



# **CI & CRC Joint Conference 2022**

***Next Generation Construction***

**March 9-12, 2022**

**Arlington, VA**

**CRC Technical Program**

**Track Schedule**

**Version 1 – January 12, 2022**

<https://cisummit-crc.asce.org/>

**Thursday March 10, 2022**  
**Session 1: 1:00 pm - 2:00 pm**

**Track: Construction Education**

	CED-10	Correlation Between Brain Cognitive Response And On-Line Questionnaire During A Construction Safety Training In Virtual Reality	Krishna Kisi, Tulio Sulbaran
Room:	CED-14	VROnSite: Online Site Visits Using Web-Based Virtual Environments	Ricardo Eiris, Yuan Sun, Masoud Gheisari, Brent Marsh, Pasi Lautala
Potomac 1	CED-22	Conversational Virtual Humans On 360-Degree Virtual Sites: Guiding Students On A Site Visit To A Mechanical Room	Jing Wen, Masoud Gheisari
	CED-32	Use Of Virtual Site Visits In Construction Management Distance Education	Alireza Shojaei, Amirsaman Mahdavian, Saeed Rokooei, Ahmed Al-Bayati

**Track: Health, Safety, and Workforce Issues**

	HSW-29	Risk Assessment For Using Uas In Construction: A Fuzzy Analytical Hierarchy Process	Yiye Xu, Yelda Turkan
Room:	HSW-31	Safety Culture Element System And Its Management Mechanism Analysis In Construction Projects	Yuecheng Huang, Zhihui Zhang
Potomac 2	HSW-32	Comprehensive Analysis On The Effectiveness Of The Multiskilling Strategy Among Craft Professionals	Rakan K Albalawi, Paul M. Goodrum, Tim Taylor, Kevin Real, Mohammed A. Albattah
	HSW-33	Assessing Lower Extremity Kinematics Of Roofing Tasks	Matin Jahani Jirsaraei, Behzad Esmaili, Parth Pathak

**Track: Automation in Construction**

	AIC-08	Evaluating The Perception Of Human-Robot Collaboration Among Construction Project Managers	Mahya Sam, Bryan Franz, Edward Seh-Taylor, Christopher Mccarty
Room:	AIC-10	Human Robot Comparison In Rapid Structural Inspection	Pengxiang Xia, Fang Xu, Qi Zhu, Jing Du
Potomac 3	AIC-11	Human Intent Prediction In Human-Robot Collaboration: A Pipe Maintenance Example	Tianyu Zhou, Yubo Wang, Jing Du
	AIC-17	Toward Human-In-The-Loop Construction Robotics: Understanding Workers' Response Through Trust Measurement During Human-Robot Collaboration	Shayan Shayesteh, Houtan Jebelli

**Track: Infrastructure Systems, Sustainability and Resilience**

	ISR-06	Economic Viability Of Solar Panels For Single Family Homes	Pramen Prasad Shrestha, Mythili Pragada
Room:	ISR-98	Economics Of Energy Efficient Electrical Appliances Used In Residential Buildings In The U.S.	Mohamed Abdel-Raheem, Miranda Garcia, Mark Hernandez, Shaun Morin
Potomac 4	ISR-114	Preliminary Analysis Of Environmental Focus Roofing Strategies In Colorado'S Front Range Region	Joe Oakman, Rodolfo Valdes-Vasquez
	ISR-112	Understanding How Green Contractors Displayed Social Sustainability Actions Due To The Blm Movement In 2020	Rodolfo Valdes-Vasquez, Deniz Besiktepe

**Track: Health, Safety, and Workforce Issues**

	HSW-43	Construction Safety Training Interventions: State Of The Science And Future Opportunities	Abdullah Alsharif, S M Jamil Uddin, Alex Albert, Siddharth Bhandari, Edward Jaselskis
Room:	HSW-68	Evaluation Of Construction Workers' Emotional States During Virtual Reality-Based Safety Training	Kwonsik Song, Gaang Lee, Sanguk Han, Sanghyun Lee
Potomac 5	HSW-05	Are Multimedia Training Interventions Effective Within Traditional Safety Training Frameworks?	Sreeja Thallapureddy, Siddharth Bhandari, Alex Albert
	HSW-64	Role Of Safety Training In Reducing Fatigue Among Construction Workers	Mostafa Namian, Ahmed Al_Bayati, Chukwuma Nnaji

**Track: Contracting, Project Delivery, and Legal Issues**

	CDL-04	Sharing Risk Contingency Costs In Construction Joint Venture Agreements: A Cooperative Game Theory Approach	Radwa Eissa, Yasmein Shahin, Mohamed S. Eid
Room:	CDL-14	Major Causes Of Claims And Disputes On Transportation Public-Private-Partnership Projects	Omar Shabana, Ghada M. Gad
Potomac 6	CDL-42	Management And Contract Allocation Of Geotechnical Risks On Mega Design-Build Infrastructure Projects	Hajer Dawoody, Ghada Gad
	CDL-54	Selection Factors For Progressive Design-Build Delivery Method	Behzad Esmaili, Ruqaya Alameri

**Track: Computer Applications, Information Modeling, and Simulation**

	CAS-02	Framework For Simulating Crew Motivation Impact On Productivity: A Hybrid Modeling Approach	Nebiyu Kedir, Mohammad Raoufi, Aminah Robinson Fayek
Room:	CAS-56	Use Of Digital Human Modeling For Estimating Physiological Workloads Of Construction Tasks	Lynn Shehab, Hiam Khoury, Saif Al-Qaisi
Arlington	CAS-63	Optimization Of Labor Flow Efficiency In Steel Fabrication Project Planning	Leila Zahedi, Ming Lu
	CAS-72	A Bim-Enabled Dashboard System For Construction Project Monitoring And Control	Veerasak Likhitrungsilp, Photios G. Ioannou, Pimpisut Nantapanuwat

**Track: Advanced Technologies and Data Analytics**

	ADT-30	Virtual Reality And Construction Industry: Review Of Current State-Of-Practice And Future Applications	Jazmin Lopez, Siddharth Bhandari, Matthew Hallowell
Room:	ADT-39	Worker-Aware Robotic Motion Planner In Construction For Improved Psychological Well-Being During Worker-Robot Interaction	Yizhi Liu, Houtan Jebelli
Fairfax	ADT-50	Developing A Comprehensive 3D Point Cloud Dataset For Construction Projects	Hong Huang, Cheng Zhang, Lei Fan
	ADT-72	A System-Of-Systems Framework Of Data Analytics To Support Strategic Decision-Making In The Construction Industry	Navid Nickdoost, Juyeong Choi, Yassir Abdelrazig

**Track: Infrastructure Systems, Sustainability and Resilience**

	ISR-54	Empirical Analysis Of Factors Associated With Financial Loss Due To Hurricane Harvey	Frederick Chung, Baabak Ashuri
Room:	ISR-96	Challenges And Risks In Resilience Management Of Water And Wastewater Infrastructures	Nikhitha Adepu, Sharareh Kermanshachi, Elnaz Safapour, Apurva Pamidimukkala
Prince William	ISR-116	The Impact Of Natural Disaster Affected Housing Service Sector On The Interrelated Industries	Kwanghyuk Im
	ISR-124	Natural Disasters, Inequality, And Civil Infrastructure Systems: A Social Sensing Approach For Identifying Socioeconomic And Physical Vulnerabilities	Mostafa Batouli, Deepti Joshi

**Thursday March 10, 2022**  
**Session 2: 2:30 pm - 3:30 pm**

**Track: Construction Education**

	CED-16	Evaluating The Effectiveness Of Extracurricular Online Workshops On Student Learning In Construction	Yewande Sonayon Abraham, Bilge Gakhan Aelik, Max Frasier Spaan, Natalie Mansson
Room:	CED-40	Learning Factory For Construction To Provide Future Engineering Skills Beyond Technical Education And Training	Jochen Teizer, Christos Chronopoulos
Potmac 1	CED-01	Integration Of Virtual Technology As A Pedagogical Tool In Construction Knowledge Transfer	Ramyani Sengupta, Anthony E. Sparkling
	CED-02	Developing Context And Practice-Based Curricula In Construction Engineering And Management	Diana Marcela Franco Duran

**Track: Health, Safety, and Workforce Issues**

	HSW-71	Do Osha 10/30-Hour Training Programs Revamp The Safety Attitudes Of Construction Workers?	Mostafa Namian, Mohammadsoroush Tafazzoli, Sharareh Kermanshachi, Yilei Huang
Room:	HSW-59	Working Safely With Drones: A Virtual Training Environment For Workers On Heights	Idris Jeelani, Masoud Gheisari, Eduardo Mendes, Gilles Albeaino, Patrick Brophy
Potomac 2	HSW-65	Enhancing Workers' Vigilance To Electrical Hazards Through A Virtually Simulated Accident	Namgyun Kim, Changbum Ryan Ahn, Austin Miller, Robert Dibello, Daniel Lobello, Somyung Oh, Ann Mcnamara
	HSW-75	Impact Of Hazard State On Construction Workers Safety Risk Assessment	Abdullahi Ibrahim, Chukwuma Nnaji, Mahmoud Shakouri, Mostafa Namian

**Track: Automation in Construction**

	AIC-26	Exploring The Use Of Mobile Technologies For Highway Construction Inspection	Mamdouh Mohamed, Dan Tran
Room:	AIC-33	Automated Visual Inspection Planning For Prefabricated Modules With 3D Laser Scanning	Rachel Hyo Son, Kevin Han
Potomac 3	AIC-34	Automated Vision-Based Building Energy Assessment Using Drone Thermography	Shayan Mirzabeigi, Mohamad Razkenari

**Track: Project and Organizational Management and Planning**

	PMP-11	Barriers & Motivators Of Knowledge Sharing In A Virtual Engineering Office	Marilyn Karam, Hala Sanboskani, Daoud Kiomjian, Issam Srour
Room:	PMP-71	Review Of Current Practices To Implement Organization-Wide Knowledge Repositories	Siddharth Banerjee, Abdullah Alsharif, Edward Jaselskis, Kalyan Piratla
Potomac 4	PMP-38	The Effect Of The Economic And Social Motivations On Knowledge Sharing Behavior In Megaprojects: A Mediating Effect Of Environmental Dynamism	Hui He, Qinghua He, Ge Wang, Xiaoxue Liu, Jun Zhu
	PMP-27	Understanding Organizational Improvisation In Construction Megaprojects	Kaiwen Jiang, Yun Le, Xian Zheng, Xinyue Zhang

**Track: Computer Applications, Information Modeling, and Simulation**

	CAS-68	Automated Prioritization Of Requirements To Support Risk-Based Construction Inspection Of Highway Projects Using Lstm Neural Network	Tuyen Le, Fahad Ul Hassan
Room:	CAS-71	Applicability Of Artificial Intelligence (Ai) Methods To Construction Manufacturing: A Literature Review	Mohsen Hatami, Suman Paneru, Ian Flood
Potomac 5	CAS-75	Analyzing Passenger Flow Lines And Optimizing The Facility Layout Management For Cairo Metro Elevated Stations	Helen Saher Ghali, Khalid Nassar, Yasmeen Essawy, Abdelhamid Abdullah
	CAS-76	Simulation Of An Earth Embankment Dam In Adverse Rainy Weather	Haidy Saher Ghali, Khalid Nassar, Yasmeen Essawy, Abdelhamid Abdullah

**Track: Contracting, Project Delivery, and Legal Issues**

	CDL-02	Precontract Negotiations In Design-Build Projects	Elif Deniz Oguz Erkal, Keith Molenaar
Room:	CDL-19	Current State Of Practice In Selection And Implementation Of Airport Capital Project Delivery Methods	Phuong H.D. Nguyen, Daniel Tran
Potomac 6	CDL-05	Project Performance Comparison Of Vertical Projects Versus Horizontal Projects	Pramen Prasad Shrestha, Elina Prajapati
	CDL-07	Impacts Of Alternative Contracting Methods For Utility Coordination Of Transportation Projects	Tarig A. Omer, Roy Sturgill, Timothy Taylor

**Track: Computer Applications, Information Modeling, and Simulation**

	CAS-09	A Framework For Bim, Bas, And Iot Data Exchange Using Semantic Web Technologies	Shu Tang, Cheng Zhang, Jianli Hao, Fangyu Guo
Room:	CAS-06	Identifying Prevailing Research Topics In Facility Maintenance Information And Xr Visualization Via Text Mining	Daniel Weeks, Fernanda Leite
Arlington	CAS-43	A Bim Information Processing Framework To Facilitate Enriched Bim Applications	Ran Ren, Jiansong Zhang, Yunfeng Chen, Hazar Nicholas Dib
	CAS-44	Digital Twin Aided Healthcare Facility Management: A Case Study Of Shanghai Tongji Hospital	Ying Song, Yongkui Li

**Track: Advanced Technologies and Data Analytics**

	ADT-06	Designing An Automated Multi-Objective Optimization Model For Integrated And Sustainable Farming	Ossama Hosny, Elkhayam Dorra, Ahmed El-Eslamboly, Khaled Tarabieh, Ibrahim Abotaleb, Mariam Amer, Mostafa Farouk, Heba Gad, Youmna Abd El Raoof, Adham Sherif, Youssef Hussien
Room:	ADT-07	State-Of-The-Practice Of Big Data In Decision Making Processes Within The Construction Industry	Joao Victor Stedile Zolin, Katherine Maslak Madson
Fairfax	ADT-43	Measuring The Impact Of Information Display Methods On Ar Hmd For Comprehending Construction Information With Eeg	Yimin Qin, Tanyel Bulbul
	ADT-66	An Investigation Of Visualization Technologies For Remote Work In The Architecture, Engineering And Construction Industry	Oluwatobiloba Samuel Sowunmi, Lingshuang Song, Randi Scheiber, Zia Din Ud

**Track: Infrastructure Systems, Sustainability and Resilience**

	ISR-52	Socioeconomic And Housing Vulnerability'S Role To Decision Time For Reconstruction In Puerto Rico After Hurricane Maria	Tonmoy Sarker, Dr. Cristina Poleacovschi, Dr. Ivis Garcia Zambrana, Dr. Carl F Weems, Dr. Kaoru Ikuma, Dr. Chris Rehmann
Room:	ISR-20	Knowledge And Perception Of Single-Family Residential Building Resilience And Its Impact On Disaster Evacuations Decisions	Giovanna Fusco, Jin Zhu
Prince William	ISR-28	Integrating Social Equity And Vulnerability With Infrastructure Resilience Assessment	Sunil Dhakal, Lu Zhang
	ISR-35	Vulnerability Of Southwest Florida Water Infrastructure Under The Impacts Of Hurricane	Long D Nguyen, Seneshaw Tsegaye

**Thursday March 10, 2022**  
**Session 3: 4:00 pm - 5:15 pm**

**Track: Construction Education**

	CED-09	Integrating Front-End Planning And Infrastructure Sustainability In Construction Education Through Problem-Based Learning	Valentina Ferrer, Mohamed Elzomor, Rubaya Rahat, Piyush Pradhananga
	CED-12	A Network-Based Approach To Understand Potentials For On-The-Job Training In Construction Professions	Xi Chen, Mohammad Ilbeigi
Room: Potmac 1	CED-13	Unmanned Aaircraft Vehicles In Construction And Engineering Higher Education Programs	Christofer M. Harper, Mohammed Mehany, Manish Parajuli
	CED-21	Improving Bim Integration And Implementation In Construction Education	Siyuan Song, Mohammad Ammar Alzarrad, Sungjin Kim
	CED-30	Students Perception Of Instructional Delivery Methods Utilizing Various Teaching Modalities In An Integrated Construction Management Curriculum	Joseph Cleary, Stacy Kolegraff, Andrew Kline

**Track: Health, Safety, and Workforce Issues**

	HSW-80	Health And Safety Of Construction Field Workforce Active In Extreme Weather Conditions	Sanjgna Karthick, Sharareh Kermanshachi, Issa Ramaji
Room: Potomac 2	HSW-82	Utility Of Wearable Sensing Devices For Environmental Monitoring On Construction Sites	Ibukun Awolusi, Antonio Martinez-Molina, Chukwuma Nnaji, Miltiadis Alamaniotis, Tulio Sulbaran
	HSW-83	Effect Of Time Pressure And Cognitive Demand On Line Workers' Risk-Taking Behaviors: Assessment Of Neuro-Psychophysiological Responses In A Mixed-Reality Environment	Shiva Pooladvand, Sogand Hasanzadeh, Beyza Kiper, Aditya Mane
	HSW-88	Safety Innovation Adoption In Construction: Role Of Safety Compliance And Safety Attitude	Tolulope Sanni, Chukwuma Nnaji, Ibukun Awolusi, Ahmed Al-Bayati

**Track: Automation in Construction**

	AIC-02	A Goal-Oriented Framework For Implementing Change In Off-Site Construction In The Industry 4.0 Era	Fatima Alsakka, Farook Hamzeh, Mohamed Al-Hussein, Haitao Yu
Room: Potomac 3	AIC-09	Exoskeleton Training Through Haptic Sensation Transfer In Immersive Virtual Environment	Yang Ye, Yangming Shi, Jing Du, Youngjae Lee, Garret Burks, Divya Srinivasan
	AIC-13	Real-Time And Automatic Detection Of Welding Joints Using Deep Learning	Doyun Lee, Guang-Yu Nie, Kevin Han

**Track: Project and Organizational Management and Planning**

	PMP-06	Identifying Multilevel Metrics For Construction Competency And Performance Measures	Yisshak Tadesse Gebretekle, Aminah Robinson Fayek
Room: Potomac 4	PMP-13	Exploring Trends In Risk Statements Among Design And Construction Of Scientific Research Facility Projects	Evan Dicks, Keith Molenaar
	PMP-05	Pop: A Data-Based Construction Project Overall Performance Model	Hiba Jalloul, Awad S. Hanna, Wafik Lotfallah
	PMP-20	Collaborative Planning Metrics In Construction Projects: A Factor Analysis Approach	Amr El-Sayegh, Islam El-Adaway
	PMP-46	New Heuristic Method Of Section Network Compression Process For Large-Scale Networks	Silas Stewart, Yoojung Yoon

**Track: Advanced Technologies and Data Analytics**

	ADT-63	A Natural Language Processing-Based Approach For Clustering Construction Projects	Chau Le, Taewoo Ko, H. David Jeong
Room: Potomac 5	ADT-12	Forecasting Field Production Using Machine Learning Time Series	Johnny Sawma Awad, Issam Srour, Bassel Safa, Sena Assaf
	ADT-25	#Covid-19: Understanding Construction Industry Responses On Twitter In The Emergence Of Novel Coronavirus	Priyanka Linge, M Ahmed Rusho, Md Ashraf Ahmed, Arif Mohaimin Sadri
	ADT-68	E-Ticketing Technology In Construction Projects: Adoption, Benefits, And Challenges	Karthik Subramanya, Sharareh Kermanshachi

**Track: Contracting, Project Delivery, and Legal Issues**

	CDL-13	Longitudinal Study Of Information Management In University Construction Contracts	Amelia Celozza, Daniel P. De Oliveira, Fernanda Leite
Room: Potomac 6	CDL-15	Leveraging Alternative Technical Concept For Contract Delivery Of Accelerated Bridge Construction	Piyush Pradhananga, Mohamed Elzomor
	CDL-21	Dimensions Of Innovation In Project Delivery Method Selection For Highway Projects	Vassiliki Demetracopoulou, William O'Brien, Nabeel Khwaja
	CDL-27	State-Of-The-Art Review On The Applicability Of Natural Language Processing (Nlp) Methods To Address Legal Issues In Construction	Fahad Ul Hassan, Tuyen Le

**Track: Computer Applications, Information Modeling, and Simulation**

	CAS-14	Model Requirements For The Development Of Extended Reality Applications In Construction Projects: A Literature Review	Bing Han, Fernanda Leite
Room: Arlington	CAS-69	Framework And Case Studies For Context-Aware Ar System (Caars) For Ubiquitous Applications In The Aec Industry	Gabriela Flores Linares, Nazila Roofigari-Esfahan, Daniel Antonio Linares-Garcia
	CAS-07	Vision-Based Recognition Of Construction Worker'S Hand Signals	Xin Wang, Zhenhua Zhu
	CAS-48	Neural Networks In The Construction Industry: Knowledge Gaps And Possibilities	Emil L. Jacobsen, Jochen Teizer

**Track: Advanced Technologies and Data Analytics**

	ADT-30	Virtual Reality And Construction Industry: Review Of Current State-Of-Practice And Future Applications	Jazmin Lopez, Siddharth Bhandari, Matthew Hollowell
Room: Fairfax	ADT-39	Worker-Aware Robotic Motion Planner In Construction For Improved Psychological Well-Being During Worker-Robot Interaction	Yizhi Liu, Houtan Jebelli
	ADT-50	Developing A Comprehensive 3D Point Cloud Dataset For Construction Projects	Hong Huang, Cheng Zhang, Lei Fan
	ADT-72	A System-Of-Systems Framework Of Data Analytics To Support Strategic Decision-Making In The Construction Industry	Navid Nickdoost, Juyeong Choi, Yassir Abdelrazig

**Track: Infrastructure Systems, Sustainability and Resilience**

	ISR-41	Evaluation Of Safe-To-Fail Criteria For Coastal City	Rubaya Rahat, Mohamed Elzomor, Piyush Pradhananga
Room: Prince William	ISR-45	Analyzing Critical Impacting Factors On The Future Of Bridges To Support Bridge Planning	A.M.M. Muhaimin, Lu Zhang, Xuan Lv, Nipesh Pradhananga, Vamsi Sai Kalasapudi
	ISR-50	Information Fusion And Finite Element Model Simulations For Bridge Condition Prognosis With Conflicting Data	Zhe Sun, Pingbo Tang, Ying Shi
	ISR-55	A Data Integration Approach For Assessment Of Rainfall-Induced Slope Failure Susceptibility	Anil Baral, Mohsen Shahandashti

**Friday March 11, 2022**  
**Session 4: 9:30 am - 10:30 am**

**Track: Construction Education**

	CED-04	Assessing The Impact Of Humanitarian Engineering Coursework On Upper-Division Undergraduate Engineering Identity Development	Leigh Hamlet, Jessica Kaminsky
Room:	CED-41	Concept Maps Lead To Better Problem Statements: An Empirical Study Measuring The Effects Of Priming Students To Think In Systems	Paulo Ignacio, Julie Milovanovic, Tripp Shealy, John Gero
Potomac 1	CED-42	Concept Maps Decrease Students' Neurocognitive Demand When Thinking About Engineering Problems	Ushma Manandhar, Mo Hu, Julie Milovanovic, Tripp Shealy, John Gero
	CED-33	The Impact Of Remote Learning On College Students' Workload And Productivity During The Covid-19 Pandemic	Biao Kuang, Chi Tian, Hongyue Wu, Yunfeng Chen, Luciana Debs

**Track: Health, Safety, and Workforce Issues**

	HSW-20	A Novel Map-Matching Algorithm For Relating Work Zones And Crashes	Zhuoran Zhang, Burcu Akinci, Sean Qian
	HSW-26	Enhanced Situational Awareness In Worker-Robot Interaction In Construction: Assessing The Role Of Visual Cues	Shayan Shayesteh, Houtan Jebelli
Room:		Spatial Exposure To Dynamic Safety Hazards In Construction Sites	
Potomac 2	HSW-77	Through 360-Degree Augmented Panoramas: Ecological Validity In Safety Research	Sogand Hasanzadeh, Behzad Esmaeili, Kyeongsuk Lee
	HSW-96	Investigation Of Factors Impacting Situation Awareness Of Highway Workers And Applicable Warning Methods	Wenjun Han, Nazila Roofigari-Esfahan, Ginny Nayyar

**Track: Automation in Construction**

	AIC-16	Intention Estimation In Physical Human-Robot Interaction In Construction: Empowering Robots To Gauge Workers' Posture	Yizhi Liu, Houtan Jebelli
Room:	AIC-21	Barrier Analysis Of Effective Implementation Of Robotics In The Construction Industry	Amit Ojha, Mahmoud Habibnezhad, Houtan Jebelli, Robert Leicht
Potomac 3	AIC-22	Digital Twin In The Architecture, Engineering And Construction Industry: A Bibliometric Review	Manea Almatared, Hexu Liu, Shengxian Tang, Mohammed Sulaiman, Zhen Lei, Hong Xian Li
	AIC-24	An Integrated Supervised Reinforcement Machine Learning Approach For Automated Clash Resolution	Ashit Harode, Walid Thabet, Xinghua Gao

**Track: Project and Organizational Management and Planning**

	PMP-72	Knowledge Exchanges In Complex Project Networks: Influence Model	Meltem Duva, Dong Zhao, Sinem Mollaoglu, Kenneth A. Frank
Room:	PMP-73	Network Topologies And Team Performance: A Comparative Study Of Aec Projects	Meltem Duva, Sinem Mollaoglu, Dong Zhao, Kenneth A. Frank
Potomac 4	PMP-15	An Integrated Sustainability Performance Criteria Checklist For Sustainable Public Housing Projects	Asma Almahde Sharafeddin, Ingrid Arocho
	PMP-17	Human Values In Sustainable Construction Management: A Literature Review	David Gutierrez, Leidy Klotz

**Track: Advanced Technologies and Data Analytics**

	ADT-01	A Sensor-Based Empirical Framework To Measure Construction Labor Productivity	Phuong Nguyen, Aminah Robinson Fayek, Farook Hamzeh
Room:	ADT-83	Simplified Emissions Measurement System For Construction Equipment	Jochen Teizer, Sā, Ren Wandahl
Potomac 5	ADT-89	Effectiveness Of A Real-Time Parking Guidance System	Deepak Kanhaiyalal Sharma, Scott Parr, Aycan Kara
	ADT-45	Synthetic Training Image Dataset For Vision-Based 3D Pose Estimation Of Construction Workers	Jinwoo Kim, Sanghyun Lee, Daeho Kim, Julianne Shah

**Track: Contracting, Project Delivery, and Legal Issues**

	CDL-28	Enabling Faster Project Delivery Through Use Of Construction-Driven Designs	Aleksandra Markovic Graff, Jesus M. De La Garza
Room:	CDL-29	Determining Contract Requirements For Quality Assurance Program In Innovative Project Delivery	Jung Hyun Lee, Evan Mistur, Lier Liu, Baabak Ashuri
Potomac 6	CDL-39	Comar Procurement In U.S. Public Projects: Qualifications-Driven Processes And Criteria	Hala Sanboskani, Mounir El Asmar, Bahaa Chammout, Oscar Bou Maachar
	CDL-48	A Comparison Of Georgia Dot'S Design-Build Legislation And Project Expenditures With Those Of Bordering States	Wesley Mitchell, Raed Jarrah, Chang-Ray Chen

**Track: Computer Applications, Information Modeling, and Simulation**

	CAS-39	Simulating Urban Population Activities Under Extreme Events With Data-Driven Agent-Based Modeling	Haiyan Hao, Yan Wang, Qi Wang
Room:	CAS-46	The Concept Of Digital Twin For Construction Safety	Jochen Teizer, Karsten W. Johansen, Carl Peter Leslie Schultz
Arlington	CAS-19	Management Solutions For Cyber-Physical Security In Smart Built Environment	Ping Xu, Xinghua Gao, Philip Agee
	CAS-26	Capturing Dynamics Of Uas-Based Construction Safety Management Using Causal Loop Diagram	Soowon Chang, Kyungki Kim, Jinhuk Kwon, Sungjin Kim

**Track: Advanced Technologies and Data Analytics**

	ADT-46	Emergency Management In Smart Cities: Infrastructure-Less Communication Systems	Mohammad Ilbeigi, Azita Morteza, Ramtin Ehsani
Room:	ADT-61	A Theoretical Architecture For Data-Quality-Aware Analytical Applications In The Construction Firms	Xi He, Rui Liu, Chimay Anumba
Fairfax	ADT-19	Exploring The Capabilities Of Optical Satellite Imagery To Evaluate Pavement Condition	Mohammad Bashar, Cristina Torres-Machi
	ADT-28	Drivable Space Extraction From Airborne Lidar And Aerial Photos	Ryan Dow, Su Zhang, Susan Bogus, Fei Han

**Track: Infrastructure Systems, Sustainability and Resilience**

	ISR-67	Towards Sustainable Management Of Disaster Debris: Three-Phase Post-Disaster Data Collection Planning	Hiba Jalloul, Juyeong Choi, Sybil Derrible, Nazli Yesiller
Room:	ISR-70	Disasters As Mega-Disruptions To Construction Supply Chains	Erin Arneson
Prince William	ISR-18	Exploring Challenges To Implement An Integrated Urban Infrastructure Management Approach	Felipe Araya, Sebastian Vasquez
	ISR-83	A Literature Review On The Human Dimension In Water-Energy Nexus	Zheng Ren, Jintao Zhang, Iram Sifat, Wenjun Xiang, Wei Zhang, Baikun Li, Jin Zhu



**Friday March 11, 2022**  
**Session 5: 11:00 am - 12:00 pm**

**Track: Construction Education**

	CED-24	International Construction Education Experiences: Designing A Comprehensive Research Approach	Verena Schneider, David Grau, Samuel T. Ariaratnam
Room:	CED-08	Construction Industry Institute'S Impact On Construction Engineering And Management Academic Publications	Amelia Celozza, Fernanda Leite, Daniel P De Oliveira
Potomac 1	CED-18	Operationalization Of Desirable Skill Sets In Novice Construction Management Professionals	Daniel Yamoah Agyemang, Patrick Sik Wah Fong, Ernest Kissi
	CED-37	Relationship Between Student Engagement And Academic Network Properties	Zhiting Chen, Dong Zhao

**Track: Health, Safety, and Workforce Issues**

	HSW-19	Towards A Safety Culture Model For Small Construction Organizations	Ashtarout Ammar, Zaman Al-Shabbani, Gabriel Dadi
Room:	HSW-23	Review Of Safety Resilience In Construction: Current Research Status, Challenges, And Future Needs	Joshua D. Robbins, Jun Wang, Behzad Esmaeili
Potomac 2	HSW-40	Preventative Safety Metrics With Highway Maintenance Crews	Zamaan Al-Shabbani, Ashtarout Ammar, Gabriel Dadi
	HSW-47	Review For Construction And Demolition Waste Materials And Control Practices In The U.S.	Abdulaziz Alwadhenani, Yoojung Yoon, Radhey Sharma

**Track: Automation in Construction**

	AIC-30	Utilizing Text Analysis In Systematic Review Design: Perceptual And Cognitive Barriers To Adoption Of Robotic And Automated Systems In Construction	Edward Seh-Taylor, Christopher Mccarty, Mayha Sam, Bryan Franz
Room:	AIC-39	Dematerialization In Housing Industry: Modular Light Wood-Frame Structure Vs Conventional Wood-Frame Structure For Multi-Family Housing	Arezou Sadoughi, Gregory Sloditskie
Potomac 3	AIC-47	Towards Intelligent Agents To Detect Work Pieces And Processes In Modular Construction: An Approach To Generate Synthetic Training Data	Keundeok Park, Semiha Ergan
	AIC-48	The Need For Responsive Environments: Bringing Flexibility To Clinic Spaces	Daniel Bin Lu, Semiha Ergan, Devin Mann, Katharine Lawrence

**Track: Project and Organizational Management and Planning**

	PMP-43	Lean Adoption For Trade Contractors: Benefits, Barriers, And Path Forward	Elnaz Asadian, Robert Leicht, John Messner
Room:	PMP-48	Development Of Key Performance Indicators For Performance Assessment Of Owner'S Project Managers	Shantanu Kumar, Mohammed S. Hashem M. Mehany
Potomac 4	PMP-85	Evm's Maturity And Its Impact On Project Cost And Schedule Performance Of Large And Complex Projects: A Preliminary Analysis	Mounir El Asmar, G. Edward Gibson, Jr., Vartenie Aramali, Hala Sanboskani
	PMP-81	Construction Business Strategies Used By General Contractors In The United States For Market Enhancement	Haiyan Sally Xie, Jayraj Singh Solanki, Owen Shi

**Track: Health, Safety, and Workforce Issues**

	HSW-79	Physical, Mental, And Emotional Health Of Construction Field Labors Working In Extreme Weather Conditions: Challenges And Overcoming Strategies	Sanjgna Karthick, Sharareh Kermanshachi, Mostafa Namian
Room:	HSW-12	Feasibility Of A Mobile Electroencephalogram (Eeg) Sensor-Based Stress Type Classification For Construction Workers	Gaang Lee, Sanghyun Lee
Potomac 5	HSW-16	Lean-Based Integrated Approach For Manual Work Design Optimization In Modular Construction	Ahmed Zaalouk, Sanghyeok Han
	HSW-28	A Study On Assessing The Awareness Of Heat-Related Illnesses In The Construction Industry	Siyuan Song, Fan Zhang

**Track: Contracting, Project Delivery, and Legal Issues**

	CDL-10	Identifying Contingency Liability From P3 Contracts Using Rule-Based Nlp	Yu Wang, Qingbin Cui, Kunqi Zhang, Man Liang
Room:	CDL-09	In The Name Of The Pandemic: A Case Study Of Contractual Modifications In Ppp Solicited And Unsolicited Proposals In Covid-19 Times	Gabriel Castelblanco, Jose Guevara, Paula Mendez-Gonzalez
Potomac 6	CDL-18	Ppp Renegotiation Flight Simulator: A System Dynamics Model For Renegotiating Ppps After Pandemic Crisis	Gabriel Castelblanco, Jose Guevara, Paula Mendez-Gonzalez
	CDL-24	Investigating Financial Risks Associated With Public-Private Partnerships For Transportation Project Delivery	Kalyani Joshi, Christofer M. Harper, John Killingsworth, Suren Chen

**Track: Computer Applications, Information Modeling, and Simulation**

	CAS-31	An Optimal Resource Allocation Strategy For Retrofitting Unreinforced Masonry Buildings In The Pre-Disaster Stage	Mohammad Sadra Fardhosseini, Amit Ojha2, Mahmoud Habibnezhad, Houtan Jebelli, Hyun Woo Lee
Room:	CAS-33	Semi-Automatic Pipe Network Reconstruction Using Point Cloud Data	Patrick Borges Rodrigues, Paul Crovella
Arlington	CAS-36	Ontology-Based Semantic Modeling For Steel Bridge Coating Systems: Toward Analysis Of Factors That Impact Coating Premature Failures	Md Ashiqur Rahman, Lu Zhang, Kingsley Lau, Xuan Lv, Parasar Gosain
	CAS-38	Household-Targeted Hurricane Warnings For Effective Evacuation: Case Study Of Hurricane Irma In North Miami Beach	Shangde Gao, Yan Wang, Qi Wang

**Track: Advanced Technologies and Data Analytics**

	ADT-48	Real-Time Participatory Sensing-Driven Computational Framework Toward Digital Twin City Modeling	Jaeyoon Kim, Youngjib Ham
Room:	ADT-76	Case Study: Assessing The Structural Condition Of Steel Bridges Using Terrestrial Laser Scanner (Tls)	Hani Alzraiee, Luke Psomas, Ryan Trainor
Fairfax	ADT-88	Network And Cluster Analysis On Bridge Inspection Reports Using Text Mining Algorithms	Younghan Edwin Jung, Mingon Kang, Michael Myung Jeong, Junyong Ahn
	ADT-10	Characteristic-Based Network Analysis On Construction Hazard Warning: A Novel Approach Of Network Of Networks	Mei Liu, Pin-Chao Liao

**Track: Infrastructure Systems, Sustainability and Resilience**

	ISR-102	Post-Hurricane Recovery Process: Analysis Of The Public And Subject Matter Experts' Perspectives Using Structural Equation Modeling (Sem)	Behzad Rouhanizadeh, Sharareh Kermanshachi
Room:	ISR-104	Investigation Of Causal Relationships Among Factors Affecting Post-Disaster Reconstruction Process: Adoption Of Social Network Analysis (Sna) Method	Behzad Rouhanizadeh, Sharareh Kermanshachi
Prince William	ISR-93	Homeowners' Motivations To Invest In Energy-Efficient Technologies In Residential Buildings Of Rural Midwest America	Linnel Marie Ballesteros, Cristina Poleacovschi, Ulrike Passe, Kristen Cetin, Anne Kimber, Diba Malekpour Koupaei, Tanya Sharma, Forrest Douglass
	ISR-122	Human-In-The-Loop Model Predictive Operation For Energy Efficient Hvac Systems	Mostafa Meimand, Farrokh Jazizadeh

**Friday March 11, 2022**  
**Session 6: 1:30 pm - 2:30 pm**

**Track: Construction Education**

	CED-03	Full Scale Augmented Reality To Support Construction Sequencing Education Case Study	Kieren H. Mccord, Steven K. Ayer, Karan R. Patil, Wei Wu, Jeremi S. London, Logan A. Perry
Room:	CED-11	Feasibility Of Embodied Virtual Agents For Augmenting Students' Knowledge Of Robotic Safety In Construction	Amit Ojha, Houtan Jebelli, Mahmoud Habibnezhad
Potomac 1	CED-43	Exploring The Benefits Of Social Presence Enabled Augmented Reality Platform For Online Learners	Saurav Shrestha, Yongwei Shan, Ph.D., P.E., Brian Chung
	CED-36	Data Analytics And Computational Thinking In Construction Engineering And Management Education: A Conceptual System	Abiola Akanmu, Vincent S Akligo, Omobolanle Ogunseiju, Sang Won Lee, Homero Murzi

**Track: Health, Safety, and Workforce Issues**

	HSW-08	Defining Serious Injuries On Construction Jobsites: Lessons From The Literature	Arnaldo Bayona, Siddharth Bhandari, Matthew R. Hallowell
Room:	HSW-49	Random Forest Analysis Of Occupational Accident Reports Among Roofing Contractors	Ikechukwu Sylvester Onuchukwu, Behzad Esmaeil
Potomac 2	HSW-53	Numerical Simulation Of Asphalt Fumes Diffusion During Pavement Construction Using Cfd Method	Dan Chong, Hui Hou, Qi Feng
	HSW-24	Impact Of Green Construction On Safety Performance In The Built Environment	Ali Amer Karakhan, Ahmed Jalil Al-Bayati, Hashem Izadi Moud, Ola Thamer Al-Saffar

**Track: Automation in Construction**

	AIC-14	Identification Of Indicators For Effectiveness Evaluation Of Four-Legged Robots In Automated Construction Progress Monitoring	Kereshmeh Afsari, Srijeet Halder, Ryan King, Walid Thabet, John Serdakowski, Stephen Devito, Mahnaz Ensafi, Jason Lopez
Room:	AIC-20	A Framework To Enhance Utilization Of Automated Progress Measurements In Construction Projects	Negar Mansouri Asl, Ahmed Hammad
Potomac 3	AIC-53	A Practical Application Using Parametric Modeling For As-Built Bim Generation From Point Clouds	Jong Won Ma, Yu-Chen Lee, Fernanda Leite
	AIC-28	Application Of Unmanned Aerial System (Uas) In Highway Construction Progress Monitoring Automation	Reihaneh Samsami, Amlan Mukherjee, Colin N Brooks

**Track: Project and Organizational Management and Planning**

	PMP-03	Choosing By Advantages (Cba) Method To Determine Feasibility Of Mass Timber Building Material In The Us Construction Market	Shafayet Ahmed, Ingrid Arocho
Room:	PMP-30	Using Functional Near-Infrared Spectroscopy (Fnirs) To Evaluate The Construction Decision Making Inventory (Cdmi)	Krishna Kisi, Tulio Sulbaran
Potomac 4	PMP-58	A Quantitative Assessment Of Change Adoption Success Within The Facility Management Industry	Dipin Kasana, Justin Dodd, Jake Smithwick, Amirali Shalwani, Brian Lines
	PMP-02	Facility Design Standardization: Six Solution Pieces And Industry Maximization Enablers	Jin Ouk Choi, Binit Kumar Shrestha, Seung Ho Song, Jennifer Shane, Young Hoon Kwak

**Track: Construction Scheduling, Estimating, Economics, and Controls**

	CEC-08	Developing A Multivariate Time-Series Model To Forecast The Level Of Competition In Transportation Projects	Minsoo Baek, Baabak Ashuri, Suma Veeravenkatappa
Room:	CEC-10	A Pattern-Recognition Method For Highway Construction Project Expenditure Cash Flows Using Clustering-Based K-Means Approach	Minsoo Baek, Yunping Liang, Baabak Ashuri
Potomac 5	CEC-16	Predicting Ratio Of Low Bid To Owner'S Estimate Using Feedforward Neural Networks For Highway Construction	Mingshu Li, Qiu Zheng, Baabak Ashuri
	CEC-27	Forecasting Architecture Billings Index Using Time Series Models	Soojin Kim, Bahram Abediniangerabi, Mohsen Shahandashti

**Track: Contracting, Project Delivery, and Legal Issues**

	CDL-40	Award Algorithms And Technical Scoring Trends In Design-Build Best-Value Highway Projects	Maria Calahorra-Jimenez
Room:	CDL-23	Transferal Of Responsibilities Of Ppp European Equity Markets: Dependency Analysis	John Sebastian Salazar, Jose Alberto Guevara, Luis Alberto Herrera
Potomac 6	CDL-49	Synthesis Of Challenges For Public-Private Partnerships (Ppps) In Transportation Infrastructure In South East Asia	Chi Nguyen Anh, Michael J Garvin
	CDL-26	The Moderating Role Of Trustworthiness In The Relationship Between Institutional Distance And Private Ownerships In Ppps: Evidence From Emerging Markets And Developing Countries	Qinghua He, Yang Li, Ge Wang, Zilun Wang

**Track: Computer Applications, Information Modeling, and Simulation**

	CAS-47	Toward Wi-Fi-Enabled Real-Time Communication For Proactive Safety Systems In Highway Work Zones: A Case Study	Sepehr Sabeti, Omidreza Shoghli, Hamed Tabkhi
Room:	CAS-49	Evaluating Facility Asset Information Needs In A Common Data Environment To Support Maintenance Workers	Zahra Ghorbani, Rebecca Napolitano, Craig Richard Dubler, John Isaac Messner
Arlington	CAS-54	Adopt The 3D Bim Coordination During The Early Design Stages In Egypt	Mahmoud Othman, Emad Elbeltagi, Mohamed Abdel Shakour, Ahmed Amer
	CAS-61	Digital Twin In Practice: Emergent Insights From An Ethnographic-Action Research Study	Ashwin Agrawal, Vishal Singh, Robert Thiel, Michael Pillsbury, Harrison Knoll, Jay Puckett, Martin Fischer

**Track: Advanced Technologies and Data Analytics**

	ADT-29	Characterizing Residential Energy Consumption Patterns In The Rural Midwest	Diba Malekpour, Kristen Cetin, Ulrike Passe, Cristina Poleacovschi, Anne Kimber
Room:	ADT-44	Artificial Intelligence For Equitable Practices In Energy Infrastructure: Literature Review	Anne Ruckman, Jessica Kaminsky
Fairfax	ADT-47	Semantic Modeling For Supporting Planning Decision Making Towards Smart Cities	Lan Zhang, Kaijian Liu
	ADT-57	Spatial Analysis On Routine Occupant Behavior Patterns And Associated Factors In Residential Buildings	Yunjeong Mo, Dong Zhao

**Track: Infrastructure Systems, Sustainability and Resilience**

	ISR-25	Unifying Assessments Of Sustainability And Resilience In Civil Infrastructure Systems: The Case Of Masonry Structures	Samir Jung Pandey, Arif Mohaimin Sadri, Wallied Orabi
Room:	ISR-26	Critical Review Of Sustainability, Resilience And Their Unifying Assessments For Civil Infrastructure Systems	Samir Jung Pandey, Arif Mohaimin Sadri
Prince William	ISR-46	A Review Of A Socio-Technical System Approach For Interdependent Infrastructure Systems Resilience Analysis: Present Status And Future Trends	Chen Xia, Yuqing Hu
	CED-25	Exploring Disaster Preparedness And Awareness Due To Natural Hazards Using Structural Equation Modelling (Sem)	Ronik Patel, Sharareh Kermanshachi, Roya Etmnani-Ghasrodashti, Mohammadsorosh Tafazzoli

**Friday March 11, 2022**  
**Session 7: 2:45 pm - 3:45 pm**

**Track: Engineering and Materials Design, Quality, and Value Management**

	EQV-03	Cost Analysis Of A Mass Timber Building Project: Comparison Of Budgeted And Actual Construction Cost	Shafayet Ahmed, Ingrid Arocho
Room:	EQV-04	Identifying The Level Of Awareness And Challenges To Adopt Mass Timber By The Construction Practitioners In The United States	Shafayet Ahmed, Ingrid Arocho
Potomac 1	EQV-27	Leed Assessment Of Green Lightweight Concrete Containing Plastic Based Aggregates In Construction	Fahad K. Alqahtani, Ibrahim Abotaleb, Sara Harb
	EQV-12	Performance Of Engineered Cementitious Composite Material Under Differing Site Conditions	Michele Anderson, Susan Bogus

**Track: Health, Safety, and Workforce Issues**

	HSW-25	Construction Hazard Recognition: A Smart Literature Review	S M Jamil Uddin, Abdullah Alsharef, Alex Albert, Siddharth Bhandari
Room:	HSW-54	Noise Management In Construction: Identifying Strategies And Controls For Improvement	Ifeanyi Okpala, Tolulope Sanni, Chukwuma Nnaji
Potomac 2	HSW-09	Musculoskeletal Disorders In Concrete Formwork Construction	Ziyu Jin, John Gambatese
	HSW-51	Biomechanical Analysis In Construction Engineering And Management Research: A Review	Abdullahi Ibrahim, Chukwuma Nnaji, Ziyu Jin

**Track: Automation in Construction**

	AIC-50	Automated Process Data Collection For Modular Construction Using Computer Vision	Roshan Panahi, Joseph Louis, Ankur Podder, Colby Swanson
Room:	AIC-65	A Decision Support System For The Integration Of Robotics In Offsite Construction	Behnam M. Tehrani, Cagri Goksel Ozmerdiven, Aladdin Alwisy
Potomac 3	AIC-35	Graphical Networks For Optimizing Hospital Layouts At Macro And Micro Scales	Jennifer I. Lather, Andrew I Harms
	AIC-43	Drone-Related Deployment Limitations In Construction: A Research Roadmap	Gilles Albeaino, Masoud Gheisari, Raja R. A. Issa

**Track: Project and Organizational Management and Planning**

	PMP-21	Mitigating The Winner'S Curse Dilemma In Multi-Stage Construction Bidding	Muaz Ahmed, Islam El-Adaway, Kalyn Coatney
Room:	PMP-35	Front End Planning For Industrial Projects: Identifying The Reasons Behind Schedule And Cost Overruns Using The New Pdri Matr	Namho Cho, G. Edward Jr. Gibson, Mounir El Asmar
Potomac 4	PMP-42	Are Different Innovations More Challenging To Implement: A Comparison Of Different Types Of Changes In The Aec	Omar N Maali, Amiral Shalwani, Brian C. Lines, Kristen Hurtado, Kenneth T. Sullivan
	PMP-51	A Framework For Assessing Strategies To Combat Individuals' Resistance To Technological Innovation In The Construction Industry	Yelly Kwesy Lawluyv, Fangyu Guo, Kaiyang Wang

**Track: Construction Scheduling, Estimating, Economics, and Controls**

	CEC-14	Framework Of Automatic Cycle Schedule Management Based On Bim Technology	Yanhui Jia, Ding Liu
Room:	CEC-17	Feasibility Of An Integrated Heuristic And Machine Learning Approach For Schedule Health Monitoring In Construction	Yoonhwa Jung, Fouad Amer, Mani Golparvar-Fard
Potomac 5	CEC-30	Developing Assessment Criteria For State Dots' Standard Specifications On Contractor Schedules	Byung Gi Han, Junghye Son, Nabeel Khwaja, William J. O'Brien
	CEC-06	Construction Insurance Machine-Learning Estimation Approach For Multiple Attempted Bids	Ayman El Hakea, Mohamed S. Eid

**Track: Infrastructure Systems, Sustainability and Resilience**

	ISR-38	Comparison Of Different Blue-Green Infrastructure Strategies In Mitigating Urban Heat Island Effects And Improving Thermal Comfort	Siqi Jia, Yuhong Wang
Room:	ISR-94	Assessment Of The Relative Importance Of The Main Parameters Used In The Selection Of The Urban Heat Island Mitigation Strategies	Mohamed Abdel Raheem, Bahareh Bathaei
Potomac 6	ISR-37	Incorporating The Human Factor In Modeling Interdependent Infrastructure Systems	Joseph Jonathan Magoua, Fei Wang, Nan Li
	ISR-117	The Envision Rating System Helps Shape Public Preferences For Sustainable Stormwater Design	Mo Hu, Tripp Shealy

**Track: Computer Applications, Information Modeling, and Simulation**

	CAS-23	A Survey Of Trends Of Building Fire Simulation In The Architecture, Engineering, And Construction (Aec) Domains	Fan Yang, Jiansong Zhang, Bedrich Benes
Room:	CAS-27	Computer Vision-Driven Building Energy Modeling Framework For Post Occupant Interior Energy Consumption	Pochien Yu, Mingshun Tseng, Jacob J. Lin
Arlington	CAS-73	Exploring Human-Building Energy-Related Actions Modeling And Simulation	Seddigheh Norouziasl, Amirhosein Jafari
	CAS-80	Issues In Bi-Directional Interoperability Between Bim And Bem	Hang Li, Jiansong Zhang, Xiaorui Xue, Luciana Debs, Soowon Chang, Ming Qu, Anthony Sparkling, David Goldwasser

**Track: Advanced Technologies and Data Analytics**

	ADT-77	Energy And Demand Saving Potential Due To Integrated Hvac, Lighting, And Shading Controls In Small Office Buildings	Soham Vanage, Hao Dong, Kristen Cetin
Room:	ADT-71	Nudging Occupants For Energy-Saving Through Voice-Based Proactive Virtual Assistants	Tianzhi He, Farrokh Jazizadeh
Fairfax	ADT-08	Aging In Smart Buildings: How Can Smart Building Technologies Support The Cognitively Impaired Aging Population	Saeid Alimoradi, Xinghua Gao
	ADT-17	Estimating Construction Work Zones Capacity Using Deep Neural Network	Ali Hassandokht Mashhadi, Nikola Markovič, Abbas Rashidi

**Track: Infrastructure Systems, Sustainability and Resilience**

	ISR-100	Key Components In Schedule Development Of Post-Disaster Reconstruction Projects	Elnaz Safapour, Sharareh Kermanshachi
Room:	ISR-07	Transitioning To The Next Era Of Modular Construction: Reconfiguration, Reuse And Building Stock Agility	Christopher Rausch, Sheida Shahi, Aziz Dhamani, Carl Haas
Prince William	ISR-12	Digitization, Digitalization And Digital Transformation (3Ds): Explicating The Disparities And Applications Of The 3Ds In The Construction Industry	Emmanuel Kingsford Owusu, Albert P.C. Chan, Linyan Chen, Peter Amoah
	ISR-34	Factors And Indicators To Assess Sustainable Development Goals (Sdg) In Public Works Procurement	Laura Montalban-Domingo, Tatiana Garcia-Segura, Maria Amalia Sanz-Benlloch, Eugenio Pellicer



**Friday March 11, 2022**  
**Session 8: 4:15 pm - 5:15 pm**

**Track: Engineering and Materials Design, Quality, and Value Management**

	EQV-06	Structural Behaviour Of Composite Reinforced Concrete One-Way Slabs Voided With Plastic Bubbles	Amer Mohammed Ibrahim, Ibrahim Abbas, Rouwaida Hussein Ali
Room:	EQV-10	Life Cycle Cost Assessment Of Green Lightweight Concrete Utilizing Recycled Plastic Based Lightweight Aggregates	Fahad K. Alqahtani, Ibrahim Abotaleb, Mohamed Elmenshawy
Potomac 1	EQV-26	Investigation Of Relationship Between Geotechnical Parameters And Electrical Resistivity Of Sandy Soils	Mina Zamanian, Mohsen Shahandashti
	EQV-13	Identifying And Prioritizing Criteria For Selecting Sustainable Façade Materials Of High-Rise Buildings	Pouria Mohammadi, Amir Mohammad Ramezaniapour, Abdolmajid Erfani

**Track: Health, Safety, and Workforce Issues**

	HSW-07	Leveraging Natural Language Processing To Identify Health And Safety Challenges During Post-Disaster Reconstruction	S M Jamil Uddin, Mahzabin Tamanna, Alex Albert, Nipesh Pradhananga
Room:	HSW-38	Hiring For The New Age: Job Advertisements And The Transportation Workforce	Kristal Metro, Susan M. Bogus, Christofer Harper
Potomac 2	HSW-62	Investigating Hazards And Safety Risks Inherent In Human-Robot Interactions	Ifeanyi Okpala, Chukwuma Nnaji, John Gambatese
	HSW-74	Scale Equivalence In Canada And The United States For Interpersonal Conflicts At Work And Individual Resilience In The Construction Sector	Yuting Chen, Brenda Mccabe, Jun Wang, Douglas Hyatt

**Track: Automation in Construction**

	AIC-44	Bim Integration And Value Engineering: Design For Assembly, Optimization And Real Time Cost Visualization In Off-Site Construction	Arun Sekhar, Uma Maheswari
Room:	AIC-54	Information Exchange For Supporting Bim To Robotic Construction	Austin Dennis Mcclymonds, Somayeh Asadi, Robert Leicht, Alan Wagner
Potomac 3	AIC-03	Named Entity Recognition Algorithm For Ibisds Using Neural Network	Ning Wang, Raja R. A. Issa, Chimay J. Anumba
	AIC-40	Extraction Of Activities Information From Construction Contracts Using Natural Language Processing (Nlp) Methods To Support Scheduling	Fahad Ul Hassan, Tuyen Le

**Track: Project and Organizational Management and Planning**

	PMP-52	Digital Technology In Architecture, Engineering And Construction (Aec) Industry: Research Trend And Practical Status Towards Construction 4.0	Kaiyang Wang, Fangyu Guo, Cheng Zhang, Jianli Hao, Dirk Schaefer
	PMP-60	Identification Of The Barriers To Data-Centric Approach In The Construction Industry	Ali Karji, John Messner, Robert Leicht, Christopher Mccomb
Room:	PMP-64	A Comparative Analysis Of Production Metrics Across Vdc Implementations	Tulika Majumdar, Steinar G. Rasmussen, Alexandre Almeida Del Savio, Katrin Jä³Hannedottir, Eilif Hjelseth, Martin Arthur Fischer
Potomac 4	PMP-78	Transition To Supervision: A Skill Gap Analysis Between Female And Male Construction Supervisors	Callie Thomason French, Susan Bogus

**Track: Construction Scheduling, Estimating, Economics, and Controls**

	CEC-01	Economic Vulnerability Assessment Of The Construction Industry In The United States	Arkaprabha Bhattacharyya, Makarand Hastak
Room:	CEC-23	Prediction Of Egypt'S Construction Industry Resilience	Ahmed Gamal Shiha, Elkhayam Dorra
Potomac 5	CEC-24	Integrated Dematel And Anp-Based Framework To Model Construction Labor Productivity	Ali Bayesteh, Elyar Pourrahimian, Ming Lu, Simaan Abourizk
	CEC-26	Cost Estimate Risk Factors In U.S. Army Corps Of Engineers' Emergency Streambank Protection Projects	Hunter Waugaman, Mohammad Ammar Alzarrad, James Bryce

**Track: Infrastructure Systems, Sustainability and Resilience**

	ISR-17	Designing A Communication Practice To Build Community Capacity For Safer Housing	Briar Goldwyn, Amy Javernick-Will, Abbie Liel, Matthew Koschmann
Room:	ISR-32	Identifying And Assessing Critical Indicators Of Resilience In Active Construction Sites	M Ahmed Rusho, Md Nizamul Hoque Mojumder, Arif Mohaimin Sadri, Lu Zhang
Potomac 6	ISR-22	Identifying The Commonalities Between Lean Construction And Leed Requirements	Emel Sadikoglu, Sevilay Demirkesen, Chengyi Zhang
	ISR-74	Benchmarking Drinking Water Consumption During Construction Phase	Hashem Izadi Moud, Kenneth Sands, Craig Capano, Jalen Vowels, Kailey Stockinger, Jeanette Hariharan

**Track: Computer Applications, Information Modeling, and Simulation**

	CAS-12	Machine Learning-Enabled Automatic Vehicle Detection For Virtual Weigh-In-Motion Applications	Mohammad Afsar Sujon, Fei Dai
Room:	CAS-10	Visual Surveying Of On-Road Vehicle Height For Over-Height Warning Using Deep Learning And View Geometry	Linjun Lu, Fei Dai
Arlington	CAS-11	A Convolutional Neural Network Model For Identifying Unclassified And Misclassified Vehicles Using Spatial Pyramid Pooling	Jieyi Bao, Xiaoqiang Hu, Yi Jiang, Shuo Li
	CAS-70	Development Of Virtual Reality-Based Driving Simulator For Assessing Digital Speed Feedback Signs	Qichao Wang, Dong Zhao, Timothy Gates, Peter Savolainen

**Track: Advanced Technologies and Data Analytics**

	ADT-67	Blockchain-Based Methodology For Collaborative Risk Assessment	In Bae Chung, Carlos Caldas
Room:	ADT-55	Mining And Visualizing Cost And Schedule Risks From News Articles With Nlp And Network Analysis	Nan Gao, Ali Touran, Qi Wang
Fairfax	ADT-04	Artificial Intelligence Application For Risk Template Generation In Major Transportation Projects	Abdolmajid Erfani, Veronica Hercules Villeda, Qingbin Cui
	ADT-20	Machine Learning And Artificial Intelligence Applications In Building Construction: Present Status And Future Trends	Mahnaz Ensafi, Saeid Alimoradi, Xinghua Gao, Walid Thabet

**Track: Infrastructure Systems, Sustainability and Resilience**

	ISR-40	A Unified Tool To Foster Front-End Planning And Sustainability In Infrastructure Projects	Valentina Ferrer, Piyush Pradhananga, Mohamed Elzomor
Room:	ISR-53	Energy Infrastructure Scenarios For Reducing Distribution Losses And Carbon Emissions Using Multimethod Simulation With Gis	Soowon Chang
Prince William	ISR-56	Developing A Sustainability And Resilience Monitoring Scheme For Infrastructure Projects Using Sustainable Development Goals (Sdgs)	Shantanu Kumar, Mohammed S. Hashem M. Mehany
	ISR-59	Governing Contractor Greenwashing Behaviors In Construction Projects: The Heterogeneous And Interactive Roles Of Formal Contracts And Trust	Zilun Wang, Ge Wang, Yuan He, Yang Li

**Saturday March 12, 2022**  
**Session 9: 8:15 am - 9:15 am**

**Track: Engineering and Materials Design, Quality, and Value Management**

	EQV-16	Mistakeproofing Framework And Applications In Civil Engineering Operations And Products	Iris D. Tommelein, Karilin Yiu
Room:	EQV-17	Modular Adaptable Hospital Design (Mahd): Proposing A Design And Construction Methodology For Flexible And Adaptable Hospitals	Gordon Kuān, Daniel Mark Hall, David Grossmann, Konrad Graser
Potomac 1	EQV-23	Literature Review Of Residential Above Ground Storm Shelter	Bi Zhang, Ajay Shanker
	EQV-09	Critical Constructability Review Indicators For Construction Of Transportation Infrastructure	Minerva Bonilla, William Rasdorf, Amin Akhnoukh, Nick Norboge, Daniel Findley, Clare Fullerton

**Track: Health, Safety, and Workforce Issues**

	HSW-06	Incident Investigations And Learning: Methods, Barriers And Opportunities	Sreeja Thallapureddy, Siddharth Bhandari, Matthew Ryan Hollowell, Fred Sherratt, Evan Stoddard, Hayley Hansen
Room:	HSW-18	Assessing The Safety Climate Of A State Department Of Transportation Through Its Highway Maintenance Crews	Ashtarout Ammar, Zaman Al-Shabbani, Gabriel Dadi
Potomac 2	HSW-22	Annual Revenue'S Influence On The Safety Performance Of Construction Firms	Ahmed Jalil Al-Bayati, Ali A. Karakhan
	HSW-42	Safety Risks Of Reconstruction Workers In Clean-Up And Recovery Phase Due To Natural Hazards	Apurva Pamidimukkala, Sharareh Kermanshachi, Thahomina Jahan Nipa

**Track: Automation in Construction**

	AIC-67	Built-In Versus Standalone Code Checking The Case Of Automated Egress Path Checker	Abdelhamid Abdullah, Khaled Nassar, Alaa Mandour
Room:	AIC-18	Model Validation For Automated Building Code Compliance Checking	Jin Wu, Jiansong Zhang, Luciana Debs
Potomac 3	AIC-29	Automated Construction Progress Monitoring Of Partially Completed Building Elements Leveraging Geometry Modeling And Appearance Detection With Deep Learning	Aritra Pal, Jacob J. Lin, Shang-Hsien Hsieh
	AIC-07	Computer Vision-Based Geometry Mapping And Matching Of Building Elements For Construction Robotic Applications	Christopher Lacny, Jiansong Zhang

**Track: Project and Organizational Management and Planning**

	PMP-87	Determinants For Operating Organization Selection In Urban Rail Transit Project Under Public-Private Partnerships	Xian Zheng, Rui Li, Long Yi Han, Ying Jia Chen, Xiao Hu
Room:	PMP-40	Assessing Automation Readiness Of Recurring Pavement Failure In Developing Countries: Case Studies Of Nigeria And Jordan	Olugbenro Ogunrinde, Ifeanyi Udodilim Okpala, Rapheal Ojelabi Abiodun, Opeyemi Oyeypio, Muhammad Tyseer Hatamleh
Potomac 4	PMP-49	Comparative Analysis Of Right Of Way Acquisition Processes By State Dots	Frederick Chung, Baabak Ashuri
	PMP-74	Integration Of Utility Coordination And Highway Design	Shani Montes, Roy E. Sturgill, Timothy R.B. Taylor

**Track: Construction Scheduling, Estimating, Economics, and Controls**

	CEC-42	Optimization Of Multi-Skilled Labor With The Application Of Partial Allocation Of Resources	Amira Saleh, Ibrahim Abotaleb, Ossama Hosny
Room:	CEC-32	An Artificial Intelligence Based Model For Construction Activity Sequence Prediction In Highway Projects	Hamed Alikhani, David Jeong
Potomac 5	CEC-15	Construction Procedural Information Extraction From Textual Sources To Support Scheduling	Ran Ren, Jiansong Zhang

**Track: Infrastructure Systems, Sustainability and Resilience**

	ISR-08	Graph-Based Simulation For Cyber-Physical Attacks On Smart Buildings	Rahul Agarwal, Na Meng, Xinghua Gao, Yuqing Liu
Room:	ISR-30	Smart Building Conceptualization: A Comparative Analysis Of Literature And Standards	Alireza Borhani, Atieh Borhani, Carrie Sturts Dossick, Julie Jupp
Potomac 6	ISR-39	Measurement And Verification And Model Validation To Evaluate Energy And Demand Savings From Smart Building Technologies In A Residential, Controlled Laboratory	Yiyi Chu, Debrudra Mitra, Kristen Cetin
	ISR-48	Digital Twin Cities: Data Availability And Systematic Data Collection	Michael Jacobellis, Mohammad Ilbeigi

**Track: Computer Applications, Information Modeling, and Simulation**

	CAS-51	Virtual Reality For Enhancing Safety In Construction	Ibrahim Abotaleb, Ossama Hosny, Khaled Nassar, Sahar Bader, Mohamed Elrifae, Salma Ibrahim, Yasmin El Hakim, Mohamed Sherif
Room:	CAS-05	Design And Development Considerations For Construction Virtual Reality Training Modules: A Case Study	Saeed Rokoei, Alireza Shojaei, Amin Alvanchi, Reza Azad
Arlington	CAS-30	Perceptions Of Augmented And Virtual Reality Technologies Adoption Within The Aec Industry	Vahid Balali, Xiang Guo, Soheil Fathi, Arsalan Heydarian
	CAS-79	Semi-Automated Generation Of 3D Bridge Models From 2D Pdf Bridge Drawings	Temitope Akanbi, Jiansong Zhang

**Track: Advanced Technologies and Data Analytics**

	ADT-33	Non-Intrusive Method For Capturing Occupant Thermal Discomfort Cues	Nidia Ines Bucarelli, Nora El-Gohary
	ADT-36	Early-Stage Advisory System For Energy-Conscious Design Of Building Facade Systems	Bahram Abediniangerabi, Mohsen Shahandashti
Room:	ADT-05	A Shearlet Transform-Based Method For Automated Rebar Recognition Using Gpr B-Scan Image Data	Zhongming Xiang, Ge Ou, Abbas Rashidi, Ali H Mashhadi
Fairfax	ADT-70	Temporary Traffic Control Device Detection For Road Construction Projects Using Deep Learning Application	Kyubyung Kang, Donghui Chen, Kwangcheol Kim, Dan Koo, Myungjin Chae, Sungchul Seo, Hyung-Keun Park

**Track: Infrastructure Systems, Sustainability and Resilience**

	ISR-78	Construction Assessment Framework Of Electrical Transmission Structures From Decommissioned Wind Turbine Blades	Yulizza Henao, Russell Gentry, Tristan Al-Haddad, Lawrence C. Bank, John E. Taylor
Room:	ISR-99	Constructing Electric Conductive Pavement Using A More Sustainable Method	Mohamed Abdel Raheem, Mohammad Anis
Prince	ISR-126	Online Engagement Of Facility Users In Rehabilitation Decision Making	Ahmed Attalla, Tamer El-Diraby
William	ISR-121	Experimental Study Of Mechanical Connectors For Application In Rebar Cages	Masood Vahedi, Hamed Ebrahimian, Ahmad Itani

**Saturday March 12, 2022**  
**Session 10: 9:30 am - 10:30 am**

**Track: Engineering and Materials Design, Quality, and Value Management**

	EQV-14	Exploring Utilization Of The 3D Printed Housing As Post-Disaster Temporary Shelter For Displaced People	Karthik Subramanya, Sharareh Kermanshachi
Room:	EQV-24	A Framework For Estimating The Re-Use Value Of In-Situ Building Materials	Aida Mollaei, Chris Bachmann, Carl Haas
Potomac 1	EQV-05	Developing A Value Dashboard For Tracking Value Alignment During Design	Salam Khalife, Farook Hamzeh
	EQV-11	Examination Of Contractor Quality Control Plans For Highway Construction Projects	Mamdouh Mohamed, Dan Tran

**Track: Health, Safety, and Workforce Issues**

	HSW-30	Smart Robotic System To Fight The Spread Of Covid-19 At Construction Sites	Jonathan Seagers, Yizhi Liu, Houtan Jebelli
Room:	HSW-44	The Impact Of Covid-19 Pandemic On Construction Labor Force And Performance Metrics: A Case For Automation	Olugbenro Ogunrinde, Ifeanyi Udodilim Okpala, Muhammad Tyseer Hatamleh, Opeyemi Oyeyipo, Rapheal Abiodun Ojelabi
Potomac 2	HSW-103	Development Of Strategies To Improve Health And Safety Of Women In Construction Industry: A Delphi Method	Apurva Pamidimukkala, Sharareh Kermanshachi
	HSW-52	Measures To Boost Mental Health In The Construction Industry: Lessons From The Nigerian Workplace	Janet Mayowa Nwaogu, Albert P. C. Chan

**Track: Automation in Construction**

	AIC-68	Application Of Concrete 3D Printing For Bridge Construction: Current Challenges And Future Directions	Seyedeh Sara Miryousefi, Ali Kazemian, Amirhosein Jafari
Room:	AIC-38	Exploring Human-Machine Interfaces For Teleoperation Of Excavator	Jin Sol Lee, Youngjib Ham
Potomac 3	AIC-06	Integrating Ai In An Audio-Based Digital Twin For Autonomous Management Of Roadway Construction	Anisha Deria, Yong-Cheol Lee, Pedram Ghannad
	AIC-12	Digital Twin In Construction Safety And Its Implications For Automated Monitoring And Management	Moeid Shariatfar, Anisha Deria, Yong-Cheol Lee

**Track: Project and Organizational Management and Planning**

	PMP-08	A Framework To Measure The Cost Of Controversy Surrounding Energy Construction Projects	Wilmaida Lapatin, Lauryn Spearing, Perena Tiedmann, Olga Kavvada, Maria Giorda, Jean Damião Lou, Kasey M. Faust
Room:	PMP-70	Identification Of Management Processes That Impact Capital Efficiency On Downstream And Chemical Projects	Zhe Yin, Carlos Caldas, Daniel De Oliveira
Potomac 4	PMP-01	Mapping The Preconstruction Project Development Process For Transportation Projects	Tarun Anand Narasim, Dennis C. Bausman, Ajay S. Jadhav, Meebrur Chowdhury
	PMP-16	Making Project Risk Response Decisions Through Stakeholders' Impact On Project Risk Interaction	Zhixue Liu, Ronggui Ding, Lei Wang, Rui Song, Xinyi Song

**Track: Construction Scheduling, Estimating, Economics, and Controls**

	CEC-05	Determination Of Optimal Rolling Planning Period For The Management Of Bim-Based Construction Supply Chain Processes	Qian Chen, Borja Garcia De Soto, Bryan T. Adey
Room:	CEC-33	Building Optimization Model For Minimizing Operation And Maintenance Costs	Mahdi Ghafoori, Moatassem Abdallah
Potomac 5	CEC-34	Estimating Electricity Consumption Of Buildings Using Information Theory And Machine Learning Methods	Mahdi Ghafoori, Moatassem Abdallah
	CEC-43	Linear Optimization Model For Scheduling Repetitive Construction Projects With Multiple Crews	Shahryar Monghasemi, Moatassem Abdallah

**Track: Infrastructure Systems, Sustainability and Resilience**

	ISR-110	Development Of Innovative Strategies To Enhance The Resilience Of The Critical Infrastructure	Thahomina Jahan Nipa, Sharareh Kermanshachi, Karthik Subrananya
Room:	ISR-03	A Web-Based System To Optimize Project Waste Management Decisions	Boushra Barakat, Issam Srour
Potomac 6	ISR-14	Transportation Asset Data Management: Bim As A Holistic Data Management Approach	Ashtarout Ammar, Gabriel Dadi, Hala Nassereddine
	ISR-68	Evaluating Management Risks In Megaprojects: Case Of International Defense Construction	M. Scott Stanford, Evan Dicks, Patrick Suermann

**Track: Computer Applications, Information Modeling, and Simulation**

	CAS-81	Digital Civil Infrastructure And Why Is It Important For Transportation Agencies?	Hani Alzraiee, Jessica Mcarthur, William Francis Killmond
Room:	CAS-03	The Effects Of Uav-Captured Image Degradation Issues On The Quality Of 3D Reconstruction	Dhakshna B Morthy, Yiqing Liu, Justin Ker-Wei Yeoh
Arlington	CAS-08	Facilitating Smart Contract In Project Scheduling Under Uncertainty - A Choquet Integral Approach	Chuanni He, Min Liu, Zhigao Wang, Gongfan Chen, Yuxiang Zhang, Simon M. Hsiang
	CAS-13	Integrating 4D Bim And Fds To Simulate And Assess Fires In Buildings Under Construction	Qi Sun, Yelda Turkan, Erica Fischer

**Track: Advanced Technologies and Data Analytics**

	ADT-40	Construction Worker Ergonomic Assessment Via Lstm-Based Multi-Task	Jiannan Cai, Xin Li, Xiaoyun Liang, Wei Wei,
Room:	ADT-41	Evaluation Of Uas Flight Configuration Factors And Their Impacts On Photogrammetric Survey Accuracy	Yajie Liu, Kevin Han, William Rasdorf
Fairfax	ADT-49	Deep Learning-Based Relation Extraction From Construction Safety Regulations For Automated Field Compliance Checking	Xiyu Wang, Nora El-Gohary
	ADT-54	Digital Safety Planning And Monitoring On Highway Construction Project	Hani Alzraiee, Tong Goh

**Track: Infrastructure Systems, Sustainability and Resilience**

	ISR-19	Connecting Pre-Existing Characteristics Of Water Utilities To Impacts During The Covid-19 Pandemic	Lauryn Spearing, Nathalie Thelemaque, Felipe Araya, Jessica Kaminsky, Kasey Faust
Room:	ISR-47	Using Wastewater Flow To Understand Water System'S Demand Behavior During Covid-19 Pandemic In An Urban Metropolitan City In Texas	Amal Bakchan, Arkajyoti Roy, Kasey M. Faust
Prince William	ISR-58	Water Utilities And The Covid-19 Pandemic: A Review Of Pandemic-Related Research	Nathalie Thelemaque, Lauryn Spearing, Kasey Faust, Jessica Kaminsky
	ISR-77	Managing Leakages In Intermittent Water Supply Systems: The Role Of Network Zoning And Supply Scheduling	Saad Aljadhari, Abdulrahman Bin Mahmoud Bin Mahmoud

## Saturday March 12, 2022

### Session 11: 11:00 am - 12:00 pm

#### Track: Engineering and Materials Design, Quality, and Value Management

	EQV-15	Streamlining Well Concepts Of Office Buildings For Developing Countries: The Case Of Malaysia	Carmen Y. M. Tan, Rahimi A. Rahman, Bo Xia, Qing Chen
Room:	EQV-20	Upstream Digitized Materials Tracking By Vendors And Suppliers: Barriers, Drivers, And Benefits	Verena Schneider, David Grau
Potomac 1	EQV-25	Strategies For Enhancing Construction Waste Recycling: A Fuzzy Synthetic Evaluation	Rahimi A. Rahman, Mazen M. A. Omer, Saud Almutairi
	EQV-21	Multi-Objective Optimization Model To Minimize Upgrade And Utility Costs Of Large Existing Buildings	Mahdi Ghafoori, Moatassem Abdallah

#### Track: Health, Safety, and Workforce Issues

	HSW-21	Reducing Harassment For Women In The Professional Construction Workplace With Zero-Tolerance And Interventionist Policies	Candice Sexton, Jiansong Zhang
Room:	HSW-37	Occupational Health And Safety Challenges In Construction Industry: A Gender-Based Analysis	Apurva Pamidimukkala, Sharareh Kermanshachi
Potomac 2	HSW-69	Analysis Of Gender Perception In The Construction Sector: Colombian Case.	Cristian Camilo Osorio Gã³mez, Marieth Stephany Castro Forero, Candice Starr Sexton, Jiansong Zhang, Lina Verã³nica Zuluaga Botero
	HSW-76	A Gender Analysis Of Construction Executive Career Path Progression Using LinkedIn Data	Paul J. Hickey, Veronica Hercules Villeda, Adam Johnson, Abdolmajid Erfani, Qingbin Cui

#### Track: Computer Applications, Information Modeling, and Simulation

	CAS-34	Construction Site Segmentation Using Drone-Based Ortho-Image And Convolutional Encoder-Decoder Network Model	Yuhan Jiang, Sisi Han, Yong Bai
Room:	CAS-52	Augmented Reality Communication On Active Construction Sites: A Pilot Study Exploring Non-Technological Factors	Rita El Kassis, Steven Ayer, Mounir El Asmar, Pingbo Tang
Potomac 3	CAS-55	Adaptation Of A Contractor'S Risk Behavior In A Competitive Bidding Environment	Rita Awwad, Wiam El Irani
	CAS-57	Earthwork Surface Creation And Volume Computation Using Uav 3D Mapping	Nickolas Villalobos, Hani Alzraiee

#### Track: Project and Organizational Management and Planning

	PMP-18	Understanding And Comparing The Different Fund Levels In Airport Improvement Program Projects: A Graph Theory Approach	Ramy H. Khalef, Islam El-Adaway
Room:	PMP-23	Improved Project Planning Strategies For Transportation Assets: The Necessity Of Early Stakeholder Involvement	Katherine Maslak Madson, Bukola Oni
Potomac 4	PMP-36	A Pre-Demolition Planning Framework To Balance Recyclability And Productivity	Hiba Jalloul, Ana Daniela Pinto, Juyeong Choi
	PMP-62	Project Team Collaborations During Time Of Disruptions: Transaction Costs, Knowledge Flows, And Social Network Theory Perspective	Hasan Gokberk Bayhan, Sinem Mollaoglu, Hanzhe Zhang, Kenneth A. Frank

#### Track: Construction Scheduling, Estimating, Economics, and Controls

	CEC-09	Machine Learning Framework To Predict Last Planner System Performance Metrics	Lynn Shehab, Diana Salhab, Elyar Pourrahimian, Karim Noueihed, Gunnar Lucko, Farook Hamzeh
Room:	CEC-45	A Rating Score For Assessing The Risks And Challenges Associated With Modular Construction	Mohamad Abdul Nabi, Islam El-Adaway
Potomac 5	CEC-44	Benefits Of Building Information Modeling In Road Projects For Cost Overrun Factors Mitigation	Omar Sánchez, Karen Castaneda, Rodrigo F. Herrera, Eugenio Pellicer

#### Track: Infrastructure Systems, Sustainability and Resilience

	ISR-10	A Framework For Evaluating Societal Impacts Caused By Disruptions To Inland Waterways	Katherine Maslak Madson, Jennifer Lather
Room:	ISR-15	Framework For Measuring Infrastructure Vulnerability And Resiliency Of Communities During A Flood Disaster	Anisha Deria, Yong-Cheol Lee, Pedram Ghannad
Potomac 6	ISR-107	Analysis Of The Resilience Management Dimensions Based On Project Complexity Level	Thahomina Jahan Nipa, Sharareh Kermanshachi, Ronik Ketankumar Patel
	ISR-108	Analysis Of Investment Decision-Making Factors In Resilience Improvement Of Transportation Infrastructures	Thahomina Jahan Nipa, Sharareh Kermanshachi, Sanjgna Karthick

#### Track: Computer Applications, Information Modeling, and Simulation

	CAS-15	Semi-Automated Conversion Of 2D Orthographic Views Of Wood Building Components To 3D Information Models	Temitope Akanbi, Oscar Wong Chong, Jiansong Zhang
Room:	CAS-16	Interactive Visual Representation Of Inter-Connected Requirements In Building Codes	Xiaorui Xue, Jiansong Zhang, Nora El-Gohary
Arlington	CAS-17	Analyzing The Impact Of Covid-19 Pandemic Risks On Construction Projects In Developing Countries: Case Of Iraq	M.K.S Al-Mhdawi, Mario Brito, Bhakti Stephan Onggo, Hatim A. Rashid
	CAS-20	Desktopeye: A Desktop-Based Eye-Tracking System For 3D Model Review Analysis	Yangming Shi, Jing Du

#### Track: Advanced Technologies and Data Analytics

	ADT-62	Feasibility Assessment And Enhancement Of Tof-Based Uwb RtlS For Non-Line-Of-Sight Conditions On Construction Sites	Tian Jin, Farnaz Sadeghpour
Room:	ADT-26	A Framework For Eeg-Based Ubiquitous Hazard Identification And Proactive Safety Management	Jungho Jeon, Hubo Cai
Fairfax	ADT-74	Early Pilot Deployment Of A Decision-Making Framework To Select Wearable Internet Of Things Devices For Safety On Construction Sites	Ibukun Awolusi, Tulio Sulbaran
	ADT-82	Worker Safety And Health Activity Monitoring In Construction Using Unmanned Aerial Vehicles And Deep Learning	Ibukun Awolusi, Aliu Akinsemoyin, Debaditya Chakraborty, Ahmed Al-Bayati

#### Track: Infrastructure Systems, Sustainability and Resilience

	ISR-75	Comparing Impacts Of Indoor Environmental Quality Factors On Satisfaction Of Occupants With Different Genders And Ages Between Office- And Home-Based Work Environments	Xingzhou Guo, Yunfeng Chen
Room:	ISR-66	Impacts Of The Covid-19 Pandemic On Services Utilization And Energy Consumption In Healthcare Facilities: Evidence From Shanghai Municipal Hospitals	Yongkui Li, Lingyan Cao, Jiansong Zhang, Yi Jiang
Prince William	ISR-44	Understanding Covid-19'S Impacts On Multi-Sector Stakeholder Values On Housing Resilience	José E. Velázquez-Díaz, Parasar Gosain, N. Emel Ganapati, Lu Zhang
	ISR-97	Analyzing The Resilience Of Construction Firms Through Resilience Indicators	Sai Akhila Boddhi Reddy, Ingrid Arocho