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DiSIA

DIPARTIMENTO DI STATISTICA,
INFORMATICA, APPLICAZIONI
"GIUSEPPE PARENTI"

DiSIA SEMINAR

PhD Seminar Series

“Seminari di Statistica del Dottorato”

GEERT VERBEKE

Leuven Biostatistics Centre
KU Leuven, BE

8th October, 12:00 am

**Centro Didattico Morgagni
Viale Morgagni, 40, Room 203**

JOINT MODELS FOR HIGH-DIMENSIONAL LONGITUDINAL DATA

In many applications, multiple outcomes are measured repeatedly within a sample of subjects, and the research questions of interest cannot be answered without jointly modeling all outcomes. Examples include joint tests for treatment effects on longitudinal evolutions in multiple outcomes, investigating how longitudinal trends are associated with one another, modeling changes in shape, or classification based on longitudinal information from various outcomes. In this presentation, various approaches towards joint modeling of multiple longitudinal outcomes will be presented, discussed, and compared. A flexible model that can easily handle unbalanced data and outcomes of mixed nature is a mixed model which assumes a random-effects model for each outcome separately and a joint distribution for all random effects in the multivariate mixed model. However, in cases where many outcomes are to be modeled simultaneously, the high dimension of the random-effects distribution poses specific numerical problems. We propose a pairwise model fitting approach in which all possible bivariate models are fitted, and where inference follows from pseudo-likelihood arguments. The approach is applicable for linear, generalized linear, and nonlinear mixed models, or for combinations of those. The methodology will be extensively illustrated in the analysis of several real data sets.