Spatial statistics

PhD School in Statistical Sciences, University of Padua

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Course Description

This course is designed to introduce the students to statistical models for spatial data. The couse will cover theory and methods for the three major topics of spatial statistics : (i) point-referenced data, (ii) areal/lattice data, and (iii) point processes. Students will also be introduced to the computational aspects of spatial statistics, illustrating the main packages in R for the analysis of spatial data. The real data examples mainly come from environmental sciences.

Tentative Schedule

5	November	9.00-13.00	Point-referenced data: spatial processes; stationarity. Variogram and covariance functions. Estimation of parameters of a spatial process. Spatial prediction and kriging.
8	November	9.00-13.00	Areal/lattice data: spatial autocorrelation, Markov random fields. Statistical inference for Markov random fields.
12	November	9.00-13.00	Point processes theory. An introduction to statistical inference for point processes.

Recommended text

- Gaetan, C. and Guyon, X. (2010) Spatial Statistics and Modeling, Springer, New York.