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Geostatistics - Using Software For Geospatial Analysis

Transforming
Business *for* Good

ACS
REGISTRARS
ISO 29990

ACS
REGISTRARS
Quality Assurance
ISO 9001

ilm
Approved
Centre

PMI
Registered
Education
Provider ®
Project
Management
Institute

bci
Business Continuity
Institute
Corporate Partnership

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Course content

Why Choose this Training Course?

This training course is an ideal presentation of using statistics methods in spatial data analysis. It presents the concepts used in geoscience with special emphasis on oil and gas exploration. The use of omnipresent Excel for the geospatial analysis for the initial applied research in geology and exploration. Advanced concepts of using free R software for geospatial analysis trough examples is also presented, with explaining of statistical methods used and the packages.

This course is designed to help professionals in data analysis, geologists and oil and gas professionals to remove the limitations of using an off-the-shelf software, which is quite helpful but it limits the ability of the professional using it to apply its knowledge and extend the models used, as the readymade software applies pre-designed algorithms and `'forces'' the data into distributions applicable for the models. This training course will allow the professionals to understand how they can use free or low-cost software to extend the capabilities of commercial software and enable them to use their own ingenuity without limitations.

This training course will feature:

Explanation of geoscience and its applications in oil and gas
Integrating information from various sources with varying degrees of uncertainty
Establishing relationships between measurements and reservoir properties
Using semi-variograms and kriging
Hands-on practice in using excel and R for spatial data analysis
Advanced concepts: Monte Carlo Simulation, k-means, numerical facies modeling, fuzzy logic

By the end of this training course, participants will be able to:

Learn the concepts and methods of geostatistics
Understand the capabilities of Excel and R programming language
Acquire the knowledge of available R packages for spatial data analysis
Import, analyze and interpret results from spatial data
Perform Monte Carlo simulation, clustering analysis and other advanced techniques

Who is this Training Course for?

This training course is designed for all professionals working in the field of data analysis, oil and gas exploration, geology and reservoir modelling.

This Course is suitable to a wide range of professionals but will greatly benefit:

Data Scientists
Data Analysts
Geologists
Petroleum engineers
Reservoir engineers
Other professionals involved in spatial analysis and oil and gas exploration

Course content

Day One: Geostatistics - Concepts and Introduction to Software

Basics of Geostatistics
Geostatistical reservoir modelling
Short introduction to Excel
Short introduction to R and R studio
Exercise: importing well log data into excel and creating GR vs Depth plot
Exercise: importing well log data into R and initial analysis

Day Two: Spatial Data Analysis

Spatial Data Sampling
Spatial Resolution Gap
Spatial Weight Matrices
Basis of data analysis: statistical measures, correlation and autocorrelation
Exercise: determining correlation and autocorrelation in well log data using Excel
Exercise: Plotting Spatial connectivity

Day Three: Steps in Geostatistics: The Variogram and Kriging

Variogram and Modelling
Sampling for the Variogram
Nested Sampling
Geostatistical Prediction: Kriging
Exercise: Performing ANOVA in Excel, Kriging Example in Excel
Exercise: Variogram and Kriging in R studio

Day Four: Big Data Analytics and its Relation to Oil and Gas

Big Data Concepts
Clustering analysis
Spatial Variance and Covariance
Data distributions
Exercise: Variance and covariance calculation in Excel
Exercise: Clustering analysis in R studio

Day Five: Advanced Topics in Spatial Statistics

Bayesian Theory and Spatial Data
Monte Carlo Analysis
Markov Chains
Exercise: Monte Carlo Simulation for Oil and Gas reserves simulation in Excel
Exercise: Monte Carlo Simulation in R
Fuzzy Logic, Machine Learning and generative algorithms and the future of prediction
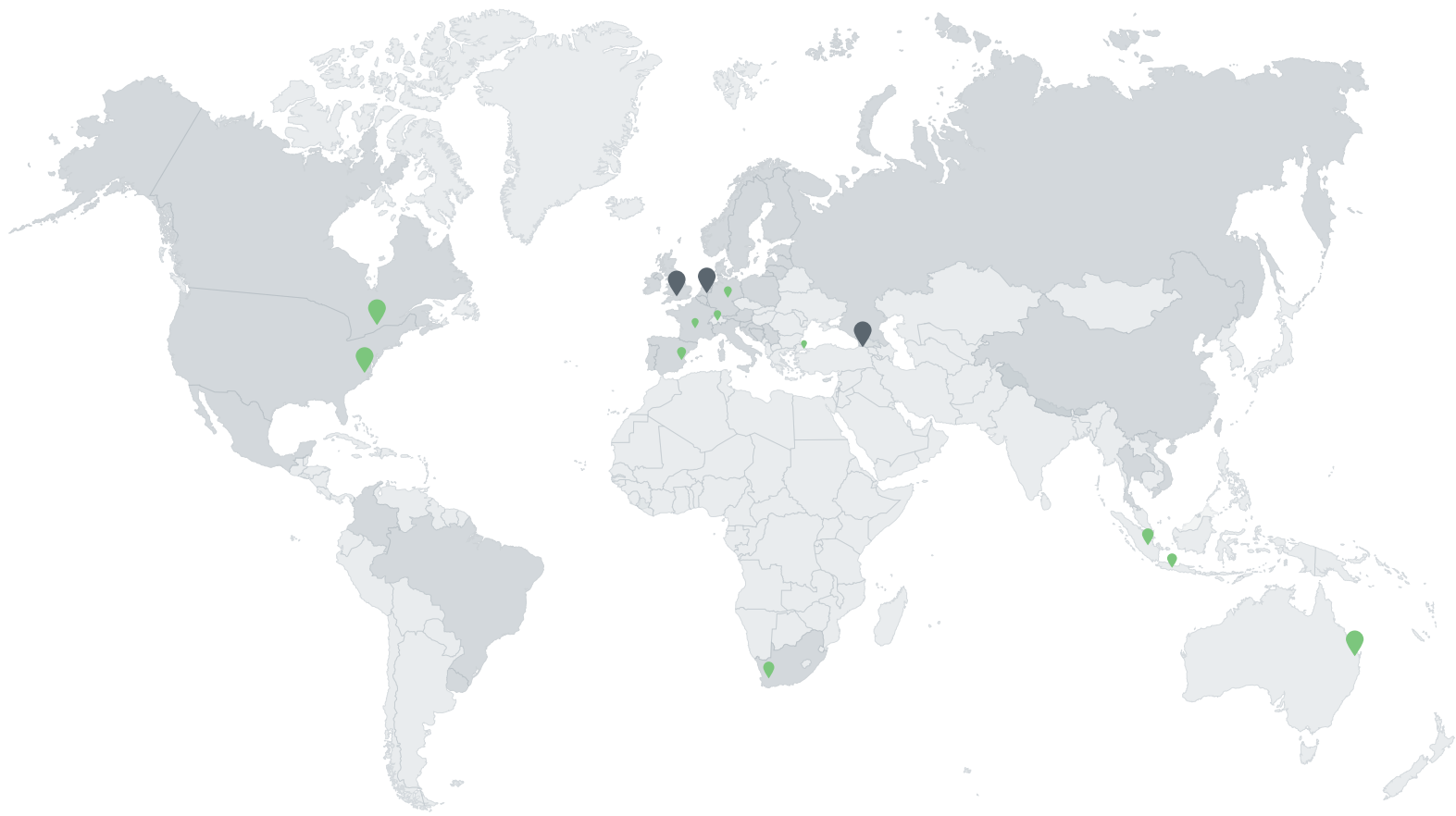
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About informatech GLOBAL LEADERSHIP CONSULTANTS

informatech is a global leadership consultancy that aligns people, purpose & strategy - driving socially responsible transformation in global organisations. Our international network includes 215 partners, consultants, and coaches in 24 countries throughout Europe, North America, Latin America, Asia, and Africa. We transform leaders, align teams and create resolve and passion to win. Typical interventions are to accelerate performance, execute strategy and embed capability and change.

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