

eCAADe2023
**DIGITAL DESIGN
RECONSIDERED**

eCAADe2023
**SESSIONS
SCHEDULE**

eCAADe2023

DAY 01

Sessions 1

1.1 - DIGITAL DESIGN & FABRICATION

SESSION 1.1

Room:	HS I	Date: 20.09.2023 Time: 11:00 -12:30	Session Chair: José Pedro Sousa
022	Jiangyang Zhao, Asterios Agkathidis, Davide Lombardi, Hanmei Chen	A Computational Framework for Parametric Design and Robotic Fabrication of the Dougong joint	
077	Dimitra-Anna Tsoi, Christos Koureas, Evangelia Tsoukala, Alexandros Efstathiadis, Ioanna Symeonidou	Prototyping Architecture: A flat-pack timber plate structure from design to production	
079	Marco Hemmerling, Max Salzberger	:metabolon - A prototypical approach towards sustainable housing	
110	Rossella Siani	Digital Fabrication Joints: Educational experience	
240	Anton Brodmann, Efstathios Damsas, Arne Drewes, Anna Prell, Benjamin Spaeth, Michael Herrmann	Computational Design and 3D Printing of a Biopolymer Construction System for Freeform Applications	
388	Marilies Wedl, Peter Bauer	Reconsidering the Construction of Complex Architectural Shapes: On the practical significance of Orthogonal Circle Packings in the creation of Architectural Freeform Structures	

1.2 - DIGITAL DESIGN & SUSTAINABILITY ONE

SESSION 1.2

Room:	HS II	Date: 20.09.2023 Time: 11:00 -12:30	Session Chair: Katerina Sysova
060	Fatemeh Mostafavi, Seyran Khademi	Micro-Climate Building Context Visualization	
112	Andrea V. Aguilera, Yu Zhang, Kristina Shea	Mobile Augmented Reality for Aided Manual Assembly of Compressed Earth Block Dwellings	
157	Elena Shilova, Andy Watts, Bamdad Ayati, Alan Chandler, Armor Gutierrez Rivas	Bridging The Gap Between Academia and Practice	
284	Gozde Damla Turhan	Life Cycle Assessment for the Unconventional Construction Materials in Collaboration with a Large Language Model	
326	Grégoire Gaudreault, Andrei Nejur	Heteromorph	

1.3 - DIGITAL DESIGN EDUCATION ONE

SESSION 1.3

Room:	HS V	Date: 20.09.2023 Time: 11:00 -12:30	Session Chair: Wolfgang Dokonal
025	Renate Weissenböck, Jan Michael Werner	Analogue Computation: An educational framework for introducing first-year architecture students to parametric design through manual making	
095	Tim Ireland, Georgios Spyridon-Athanasopoulos, Peter Buš	Some Spatial Experiments: Student work exploring intersections between computing, biological and semiotic theory through architecture	
266	Selen Çiçek, Gözde Damla Turhan, Mine Özkar	Reconsidering Design Pedagogy through Diffusion Models	
311	Zuardin Akbar, Gili Ron, Thomas Wortmann	Democratizing the Designer's Toolbox: Adopting free, open-source, and platform-agnostic tools into computational design teaching	
313	Michal Gath-Morad, Raphaël Baur, Christoph Hölscher	The DesignMind toolkit	
319	Irina Miodragovic Vella	Digital Design in 'Peripheral' Contexts	

1.4 - ONLINE: COLLABORATION & EDUCATION

SESSION 1.4

Room:	HSVI & Online	Date: 20.09.2023 Time: 11:00 -12:30	Session Chair: Alexander Grasser-Pargner
015	Muhammet Ali Heyik, Emre Karataş, Meral Erdoğan	Leveraging Collective Intelligence from Crowdsourcing to Co-creation in Field Studies	
055	Ahmed Ismail, Philippe Marin	Direct data flows as alternative to file-based Exchanges in AEC: A comparative case study of two plugin developments	
146	Yuval Kahlon, Weiheng Hu, Momoko Nakatani, Jiang Zhu, Takuya Oki, Yichuan Zhu, Haruyuki Fujii	The Holographic Studio: Real-time virtual teleportation in Mixed Reality for enhancing design education	
198	Romman Jahandideh, Aran Jahandideh, Ikhwani Kim	Creating Immersive Virtual Landscapes A User-Centered Approach to Enhance Depth Perception in Head-Mounted Displays	
215	Abdullah Sheikh, Kristof Crolla	Architectural Education with Virtual Reality	
447	Alexander Htet Kyaw, Jack Otto, Leslie Lok	Active Bending in Physics-Based Mixed Reality: The design and fabrication of a reconfigurable modular bamboo system	
468	Likai Wang, Patrick Janssen, Rudi Stouffs	Teaching Computational Design Optimization - An experimental course for performance-based building massing exploration	

eCAADe2023
DAY 01
Sessions 2

2.1 - DIGITAL FABRICATION & MATERIAL EXPERIMENTS

SESSION 2.1

Room: **HS I** Date: 20.09.2023 Time: 14:30 -16:00 Session Chair: **Vera Parlac**

- 062** Erin Hunt, Haley Arthur Hexcrete Modular and Recyclable Paper Clay Formwork
- 130** Mehmet Oğuz Nas, Arzu Gönenç Sorguç 4D Printing of Hygroscopic Wood Based Actuators for Climate Responsive Skin
- 149** Camila Martínez Alarcón, Tom Svilans 3D-Printing Bioplastics onto Textiles
- 239** Martin Tamke, Shahriar Akbari, Ruxandra Chiujdea, Paul Nicholas, Mette Ramsgaard Thomsen A Computer Vision-Based Long-term Monitoring Framework for Biobased Materials
- 264** Gozde Damla Turhan, Selen Cicek, Filiz Ozbengi-Uslu Biobased Material Computation and Digital Fabrication for Bacterial Cellulose-Based Biofabrics
- 292** Dhruv Thakker, Rozhin Hadavi, Nikhil Raj, Vijayalakshmi Vijayappan, Honey Gupta, Jingyuan Meng, Guillem Perutxet Olesti, Ben Lee, Nikolett Karastathi, Pradeep Devadass Developing Feedback Based Robotic Manufacturing Method for Earth-Based Materials

2.2 - DIGITAL DESIGN & SUSTAINABILITY TWO

SESSION 2.2

Room: **HS II** Date: 20.09.2023 Time: 14:30 -16:00 Session Chair: **Sevil Yazici**

- 196** Predrag Radomirović, Vesna Stojaković, Vlado Delić The Influence of the Folding Ceiling Structure on the Room Acoustics
- 210** Kaan Buyukmihci, Sevil Yazici A Generative Design Model for Demolition Waste Reuse
- 334** Alexandros Efstathiadis, Ioanna Symeonidou Developing Strategies for the Analysis and Implementation of Biomimetic Design Solutions
- 372** Roger Loho, Max Stein, Timo Carl, Markus Schein From Sheet to 3D Form
- 389** Szende Szentesi-Nejur, Francesco de Luca, Andrei Nejur, Payam Madelat Early Design Clustering Method Considering Equitable Daylight Distribution in The Adaptive Re-Use of Heritage Buildings
- 441** Petra Sochůrková, Daniel Svíták, Imrich Vaško, Shota Tsikoliya, Pierre Oskam, Max Latour Bioreceptivity as a Factor of Additive Fabrication

2.3 - DIGITAL DESIGN EDUCATION TWO

SESSION 2.3

Room: **HS V** Date: 20.09.2023 Time: 14:30 -16:00 Session Chair: **Aulikki Herneoja**

- 152** Jin Lee, Seung Wan Hong Developing the Reinforcement-Learning Child Agents for Measuring Play and Learning Performance in Kindergarten Design
- 197** Frederick Chando Kim, Mikhael Johanes, Jeffrey Huang Text2Form Diffusion: Framework for learning curated architectural vocabulary
- 200** Mohammed Faraj Al-Suwaidi, Asterios Agkathidis, Adonis Haidar, Davide Lombardi Immersive Technologies in Architectural Education: A pedagogical framework for integrating virtual reality as the main design tool in a fully virtualised architectural design studio environment
- 344** Lukas Raabe, Francesca Andriolli, Wolfgang E. Lorenz, Gabriel Wurzer F2F - Algorithmic approach on kindergarten architecture
- 345** Ioanna Symeonidou, Alexandros Efstathiadis Digital Biomimicry: Developing an algorithmic design curriculum
- 477** Peter Ferschin, Georg Suter, Marco Palma, Ingrid Erb, David Hahn, Bálint Kovács, Georg Nawratil, Kiumars Sharifmoghadam Transformable Luminaire Design: From digital sketch to fabrication through computation and simulation

2.4 - ONLINE: GENERATIVE DESIGN & AI

SESSION 2.4

Room: **HSVI & Online** Date: 20.09.2023 Time: 14:30 -16:00 Session Chair: **Gabriel Wurzer**

- 010** Abel Sepúlveda, Nasim Eslamirad, Francesco De Luca Machine Learning Approach versus Prediction Formulas to Design Healthy Dwellings in a Cold Climate
- 051** Jayedi Aman, Jong Bum Kim, Debora Verniz, AI-Integrated Urban Building Energy Simulation: A framework to forecast the morphological impact on daylight availability
- 089** Hooshiar Ahmadpanah, Adonis Haidar, Seyed Mostafa Latifi BIM and Machine Learning (ML) Integration in Design Coordination: Using ML to automate object classification for clash detection
- 377** Qiyan Zhang, Biao Li, Hongjian Li, Peng Tang Towards Integration and Hybridization in Urban Generation: An extendable urban generative system for better natural ventilation
- 444** Amelia Wen Jiun Gan, Quoc Dang, Blaine Western, Jose Luis García del Castillo AI-Mediated Group Ideation
- 450** Keerthana Govindarazan, Heather Ligler, Yasmine Abbas, Jose Duarte Translating Christopher Alexander's Patterns for Immersive Virtual Reality A rule-based approach to behavior testing in VR
- 452** Haixin Yin, Jinzi Wei, Jose Luis García del Castillo y López Speedy Façade

eCAADe2023
DAY 01
Sessions 3

3.1 - ROBOTIC CONSTRUCTION

SESSION 3.1

Room: **HS I** Date: 20.09.2023 Time: 16:30 -18:00 Session Chair: **Renate Weissenböck**

- 049** Caleb Chan, Antony Pelosi, Andre Brown VR Controlled Remote Robotic Teleoperation for Construction Applications
- 084** Alexander Wolf, João Carvalho, Bruno Figueiredo, Paulo Jorge Sousa Cruz, Campos Tatiana Support-strategies for Robocasting Ceramic Building Components
- 317** Alireza Zamani, Alale Mohseni, Özgüç Bertuğ Çapunaman Reconfigurable Formwork System for Vision-Informed Conformal Robotic 3D Printing
- 318** Chowdhury Ali Imam, Hanin Abdel Salam Othman, Özgüç Bertuğ Çapunaman Robotic Plaster Carving: Formalizing subtractive detailing of plaster surfaces for construction and crafts
- 414** Abel Groenewolt, Oliver Krieg, Achim Menges Collaborative Human-Robot Timber Construction
- 422** Felix Amsberg, Xiliu Yang, Lior Skoury, Aimée Sousa Calepso, Michael Sedlmair, Thomas Wortmann, Achim Menges Multi-Actor Fabrication for Digital Timber Construction

3.2 - DIGITAL DESIGN & OPTIMIZATION

SESSION 3.2

Room: **HS II** Date: 20.09.2023 Time: 16:30 -18:00 Session Chair: **Sung-Ah Kim**

- 014** Gen Karoji A Data-Oriented Optimization Framework
- 037** Susana Alexandra Santos Pereira, Bruno Figueiredo, Paulo Mendonça Performance-Based Design: Report of an academic workshop with energy efficiency simulation tools
- 038** Chuheng Tan, Dongqi Ying A "Designer-centric" Framework for Building Massing optimization
- 054** Abdulwahab Abdulmajeed, Asterios Agkathidis, Theo Dounas, Davide Lombardi Mass-customisation of dwellings in the Middle East: developing a design-to-fabrication framework to resolve the housing crisis in Saudi Arabia
- 073** Elie Daher, Sylvain Kubicki, Antonino Marvuglia A Digital Collaborative Framework for Evaluating the Environmental Impacts and the Potential of Vertical Building Extensions

3.3 - COLLABORATION & PARTICIPATION

SESSION 3.3

Room: **HS V** Date: 20.09.2023 Time: 16:30 -18:00 Session Chair: **Henri Achten**

- 236** Matti Drechsel, Nick Förster, Dominik Berger, Gerhard Schubert, Frank Petzold Mobilizing Publics - Reconsidering digital design as a catalyst in co-creation processes
- 359** Panagiotis Parthenios, Anna Karagianni, Vassiliki Geropanta, Alexandros Tzortzakakis, Stavros Kallimeris, Panagiota Dania, Charalampos Delintadakis A collaborative Virtual Reality platform for Opera Rehearsal: Designing for performing arts
- 369** Alexander Grasser Decentralized Participation and Agency in Digital Art and Architecture, An Exploration of Pixel and Voxel-Based Case Studies
- 371** Alexandra Moisi, Rupert Maleczek, Kristina Schinegger, Stefan Rutzinger Remediating Realities - Rethinking design through participation and gamification
- 383** Georgios (Yorgos) Berdos, Theodore Dounas, Jiri Vele Decentralised Additive Manufacturing for Architecture

3.4 - ONLINE: EXPERIMENTATIONS

SESSION 3.4

Room: **HSVI & Online** Date: 20.09.2023 Time: 16:30 -18:00 Session Chair: **Rudi Stouffs**

- 096** Frederick Peter Ortnr, Zebin Chen, Peng Song, Pengyun Qiu Urban Fabric Generation: A comparative analysis of multiple vector field methods
- 120** Gaëlle Baudoux, Pierre Leclercq Experimenting with a New Proposal for Digital Design Instrumentation: A Wizard of OZ method to study its impact on activity
- 164** Agit Coskun, Mads Brath Jensen Integrating Additional Elements in Clay 3D Printing with Human Intervention
- 180** Yael Engelhart, Aaron Sprecher YONA 2.0 The Reenactment: Visions of computerized machines
- 186** Veli Mustafa Yonder, Fehmi Dogan, Hasan Burak Cavka, Gokmen Tayfur, Ozum Dulgeroglu Decoding and Predicting the Attributes of Urban Public Spaces with Soft Computing Models and Space Syntax Approaches
- 423** Tahmures Ghiyasi, Seyed Hossein Zargar, Ali Baghi Layer-by-Layer Pick and Place Collaboration Between Human and Robot Using Optimization
- 466** Zidong Liu, Han Li, Daniel Koehler, Yan Li Predicting Non-functional Nodes of Floorplan via Graph Neural Network (GNN)

eCAADe2023
DAY 02
Sessions 4

4.1 - ADDITIVE MANUFACTURING STRATEGIES

SESSION 4.1

Room:	HS I	Date: 21.09.2023 Time: 09:00 -10:30	Session Chair: Antonio Fioravanti
074	Asterios Agkathidis, David Jourdan, Yang Song, Arathi Kanmani, Ansha Thomas	Four-Dimensional Printing on Textiles Evaluating Digital File-to-Fabrication Workflows for Self-Forming Composite Shell Structures	
209	Islam Salem, Sherif Abdelmohsen, Yasser Mansour	Coupling Non-planar Robotic Clay Deposition with Multipoint Forming to Optimize the Manufacturing of Double Curved Façade Panels	
246	Peter Massin, Andreas Körner, Marjan Colletti, Georg Gasser, Theresa Uitz, Kilian Bauer	Postdigital Natures: Digital-material hybrids for robotic 3D printing of architectural elements	
282	Jiri Vele, Lukáš Kurilla, Henri H.Achten	Improving Buildability of Overhangs of 3D Printed Objects Through Non-Planar Slicing Informed by Force Flow Analysis	
363	Julia Fleckenstein, Federico Bertagna, Valeria Piccioni, Mareen Fechner, Mia Düpre, Pierluigi DAcounto, Kathrin Dörfler	Revisiting Breuer through Additive Manufacturing: Passive solar-control design strategies for bespoke concrete building envelope elements	
403	Luca Breseghello, Ardeshir Talaei, Daniele Florenzano, Roberto Naboni	Shape-Env - Camera-enhanced robotic terrain-shaping for complex 3D concrete printing	

4.2 - BIM & SUSTAINABILITY

SESSION 4.2

Room:	HS II	Date: 21.09.2023 Time: 09:00 -10:30	Session Chair: Armando Trento
099	Arlind Dervishaj, Arianna Fonsati, José Hernández Vargas, Kjartan Gudmundsson	Modelling Precast Concrete for a Circular Economy in the Built Environment	
222	Angelo Massafra, Riccardo Gulli	Enabling Bidirectional Interoperability between BIM and BPS through Lightweight Topological Models	
227	Jon Moorhouse, Tim Freeman	Towards a Genome for Zero Carbon Retrofit of UK Housing	
258	Soon Min Hong, Geunjae Kim, Hyeongmo Gu, Taehoon Kim, Seungyeon Choo	Development of Building Component Combination Algorithms for Generative Design-based DfMA Applications	
272	Leonardo Jorge, Carolina Eyesen, José Nuno Beirão	Design Cost Analysis in a BIM/VPI Framework	
350	Ugo Maria Coraglia, Gabriel Wurzer, Marco Alvise Bragadin	A Methodological Approach to represent Climate Change Impacts on Buildings	

4.3 - TEXT-TO-IMAGE-TO-DESIGN

SESSION 4.3

Room:	HS V	Date: 21.09.2023 Time: 09:00 -10:30	Session Chair: Tomohiro Fukuda
048	Christina Doumptioti, Jeffrey Huang	Text to Image to Data	
068	Yuki Mugita, Tomohiro Fukuda, Nobuyoshi Yabuki	Future Landscape Visualization by Generating Images Using a Diffusion Model and Instance Segmentation	
137	Quintin Blaas, Antony Pelosi, Andre Brown	Reconsidering Artificial Intelligence as Co-Designer	
145	Jonathan Dortheimer, Gerhard Schubert, Agata Dalach, Lielle Joy Brenner, Nikolas Martelaro	Think AI-side the Box! Exploring the Usability of text-to-image generators for architecture students	
183	Ines Werker, Kinza Beneich	Open AI in the Design Process - To what extent can text-to-image software support future architects in the early design process?	
436	Mathias Bank Stigsen, Alexandra Moisi, Shervin Rasoulzadeh, Kristina Schinegger, Stefan Rutzinger	AI Diffusion as Design Vocabulary - Investigating the use of AI image generation in early architectural design and education	

4.4 - ONLINE: FABRICATION & THEORY

SESSION 4.4

Room:	HSVI &Online	Date: 21.09.2023 Time: 09:00 -10:30	Session Chair: Wolfgang Lorenz
012	Shahram Minooee Sabery, Valentina Soana, Cephas Bhaskar, Yelay Bayraktaroglu	Elastic Choreographies: A robotic bending active structure interacting with humans	
086	Tamar Nix, Aaron Sprecher	Crochet Digital Assemblage - Notes on additive manufacturing of textile in architecture	
142	Qianbin Xu, Frederico Fialho Teixeira, Maryam Shafiei	Frameworks in Flexible Timber Design Systems Combining Mortise-Tenon Joints and Discrete Timber Blocks	
224	Veli Mustafa Yonder, Ozum Dulgeroglu, Fehmi Dogan, Hasan Burak Cavka	The Role of the Computational Designer From Computer-Aided Design to Machine Learning-Aided Design: A study on generative models and design prompts	
426	Amin Adelzadeh, Hamed Karimian-Aliabadi, Christopher Robeller	Wave-edge Modeling Method for Segmented Timber Plate Shell Structures: A computational tool for optimizing the bonding area of CLT joints	
472	Marianna Charitonidou	Urban Scale Digital Twins Vis-à-Vis Complex Phenomena: Datafication and social and environmental equity	

eCAADe2023
DAY 02
Sessions 5

5.1 - GENERATIVE DESIGN & AI ONE

SESSION 5.1

Room: **HS I** Date: 21.09.2023 Time:11:00 -12:30 Session Chair: **Branko Kolarevic**

- 044** Ingrid Mayrhofer-Hufnagl, Benjamin Ennemoser From Linear to Manifold Interpolation: Exemplifying the paradigm shift through interpolation
- 166** Ximing Zhong, Immanuel Koh, Pia Fricker Building-GNN: Exploring a co-design framework for generating controllable 3D building prototypes by graph and recurrent neural networks
- 221** Chowdhury Ali Imam, Heather Ligler 3D Voxel Grammar of Mangalabas (Goodwill House)
- 250** Adam Sebestyen, Ozan Özdenizci, Urs Hirschberg, Robert Legenstein Generating Conceptual Architectural 3D Geometries with Denoising Diffusion Models
- 328** Alexis Andreou, Odysseas Kontovourkis, Solon Solomou, Andreas Savvides Rethinking Architectural Design Process using Integrated Parametric Design and Machine Learning Principles
- 392** Mikhael Johanes, Jeffrey Huang Generative Isovist Transformer: Machine learning for spatial sequence synthesis

5.2 - DIGITAL DESIGN & SIMULATION ONE

SESSION 5.2

Room: **HS II** Date: 21.09.2023 Time:11:00 -12:30 Session Chair: **Peter Buš**

- 123** Mili Kyropoulou, Sarith Subramaniam, Michael F. Tobin, Sabine Hoffmann Modeling Photosynthetically Active Radiation using a Spectrally Weighted Raytracing Approach
- 144** Naufal Andi Irsyad, Miktha Farid Alkadri, Francesco De Luca, Muhammad Arif, Florian Heinzelmann Tropical Responsive Envelopes for Urban Heat Island mitigation in tropical countries
- 150** Yongjun Song, Jin Lee, Hongju Yang, Yongje Byeon, Seung Wan Hong Effects of a Visual Perception-Equipped Fire Evacuee Simulation on the Design Trade-Offs in Students' Architectural Projects
- 296** Ayoub Lharchi, Martin Tamke, Paul Nicholas, Carl Eppinger, Konrad Sonne, Hasti Valipour Goudarzi, Gabriella Rossi, Mette Ramsgaard Thomsen, Sensing and Augmenting for Adaptive Assembly Strategies
- 354** Natalie Walter, Benay Gürsoy Simulating Acoustic Performance of Mycelium-Based Sound Absorption Panels
- 460** Kyratsoula-Tereza Papanikolaou, Katherine Liapi, Ioannis Sibetheros, Evangelia Vlachaki A Simulation Model for Stormwater Runoff Management in Urban Blocks

5.3 - VIRTUAL HERITAGE

SESSION 5.3

Room: **HS V** Date: 21.09.2023 Time: 11:00 -12:30 Session Chair: **Anetta Kepczynska-Walczak**

- 105** Sevde Karahan, Leman Figen Gül The Role of Game Space on Spatial Knowledge Acquisition in Archaeological Sites: A pilot study
- 161** Xiaolu Wang Photogrammetry Enables the Critical Reinterpretation and Regeneration of Architectural Heritage
- 211** Doğan Kalak, Derya Güleç Özer, Serdar Aydın Experiencing Cultural Heritage Through Gamification – Mardin orphanage
- 253** Eonyong Kim, JongJin Park Using Digital Twins for Architectural Heritages
- 397** Daniele Melo Santos Paulino, Kali Lewis, Rebecca Napolitano, Heather Ligler Automating the Adaptive Reuse of Cultural Heritage: A computational framework for reconfiguring historic masonry buildings
- 474** Dominik Lengyel, Catherine Toulouse Mental modelling - CAAD for translating verbal scientific hypotheses about architecture

5.4 - ONLINE: FABRICATION &SUSTAINABILITY

SESSION 5.4

Room: **HSVI &Online** Date: 21.09.2023 Time: 11:00 -12:30 Session Chair: **Ioanna Symeonidou**

- 138** Kristof Crolla, Nichol Wong Catenary Wooden Roof Structures: Precedent knowledge for future algorithmic design and construction optimisation
- 353** Nicholas van Son, Marshall Prado Hybrid Thermoplastic-Composite Building Components
- 365** Vasiliki Fragkia, Isak Worre Foged Thermodynamic Architectural Surfaces An integrative modeling method for thermal design of wood and PCM lightweight structures
- 384** John Conrad, Lawson Spencer, Roberto Amador, Tyler Linnehan, Moneeb Genedy, Sriramya Nair, Sasa Zivkovic Concrete Printed Gyroid Column: A structurally optimized, sand layer supported printing method
- 439** Amin Adelzadeh, Hamed Karimian-Aliabadi, Karl Åhlund, Christopher Robeller ReciprocalShell: A hybrid timber system for robotically-fabricated lightweight shell structures
- 451** Hamed Karimian-Aliabadi, Amin Adelzadeh, Karl Åhlund, Christopher Robeller Structural Efficiency of a Hybrid Construction System for a Lightweight Timber Shell Demonstrator: ReciprocalShell case study

eCAADe2023
DAY 02
Sessions 6

6.1 - GENERATIVE DESIGN & AI TWO

SESSION 6.1

Room: **HS I** Date: 21.09.2023 Time:14:30 -16:00 Session Chair: **Immanuel Koh**

- 052** Thanh-Luan Le, Sung-Ah Kim Game-based Platform for Daylight Analysis using Deep Learning
- 162** Hanbing Zhao, Anton Savov, Hang Zhang, Benjamin Dillenburger A Framework for the Design and Evaluation of Architectural Tilesets
- 205** Ahmed Meeran, Sam Joyce Rethinking Airport Spatial Analysis and Design: A GAN based data driven approach using latent space exploration on aerial imagery for adaptive airport planning
- 366** Aditya Soman TOPOGEN: A generative design methodology for Building engineering

6.2 - DIGITAL DESIGN & SIMULATION TWO

SESSION 6.2

Room: **HS II** Date: 21.09.2023 Time:14:30 -16:00 Session Chair: **Anette Kreutzberg**

- 124** Alim Battal, Sevil Yazici Computational Design and Analysis of Shell Topologies driven by Different Microstructural Patterns found in Natural Materials
- 156** Ruizhe Luo, Xingzhao Zhang, Luqiao Yang, Ruyi Yang, Fazhuo Zhang, Ding Zhang, Chenyu Huang, Jiawei Yao Predicting the Environmental Effects of Urban Morphology and Greenery Using Deep Generative Models
- 188** Ahmet Keles, Sevil Yazici Design of Lightweight Fibrous Shells by the Use of Knitting Patterns
- 259** Povl Filip Sonne-Frederiksen, Niels Martin Larsen, Jan Buthke Point Cloud Segmentation for Building Reuse - Construction of digital twins in early phase building reuse projects
- 395** Mauricio Loyola, Forrest Meggers A Computational Framework for Analyzing Spatial Behavior in Buildings
- 407** Andrzej Zarzycki Life-Safety in Buildings through Smart Interactions

6.3 - VIRTUAL AND AUGMENTED REALITY

SESSION 6.3

Room: **HS V** Date: 21.09.2023 Time: 14:30 -16:00 Session Chair: **Marie-Therese Harnoncourt-Fuchs**

- 039** Kai Reaver Policy considerations for Extended Reality (XR) implementation in Urban Planning and the Built Environment
- 252** Theresa Uitz, Andreas Körner Environment-Responsive Materials as Dynamic Markers for Architectural Augmented Reality Applications
- 256** David Stephen Panya, Taehoon Kim, Gu Hyeongmo, Seungyeon Choo Development of a Real-time BIM-VR Multi-Collaborative Design Environment
- 382** Sarah Blahut, Marie-Therese Harnoncourt-Fuchs Mixed Reality Interactive Representations for the Assembly of a Custom Timber Tower
- 461** Han Tu, Guzden Varinlioglu, Lingxuan Gao, Bangyan Chen, Takehiko Nagakura Feeling Like Humans Low-cost wearable sensors for design research in the age of AI

6.4 - ONLINE: GENERATIVE DESIGN & EXPERIMENTATIONS

SESSION 6.4

Room: **HS VI** Date: 21.09.2023 Time: 14:30 -16:00 Session Chair: **Urs Hirschberg**

- 125** Lale Başarir, Selen Çiçek, Mustafa Koç Demystifying the patterns of local knowledge: The implicit relation of local music and vernacular architecture
- 247** Jinyu Wang, Chenyu Huang, Elaine Zhu, Yanting Shen, Jiawei Yao, Hang Shi, Rui Peng Enhanced Crowd-Driven Retail Counter Layout Design Using Generative Adversarial Network
- 305** Yanting Shen, Yiwen Xu, Weikang Kong, Fan Fei, Xilong Chen, Chenyu Huang, Jiawei Yao Using GeoAI to Reveal the Contribution of Urban Park Green Space Features to Mitigate the Heat Island Effect
- 351** Adam Novotník, Lukáš Kurilla Memorable space

eCAADe2023
DAY 03
Sessions 7

7.1 - DEEP LEARNING APPLICATIONS IN DESIGN

SESSION 7.1

Room: **HS I** Date: 22.09.2023 Time: 09:00 - 10:30 Session Chair: **Ingrid Mayrhofer-Hufnagl**

- 031** Ilkim Canli, Ipek Gursel Dino, Sinan Kalkan Useful Daylight Illuminance Prediction Under Data Imbalance in an Urban Context
- 069** Hiroto Shimizu, Tomohiro Fukuda, Nobuyoshi Yabuki Deep-learning Point Cloud Classification for Estimating the Weight of Single-material Construction and Demolition Waste of Unknown Shape
- 204** Igor Lacroix, Orkan Zeynel Güzelci, José Pedro Sousa Evolutive Dataset for Social Housing Design Projects through Artificial Intelligence: From pixel to BIM through deep learning
- 281** Šimon Prokop, Jiří Kubalík, Lukáš Kurilla Neural Networks for Estimating Wind Pressure on Complex Double-Curved Facades

7.2 - DIGITAL CITIES

SESSION 7.2

Room: **HS II** Date: 22.09.2023 Time: 09:00 - 10:30 Session Chair: **Pia Fricker**

- 028** Ran Shabtay, Diego Navarro, Josep Muntanola Thornberg Walkability as a Factor in the 15-minute City: A Comparative Analysis of Barcelona's Neighborhoods
- 071** Guy Austern, Roei Yosifof, Dafna Fisher-Gewirtzman A Dataset for Training Machine Learning Models to Analyze Urban Visual Spatial Experience
- 091** Mojgan Rezakhani, Sung-Ah Kim Utilizing Web Applications for Developing Digital Twin: Case study urban tunnel with kinetic roof
- 163** Yanxia Qiu, Pia Fricker Computational Design Methods for Enhancing Urban Biodiversity - The flight of the bumblebee: Improving urban green for ecosystem services
- 378** Sergio Araya, Cesar Fuentes, Mikko Strahlendorff, María Jesus Camus, Anni Kröger Three-Dimensional Realtime Air Quality Mapping using Astronomical algorithms on Urban Environments

7.3 - VIRTUALITY & THEORY

SESSION 7.3

Room: **HS V** Date: 22.09.2023 Time: 09:00 - 10:30 Session Chair: **Alessio Erioli**

- 116** Emmanouil Xylakis, Ali Najm, Antonios Liapis, Georgios N Yannakakis, Despina Michael-Grigoriou Eliciting and Annotating Emotion in Virtual Spaces
- 249** Guzden Varinlioglu, Han Tu, Takehiko Nagakura Affective Computing for Game User Research
- 362** Cassia De Lian Cui, Davide Simeone, Stefano Cursi, Edoardo Currà, Antonio Fioravanti Knowledge modelling and fuzzy ontologies integration for Classical and Industrial Archaeologies
- 387** Sheng-Yang Huang, Enriqueta Llabres-Valls, Aiman Tabony, Luis Carlos Castillo Damascus House: Exploring the connectionist embodiment of the Islamic environmental intelligence by design
- 432** Armando Trento, Antonio Fioravanti, Joachim Kieferle The Need to Reconsider Digital Design Entities
- 470** Nima Sharafi Rohani, Ayşegül Akçay Kavakoğlu AI-Driven Spatial Adaptations Through Emotions: The case of emo-land as a human-centric approach

7.4 - IDEATION & FORM FINDING

SESSION 7.4

Room: **HSVI** Date: 22.09.2023 Time: 09:00 - 10:30 Session Chair: **Gernot Riether**

- 065** Hadas Sopher, Hernan Casakin, John S. Gero The Temporal Effect of Immersive VR on Student-Tutor Interaction in Architectural Design Crits
- 085** Zeynep Selcen Narin, Faruk Can Ünal An Evaluation of Sketching Processes in Physical and Immersive Environments
- 238** Rick Titulaer, Filique Nijenmanting, Mathew Vola Early-Stage Form-Finding for a Complex Urban High-Rise using an Informed Data-Driven Design Approach
- 290** Dalibor Dzurilla, Hadas Sopher, Tomás Dorta Architect-Client Communication During Co-ideation with 2D Digital and 3D Immersive Sketches
- 421** Serdar Aydin, Büşra Şik, Merve Şule Yörük, Begüm Aktaş Assessment of Correlative Digital Drawing Features in the Design Processes of Unstructured Creativity
- 476** Phillip Stauss, Shervin Rasoulzadeh, Julia Reisinger, Iva Kovacic From Sketching to BIM – Workflow for the generation of IFC-based BIM models from 4D semantic sketches

eCAADe2023
DAY 03
Sessions 8

8.1 - ASSEMBLAGE & FORM FINDING STRATEGIES

SESSION 8.1

Room: **HS I** Date: 22.09.2023 Time: 11:00 - 12:30 Session Chair: **Adam Sebestyen**

- 092** Peter Buš, Peter Russell, Terrence Curry, Chaoyun Wu A Parametric Tolerance Model for Numerically Controlled Digital Fabrication: Adaptation of kit-of-parts components for a pre-manufactured WikiHouse scenario
- 181** Cristina Nan, Andrea Rossi Discrete Circular Scaffolding A reflection on discrete systems in construction
- 226** Ho Man Yau, Theodoros Dounas, Wassim Jabi, Davide Lombardi Timber joints analysis and design using Shape and Graph Grammar-based Machine Learning approach
- 277** Esti Nurdiah, Tsung-Hsien Wang, Wen-Shao Chang Form Finding and Optimisation of Bamboo Gridshell Structures
- 288** Alessio Erioli Architectural Assemblages as Computational Medium: Introducing Assembler, a tool for the design and study of architectural assemblages
- 357** Hua-Chun Hsu, Pei-Hsien Hsu An Integrated Method for the Mesh Representation and Segmentation of Kagome Weaving Geometries

8.2 - THEORY & EXPERIMENTATIONS

SESSION 8.2

Room: **HS II** Date: 22.09.2023 Time: 11:00 - 12:30 Session Chair: **Panagiotis Parthenios**

- 113** Nuno Pereira da Silva, Sara Eloy, Ricardo Resende Drone Robotic Construction: A methodology for simulating the construction performed by drones using virtual and augmented reality
- 206** Jeremy Ham Cross-Domain Representation Reconsidered: Using parametric tools to understand music
- 308** Adonis Haidar Evolution of Modelling in Architecture: A Framework for the categorisation and evaluation of digital models in Architectural Design
- 456** Gernot Riether, Taro Narahara AI Tools to Synthesize Characteristics of Public Spaces

8.3 - VIRTUAL REALITY AND GAMING ENVIRONMENTS

SESSION 8.3

Room: **HS V** Date: 22.09.2023 Time: 11:00 - 12:30 Session Chair: **Bob Martens**

- 057** Merve Taşdelen, Derya Güleç Özer, Ayşegül Akçay Kavakoğlu The Quest of Spatial Presence by Puzzle-Solving Games in VR
- 064** Daiki Kido, Osamu Imazeki, Kahoru Nakayama, Yasuhiro Nakano Visualization of Computer-aided Engineering Simulations on Multi-User Virtual Reality for Consensus Building
- 066** Taichi Shirahase, Tomohiro Fukuda, Nobuyoshi Yabuki Developing a Mixed-Reality System with Reflection Rendering of Virtual Objects Using Generative Adversarial Networks
- 106** Anders Hermund, Debora Lombardi, Ramsøy The Cognitive Experience of Architecture in Real-Life and Virtual Reality
- 107** Begum Moralioglu, Leman Figen Gül [des-Fi]XR: Envisioning future spaces with XR technologies by using design fiction
- 143** Pascal Mosler, Maximilian Gehring, Wolfgang Dokonal, Melisa Cizmeci, Pascal Geist, Tim Haas, Tiago Soares, Christopher Sohlmaier, Uwe Rüppel Using the Game Engine Unity Efficiently in Teaching: Development of a fully-automated webserver-based build pipeline