Artificial intelligence models aim to forecast eviction, promote renter rights

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Two artificial intelligence-driven models designed by researchers from the Penn State College of Information Sciences and Technology could help promote the rights of low-income renters in the United States when

facing forced eviction. Both models aim to forecast where and how many renters could be at risk of eviction to help better inform policymaking and resource allocation.

The researchers' first model, "Weakly-supervised Aid to Relieve Nationwide Eviction Rate," helps to identify areas where there could be a high concentration of individuals facing eviction. To identify these hotspots, their framework uses sociological data—such as renters' educational and financial characteristics that are historically associated with housing instability—to label satellite data based on certain features in each image, such as the presence of trees and signs of gentrification. This data is used to train a machine learning model, which identifies eviction filing hotspots in other locations.

"Not all states make data on housing instability and eviction rates available, and there is a high cost to collect this data when it's even available," said Amulya Yadav, PNC Career Development Assistant Professor and co-author on the study. "Our model presents a novel approach by using other data points related to eviction filings to create more efficient and accurate reporting that is highly generalizable to different counties across the country."

The second model, "Multi-view model forecasting the number of tenants at-risk of formal eviction," aims to provide an accurate forecast of tenants at-risk of eviction at a certain point in the future.

In a similar approach, the model uses data from available eviction filing records, the U.S. Census' American Community Survey, and labor and employment statistics to estimate the number of tenants who may face eviction in each census tract.

Through a collaboration with the Child Poverty Action Lab, a leading non-profit leveraging data-driven approaches to inform actions for

relieving poverty-related issues across Dallas County, Texas, the team tested both models against a real-world dataset in that county, where eviction records are more complete and readily available. The models proved to be more accurate than existing baseline models, outperforming some by up to 36%.

"There are resources available to help renters facing housing instability, but they are allocated with tremendous variability—and sometimes they're not used at all," said Maryam Tabar, doctoral student and lead author on the study. "There is a need to use these funds and resources more efficiently, which is possible through more accurate forecasting of potential evictions."

The team presented the "Weakly-supervised Aid to Relieve Nationwide Eviction Rate" model at the 31st ACM International Conference on Information and Knowledge Management and the multi-view model forecasting the number of tenants at-risk of formal eviction at the 31st International Joint Conference on Artificial Intelligence late last year.

Both models are being evaluated by subject matter experts for a pilot deployment in the field. The team said they hope they can assist non-government organizations and policymakers in making more data-driving decisions about where to allocate resources to better address housing instability, as well as support advocacy efforts with elected officials and agencies related to housing instability.

"Eviction disproportionately impacts individuals from underrepresented backgrounds and can exacerbate existing societal problems related to income disparity, educational attainment, and mental health," said Dongwon Lee, professor and co-author on the study. "These models can help us better address these challenges and improve the lives of those vulnerable to eviction."