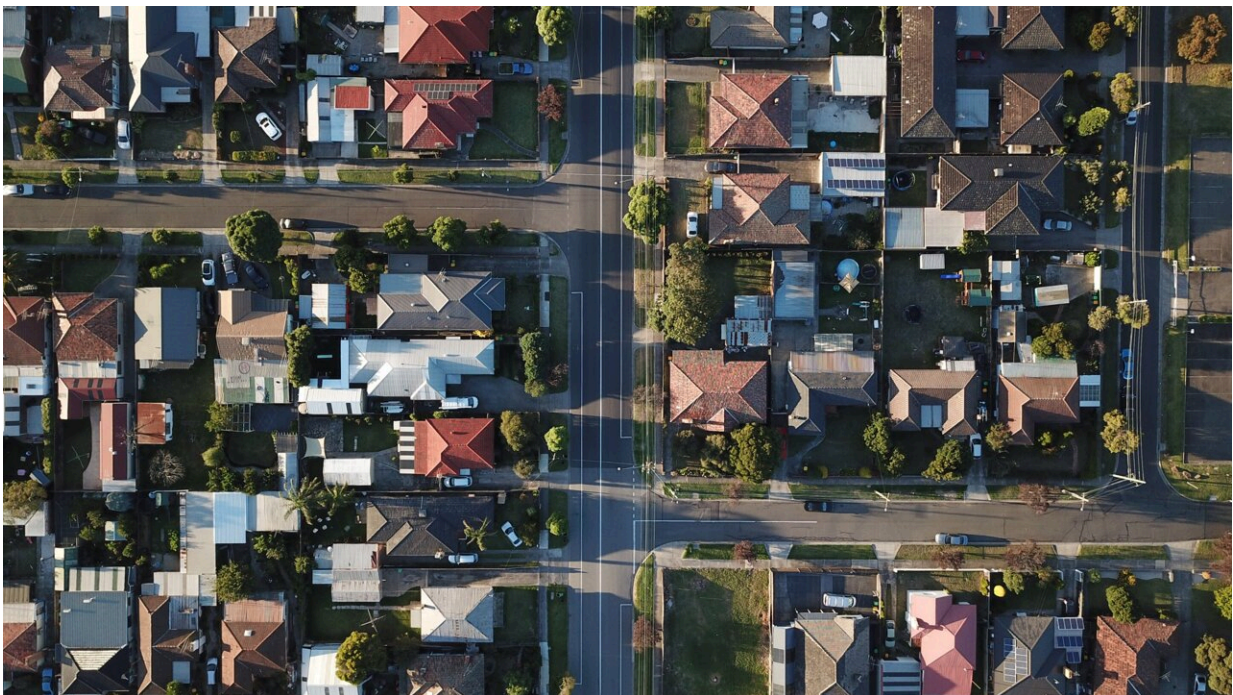# New property valuation technique delivers more accurate predictions using machine learning and big data

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Credit: Unsplash/CC0 Public Domain

Researchers at the University of South Australia have developed a machine learning technique that makes property valuation more transparent, reliable, and practical, with the ability to accurately model the impact of urban development decisions on property prices.

The technique was created and validated using over 30 years of historical sale information in metro Adelaide and uses purpose-developed machine learning algorithms to process huge amounts of data about housing, urban structure and amenities, making it possible to quantify the effects of urban planning policies on housing value.

Lead researcher, UniSA geospatial data analyst and urban planning expert Dr. Ali Soltani, says the technique, has implications for the property, urban planning, and infrastructure sectors.

"Our modeling technique and findings may help real estate investors, builders, property owners, house appraisers, and other stakeholders gain a more realistic view of the value of property and the factors that affect that," Dr. Soltani says.

"This research has implications for policymakers by providing insights into the potential impacts of urban planning—such as infill regeneration, master-planned communities, gentrification, and population displacement—and infrastructure provision policies on the housing market and subsequent local and regional economy.

"By capturing the complicated influence of infrastructure elements such as road and public transportation networks, commercial centers, and natural landscapes on home value, our model is especially valuable for enhancing the accuracy of current land value predictions and lowering the risks associated with traditional property valuation methodologies, which are largely dependent on human experience and limited data."

Dr. Soltani says the model—developed in conjunction with Professor Chris Pettit from UNSW's City Futures Research Center—may also be extended to include other economic features at both the macro and micro levels, such as changes in interest rates, employment rates, and the influence of COVID-19, by harnessing the benefits of big data

technologies.

"This model has the potential to be used as a decision-support platform for a variety of stakeholders, including home buyers and sellers, banks and financial agents, investors, the government, and insurance or loan agents," Dr. Soltani says.

"Our technique makes it simpler for stakeholders and the general public to apply the findings of sophisticated models on historical or real-time data from multiple sources, which have previously been almost black-box and expert-oriented."

A summary of this research has been recently published in the journal *Cities*.

More information: Ali Soltani et al, Housing price prediction incorporating spatio-temporal dependency into machine learning algorithms, *Cities* (2022). DOI: 10.1016/j.cities.2022.103941

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