University of California, Irvine
Statistics Seminar

Joint Quantile Regression under Spatial Dependency

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4 p.m., 6011 Bren Hall
(Bldg. #314 on campus map)

Four decades ago, Roger Koenker and Gib Basett introduced the idea of quantile regression (QR). Today, QR is widely recognized as a fundamental statistical tool for analyzing complex predictor-response relationships, with a growing list of applications in ecology, economics, education, public health, climatology, and so on. In QR, one replaces the standard regression equation of the mean with a similar equation for a quantile at a given quantile level of interest. But the real strength of QR lies in the possibility of analyzing any quantile level of interest, and perhaps more importantly, contrasting many such analyses against each other with fascinating consequences.

In spite of the popularity of QR, it is only recently that an analysis framework has been developed (Yang and Tokdar, JASA 2017) which transforms Koenker and Basett's four-decade old idea into a model based inference and prediction technique in its full generality. In doing so, the new joint estimation framework has opened doors to many important advancements of the QR analysis technique to address additional data complications. In this talk I will present recent such developments, specifically focusing on the issue of additional dependence between observation units. Such dependency manifests in many common situations, e.g., when one simultaneously measures multiple response variables per observation unit, when a response is measured repeatedly over time and/or space, or, when data is drawn from a network of individuals. This talk will focus primarily on addressing spatial dependency.

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