Working Group on Statistical Learning Seminar

Title: A Bayesian framework for neuroimaging meta-analysis

Speaker: Felice Lamberti (University of Bologna)

Date: Thu 2nd April 2026 at 3:00PM

Location: E0.32 (beside Pi restaurant)

Abstract: Neuroimaging meta-analysis has historically focused on the development of coordinate-based methods, as statistical parametric maps were often unavailable and studies typically reported only the coordi nates of activation foci. As a consequence, meta-analysis combining re ported peak coordinates and image-based information remains largely unexplored. In this work, we develop a Bayesian model for the joint analysis of coordinate-based meta-analysis (CBMA) and image-based meta-analysis (IBMA) data. Activation foci are modeled as realizations of a doubly stochastic Poisson process, while image data are treated as noisy observations of an underlying smooth spatial function. Parsimony in the number of parameters is achieved by introducing a sparse latent factor structure. Using simulated data, we evaluate the proposed model in terms of its ability to accurately estimate the underlying activations.