Artificial Intelligence in Architecture, Engineering and Construction

AI AEC

March 20-21, 2024
HELSINKI, FINLAND & VIRTUAL

Tuesday
March 19, 2024

19.00 - 21:00 GET TOGETHER AND EXHIBITION

All times are EET (CET +1)
Organizer reserves right for changes
**Wednesday March 20, 2024**

08:45 **OPENING SESSION**
Venue: Sirkus  Chair: VESA JÄRVINEN, AINS Group / A-Insinöörit
Opening of the AI in AEC 2024 Conference
VESA JÄRVINEN, AINS Group / A-Insinöörit

09:00 **Keynote 1** A Quantum future with AI
ROB GREIG, Arup, United Kingdom

09:30 **Keynote 2** Embracing the Future: AI Integration for Advanced Building Control
TEA ŽAKULA, University of Zagreb, Croatia

10:15 **COFFEE AND EXHIBITION**

10:45 **SMART BUILDINGS**
Venue: Sirkus  Chair: DAVOR STJELJA, Granlund

09:00 Mind-Controlled Smart Homes: Brain-Computer-Interface and Digital Twin Hybrid Approach
AHMED ZAKZOUK, Dresden University of Technology, Germany

DAVOR STJELJA, Granlund, Finland

11:30 Data Requirements for AI Use in Building Automation Systems: Challenges, Costs and Solutions
NIKOLA BADUN, University of Zagreb, Croatia

11:45 Humanizing Human-Centered Control Systems in Buildings and Occupant Comfort Prediction Using Machine Learning
ARLINDA BRESA, University of Zagreb, Croatia & University of Prishtina, Kosovo

12:00 **LUNCH AND EXHIBITION**

13:00 **COMPUTATIONAL DESIGN**
Venue: Sirkus  Chair: HEIKKI ARVIO, Ramboll

11:00 Leveraging Unsupervised Machine Learning for Precise BIM Model Creation using ICP Registration Algorithm: A Case Study
RAMIZ MOHAREB & DIRK MÜNZER, BuP. Boll Beraten und Planen, Germany

11:45 Automatic BIM generation from scanned architectural drawings
LEO SALOMAA, Make a BIM, Finland

12:00 Evaluation of Structural Element Safety Using Finite-Element Analysis, Deep Neural Network and Monte Carlo Simulation
ANTON KRALJ, TCPS, Croatia

12:15 Deep learning based crack segmentation in 3d computed tomography images of concrete
ANNA NOWACKA, Fraunhofer Institute for Industrial Mathematics, Germany

12:45 Augmenting Dubal’s Finite Element Analysis Software with AI
Dr. MICHAEL KRAAS & DOGUUKAN KARATAS, Dubal Software, Germany

14:00 **COFFEE AND EXHIBITION**

14:30 **AI TRANSFORMING THE INDUSTRY**
Venue: Sirkus  Chair: MIRO RISTIMÄKI, Skanska

15:00 Keynote 3 AI in the Era of Retrofit
KAROLIINA TORTTILA, Trimble Inc., Finland

15:30 Location Intelligence + Artificial Intelligence combined
MARCO GOLDMAN, Esri Inc., United States

15:45 HOW AI + Big Data Will Transform the AEC Industry
BRIAN FURR, BST Global, United States

16:00 - 16:30 DISCUSSION WITH session speakers

19:00 **HELPSINKI CITY RECEPTION**
Thursday
March 21, 2024

09:00
LARGE LANGUAGE MODELS
Venue: Sirkus  Chair: SIMON OSTER, Arcadis
09:00
Keynote 6: TileGPT: Tile-based Design Exploration with Large Language Models
Dr. ADAM GAIER, Autodesk Research, Germany

10:15
COFFEE AND EXHIBITION
10:45
AI-BASED MODELING
Venue: Sirkus  Chair: JOONAS HELMINEN, Sweco
10:45
Beyond Traditional AI: PINNs Supercharged with MOO and Parallel Computing with Focus on Building Performance Simulations
Dr. RANIA LABIB, Prairie View A&M University, United States
11:00
Probabilistic Machine Learning Surrogates With Bayesian Neural Networks
ARCHIE LUXTON, Arup, United Kingdom
11:15
From Physics to AI: Modelling Buildings’ Thermal Dynamics
LINA MORKUNAITE, Kaunas University of Technology, Lithuania
11:30
Enhancing Structural Assessment with Bayesian Deep Learning Surrogates for Cost-effective and Sustainable Maintenance of Existing Reinforced Concrete Frame Bridges
SOPHIA KURNH, ETH Zurich, Switzerland
12:00
LUNCH AND EXHIBITION
13:00
DESIGN OPTIMIZATION
Venue: Sirkus  Chair: HENRI PITKÄNEN, Trimble
13:00
Machine Learning and Evolutionary Optimization in Immersed Tunnel Design
FELIPE BANDEIRA DE MELO MORAES & KONSTANTIN KRASNOPOLOV, Ramboll, Denmark
13:15
GENERATIVE AI & PARAMETRIC BRIDGE DESIGN BASED ON HISTORICAL DATA
ALEJANDRO PALPA, GEHR, Peru
13:30
Advanced impact assessment of road infrastructure designs using AI
RENAUD DE MONTAIGNAC & ALAIN ANTHONY MARDO, ORIS, France
13:45
Data-Driven Predimensioning: Applying Graph Neural Networks to Reinforced Concrete Design
NILS SCHÄFER, Technische Universität Braunschweig, Germany
14:00
Towards a Holistic AI Design Assistant
DIEGO APELLÁNIZ, Tongji University, China
14:15
Theory of Design Redundancy and Its Application in AI assisted Structural Design Automation
Prof. KIN ZHAO, Tongji University, China
14:30
COFFEE AND EXHIBITION
15:00
CLOSING SESSION
Venue: Sirkus  Chair: VESA JÄRVINEN, AINS Group / A-Insinöörit
15:00
Keynote 8: How AI Disrupts: Lessons for the Built Environment from Other Industries
CLAYTON MILLER, National University of Singapore, Singapore
15:30-15:45
Closing Words
VESA JÄRVINEN, AINS Group / A-Insinöörit