The Department of Architecture invites you to the presentation of
Dr Odysseas Kontovourkis for promotion to the rank of Associate Professor

Automation and robotics towards a regenerative sustainability in the construction sector

Monday June 19th 2023 at 4:00 p.m.
New campus, UCY Library, LRC 012
University of Cyprus

ZOOM LINK
https://ucy.zoom.us/j/91255899559?pwd=ejdiRm1RbHFxQ2U5eGM4QVZSVk1KQT09

ABSTRACT

The construction sector is responsible for a large percentage of annual global carbon dioxide emissions, which imposes urgent measures for mitigation. According to the research action Restore, Regenerative Sustainability in construction aspires to contribute towards this goal, by reversing damage caused by construction activity, as well as using strategies to improve health, quality of life and productivity. During the construction process, the incorporation of new materials, technologies and tools is necessary. The emerging technologies of automation and robotics –although still in the early stages of adoption within the construction industry – have the potential to provide superior advantages. These include improving construction quality and productivity rates, as well as reducing materials, construction time, cost and negative environmental impact. The presentation will focus on Robotic Timber Construction, Robotic 3D Printing and Adaptive Casting for the construction of modular structures using timber, earth and cement-based materials. It will stress the importance of pre-processing, processing and post-processing key research phases. Which in turn, can be related to design, construction and future life development respectively. But also, to the evaluation phase based on specific key performance indicators. Focusing on Robotic 3D Printing, the presentation will examine advantages over conventional construction approaches, especially in complex design tasks. It will also highlight the importance of parametric design and control, design optimisation and 3D Printing experimentation, as well as the proportional relation between material reduction and printing cost or environmental impact minimisation. Other research aspects such as digital reconstruction and geometric conformity evaluation will also be highlighted. Further research will emphasise an equally important research phase: the future life of structures, towards a future of Regenerative Sustainability.

PROFILE OF THE SPEAKER

Odysseas Kontovourkis is currently an Assistant Professor in the Department of Architecture at the University of Cyprus. He is director of the research Lab for Digital Developments in Architecture and Prototyping - d2AP and the Robotic Construction Lab as well as academic direction of the Fab Lab UCY. He received his Diploma in Architecture Engineering from the National Technical University of Athens (NTUA), Greece. He conducted research studies in the field of Structural Mechanics and Dynamics, Theory of Earthquake Resistance Structures in the Department of Architecture Engineering at the University of Osaka, Japan, and PhD studies in the Department of Architecture and Civil Engineering at the University of Bath, United Kingdom. His current research interests focus on the development of computational design and fabrication procedures based on multi-objective analysis, performance-based architectural design and robotic construction according to sustainability criteria. Also, he examines topics in the fields of Parametric Design, 3D Printing, 3D Scanning, Virtual and Augmented Reality. He participates in research projects and his research has been published in refereed journals and presented in conference proceedings. Also, he is active member and serves as peer reviewer in journals and international conferences dedicated to the promotion of research and education in computational design and fabrication.