

# AI & BIG DATA

## workshop

22/09/2022 | 10:00 | Auditório I – ESTIG - IPBEJA

### Program

**10:00-10:05 – Opening – Luís Bruno – Coordinator LabSI2**

**10:05-10:10 - Presentation of the DATA SCIENCE & BIG DATA LAB research group  
Universidad Pablo de Olavide – Seville – Spain**

**10:15 - 10:45 - A new big data triclustering approach for extracting three-dimensional patterns in precision agriculture – David Gutierrez Avilés**

*Precision agriculture focuses on the development of site-specific harvest considering the variability of each crop area. Vegetation indices allow the study and delineation of different characteristics of each field zone, generally invisible to the naked-eye. In this seminar, we will present a new big data triclustering approach based on evolutionary algorithms. The algorithm shows its capability to discover three-dimensional patterns on the basis of vegetation indices from vine crops. Different vegetation indices have been tested to find different patterns in the crops. The results reported using a vineyard crop located in Portugal depicts four areas with different moisture stress particularities that can lead to changes in the management of the vineyard.*

**10:45 – 11:15 - An introduction to the data streaming paradigm and a new algorithm for time series forecasting in real-time - Laura Melgar-García**

*Streaming data refers to flows of high-dimensional data that must be processed in real-time. An intrinsic characteristic of streaming data is the possibility of variation and transformation of its behavior as time passes. In this context, real-time models must be able to adapt and adjust to online incoming data to provide timely and accurate responses. In this seminar, we will present a new forecasting algorithm for streaming time series based on the k-weighted nearest neighbors, called StreamWNN. The model follows online incremental learning to adjust to new incoming patterns and detects novelties and anomalies in real-time.*



**David Gutiérrez-Avilés** received his Ph.D. in Computer Science from the University of Seville, Spain, in 2015. He was in at the Department of Computer Science of Pablo de Olavide University until 2020; currently, he is an assistant professor at the Department of Computer Science of the University of Seville. His primary areas of interest are time series forecasting, machine learning, and big data.



**Laura Melgar-García** is a PhD student in Computer Science at the Pablo de Olavide University with a predoctoral researcher grant (FPU) from the Spanish Ministry of Science and Innovation. Before starting her PhD studies, she earned a Bachelor's degree in Biomedical Engineering in 2017 and a Master's degree in Software Engineering in 2018. Her main research fields are modeling and analysis of massive data, focusing on batch and streaming/online processing. The object of her research seeks to obtain both descriptive and predictive models with applications in real problems such as precision agriculture, energy consumption or biomedical solutions.