



Spatial Statistics

Presented by the Department of Statistics, University of Pretoria

14 February - 21 March 2022

SACNASP CPD Points

Spatial statistics has started worldwide with the seminal work of Danie Krige, who worked in mining studies at Wits. Its importance to the South African research community is much wider and goes these days into poverty alleviation, meteorology and climate, the environment, ecology and agriculture. To analyse spatially allows the statistician to incorporate the spatial correlation present in many datasets, without which model interpretation may be incorrect. There is a wealth of knowledge on spatial statistics within South Africa, however, the research field of spatial statistics is still relatively young and much expert guidance is required to build the field in terms of research as well as training. Spatial statistics has very important applications in the South African context. There is a need to have trained spatial statisticians across industry and academia.

Course content

The course covers the following topics and practical examples will be done in R and QGIS:

- The Need for Spatial Analysis
- Types of Spatial Data
- Autocorrelation-Concept and Elementary Measures
- Autocorrelation Functions
- The Effects of Autocorrelation on Statistical Inference
- Random, Aggregated, and Regular Patterns
- Binomial and Poisson Processes
- Testing for Complete Spatial Randomness
- Second-Order
- Properties of Point Patterns
- The Inhomogeneous Poisson Process
- Marked and Multivariate Point Patterns
- Point Process Models
- Semi-variogram and Co-variogram
- Covariance and Semi-variogram Models
- Estimating the Semivariogram;
- Spatial Prediction and Kriging: Optimal Prediction in Random Fields
- Linear Prediction-Simple and Ordinary Kriging
- Linear Prediction with a Spatially Varying Mean
- Kriging in Practice
- Estimating Covariance Parameters
- Model- and Design-based spatial sampling
- Testing for similarity of spatial data sets.

Learning outcomes

- Analyse spatial data in R as well as theoretically
- Compute summary spatial functions in R
- Implement Kriging in R and QGIS
- Implement Spatial Sampling
- Compare spatial data sets for similarity

Who should enrol?

Practitioners and academics and students with basic knowledge of statistics and who would like to develop their spatial statistics skills for research or industry purposes.

Course fees

R6 000.00 (VAT incl.) per delegate.

Course fees must be paid in full 14 days prior to course start dates. Proof of payment can be submitted to enrolments@enterprises.up.ac.za.

Admission requirements

Practitioners and academics and students with basic knowledge of statistics and who would like to develop their spatial statistics skills for research or industry purposes.

Accreditation and certification

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Registration and enquiries

Client Information Centre

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