UNIVERSITÀ DEGLI STUDI FIRENZE

FLORENCE center for DATA SCIENCE

THIRD SEMINAR

D^2 SEMINAR SERIES

Florence Center for Data Science 'Double' Seminar Series

Florence Center for Data Science is happy to present the third seminar of the Series on **June 18th**, from **2 - 3.30 pm**

Click on the link below to register for the seminar (free of charge):
https://us02web.zoom.us/webinar/register/WN_I9bCjz_cQ_K_8nOP94usTw

SPEAKERS, TITLES, ABSTRACTS:

Enrico Ravera - Magnetic Resonance Center (CERM) and Department of Chemistry, University of Florence

Title: *From algebra to biology: what does the math of ensemble averaging methods can tell us*

Abstract: Our work aims at a quantitative comparison of different methods for reconstructing conformational ensembles of biological macromolecules integrating molecular simulations and experimental data. This field has evolved over the years reflecting the evolution of computational power and sampling schemes, and a plethora of different methods have been proposed. These methods can vary extensively in terms of how the prior information from the simulation is used to reproduce the experimental data, but can be coarsely attributed to two categories: Maximum Entropy or Maximum Parsimony. In any case, the problem is severely underdetermined and therefore additional information needs to be provided on the basis of the chemical knowledge about the system under investigation. Maximum entropy looks for the minimal perturbation of the prior distribution, whereas Maximum Parsimony looks for the smallest possible ensemble that can explain in full the experimental data. On these grounds, one can expect radically different solutions in the reconstruction, but surprises are still possible - and can be justified by a rigorous geometrical description of the different methods.

Gherardo Chirici - COPERNICUS Earth Observation and Spatial Analysis and Department of Agriculture, Food, Environment and Forestry, University of Florence

Title: *Big data from space. Recent Advances in Remote Sensing Technologies*

Abstract: Since the 1970s, remote sensing technologies for terrestrial observation have generated a constant flow of data from different platforms, in different formats and with different purposes. From these, through successive steps, spatial information is generated to support the Earth resources monitoring and planning. Indispensable in various sectors: from urban planning to geology, from agriculture to forest monitoring and, more generally, any type of information to support environmental monitoring. For this reason, remotely sensed information is recognized as a typical example of big data ante litteram. Today the new cloud computing technologies (such as Google Earth Engine) allow to face the complex problem of data management and processing of big data from remote sensing with new strategies that have revolutionized the these data sources are used. From experiments on small areas, today we have moved to the possibility of operationally processing vast multidimensional and multitemporal datasets on a global scale. The increased availability of information from space is exemplified by the numerous services offered by the European Copernicus program. The presentation, starting from a brief introduction to remote sensing techniques, illustrates some examples of applications developed within the geoLAB - Geomatics Laboratory of the Department of Agriculture, Food, Environment and Forestry (DAGRI) and the UNIFI COPERNICUS Research Unit.