

IEEE Transactions on Intelligent Transportation Systems

Call for Papers

Special Issue on “Graph-based Machine Learning for Intelligent Transportation Systems”

With the advance of Internet of Things (IoT) and 5G communication technologies, various kinds of traffic data from diverse devices can be acquired nowadays, and they can help us look into intelligent transportation systems (ITS) with a new eye. However, it is a great challenge for analyzing and processing ITS data because of its complex and unstructured characteristics, such as volume, variety, velocity, value, sequence, strong-relevance, and accuracy. Although transportation systems are naturally represented as networks, i.e., road networks and internet of vehicles, they are loosely organized with multi-source heterogeneity. As a result, interest has turned to the use of relational and similarity-based representations of transportation data due to improvements in the graph-based methods, including graph embedding, graph kernels, and deep graph convolutional networks.

However, there is currently a large gap between the size of the transportation graph data we possess and the machine learning algorithms we use to process them. For instance, there are millions of nodes and billions of edges in transportation networks, but most machine learning methods dealing with graph data are limited to graphs that are many magnitudes smaller. The size and dimension of data encountered in the ITS that need to be analyzed have grown dramatically. Moreover, transportation data is often time-varying, high-dimensional, unstable, and often noisy or imbalanced, which brings additional challenges for developing efficient and effective graph-based machine learning techniques for ITS. Graph-based machine learning holds out the potential as a powerful tool for modeling complex structural data relationships and also mining both useful information and temporal patterns which could be used for building powerful analytics for ITS construction.

Considering the benefit of graph-based machine learning for ITS, some graph-based machine learning methods/architectures have been proposed. Even though these approaches have achieved certain success, there exist various scientific and engineering challenges including isolated data silos, data inaccessibility, inefficient workflows, low data quality, and privacy protection. The objective of this special section is to solicit high-quality original research papers, which address open issues in graph-based machine learning-driven discovery of ITS from both academia and industry. Review articles are also encouraged.

The topics of interest include, but are not limited to:

- Graph Embedding Methods for ITS
- Graph-Based Feature Selection for ITS
- Graph-Based Deep Learning for ITS
- Graph Recommender Systems for ITS
- Applications of Graph Learning for ITS

- Knowledge Graph Representation Learning for ITS
- Distributed Computing on Transportation Graphs
- Graph-based Machine Learning for Traffic Prediction
- Representation Learning on Graph Structured Transportation Data
- Transductive and Inductive Learning on Transportation Graphs
- Graph-based Machine Learning for Traffic Big Data Analysis
- Graph-based Trust, Fraud Detection, and Cybersecurity in ITS
- Learning from Homogenous/Heterogeneous Transportation Networks

PAPER SUBMISSION GUIDELINES

Paper submission should conform to the information for authors available at <https://mc.manuscriptcentral.com/t-its>.

SPECIAL ISSUE TIMELINES:

First submission deadline: December 2021

Notification of first decision: March 2022

First revision submission deadline: May 2022

Notification of final decision: September 2022

Final manuscript (camera ready) submission deadline: October 2022

Issue of Publication: December 2022

SUBMISSION AND REVIEW OF PAPERS

Submitted papers should be original and not be under consideration elsewhere for publication. The authors should follow the journal guidelines, regarding the manuscript content and its format when preparing their manuscripts. All papers will be reviewed by at least three independent reviewers for their suitability in terms of technical novelty, scientific rigor, scope, and relevance to this special issue.

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Dr. Kwang-Cheng Chen received the B.S. from the National Taiwan University in 1983, and the M.S. and Ph.D from the University of Maryland, College Park, in 1987 and 1989, all in electrical engineering. From 1987 to 1998, Dr. Chen worked with SSE, COMSAT, IBM Thomas J. Watson Research Center, and National Tsing Hua University, in mobile communications and networks. During 1998-2016, Dr. Chen was with National Taiwan University, Taipei, Taiwan, where he was Distinguished Professor and Irving T. Ho Chair Professor, and served as the Director, Graduate Institute of Communication Engineering, Director, Communication Research Center, and Associate Dean, College of Electrical Engineering and Computer Science. He was visiting HP Labs, Palo Alto, in 1997, Delft University of Technology (Netherlands) in 1998, Aalborg University (Denmark) in 2008, and the Research Laboratory of Electronics at the Massachusetts Institute of Technology, 2012-2013 and 2015-2016. He was with the STAG, Executive Yuan, to engineering Taiwan's telecommunication deregulation, to plan nation's ICT strategy and nation's regulator (National Communication Commission) in 1990's. Dr. Chen founded INPROCOMM Inc. In 2001, which was acquired by the MediaTek Inc. in 2004. He has been actively involving in the organization of IEEE conferences as General/TPC chair/co-chair, serving editorships with a few prestigious IEEE journals, and IEEE volunteer services with the IEEE Fellow Committee, IEEE Kiyo Tomiyasu Award Committee, and various committees (also distinguished lecturer) with IEEE Communications Society, Vehicular Technology Society, and Signal Processing Society. Most recently, Dr. Chen founds and chairs the Technical Committee on Social Networks in the IEEE Communications Society, and also serves in the IEEE Big Data Initiatives. He has contributed essential patented technology to international standards like IEEE 802 wireless LANs, Bluetooth, LTE (i.e. 4G mobile

communications) and LTE-A. He has authored and co-authored near 300 IEEE papers, 23 granted US patents, 3 books, including a few Highly Cited Papers. Dr. Chen is an IEEE Fellow and a recipient for a number of prestigious awards including 2011 IEEE COMSOC WTC Wireless Communication Recognition Award, 2014 IEEE Jack Neubauer Memorial Award, 2014 IEEE COMSOC AP Outstanding Paper Award. His technical leadership results in Best Paper Awards in major IEEE Conferences like ICC, Globecom, and PIMRC.

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Dr. Rafal Scherer is a full professor at the Czestochowa University of Technology, Poland. He has received his M.S. and Ph.D from Czestochowa University of Technology in 1997 and 2002. His research focuses on developing new methods in neural networks, computational intelligence and data mining, ensembling methods in machine learning, content-based image indexing. He authored more than 130 research papers and two books: on multiple classification techniques (2012) and Computer Vision Methods for Fast Image Classification and Retrieval (2020) published by Springer. He co-organizes every year or two years the International Conference on Artificial Intelligence and Soft Computing in Zakopane (<http://www.icaisc.eu/>) which is one of the major events on computational intelligence. He is the vice chair for IEEE Computational Intelligence Society in Poland chapter. He is also a co-editor of the Journal of Artificial Intelligence and Soft Computing Research (<http://jaiscr.eu/>). He also has organized a lot of special issues on good journals. He ran many funded research projects as principal investigator and technical members.