**Flood Analysis and Forecasting by Spatio-Temporal Data Mining**

LI Xi\*, Wataru TAKEUCHI

**Proposed presenter:** LI Xi

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**Abstract：**

Due to the global warming combined with excessive human activities, the flood have been one of the most recurrent, widespread, and disastrous hazards worldwide which caused enormous damages both in terms of loss of life and economics. Therefore, it’s necessary to grasp accurate and rich information in flood forecasting for the strategy of government and business continuity planning (BCP) of enterprises.

In recent years, the research of flood forecast and a series of methodologies based on remote sensing have been proposed. Among them, AMSR-E, which based on microwave observations have shown superiority since the capability of the signal to penetrate through clouds, their large spatial coverage. And furthermore, since flood events are dynamic processes, higher temporal resolutions are required.

The objective of this paper is to analyze flood patterns and forecast flood by spatio-temporal data mining approaches, which based on viewpoint of retrieval of historical similar patterns from image databases to perform instance-based flood analysis and forecasting. Firstly, AMSR-E data were used to map land surface water coverage (LSWC)which can fast reveal large-scale flood patterns. And the daily LSWC database in time series from 2002 to 2011 was built. Secondly, gave a ranking and lined up all the historical images from highest to lowest of LSWC, and conductedimage similarity calculation to discover hidden regularities and useful information from large collection of LSWC images. Finally, the flood pattern, possibility of flooding, as well as the reliability of information for flood analysis and forecasting were made clear by means of data mining algorithms like Bayesian inference and Hidden Markov Model. It is indicated that it played a significant role in information provision for flood analysis and forecasting.