

University of Stuttgart
Institute for Modelling Hydraulic and Environmental Systems



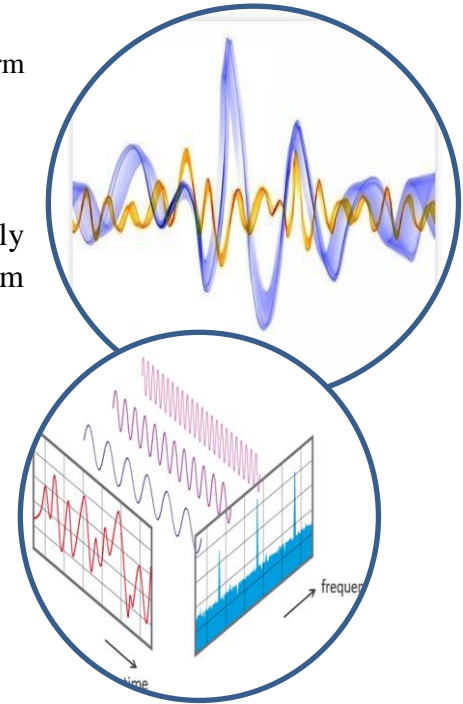
Department of Hydrology and Geohydrology
Prof. Dr.-Ing. habil. Dr. rer. nat. András Bárdossy

M.Sc. Topic:

Investigation of the flood events mechanism using Fast Fourier Transform (FFT)

Introduction:

Spatial and temporal changes in flood events are becoming increasingly important due to the rapid climate change. Fast Fourier Transform filtering is an analytical instrument to simulate the floods whether in the turns, trends or magnitude. It decomposes the time series into the components in the change in an extreme event pattern. Fourier's Theorem states that any complex periodic function can be decomposed into a set of regular basis functions of varying amplitude, period, and phase shift. Therefore, identification of the extremes and clustering them in a case study is a goal of this thesis. Based on the time series, most serious events will be defined. Then the trends and the residuals in flooding would be analyzed in different sub-catchments. Moreover, the seasonal and yearly hydrological cycle will be considered.



Prospective Task:

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

General Information:

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

Desirable Skills:

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



Apply now!

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