Statistics and Actuarial Science Seminar

Title: Network inference in genomics under censoring

Speaker: Veronica Vinciotti (Brunel University)

Date: Thu 19th September 2019 at 3:00PM

Location: Seminar Room SCN 1.25

Abstract: Regularized inference of networks using graphical modelling approaches has seen many applications in biology, most notably in the recovery of regulatory networks from high-dimensional gene expression data. Under an assumption of Gaussianity, the popular graphical lasso approach provides an efficient inferential procedure under L1 sparsity constraints. In this talk, I will focus on a latest extension to censored graphical models in order to deal with censored data such as qPCR expression data. We propose a computationally efficient EM-like algorithm for the estimation of the conditional independence graph and thus the recovery of the underlying regulatory network. Similar techniques can be used also in the context of multivariate regression where censored outcomes are to be predicted from a set of predictors. Efficient inferential procedures are presented in the high-dimensional case and pave the way for the development of more complex models that integrate data from different sources and under different mechanisms of missingness.