國 立 中 央 大 學

統 計 研 究 所

學 術 演 講

主 講 人：邱詠惠 博士生（國立中央大學統計研究所）

講　　題：**Innovations in Fixed Effects Estimation for Spatially Confounded Regression Models**

時　　間：**112年12月05日（星期二）上午11：00 ～ 12：00**

地　　點：中央大學鴻經館**M429**室

ABSTRACT

In spatial regression analysis, the confounding between fixed effects and random effects can adversely affect the estimates of regression coefficients. This paper introduces a novel estimation method for these coefficients, leveraging the fixed rank kriging approach. Uniquely, this method does not necessitate specifying any parametric covariance structures for response variables, making it more practical. The proposed method involves selecting the number of basis functions, a choice that influences both the bias and the variance of the estimators. To control the mean squared errors of these estimators, we propose two methods based on resampling and error loss, leading to the introduction of the Bagging estimator and the γ-estimator for estimating regression coefficients. Theoretical properties of the proposed methodology are explored and justified. Simulations under various spatial regression model settings with spatial confounding demonstrate that our estimation methods perform robustly, irrespective of whether the underlying correlation structure is stationary, nonstationary, isotropic, or anisotropic. Finally, we present an application of our methods to precipitation data in Colorado.

This work is cooperated with Professor Chun-Shu Chen（國立中央大學）

Keywords：Basis function; Bias reduction; Fixed rank kriging; Mean squared error; Restricted spatial regression.

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