DEPARTMENT OF STATISTICAL SCIENCES
PhD Course in Statistics

Fondazione
Cassa di Risparmio
di Padova e Rovigo

GUANGZHOU UNIVERSITY

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University of Padua
PhD Course in Statistics

XXXVIII Cycle
Opening

November 24, 2022

Padova | Scuola della Carità,
via S. Francesco 61-63 |
Room Sala della Carità

The PhD Course in Statistics welcomes the new PhD students, starting their doctoral program in October 2022.

The event foresees an invited research lecture.

Invited lecture | Abstract

Linear mixed models are widely used in a range of application areas, including ecology and environmental science. The explanatory variables are often introduced simply as in linear regression models, so ignoring potential contextual effects. We study the effects of fitting the two-level linear mixed model with a single explanatory variable when contextual effects should be included in the model. In particular, we make explicit the effect of (the usually ignored) within-cluster correlation in the explanatory variable. This study produces a number of unexpected findings. (i) Incorrectly ignoring contextual effects affects estimators of both the regression and variance parameters and the effects are different for different estimators. (ii) The log-likelihood and REML criterion functions behave well when the model is correctly specified but, when the within cluster correlation of the explanatory variable is high, have two local maxima. (iii) Standard statistical software such as SAS, SPSS, STATA, lmer (from lme4 in R) and GenStat often returns local rather than global maximum likelihood and REML estimates in this very simple problem. (iv) Surprisingly, local maximum likelihood and REML estimators may fit the data better than their global counterparts but, in these situations, ordinary least squares may perform even better than the local estimators, albeit not as well as if we fit the correct model.

Programme

16:30 | **Welcome**

Giovanna Boccuzzo
Head of the Department of Statistical Sciences,
University of Padova

Massimiliano Zattin
Vice Rector for Postgraduate and Doctorate Programmes
University of Padova

Nicola Sartori
Coordinator of the PhD Course in Statistics
University of Padova

17.00 | **Invited lecture**

Alan H. Welsh
E.J. Hannan Professor of Statistics
Research School of Finance, Actuarial Studies and Statistics,
The Australian National University, Canberra
Fitting misspecified linear mixed models

18.00 | **Cocktail**
Room “I. Damini”