

Statistics Seminar
Department of Mathematical Sciences

DATE:	Thursday, October 20, 2016
TIME:	1:15p-2:40p
LOCATION:	WH 100E
SPEAKER:	Subhashis Ghoshal, North Carolina State University
TITLE:	A Bayesian Quantile Regression Analysis of Severity of Atlantic Hurricanes and US Urbanization

Abstract

It has been observed that the strongest hurricanes in the Atlantic region over recent years are getting stronger at a faster rate than average hurricanes. An ordinary mean regression model is unable to explain such a phenomenon. A quantile regression model can appropriately incorporate such a trend. We provide a Bayesian approach for simultaneous quantile regression using a representation of simultaneous quantile functions as a convex combination of two fixed monotone increasing functions and putting a prior on these functions through a B-spline basis expansion. We show that such a prior is computationally easier to handle than an earlier used prior based on Gaussian processes, and leads to more accurate estimation and credible regions. We apply the technique on a data on hurricane severity between 1991 and 2006. Due to the extreme magnitude of hurricane strength, we use a Pareto scale to represent the data. We conclude that the slope of extremely high quantiles are significantly steeper than lower quantiles, supporting the notion that the strongest hurricanes are getting stronger at a faster rate. We also illustrate our method to study effects of urbanization in the four major regions in the United States.

The talk is based on a joint work with Priyam Das, a doctoral student at NC State University

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