



Special Session Proposal

Machine Learning in Regional Science: Perspectives, Methods, and Applications

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Abstract

Machine learning (ML) and deep learning (DL) approaches are increasingly being used across the social sciences to answer questions related to transportation, urbanisation, housing, neighborhood change, and economic development. And while earlier iterations of these methods focused primarily on predictive outcomes, recent cutting-edge extensions of these approaches are now being used to assess problems of causal inference, explicitly integrate spatial information, and provide insight into the explanatory relationships driving model results.

The purpose of this session is to spur a wide-ranging conversation about the usefulness and applicability ML and DL methods in regional science and to serve as a showcase for work that develops new causal, spatially-explicit, or explanatory methods or uses these techniques in innovative applications. We welcome papers from across the disciplinary spectrum that employ ML or DL techniques or discuss the development or approaches to data science as it relates to regional science more broadly, on topics including but not limited to:

- Development or use ML and DL methods for regional science applications, e.g., regional economic development, entrepreneurship, transportation, housing, spatial interaction, urban form, population growth, neighborhood change, etc.
- Development or use of causal or explanatory ML methods, e.g., causal forests (CF), deep gravity models, or feature learning approaches

- Use of new visualization methods for non-linear relationships in ML models, e.g., partial dependence (PD) and accumulated local effects (ALE) plots
- Integration of spatial data or approaches into predictive ML or DL models, e.g., convolutional neural networks (CNN)
- Methods for optimizing spatial pattern prediction or the development of new indicators of spatial association