

University of Stuttgart
Institute for Modelling Hydraulic and Environmental Systems



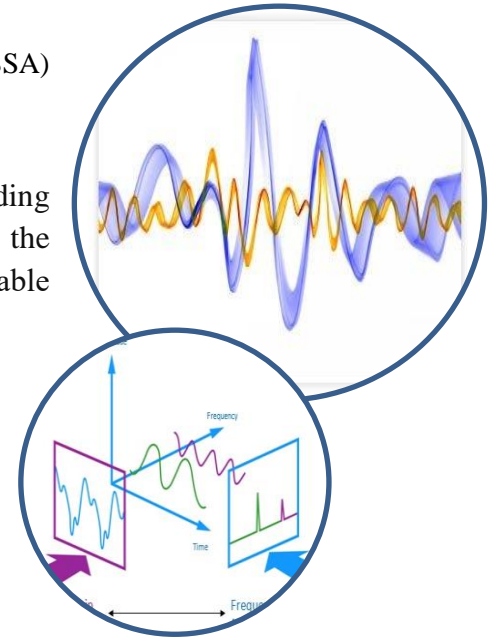
Department of Hydrology and Geohydrology
Prof. Dr.-Ing. habil. Dr. rer. nat. András Bárdossy

M.Sc. Topic:

Evaluate the flood events mechanism using Singular Spectrum Analysis (SSA)

Introduction:

Finding the most prominent flood mechanism is one of the leading challenges among the researchers, planners and governments. Now the question is: ‘how could we analyze the extreme values as most valuable parameters in our time series?’. Accordingly, evaluation of seasonal and yearly hydrological cycle effect on discharge is necessary to model a catchment. Singular Spectrum Analysis (SSA) is a relatively new approach to modeling time series data. It is a novel and potent technique to find a trend and seasonal fluctuation. It applies to many practical problems such as the time series study, multivariate statistics, signal and dynamical systems processing. The SSA method of time series analysis utilizes nonparametric techniques to decompose time series into principal components and Eigenvectors. It is particularly valuable for long time series, for which patterns are challenging to cluster and analyze.



Prospective Task:

- Literature review of numerical schemes for SSA and time series analysis
- Set up a case study in Matlab and spatial investigating
- Clustering the catchments and the most significant flood events
- Visualization of results and discussion

General Information:

- Advisors: M.Sc. Ehsan Modiri and Dr. Jochen Seidel
- Case study project, Theoretic study

Desirable Skills:

- Programming experience in Matlab
- Basic knowledge of GIS and spatial modeling
- Knowledge of Statistical and stochastic modeling, time series analysis

Apply now!



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