:00 p.m. 322 Impact of workspace environmental features on occupant well-beings. A naturalistic pilot study Xu, Jiaxuan*, Tavakoli, Arash; Jörke, Matthew J; Ruth, Parker; Vainio, Niklas; Schmiedmayer, Paul; Jain, Sneha; Landay, James; Billington, Sarah Introducing a Surge-Based Conceptual Framework and Physical Layout Considerations for Addressing Respiratory Crisis Events in Hospitals Abdolahradeh, Golnoosh*; Lather, Jennifer I Araber Abdolahradeh, Golnoosh*; Lather, Jennifer I Phomas, Michael; Ilu, zhangding; Mohammadi, Neda; Taylor, John E.* Parliminary Investigation for Understanding Temperature's Associations with Office Workers' Psychological Well-Being: A Close Look into Anxiety, Motivation and Concentration Seyedrezael, Mirmahdi*; Becerik-Gerber, Burcin, Roll, Shawn; Lucas, Gale 31. July Wednesday A Data-Driven Construction Management Activity Recognition Through Hybrid CNN-Based Data Fusion Mohammadi, Abbas*; Golazad, SeyedeZahra; Rashidi, Abbas Anxiery Concentration SeyedeZahra; Rashidi, Abbas Factors Affecting Rowiedge Ruse in Project-Based Organizations: A Perspective from Knowledge Characteristics and Project Similarity Yangaphi*, Yufe, Hongshe, WANG, Kisowel Understanding Laser Pointer-Guided Spatial Instruction in Collaboration with Construction Robots Lee, Chaeeum*, Yoon, Sungboo, Park, Moonseo; Ahn, Changbum Bridge Structural Health Monitoring Computer Vision-based Defet Detection and Evaluation for Automatic Inspection and Condition Rating of Concrete Bridges Sun, Zhe*; Liu, University Management Management Projects in Project Simplement Projects in Project Simplement Projects in Addition Project Simplement Project Projects in Addition Projec	11:15 a.m. 11:30 a.m. 11:45 a.m. 2:00 p.m. 2:15 p.m.	437 152 201 S&H 532 22 529	Li, Fangxiao*; Leicht, Robert Intelligent "Wingman": Enhancing Visual Awareness in Robotic Construction Processes Xu, Jia; Dixit, Manish; Wang, Xi* Developing Process Models for Semi-Autonomous Construction Robot Assessment Wang, Ziyi*; Leicht, Robert Rethinking building design for an era of mass robotization: A robot-minded space planning analysis enabled by IFC-represented RoboAvatar Chen, Junjie*; Lu, Weisheng; Liu, Hengzhi Exoskeleton for Worker Support Exoskeleton Fall Risk Assessment: A Study of Peak Pressure and Foot Regions Okunola, Akinwale Samuel; Afolabi, Adedeji; Akanmu, Abosede A*; Jebelli, Houtan Understanding the Impact of an Exoskeleton System On Metabolic Cost of Workers During Common Repetitive Construction Tasks Ojha, Amit; Gautam, Yogesh; Zhao, Xiayu; Sharifironizi, Ali; Jebelli, Houtan*; Martin, Anne Effect of Active Back-Support Exoskeleton on Muscular Loading During Construction Work Afolabi, Adedeji; Okunola, Akinwale Samuel; Yusuf, Anthony O; Akanmu, Abosede A*; Jebelli, Houtan Neuro-Muscular Assessment of Exoskeleton Use: A Correlation between Physiological, Psychological, and Subjective Evaluation Measures	
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4:00 p.m. 322 Impact of workspace environmental features on occupant well-being: A naturalistic pilot study Xu, Jiaxuan*, Tavakoli, Arash, Jörke, Matthew J; kuh, Parker, Vainio, Niklas, Schmiedmayer, Paul; Jain, Sneha; Landay, James; Billington, Sarah Introducing a Surge-Based Conceptual Framework and Physical Layout Constitutions for Addressing Respiratory Crisis Events in Hospitals Abdolahradeh, Golnoosh*, Lather, Jennifer I Parameter Adjustment for Mechanistic Epidemiological Models of COVID-19: Controlling for the Impact of Metro Area Crowding Thomas, Michael; liu, zhangding; Mohammadi, Neda; Taylor, John E.* 4:45 p.m. 39 A Preliminary Investigation for Understanding Temperature's Associations with Office Workers' Psychological Well-Being: A Close Look into Anxiety, Motivation and Concentration Seyedrezael, Mirmaholi*; Becerik-Gerber, Burcin; Roll, Shawn; Lucas, Gale 31. July Wednesday Al Data-Driven Construction Management 51. Enhancing Construction Equipment Activity Recognition Through Hybrid CNN-Based Data Fusion Mohammadi, Abbas*, Golazad, Seyede/Zahra; Rashidi, Abbas 10:00 a.m. 315 Factors Affecting Knowledge Reuse in Project-Based Organizations: A Perspective from Knowledge Characteristics and Project Similarity Yan, Yangshi*; YUE, Hongshe; WANG, Xiaowei Dynamic Allocation of Unionized Skilled Trades in Multi-Project Reactive Scheduling Context: Uber-Inspired Application Framework 10:15 a.m. 597 Understanding Laser Pointer-Guided Spatial Instruction in Collaboration with Construction Robots Lee, Chaeeum.*; Yoon, Sungbook, Park, Moonsoc, Ann. Changbum 11:00 a.m. 301 Sing Structural Health Monitoring 11:00 a.m. 303 Sun, Zhe*; Li, Junbo; Wang, Guangming; Liu, Zhansheng 11:15 a.m. 303 Sun, Zhe*; Li, Junbo; Wang, Guangming; Liu, Zhansheng, Wang, Guangming; Wang, Tianlel 11:30 a.m. 305 A Digital Twin-based Framework for Intelligent Operation and Maintenance of Urban Bridges 500 Sun, Zhe*; Liu, Shengyao; Liu, Zhansheng, Wang, Guangming; Wang, Tianlel	11:15 a.m. 11:30 a.m. 11:45 a.m. 2:00 p.m. 2:15 p.m. 2:30 p.m. 2:45 p.m.	437 152 201 S&H 532 22 529 549 487 164	Li, Fangxiao*; Leicht, Robert Intelligent "Wingman": Enhancing Visual Awareness in Robotic Construction Processes Xu, Jia; Dixti, Manish; Wang, Xi* Developing Process Models for Semi-Autonomous Construction Robot Assessment Wang, Ziyi*; Leicht, Robert Rethinking building design for an era of mass robotization: A robot-minded space planning analysis enabled by IFC-represented RoboAvatar Chen, Junjie*; Lu, Weisheng; Liu, Hengzhi Exoskeleton for Worker Support Exoskeleton Fall Risk Assessment: A Study of Peak Pressure and Foot Regions Okunola, Akinwale Samuel; Afolabi, Adedeji; Akanmu, Abosede A*; Jebelli, Houtan Understanding the Impact of an Exoskeleton System On Metabolic Cost of Workers During Common Repetitive Construction Tasks Ojha, Amit; Gautam, Yogesh; Zhao, Xiayu; Shariffronizi, Ali; Jebelli, Houtan*; Martin, Anne Effect of Active Back-Support Exoskeleton on Muscular Loading During Construction Work Afolabi, Adedeji; Okunola, Akinwale Samuel; Yusuf, Anthony O; Akanmu, Abosede A*; Jebelli, Houtan Neuro-Muscular Assessment of Exoskeleton Use: A Correlation between Physiological, Psychological, and Subjective Evaluation Measures Yusuf, Anthony O; Okunola, Akinwale Samuel; Afolabi, Adedeji; Akanmu, Abosede A*, Jebelli, Houtan Assessment of a Passive Shoulder-Support Exoskeleton for a Simulated Overhead Construction Work Afolabi, Adedeji; Yusuf, Anthony O; Akanmu, Abosede A* A Triangulated Study on Carpenters' Adoption of Exoskeletons in the Northwest Indiana and Chicago Area Zhang, Cheng*; Cardamone-Rayner, Raphael	
4:15 p.m. 554 Introducing a Surge-Based Conceptual Framework and Physical Layout Considerations for Addressing Respiratory Crisis Events in Hospitals Abdolahzadeh, Golnoosh*; Lather, Jennifer I Ellwood Hadden Framework and Physical Layout Considerations for Addressing Respiratory Crisis Events in Hospitals Abdolahzadeh, Golnoosh*; Lather, Jennifer I Ellwood Parameter Adjustment for Mechanistic Epidemiological Models of COVID-19: Controlling for the Impact of Metro Area Crowding Thomas, Michaej Iliu, Jahagding, Modamandi, Neda; Taylor, John E.* A Preliminary Investigation for Understanding Temperature's Associations with Office Workers' Psychological Well-Being: A Close Look into Anxiety, Motivation and Concentration Seyedrezaei, Mirmahdi*; Becerik-Gerber, Burcin; Roll, Shawn; Lucas, Gale 31 July Wednesday Al Data-Driven Construction Management Enhancing Construction Equipment Activity Recognition Through Hybrid CNN-Based Data Fusion Mohammadi, Abbas*; Golazad, SeyedeZahra; Rashidi, Abbas 10:00 a.m. 320 Factors Affecting Knowledge Reuse in Project-Based Organizations: A Perspective from Knowledge Characteristics and Project Similarity Yan, Nargahit; YuE, Hongzher, WANG, Xiaowei Dynamic Allocation of Unionized Skilled Trades in Multi-Project Reactive Scheduling Context: Uber-Inspired Application Framework Ge, Xiaoteng; Bayesteh, All; Liu, Ming*, Mohamed, Yasser 10:30 a.m. 597 Understanding Laser Pointer-Guided Spatial Instruction in Collaboration with Construction Robots Lee, Chaeeun*, Yoon, Sungboo; Park, Moonseo; Ahn, Changbum 11:00 a.m. 301 Computer Vision-Based Defect Detection and Evaluation for Automatic Inspection and Condition Rating of Concrete Bridges Sun, Zhe*, Liu, Junbo; Wang, Guangming; Liu, Zhansheng 11:10 a.m. 303 Impact Analysis of Spatiotemporal Data Processing Parameteres on Bridge Deformation Detection Sun, Zhe*, Liu, Pinyago, Meng, Xiaolin; Bao, Xiao, Hya, Liu, Lingling A. Digital Twin-based Framework for Intelligent Operation and Maintenance of Urban Bridges Sun, Zhe*, Liu, Pinyago, Me	11:15 a.m. 11:30 a.m. 11:45 a.m. 2:00 p.m. 2:15 p.m. 2:30 p.m. 2:45 p.m. 3:00 p.m.	437 152 201 S&H 532 22 529 549 487 164 S&H	Li, Fangxiao*; Leicht, Robert Intelligent "Wingman*: Enhancing Visual Awareness in Robotic Construction Processes Xu, Jia; Dixit, Manish; Wang, Xi* Developing Process Models for Semi-Autonomous Construction Robot Assessment Wang, Ziyi*; Leicht, Robert Rethinking building design for an era of mass robotization: A robot-minded space planning analysis enabled by IFC-represented RoboAvatar Chen, Junjie*; Lu, Weisheng; Liu, Hengzhi Exoskeleton for Worker Support Exoskeleton for Worker Support Exoskeleton fall Risk Assessment: A Study of Peak Pressure and Foot Regions Okunola, Akinwale Samuel; Afolabi, Adedeji; Akanmu, Abosede A*; Jebelli, Houtan Understanding the Impact of an Exoskeleton System On Metabolic Cost of Workers During Common Repetitive Construction Tasks Ojha, Amit; Gautam, Yogesh; Zhao, Xiayu; Sharifironizi, Ali; Jebelli, Houtan*; Martin, Anne Effect of Active Back-Support Exoskeleton on Muscular Loading During Construction Work Afolabi, Adedeji; Okunola, Akinwale Samuel; Yusuf, Anthony O; Akanmu, Abosede A*; Jebelli, Houtan Neuro-Muscular Assessment of Exoskeleton Use: A Correlation between Physiological, Psychological, and Subjective Evaluation Measures Yusuf, Anthony O; Okunola, Akinwale Samuel; Afolabi, Adedeji; Akanmu, Abosede A*, Jebelli, Houtan Assessment of a Passive Shoulder-Support Exoskeleton for a Simulated Overhead Construction Work Afolabi, Adedeji; Yusuf, Anthony O; Akanmu, Abosede A* A Triangulated Study on Carpenters' Adoption of Exoskeletons in the Northwest Indiana and Chicago Area Zhang, Cheng*; Cardamone-Rayner, Raphael Built Environment Well-Being Retrieval Augmented Generation (RAG) based Personalized Feedback for Construction Worker Well-Being	
4:15 p.m. 594 Abdolahzadeh, Golnoosh*; Lather, Jennifer I Ellwood 4:30 p.m. 576 Parameter Adjustment for Mechanistic Epidemiological Models of COVID-19: Controlling for the Impact of Metro Area Crowding Thomas, Michael; liu, zhangding; Mohamadi, Neda; Taylor, John E.* 4:45 p.m. 39 A Preliminary Investigation for Understanding Temperature's Associations with Office Workers' Psychological Well-Being: A Close Look into Anxiety, Motivation and Concentration Seyedrezaei, Mirmahdi*; Becerik-Gerber, Burcin; Roll, Shawn; Lucas, Gale 31 July Wednesday Al Data-Driven Construction Management Enhancing Construction Equipment Activity Recognition Through Hybrid CNN-Based Data Fusion Mohammadi, Abbas*; Golazad, SeyedezZahra; Rashidi, Abbas 10:00 a.m. 310 Factors Affecting Knowledge Reuse in Project-Based Organizations: A Perspective from Knowledge Characteristics and Project Similarity Yan, Angghir, YuE, Hongshe; WANG, Xiaowei Pyra, Nangghir, YuE, Hongshe; Wand, Yasser Understanding Laser Pointer-Guided Spatial Instruction in Collaboration with Construction Robots Lee, Chaeeun*; Yoon, Sungboo, Park, Moonseo; Ahn, Changbum 11:00 a.m. 301 Computer Vision-based Defect Detection and Evaluation for Automatic Inspection and Condition Rating of Concrete Bridges Sun, Zhe*; Li, Junbo; Wang, Guangming; Liu, Zhansheng Impact Analysis of Spatiotemporal Data Processing Parameteres on Bridge Deformation Detection Sun, Zhe*; Liu, Dirnyo; Meng, Jiaolin; Bao, Yan; Hu, Lingliang Hethod for Spatiotemporal Data-based Crack Detection of Concrete Structures 11:10 a.m. 305 Nur, Zhe*; Liu, Shengyao; Liu, Zhansheng; Wang, Guangming; Wang, Tianlei Human-in-the-loop Process Modeling using Formal Method for Spatiotemporal Data-based Crack Detection of Concrete Structures	11:15 a.m. 11:30 a.m. 11:45 a.m. 2:00 p.m. 2:15 p.m. 2:30 p.m. 2:45 p.m. 3:00 p.m. 3:15 p.m.	437 152 201 S&H 532 22 529 549 487 164 S&H 31	Li, Fangxiao*; Leicht, Robert Intelligent "Wingman*: Enhancing Visual Awareness in Robotic Construction Processes Xu, Jia; Dixit, Manish; Wang, Xi* Developing Process Models for Semi-Autonomous Construction Robot Assessment Wang, Ziyi*; Leicht, Robert Rethinking building design for an era of mass robotization: A robot-minded space planning analysis enabled by IFC-represented RoboAvatar Chen, Junjie*; Lu, Weisheng; Liu, Hengzhi Exoskeleton For Worker Support Exoskeleton Fall Risk Assessment: A Study of Peak Pressure and Foot Regions Okunola, Akinwale Samuel; Afolabi, Adedeji; Akanmu, Abosede A*; Jebelli, Houtan Understanding the Impact of an Exoskeleton System On Metabolic Cost of Workers During Common Repetitive Construction Tasks Ojha, Amit; Gautam, Yogesh; Zhao, Xiayu; Sharifironizi, Ali; Jebelli, Houtan*, Martin, Anne Effect of Active Back-Support Exoskeleton on Muscular Loading During Construction Work Afolabi, Adedeji; Okunola, Akinwale Samuel; Yusuf, Anthony O; Akanmu, Abosede A*; Jebelli, Houtan Neuro-Muscular Assessment of Exoskeleton Use: A Correlation between Physiological, Psychological, and Subjective Evaluation Measures Yusuf, Anthony O; Okunola, Akinwale Samuel; Afolabi, Adedeji; Akanmu, Abosede A*; Jebelli, Houtan Assessment of a Passive Shoulder-Support Exoskeleton Texoskeleton Use: A Correlation between Physiological, Psychological, and Subjective Evaluation Measures Yusuf, Anthony O; Okunola, Akinwale Samuel; Afolabi, Adedeji; Akanmu, Abosede A*; Jebelli, Houtan Assessment of a Passive Shoulder-Support Exoskeleton in the Northwest Indiana and Chicago Area Zhang, Cheng*; Cardamone-Rayner, Raphael Built Environment Well-being Retrieval Augmented Generation (RAG) based Personalized Feedback for Construction Worker Well-being Gautam, Yogesh; Jebelli, Houtan* Impact of workspace environmental features on occupant well-being: A naturalistic pilot study	
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4:45 p.m. 39 Concentration Seyedrezaei, Mirmahdi*; Becerik-Gerber, Burcin; Roll, Shawn; Lucas, Gale 31 July Wednesday Al Data-Driven Construction Management 9:45 a.m. 315 Enhancing Construction Equipment Activity Recognition Through Hybrid CNN-Based Data Fusion Mohammadi, Abbas*; Golazad, Seyedez Aira; Rashidi, Abbas 10:00 a.m. 320 Factors Affecting Knowledge Reuse in Project-Based Organizations: A Perspective from Knowledge Characteristics and Project Similarity Yan, Yangzhi*; YUE, Hongzhe; WANG, Xiaowei 10:15 a.m. 157 Dynamic Allocation of Unionized Skilled Trades in Multi-Project Reactive Scheduling Context: Uber-Inspired Application Framework Ge, Xiaotengi, Bayesteh, Ali; Lu, Ming*; Mohamed, Yasser 10:30 a.m. 597 Understanding Laser Pointer-Guided Spatial Instruction in Collaboration with Construction Robots Lee, Chaeeun*; Yoon, Sungboo; Park, Moonseo; Ahn, Changbum 11:00 a.m. 301 Sun, Zhe*; Li, Junbo; Wang, Guangming; Liu, Zhansheng Impact Analysis of Spatiotemporal Data Processing Parameteres on Bridge Deformation Detection Sun, Zhe*; Liu, Pinyao; Meng, Xiaolin; Bao, Yan; Hu, Liangliang 11:30 a.m. 305 A Digital Twin-based Framework for Intelligent Operation and Maintenance of Urban Bridges Sun, Zhe*; Liu, Pinyao; Liu, Zhansheng; Wang, Guangming; Wang, Guangming; Wang, Guangming; Wang, Guangming; Wang, Guangming; Wang, Tianlei 11:45 a.m. 300 Human-in-the-loop Process Modeling using Formal Method for Spatiotemporal Data-based Crack Detection of Concrete Structures	11:15 a.m. 11:30 a.m. 11:45 a.m. 2:00 p.m. 2:15 p.m. 2:30 p.m. 3:00 p.m. 3:15 p.m. 3:45 p.m.	437 152 201 S&H 532 22 529 549 487 164 S&H 31	Li, Fangxiao*; Leicht, Robert Intelligent "Wingman": Enhancing Visual Awareness in Robotic Construction Processes Xu, Jia; Dixit, Manish; Wang, Xi* Developing Process Models for Semi-Autonomous Construction Robot Assessment Wang, Ziyi*; Leicht, Robert Rethinking building design for an era of mass robotization: A robot-minded space planning analysis enabled by IFC-represented RoboAvatar Chen, Junjie*; Lu, Weisheng; Liu, Hengzhi Exoskeleton for Worker Support Exoskeleton Fall Risk Assessment: A Study of Peak Pressure and Foot Regions Okunola, Akinwale Samuel; Afolabi, Adedeji; Akanmu, Abosede A*; Jebelli, Houtan Understanding the Impact of an Exoskeleton System On Metabolic Cost of Workers During Common Repetitive Construction Tasks Ojha, Amit; Gautam, Yogesh; Zhao, Xiayu; Sharifironizi, Ali; Jebelli, Houtan*; Martin, Anne Effect of Active Back-Support Exoskeleton on Muscular Loading During Construction Work Afolabi, Adedeji; Okunola, Akinwale Samuel; Yusuf, Anthony O; Akanmu, Abosede A*; Jebelli, Houtan Neuro-Muscular Assessment of Exoskeleton Use: A Correlation between Physiological, Psychological, and Subjective Evaluation Measures Yusuf, Anthony O; Okunola, Akinwale Samuel; Afolabi, Adedeji; Akanmu, Abosede A*; Jebelli, Houtan Assessment of a Passive Shoulder-Support Exoskeleton for a Simulated Overhead Construction Work Afolabi, Adedeji; Yusuf, Anthony O; Akanmu, Abosede A* A Triangulated Study on Carpenters' Adoption of Exoskeletons in the Northwest Indiana and Chicago Area Zhang, Cheng*; Cardamone-Rayner, Raphael Built Environment Well-being Retrieval Augmented Generation (RAG) based Personalized Feedback for Construction Worker Well-being Gautam, Yogesh; Jebelli, Houtan* Impact of workspace environmental features on occupant well-being: A naturalistic pilot study Xu, Jiaxuan*; Tavakoli, Arash; Jörke, Matthew); Ruth, Parker; Vainio, Niklas; Schmiedmayer, Paul, Jain, Sneha; Landay, James; Billington, Sarah Introducing a Surge-Based Conceptual Framework and Physical Layout Considerations for Addressing Re	Ellwood
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11:10 a.m. 301 Sun, Zhe*; Li, Junbo; Wang, Guangming; Liu, Zhansheng Impact Analysis of Spatiotemporal Data Processing Parameteres on Bridge Deformation Detection Sun, Zhe*; Liu, Pinyao; Meng, Xiaolin; Bao, Yan; Hu, Liangliang Ellwood 11:30 a.m. 305 A Digital Twin-based Framework for Intelligent Operation and Maintenance of Urban Bridges Sun, Zhe*; Liu, Shengyao; Liu, Zhansheng; Wang, Guangming; Wang, Tianlei Human-in-the-loop Process Modeling using Formal Method for Spatiotemporal Data-based Crack Detection of Concrete Structures	11:15 a.m. 11:30 a.m. 11:45 a.m. 2:00 p.m. 2:15 p.m. 2:30 p.m. 2:45 p.m. 3:00 p.m. 3:45 p.m. 4:00 p.m. 4:30 p.m. 4:30 p.m. 4:30 p.m. 10:15 a.m.	437 152 201 S&H 532 22 529 549 487 164 S&H 31 322 554 576 39 All 315 320 157	Li, Fangysiao*; Leicht, Robert Intelligent "Mingman". Enhancing Visual Awareness in Robotic Construction Processes Xu, Jia; Dixit, Manish; Wang, Xi* Developing Process Models for Semi-Autonomous Construction Robot Assessment Wang, Ziyi*. Licht, Robert Rethniking building design for an era of mass robotization: A robot-minded space planning analysis enabled by IFC-represented RoboAvatar Chen, Junipe**, Liu, Weisheng; Iiu, Hengzhi Exoskeleton for Worker Support Exoskeleton fall Risk Assessment: A Study of Peak Pressure and Foot Regions Okunola, Akinwale Samuel; Afolabi, Adedeji; Akanmu, Abosede A*; Jebelli, Houtan Understanding the Impact of an Exoskeleton System On Metabolic Cost of Workers During Common Repetitive Construction Tasks Okho, Amit, Gautam, Yogesh; Zhao, Xiayu; Shariffoniai, Ali; Jebelli, Houtan "Martin, Anne Effect of Active Back-Support Exoskeleton on Muscular Loading During Construction Work Afolabi, Adedejic (Nunola, Akinwale Samuel; Visual, Anthony O; Akanmu, Abosede A*; Jebelli, Houtan Neuro-Muscular Assessment of Exoskeleton Use: A Correlation between Physiological, Psychological, and Subjective Evaluation Measures Yusuf, Anthony O; Okunola, Akinwale Samuel; Visual, Anthony O; Akanmu, Abosede A*; Jebelli, Houtan Neuro-Muscular Assessment of Exoskeleton Use: A Correlation between Physiological, Psychological, and Subjective Evaluation Measures Yusuf, Anthony O; Okunola, Akinwale Samuel; Akinwale Samuel; Akanmue, Abosede A*; Jebelli, Houtan Assessment of a Passive Shoulder-Support Exoskeleton for a Simulated Overhead Construction Work Afolabi, Adedeji; Yusuf, Anthony O; Akanmu, Abosede A*; Jebelli, Houtan Assessment of Cardenone-Rayner, Raphael Buil Environment Well-being Retrieval Augmented Generation (RAG) based Personalized Feedback for Construction Worker Well-being Retrieval Augmented Generation (RAG) based Personalized Feedback for Construction Worker Well-being Retrieval Augmented Generation (RAG) Based Personalized Feedback for Construction Feedback for Construction Respiratory Crisis	Ellwood
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2:30 p.m. 371 Simulation-based lot size comparison for production planning in lean modular integrated construction manufacturing yazuropage*; Lu, Weisheng 24:45 p.m. 370 An Optimization-based Trajectory Planning Method for Automated Module Lifting in Modular Integrated Construction 2HANG, Oligi*; PAN, Wei; HUANG, Ruopan; Zhinga, Zhingian 2HANG, Oligi*; PAN, Wei; HUANG, Ruopan; Zhinga, Zhingian 2HANG, Oligi*; PAN, Wei; HUANG, Ruopan; Zhinga, Zhingian 2HANG, Oligi*; Pan, Wei 33:30 Distriction Modular Construction bought of Construction Williams and Constructio	2:15 p.m.	154	Cao Jianneng* Said Hisham Hall Daniel	
2.45 p.m. 370 Another in Continuation Seasor Trajectory Planning Method for Automated Module Lifting in Modular Integrated Construction 2HANG, Qiqi; PAN, Wei; HUANG, Ruopan, Zhang, Zhiqian Shafin Panhaning Modular Construction Supply Chain Resilience by Disruption-Aware Buffer Zone Planning DONG, Zhiming*; Liu, Weisheng DONG, Zhiming*; Liu, Xiao, Weisheng Dong, Plandsi, Jiu, Weisheng Dong, Ribadi, Jiu, Haoming, Zhiqian, Qiqi Alaba Porduction Histories Dong, Miaosi; Xiong, Ruoxin; Tang, Pingbo*; Akinci, Burcu 31 July Wednesday Vis Innovation in Structures 9:45 a.m. 27 Another Shiming*; Pingbo*; Akinci, Burcu 31 July Wednesday Vis Innovation in Structures 9:45 a.m. 27 Another Shiming*; Pingbo*; Akinci, Burcu 10:00 a.m. 45 Nodellan, Schellar*; Pann, Erika; Birlakis, Ioannis; Luo, Pehang; Alavi, Hamidreza; WANG, MUDAN 10:15 a.m. 48 Shiming*; Ping method for overlapping finite element meshes in design support systems Nodelland Shiming*; Pann, Erika; Birlakis, Ioannis; Luo, Pehang; Pannis; Pannis; Pannis; Pannis; Pannis; Pannis; Pannis; Pan	2·30 n m	371	Simulation-based lot size comparison for production planning in lean modular integrated construction manufacturing	-
2.44 Aug. Quilty Control in Modular Integrated Construction Supporting Efficient Operations of Building Manufacturing Systems 4.15 p.m. 242 Modular & Industrialized Construction Operations of Building Manufacturing Systems 4.15 p.m. 243 Modular & Industrialized Construction 4.15 p.m. 244 Modular & Industrialized Construction 4.15 p.m. 245 Modular & Industrialized Construction 4.15 p.m. 246 Modular & Industrialized Construction 4.15 p.m. 247 Modular & Industrialized Construction 4.15 p.m. 248 Machine Learning-based Ultra-wideband Non-line-of-sight Identification for Crane-lift Positioning in Modular Integrated Construction 4.15 p.m. 349 Machine Learning-based Ultra-wideband Non-line-of-sight Identification for Crane-lift Positioning in Modular Integrated Construction Integrated Co				- Haselton
3:15 p.m. 363 DNG, Zhiming*; Lu, Weisheng Sighiating volumetric module transport process for modular integrated construction ZhENG, Zhenjie*; Pan, Wei ZhENG, Zhenjie*; Li, Xiao; Wu, Chengke Wei, Yinyi*; Li, Xiao; Wu, Chengke Wei, Yinyi*; Li, Xiao; Wu, Chengke ZhENG, Z	2:45 p.m.	370	ZHANG, Qiqi*; PAN, Wei; HUANG, Ruopan; Zhang, Zhiqian	_
3:15 p.m. 363 Digitalizing volumery: Lu, Weisheng Digitalizing volumetric module transport process for modular integrated construction ZHENG, Zhenjie*; Pan, Wei ZHENG, Zhenjie*; Pan, Wei ZHENG, Zhenjie*; Pan, Wei Zhenjie*; Nakhira, Yorie*; Tang, Pingbo* Xiong, Ruoxin; Dong, Miaosi; Jing, Haoming; Nakahira, Yorie*; Tang, Pingbo* Zhenjie*; Pan, Wei Zhenjie*; Pan, Kingien*; Pan, Kingien*; Pan, Pingbo*; Pakinci, Burcu Shingien*; Pan, Pingbo*; Pa	3:00 p.m.	129		
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3:45 p.m. 200 Towards more stable and flexible configuration: Code agent for floorplan generation in modular buildings Wei, Yinyi*; II, Xiao; Wu, Chengke Wei, Yinyi*; II, Xiao; Wu, Chengke Rowledge Embedded Human-Machine Adaptation for Supporting Efficient Operations of Building Manufacturing Systems Xiong, Ruoxin; Dong, Miaosi; Jing, Haoming, Nakahira, Yorie; Tang, Pingbo* 4:15 p.m. 134 Machine Learning-based Ultra-wideband Non-line-of-sight Identification for Crane-lift Positioning in Modular Integrated Construction 2hu, Aimin*; Pan, Wei; Zhang, Zhiqian; ZHANG, Qiqi 4:30 p.m. 384 Enhancing Quality Control in Modular integrated Construction: Integrating Point Cloud Data with Scan-vs-BIM Technology Sun, Qianchen** II, Xiao; Shen, Geoffrey Oping Explainable Production Immediate Building Components with Imbalanced Production Histories Dong, Miaosi; Xiong, Ruoxin; Tang, Pingbo*; Akinci, Burcu 131 July Wednesday VIS Innovations in Structures 9:45 a.m. 272 Accelerating Structural Topology Optimization for Subtractive Building Materials Reuse Zhang, Jing*, Haas, Carl 10:00 a.m. 155 Matching Reused Elements to Structural Designs for Steel Reuse Xookalani, Sohelia, Pang, Erikis, Brilakis, Ioannis; Luo, Pelhang; Alavi, Hamidreza; WANG, MUDAN 10:15 a.m. 43 Matching Reused Elements to Structural Designs for Steel Reuse Xookalani, Sohelia, Pang, Erikis, Brilakis, Ioannis; Luo, Pelhang; Alavi, Hamidreza; WANG, MUDAN 10:15 a.m. 43 Single tying method for overlapping finite element meshes in design support systems Hofmeyer, Herm*; Van der Wal, Sanne; Boonstra, Sjonnie; Pauwels, Pieter Hoffing method for overlapping finite element meshes in design support systems Hoffineyer, Herm*; Van der Wal, Sanne; Boonstra, Sjonnie; Pauwels, Pieter Hoffing method for overlapping finite element meshes in design support systems Hoffineyer, Herm*; Van der Wal, Sanne; Boonstra, Sjonnie; Pauwels, Pieter Hoffing Material Reuse Scalety Training For Construction: A Comprehensive Review of VR/AR-Based Safety Training Das, Niloy, Lee, Jeehee*	3:15 p.m.	363	ZHENG, Zhenjie*; Pan, Wei	
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BIM BIM and Digital Twins
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R&S Resilient & Sustainable Infrastructures
HCI Human-centered Innovation
AUT Robotics & Automation
EDU Training & Pedagogy
VIS Visualization, Simulation & Process Modeling
Cross-track
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