TOPIC	Modeling of Nonstationary Extreme Events Using the Vector Generalized Additive Model (VGAM)
AREA	Control, Machine Learning, Data mining, renewable Energy and Extreme events
SPEAKER	Norbert Agana, PhD students, ACIT Center, North Carolina A&T State University
DATE	18 March 2015, Wednesday
TIME	2:00 PM to 3:00 PM
VENUE	ACIT Center, Room 342, Fort IRC Bldg, North Carolina A&T State University, 1601 East Market Street, Greensboro, NC 27411
FEES	No Charge

SYNOPSIS

Over the recent years there have been increasing efforts from both scientists and engineers to develop accurate models for the prediction of extreme events so as to inform decision makers. Extreme events are rare events and are very difficult to model and even harder to predict. In most analyses of these events, scientists assume stationarity of the observed data. However, in real applications, where seasonality, trends, regime changes and dependence on external factors are evident, this assumption may not be valid, especially for large datasets. Therefore, there is the need to develop models that are capable of accounting for nonstationarity. A number of methods such as linear regression and Bayesian methods have been used to account for nonstationarity. In this research, we modeled extreme events in a nonstationary framework by using a data-driven approach called the Vector Generalized Additive Model (VGAM) and applying it to a 100-year (1914-2013) record of monthly precipitation in the US. We characterize the nonstationarities in precipitation and the related climate variables by expressing the distribution parameters of the Generalized Extreme Value distribution as smooth functions of explanatory variables such as time, the El Nino Southern Oscillation (ENSO) and the North Atlantic Oscillation Index (NAO). The Generalized Extreme Value distribution with covariates allows the modeling of data with dependence on covariates. Results obtained using the VGAM show an improvement over previous work where linear trend in covariates were used.

ABOUT THE SPEAKER

Norbert Agana received his BSc in mathematics and MSc in electrical engineering from University of Cape Coast and Tuskegee University respectively. He is a current PhD student in electrical and computer engineering of North Carolina A&T State University. His interest areas are machine learning and extreme events modelling

REMARKS, IF ANY