



Statistics and Actuarial Science Seminar

Title: Composite likelihood inference for simultaneous clustering and dimensionality reduction of mixed-type longitudinal data

Speaker: Monia Ranalli (Sapienza University of Rome)

Date: Thu 30th January 2020 at 3:00PM

Location: Seminar Room SCN 1.25

Abstract: This talk aims at introducing a multivariate hidden Markov model (HMM) for mixed-type (continuous and ordinal) variables. As some of the considered variables may not contribute to the clustering structure, a hidden Markov-based model is built such that discriminative and noise dimensions can be recognized. The variables are considered to be linear combinations of two independent sets of latent factors where one contains the information about the cluster structure, following an HMM, and the other one contains noise dimensions distributed as a multivariate normal (and it does not change over time). The resulting model is parsimonious, but its computational burden may be cumbersome. To overcome any computational issue, a composite likelihood approach is introduced to estimate the model parameters. The model is applied to a real dataset derived from the first five waves of the Chinese Longitudinal Healthy Longevity Survey. The model is able to identify the discriminant variables and capture the cluster structure changing over time parsimoniously.