Seminário em Engenharia Matemática

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Modelling Observed Data From a Latent Stochastic Spatial Process
Raquel Menezes

Departamento de Matemática, Universidade do Minho
Centro de Matemática (CMAT), Universidade do Minho

Abstract:
Geostatistical models become important when data is collected from different locations in space, and the variable of interest can (in theory) be measured at any location in the study area. One should assume an underlying spatial stochastic process indexed in a continuous domain, and spatial correlation must be taken into account. These models can be extended to include time, if one has data collected over space and time.

In Portugal, the spatial distribution and abundance of several commercial fish species is mostly unknown, and there are many open questions about fishing sustainability. Geostatistical models, relying on information from scientific surveys or commercial fisheries, become useful tools for the assessment of distribution species. Fishery-dependent data present advantages, namely easier to obtain and better coverage of the time dimension, but it leads to domain representation issues. The fishermen movements are guided by some prior-knowledge of the places where it is expected to find the target species, thus the sampled data do not equally represent the study area. This is coined preferential sampling (Diggle et al, 2010).

Coupling data from preferential and non-preferential samples is expected to be a win-win situation, despite the increasing complexity of the modelling process. Hopefully, a joint model involving both data-sources will allow for the construction of more accurate maps for the abundance of commercial fish species along the portuguese coast. This project counts on data provided by the Portuguese Institute of Sea and Atmosphere (IPMA).

Nota biográfica:
Raquel Menezes is Associate Professor with Habilitation at Department of Mathematics, in Minho University, Portugal, and is member of its Research Center of Mathematics. Her main research interests are Spatial and Temporal Statistics and its applications. She has been acting as principal investigator of projects funded by the Portuguese National Funding Agency for Science, Research and Technology, and being member of other funded projects. In last 10 years, she has supervised 5 PhD students and published about 24 papers in international peer-reviewed journals.