

# ABSTRACTS

## 1st Seminar D<sup>2</sup> Seminar Series

*Florence Center for Data Science 'Double' Seminar Series*

**Fabrizia Mealli - Department of Statistics, Computer Science, Applications "G. Parenti", University of Florence**

Title: *Assessing causality under interference*

Abstract: Causal inference from non-experimental data is challenging; it is even more challenging when units are connected through a network. Interference issues may arise, in that potential outcomes of a unit depend on its treatment as well as on the treatments of other units, such as their neighbours in the network. In addition, the typical unconfoundedness assumption must be extended—say, to include the treatment of neighbours, and individual and neighbourhood covariates—to guarantee identification and valid inference. These issues will be discussed, new estimands introduced to define treatment and interference effects and the bias of a naive estimator that wrongly assumes away interference will be shown. A covariate-adjustment method leading to valid estimates of treatment and interference effects in observational studies on networks will be introduced and applied to a problem of assessing the effect of air quality regulations (installation of scrubbers on power plants) on health in the USA.

**Andrew Bagdanov - Department of Information Engineering, University of Florence**

Title: *Lifelong Learning at the end of the (new) Early Years*

Abstract: Lifelong learning, also often referred to as continual or incremental learning, refers to the training of artificially intelligent systems able to continuously learn to address new tasks from new data while preserving knowledge learned from previously learned ones. Lifelong learning is currently enjoying a sort of renaissance due to renewed interest from the Deep Learning community. In this seminar I will introduce the overall framework of continual learning, discuss the fundamental role played by the stability-plasticity dilemma in understanding catastrophic forgetting in lifelong learning systems, and present a broad panorama of recent results in class-incremental learning. I will conclude the discussion with a look at current trends, open problems, and low-hanging opportunities in this area.