NARSC 2021
Call for Submissions
Special Sessions on

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

As new predictive machine learning models become more widely used – and as the rubric of "data science" is increasingly used to judge methods in many scientific fields, including the social sciences more widely– it is important for regional scientists, geographers, and urban planners to better understand how these methods operate, how they compare to traditional approaches, and how they use spatial information. In particular, the integration of spatial data into these models and the creation of *spatially-explicit* machine learning models are very important but relatively undeveloped areas of research, as several recent articles have pointed out (Singleton & Arribas-Bel 2019; Rey 2019). At the same time, the efficacy of these powerful predictive methods (such as random forest) for explanatory research questions remains inadequately understood, underscoring the need to further open the "black box" of machine learning algorithms. This is particularly important for regional scientists who are often most interested in the size and significance of explanatory relationships rather than predicting outcomes. Of course, predicting quantitative spatial economic processes is also one of the traditional domains of regional science, and the field has much to offer – theoretically and empirically – to the data- and methods-driven predictive approaches pioneered by data scientists in a variety of other fields (and often, the private sector).

The purpose of this session - which is a reprise of a successful session from 2020 - is to spur a wide-ranging conversation about the usefulness and applicability of machine learning methods in regional science and to serve as a showcase for work that develops new spatially-explicit machine learning methods or uses these techniques in innovative applications. We welcome papers from across the disciplinary spectrum that employ machine learning techniques or discuss the development or approaches of "data science" as it relates to regional science more broadly, including on topics such as:

- Integration of spatial data into predictive machine learning models such as random forest
- Structured comparisons between "newer" machine learning models and traditional (spatial) econometric approaches
- Methods for optimizing spatial pattern prediction or the development of new indicators of spatial association
- Development or use of explanatory machine learning models, including causal random forests (CRF)

- Use of new visualization methods for non-linear relationships in machine learning models, such as partial dependence (PD) and accumulated local effects (ALE) plots
- Development or use of deep learning models for regional science applications

If you are interested in presenting your research in this special session, please submit an abstract (2,000 to 5,500 characters and spaces) through the conference portal. Information on how to do that can be found here. Upon submitting your abstract, you will receive an abstract ID number (e.g. P12345). Please send your abstract ID number and a copy of your abstract (with name, email, and affiliation for all authors to Kevin Credit at kevin.credit@mu.ie no later than June 30, 2021.

Contact:

Kevin Credit
National Centre for Geocomputation
Maynooth University
kevin.credit@mu.ie

Matthew Lehnert
Spatially Integrated Social Science
University of Toledo
matthew.lehnert@rockets.utoledo.edu