Machine Learning for the Efficient Prediction of Barrier-Integrated Walk Scores

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SUMMARY

Walkability, understood as the extent to which an environment supports walking as a means of transportation in everyday life, is shaped by local, historically grown urban structures and therefore can vary significantly between cities and regions. To systematically record and compare these differences, walkability is typically measured using pedestrian indices and corresponding assessment tools. Composite assessments that calculate distances to multiple amenities simultaneously, such as the Walk Score, may take a relatively long time to process. Against this background, the present study examines a machine learning approach for the efficient estimation of senior-sensitive walkability using Walk Scores. The approach is being evaluated in two German county districts with the goal of reducing processing time while maintaining accurate approximations.

To evaluate the quality of the model and to avoid overfitting, we compared the overall accuracy of a training and a test dataset, performed cross-validation between our two study regions, and evaluated the performance. The results show that the proposed machine learning approach can generate predictions for Walk Scores that are largely accurate and transferable, with significantly lower computational costs.