

Semiparametric spatial effects kernel minimum squared error model for predicting housing sales prices

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Abstract

Housing sale price prediction has been extensively studied under semiparametric regression models. However, semiparametric kernel machines with spatial effect term have not been studied yet. This paper proposes semiparametric spatial effect kernel minimum squared error model (SSEKMSEM) and least squares support vector machine (SSELS-SVM) for estimating a hedonic price function and compares the price prediction performance with conventional parametric model and semiparametric generalized additive model (GAM). This study utilizes a large data set representing 5966 single-family residential home sales between July 2000 and August 2008 from Pitt County, North Carolina. Data from Geographic Information Systems (GIS) are incorporated to account for locational attributes of the houses. The results show that the SSEKMSEM and SSELS-SVM outperform the parametric counterparts and semiparametric GAM in both in-sample and out-of-sample price predictions, indicating that these kernel machines can be useful for measurement and prediction of housing sales prices.

Key words: Housing sale price, kernel minimum squared error, least squares support vector machine, prediction, semiparametric, spatial effect

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