Second Workshop on Knowledge Discovery from Climate Data: Prediction, Extremes, and Impacts

In cooperation with IEEE ICDM 2010, 14-17 December, 2010 (Sydney, Australia)
www.nd.edu/~dial/climkd10

Call For Papers

Important Dates

Paper Submission	August 9, 2010
Notification to Authors	September 20, 2010
Camera-Ready Copies	October 11, 2010
Workshop	December 14, 2010

Organizers

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Description

The analysis of climate data, both observed and model-generated, poses a number of unique challenges: (i) massive quantities of data are available for mining, (ii) the data is spatially and temporally correlated so the IID assumption does not apply, (iii) the data-generating processes are known to be non-linear, (iv) the data is potentially noisy, and (v) extreme events exist within the data.

In the computational data sciences, temporal, spatial and space-time data mining differ fundamentally from traditional data mining in that the learning samples are dependent, making auto- and cross-correlations important. Climate data mining is based on geographic data and inherits the attributes of space-time data mining. In addition, climate relationships are nonlinear, spatial correlations can be over long range (teleconnections) and have long memory in time. Thus, in addition to new or state of the art tools from temporal, spatial and spatio-temporal data mining, new methods from nonlinear modeling and analysis are motivated along with analysis of massive data for teleconnections and long-memory dependence.

Climate extremes may be inclusively defined as severe weather events as well as significant regional changes in hydro-meteorology, which are caused or exacerbated by climate change, and climate modelers and statisticians struggle to develop precise projections of such phenomena. The ability to develop predictive insights about extremes motivates the need to develop indices based on nonlinear dimensionality reduction and anomaly analysis in space-time processes from massive data. Knowledge discovery is broadly construed here to include high-performance data mining of geographically-distributed climate model outputs and observations, analysis of space-time correlations and teleconnections, geographical analyses of extremes and their consequences obtained through fusion of heterogeneous climate and GIS data along with their derivatives, geospatial-temporal uncertainty quantification, as well as scalable geo-visualization for decision support.

The major topics of interest to the workshop include but are not limited to:

- Methods for mining climate datasets for patterns, trends, or extremes
- Complex networks and climate
- Spatio-temporal data mining
- Mining for rare events or phenomena in climate data
- Algorithms and implementations for the analysis of climate data, including
  - Patterns / Clusters
  - Extremes / Outliers
  - Change Detection
- Methods addressing the role of uncertainty in space-time prediction
- High-performance data mining for the analysis of climate data
- Studies assessing the impacts of climate change and/or extremes
- Applications that demonstrate success stories of knowledge discovery from climate data

Paper Submission: This is an open call for papers. Only original and high-quality papers conforming to the ICDM 2010 guidelines will be considered for this workshop. Papers should be submitted using the ICDM workshop paper submission system.

Proceedings: Accepted papers will be included in an ICDM Workshop Proceedings volume, to be published by IEEE Computer Society press, which will also be archived in the IEEE Digital Library.