



ACM Transactions on Spatial Algorithms and Systems

Special Issue on Machine Learning and Location Data

Guest Editors:

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Due to the rapid development of location acquisition technologies, big location data are being collected from various data sources such as connected cars, sharing bikes, smartphones, sensors, social media, and Wi-Fi access points. This led to the proposal of various spatial algorithms, models, and systems to understand and model these data for intelligent transportation, business intelligence, public health, social economics, urban planning, urban resilience, and environmental sustainability.

Machine learning plays a central role in many of these proposals, ranging from the problem formulations (e.g., supervised learning, unsupervised learning, semi-supervised learning, and reinforcement learning) to learning techniques (e.g., multi-task learning, transfer learning, meta-learning, ensemble learning, online learning). Although deep neural networks (e.g., graph neural networks, recurrent neural networks, convolutional neural networks, and transformers) have become the standard tool for handling the spatiotemporal complexities lying in the data, there are still many open challenges. As both the location data and the application scenarios become larger and more complex, a wide range of questions and challenges still need to be addressed, including (1) enlarging the scalability of models/algorithms/systems on both spatial and temporal dimensions; (2) dealing with the data limitations (e.g., missing, incomplete, sparse, noisy); (3) analyzing multimodal location data; (4) improving the accuracy/reliability/interpretability of models; (5) alleviating privacy concerns; (6) developing models/algorithms/systems for novel application scenarios (e.g., autonomous driving, epidemic control, disaster response, event management).

This special issue intends to bring together researchers and practitioners working on machine learning algorithms and techniques for location data in multiple areas, including Spatial Data Scientists (geographic information systems, databases, storage, big data, data mining, machine learning, security/privacy), Mathematicians, Epidemiologists, Computational Social Scientists, Medical Practitioners, Psychologists, Emergency Response and Public safety, among others.

Topics

Topics of interest include, but are not limited to the following:

- Limited Supervised Learning on Location Data (Weak Supervised or Unsupervised)
- Sequential Modeling on Location Data
- Graph Learning on Location Data
- Federated Learning on Location Data
- Generative Modeling on Location Data

- Transfer Learning on Location Data
- Reinforcement Learning on Location Data
- Explainable Machine Learning Models on Location Data
- Geospatial Recommendation Systems
- Geospatial Knowledge Graphs
- Geospatial Anomaly Detection
- Geospatial Computer Vision Models/Applications
- Geospatial Natural Language Processing Models/Applications
- Machine Learning Models for Epidemic
- Machine Learning Models for Intelligent Transportation
- Machine Learning Models for Location Business Intelligence
- Machine Learning Models for Emergency/Disaster

Important Dates

- Submission Deadline: May 15, 2023
- First-round review decisions: July 1, 2023
- Deadline for revision submissions: August 15, 2023
- Notification of Final Acceptance: September 15, 2023
- Tentative Publication: Winter 2023

Submission Information

The journal welcomes articles on any of the above topics or closely related disciplines in the context of machine learning on location data. TSAS will encourage original submissions that have not been published or submitted in any form elsewhere, and submissions that may significantly contribute to opening up new and potentially important areas of research and development. TSAS will publish outstanding papers that are "major value-added extensions" of papers previously published in conferences. Such extensions should contribute at least 30% new original work. In this case, authors will need to identify in a separate document the list of extensions over their previously published paper. For more information, please visit tsas.acm.org/authors.cfm.

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