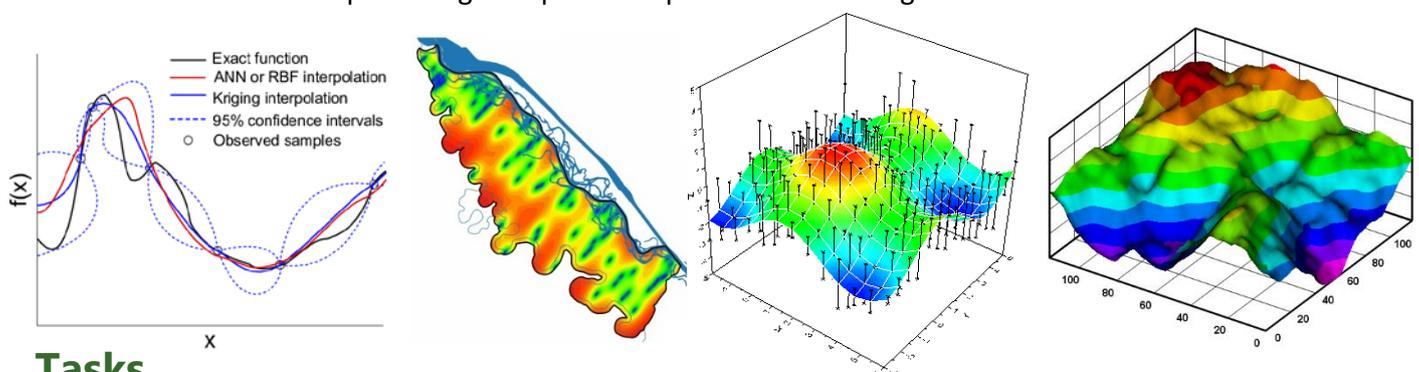




Stochastic and deterministic spatial methods for interpolation of (ground)water level variations

About

Scientific management of groundwater resources is important for its sustainable development. So, there is a need of adequate information about spatio-temporal behavior of (ground)water table variations over a region. Water table level measurements, however, are inherently expensive and time consuming, particularly during the installation phase, which requires drilling a well or a piezometer. Consequently, the number of water table measurements that are available in a given area is often relatively sparse and does not reflect the actual level of variation that may be present. Therefore, accurate interpolation of water table level at unsampled locations is needed for better planning and management. For mapping of water table level, the approach of interpolation has either been deterministic, such as inverse distance weighting (IDW), nearest neighbor (NN) and radial basis function (RBF) or stochastic, such as ordinary kriging (OK) and universal kriging (UK). Deterministic interpolation techniques create surfaces from sample points using mathematical functions, based on either the extent of similarity (IDW), considering the value of the nearest points as piecewise-constant interpolant (NN) or the degree of smoothing (RBF). On the other hand, geostatistical interpolation techniques (kriging) utilize the statistical properties of the sample points. It quantifies the spatial autocorrelation among sampling points and accounts for the spatial configuration of the sampling points around the prediction location points. The aim of this thesis is to implement different interpolation methods in a specific region/aquifer as a comparison and also then discuss the performance of different methods for predicting the spatio-temporal variations of groundwater table.



Tasks

- Doing a brief literature review
- Pre-processing the datasets of (ground)water table
- Implementation of different methods of interpolation
- Comparison the results and making a critical discussion

Requirements

- Familiar with programming languages
- Enthusiasm for working in the field of hydro(geo)logy and geostatistics

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For further discussion or if you have any questions please do not hesitate to contact us.