



The Department of Architecture invites you to the

Ph.D. Thesis Defence of

Niki Georgiou, Architect Engineer, Integrated Master in Architecture

Title: *“Deployable and Reconfigurable Linkage Structures”*

Tuesday, December 5th 2023, 10:00 a.m.

Department of Architecture, Room A106, 1st Floor, 75 Kallipoleos St., 1678 Nicosia

Abstract: In a dynamic and evolving world, where terms of reducing, reusing and recycling are of great importance, specific aspects, such as structural flexibility, modularity, efficiency and transformability gain significance towards a sustainable future of the built environment. Deployable and reconfigurable structures that are able to be easily erected in different locations and respond to varying functional, environmental, or loading conditions through shape transformations facilitate new research directions in achieving a corresponding interactive and optimized behavior. Such systems are realized through the application of an interdisciplinary design, computational fabrication, exclusive assembly techniques and construction.

Reflecting upon the aforementioned aspects, the current research investigates different typologies of deployable and reconfigurable modular linkage structures. The control sequence implemented consists of stepwise system reconfigurations that involve the selective releasing of one intermediate joint in each closed-loop linkage, effectively reducing it to a 1-DOF “effective crank–slider” (ECS) mechanism with minimum actuation components. The approach enables minimum self-weight, structural simplicity and reduced energy consumption. A kinematics and a comparative Finite-Element Analysis of linkage systems in all reconfiguration steps of a sequence have been conducted for different typologies and geometrical characteristics of the members.

Short Biography: Niki Georgiou is a practising architect, holding an Integrated Master in Architecture from the University of Cyprus, with an award of Excellence in Architectural Design for her Diploma Thesis. She is a Ph.D. candidate in the area of Architectural Technology at the Department of Architecture, University of Cyprus. Her research experience refers to deployable and transformable structures and structural design. The outcomes of her research work have been presented and published in various international conference proceedings and scientific journals.