Department of Electrical and Computer Engineering

Title: **«**TENSOR-BASED NONLINEAR CLASSIFIER FOR HIGH-ORDER DATA ANALYSIS**»**

Dr. Konstantinos Makantasis

Post-doc researcher at KIOS Research and Innovation Center of Excellence, University of Cyprus.

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Abstract: Recent advances in sensing technologies have stimulated the development and deployment of sensors that can generate large amounts of high-order data. Interdependencies between information from different data modalities can improve the performance of data classification techniques. However, exploitation of high-order data raises new research challenges mainly due to the high dimensionality of the acquired information and, depending on the application at hand, the limited number of labelled examples.

Tensor based model can tackle the dimensionality problem by (i) significantly reducing the number of training parameters that need to be estimated during training, and hence the required training samples, and (ii) by retaining the spatial structure of the input samples. In this talk we will present a tensor based nonlinear classifier for high order data analysis, which is based on a modification of a feedforward neural network, such that its weights satisfy the rank-1 canonical decomposition. Finally, we will also present an algorithm for training it.

Biography: Dr. Konstantinos Makantasis received his computer engineering diploma from the Technical university of Crete (TUC, Greece) and his Master degree from the same school. His diploma thesis entitled "Human face detection and tracking using AIBO robots", while his master thesis entitled "Persons' fall detection through visual cues". In 2016 Dr. Makantasis received his PhD at the same school working on detection and semantic analysis of object and events through visual cues. After his PhD, he was employed as a post-doc researcher at Dynamical Systems and Simulation Laboratory (DSSL-TUC, Greece), where he developed a trajectory planning algorithm for automatground vehicles using optimal control techniques. Currently, he is a post-doc researcher at KIOS Research and Innovation Center of Excellence, University of Cyprus.

He is mostly involved and interested in computer vision, both for visual spectrum (RGB) and hyperspectral data, and in machine learning / pattern recognition and probabilistic programming. He has several publications in international journals and conferences on computer vision, signal and image processing and machine learning. Finally, he has been involved as a researcher in numerous European and national competing research programs (Interreg, FP7, Marie Curie actions) towards the design, development and validation of state-of-the-art methodologies and cutting-edge technologies in data analytics and computer vision.