The Department of Computer Science at the University of Cyprus cordially invites you to the **PhD Defense** entitled:

Extending Structural and Functional Properties of Fuzzy Cognitive Maps

Speaker: Maria Papaioannou
Affiliation: University of Cyprus, Cyprus
Category: PhD Defense
Location: Room 148, Faculty of Pure and Applied Sciences (FST-01), 1 University Avenue, 2109 Nicosia, Cyprus (directions)
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Host: Christos Schizas (schizas-AT-cs.ucy.ac.cy)
URL: https://www.cs.ucy.ac.cy/colloquium/presentations.php#cs.ucy.pres.2017.papaioannou

Abstract:
FCM modelling constitutes an alternative way of building intelligent systems, using uncertain parameters that influence one - another. Such a system is constituted by certain concepts (which are characterized by a state) along with relevant interconnections (which are described by sensitivity values). Essentially, an FCM is developed by integrating the existing experience and knowledge regarding a cause – effect system in a pseudo-dynamic manner. This can be done through human knowledge and experience exploitation or through proper data analysis. Three different approaches for developing FCM models have been proposed in this thesis. The first one concerns only the cases for which there is no dataset available and thus, human experts are called to identify and define FCM's components. The second one takes an advantage of an existing dataset and can be used in the absence of relative human experts. Relative bibliography is used instead for extracting guidelines for the structure of the network and probabilistic models are derived to define the concepts and the relations. In the framework of this work, the notion of dynamic weights is also introduced. The last approach uses both human experts and a dataset to apply fuzzification of the dataset. The resulting fuzzy parameters are used to initialize the network where the Evolutionary Strategies are employed to define the states of the interrelations. All the methods proposed in this thesis were implemented for real systems using real datasets (where needed). The results presented in the thesis encourage the belief that FCMs can be used as a modeling tool for weakly-formalized and ill-structured problems, allowing the use of fuzzy information and the visualization of the causal dynamics of the modeled system.

Short Bio:
Maria Papaioannou is a Ph.D. candidate at the Department of Computer Science under the supervision of Professor Christos N. Schizas. She completed her B.Sc. in the Department of Computer Science of University of Cyprus. She also completed her M.Sc. in Intelligent Systems in the Department of Computer Science of University College of London. Her research interests lie within the broad area of Computational Intelligence and eHealth systems. She worked as a Teaching Assistant at the University of Cyprus. She also worked as a research assistant on a project dedicated to Fuzzy Cognitive Maps supported by Cyprus Research Promotion Foundation.

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