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Geographically and temporally weighted regression for modeling spatio-temporal variation in house prices

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Abstract

By incorporating temporal effects into the geographically weighted regression (GWR) model, an extended GWR model, geographically and temporally weighted regression (GTWR), has been developed to deal with both spatial and temporal nonstationarity simultaneously in real estate market data. Unlike the standard GWR model, GTWR integrates   to capture spatial a   ghting scheme   pecial cases of GTWR   ith global ordin   statistical measure   ary, Canada, from 200   in modeling both spa   e, the TWR, GWR, and GTWR models, respectively, reduced absolute errors by 3.5%, 31.5%, and
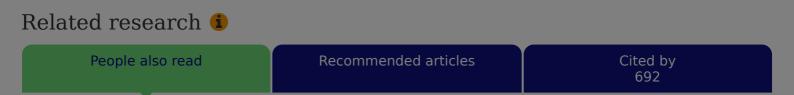
46.4% relative to a global ordinary least squares model. More impressively, the GTWR model demonstrated a better goodness-of-fit (0.9282) than the TWR model (0.7794) and the GWR model (0.8897). McNamara's test supported the hypothesis that the improvements made by GTWR over the TWR and GWR models are statistically significant for the sample data.

🔍 Keywords: geographically and temporally weighted regression   geographically weighted regression   spatial nonstationarity   temporal nonstationarity   housing price   Calgary

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