

Computer Science Seminar Series, 2011

National Capital Region

Spatio-Temporal Analysis for Bioindicators of Climate Change

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Abstract

Climate Researchers are increasingly interested in analyzing spatio-temporal trends for environmental and ecological processes that are viewed as “bioindicators” of climate change (e.g., changes in migratory patterns of birds, changes in intensity and frequency of precipitation events, floods, tornadoes and hurricanes). In particular, there is interest in modeling uncertainty for these processes using statistical methods, as a result of the recent debates over global warming of the earth's climate. The complexity, and often high-dimensionality, of these processes exhibited through different scales of spatial and temporal variability necessitates the implementation of statistical models applicable to very large data sets. In this work, we present a general framework for computationally efficient spatio-temporal trend analysis of environmental and ecological processes with linkage to climatological effects. The proposed approach allows climate researchers to investigate spatial and temporal patterns of environmental and ecological response to climate events. Finally, example applications of the proposed approach will be discussed.

Biography

Ali Arab is an Assistant Professor in the Mathematics and Statistics Department of Georgetown University. He received his B. Sc. in Applied Mathematics from the Iran University of Science and Technology. After moving to the United States, he received his M.Sc. in Mathematics and Statistics from Southern Illinois University-Edwardsville (2002) and a Ph.D. in Statistics from University of Missouri-Columbia (2007). He joined the Department of Mathematics and Statistics of Georgetown University in 2007. His current research interests include hierarchical models, spatio-temporal analysis, Bayesian inference, and risk and reliability analysis; all with focus on environmental and ecological applications. He is a member of the American Statistical Association (ASA) and the Institute of Mathematical Statistics (IMS). Contact him at aa577@georgetown.edu.