IEEE Transactions on Intelligent Transportation Systems
Call for Papers
Special Issue on "AI and Deep Learning for Intelligent and Sustainable Traffic & Vehicle Management in VANETs"

Vehicular Ad hoc Networks (VANETs) are among the most promising technology enablers to realize current and future Intelligent Transportation Systems (ITS). Nowadays, ITS have provided unquestioned evidences for improving road safety, sustainability and efficient road traffic and vehicle management. Indeed, the lives of people who travel along roads on a regular basis are directly affected by traffic management and safety. Since the number of on-road vehicles is growing fast, the number of accidents and fatalities on the roads is expected to increase steadily over the next years. VANETs provide communication services among close vehicles (V2V) and roadside infrastructure (V2I) through dedicated short-range communication (DSRC). It is by virtue of these communication services that roads have become safer and traffic flows thoroughly monitored and understood.

As a consequence of their capital role in road safety, vehicular communication networks are gaining the attention of academic, government, and industry sectors. A vehicular network has the potential to contribute to safer and more efficient transportation systems by providing a diversity of services and timely information to drivers, passengers and authorities. Routing between a source vehicle and a destination vehicle is also an important topic in VANETs. Routing in VANETs establish an appropriate route between vehicles without relying on fixed communication infrastructures. However, due to the characteristics of these networks such as self-organization, high vehicular mobility, dynamic topology changes, short-term connections and limited bandwidth, designing an effective routing protocol remains a challenging topic that requires e.g. predicting the trajectory of vehicles to establish connections of high bandwidth albeit narrow directionality. Another challenge in VANETs is securing communication between vehicles and traffic and vehicle management. Due to lack of infrastructure, open nature, the high mobility of vehicles and data privacy regulatory constraints, security is one of the most considerable topics in these networks. Deep Learning algorithms can be a suitable approach for routing and security issues, sustainable traffic and vehicle management in VANETs. The effectiveness of Deep Learning relies on the ability of these models to effectively handle the dynamics of vehicular networks, providing the algorithmic means to learn the patterns within the information flows exchanged from/to vehicles, infrastructure and pedestrians. Specific topics related to Deep Learning with clear connections to VANETs include transfer learning, online learning and federated learning, among many others.

This special issue aims at providing platform for researchers and practitioners to exchange and publish the latest research trends and results on intelligent and sustainable traffic & vehicle management in VANETs using Artificial Intelligence approaches, with an emphasis on various Deep Learning based strategies such as Computer Vision, etc. The main objective of this special issue is to encourage researchers to explore key concepts of AI and Deep Learning that can be utilized for intelligent and sustainable traffic & vehicle management in VANETs. The topics relevant to this special issue include, but are not limited to:

- Artificial intelligence for Smart traffic management in VANETs
- AI for Enhancing location-based services and navigation in VANETs
- AI and Deep learning for Internet of Vehiclesand 5G
- Artificial intelligence for traffic & vehicle management in VANETs

- AI-enabled Big data management in VANETsand Internet of Vehicles
- Artificial intelligencefor Social Internet of Vehicles and traffic management
- New Deep Learning paradigms and their application to VANETs:
    - Federated Learning
    - Transfer Learning and Domain Adaptation
    - Adversarial Machine Learning
    - Explainability of Deep Learning models
    - Deep Reinforcement Learning
- Cloud-fog based Internet of Vehicles for intelligent traffic management using AI
- AI-enabled Software design for VANETs and Internet of Vehicles
- Artificial intelligencefor Safety, security and privacy in VANETs
- Cloud and edge computing for intelligent and sustainable traffic & vehicle management in VANETs
- Evolutionary computation and Swarm Intelligence approaches for sustainable traffic & vehicle management in VANETs
- AI-enabled mobile computing fortraffic & vehicle management in VANETs
- AI based sustainable smart vehicles and traffic management
- AI based cooperative applications of IoV and UAVs
- Internet of Vehiclesfor future Internet design
- Blockchain based traffic & vehicle management in VANETs
- Protocols, architectures and applications for traffic & vehicle management in VANETs
- Lightweight protocols for sustainable traffic & vehicle management in VANETs
- AI with Image Processing for effective vehicle management in VANETs
- Computer Vision over edge devices with applications to VANETs

PAPER SUBMISSION GUIDELINES

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

IMPORTANT DATES

First submission deadline: July 2021
Notification of first decision: October 2021
First revision submission deadline: December 2021
Notification of final decision: April 2021
Final manuscript (camera ready) submission deadline: May 2021
Issue of Publication: July 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.

GUEST EDITORS

1. Prof. B. B. Gupta, Senior Member, IEEE
   National Institute of Technology, Kurukshetra, India
   Email: gupta.brij@ieee.org

2. Prof. Dharma P. Agrawal, Fellow IEEE
   University of Cincinnati, Cincinnati, USA
   Email: dpa@cs.uc.edu

3. Muhammad Sajjad
Sejong University, South Korea and Islamia College Peshawar, Pakistan
Email: Muhammad.sajjad@icp.edu.pk

4. Prof. Michael Sheng, Senior Member, IEEE
Macquarie University, Australia
Email: michael.sheng@mq.edu.au

5. Prof. Javier Del Ser
TECNALIA, Basque Research & Technology Alliance (BRTA), Spain
University of the Basque Country (UPV/EHU), Spain
Email: javier.delser@tecnalia.com

Brij B. Gupta received PhD degree from Indian Institute of Technology Roorkee, India in the area of Information and Cyber Security. In 2009, he was selected for Canadian Commonwealth Scholarship awarded by Government of Canada. He published more than 300 research papers in International Journals and Conferences of high repute. He has visited several countries, i.e. Canada, USA, Japan, Italy, Spain, Malaysia, UK, China, Thailand, Australia, Hong-Kong, etc to present his research work. His biography was selected and published in the 30th Edition of Marquis Who's Who in the World, 2012. Dr. Gupta also received Young Faculty research fellowship award from MeitY, government of India in 2017. He is also working as principal investigator of various R&D projects. He has also served as Technical program committee (TPC) member of more than 100 International conferences worldwide. Dr Gupta is Senior member of IEEE, Member ACM, SIGCOMM, Internet Society, Life Member, International Association of Engineers, Life Member, International Association of Computer Science and Information Technology. He was also visiting researcher with Yamaguchi University, Japan, with Deakin University, Australia and with Swinburne University of Technology, Australia during 2015, 2017, and 2018, respectively. Additionally, he was visiting professor with Temple University, USA and Staffordshire University, UK during June, 2019 and July 2019 respectively. At present, Dr. Gupta is working as Assistant Professor in the Department of Computer Engineering, National Institute of Technology Kurukshetra India. His research interest includes Information security, Cyber Security, Cloud Computing, Web security, Intrusion detection and Phishing.

Dharma P. Agrawal [Fellow, IEEE] is the Ohio Board of Regents Distinguished Professor and the founding director for the Center for Distributed and Mobile Computing in the Department of Electrical Engineering and Computing Systems. He has been a faculty member at the ECE Dept., Carnegie Mellon University (on sabbatical leave), N.C. State University, Raleigh and the Wayne State University. His current research interests include applications of sensor networks in monitoring Parkinson's disease patients and neurosis, applications of sensor networks in monitoring fitness of athletes' personnel wellness, applications of sensor networks in monitoring firefighters physical condition in action, efficient secured communication in Sensor networks, secured group communication in Vehicular Networks, use of Femto cells in LTE technology and interference issues, heterogeneous wireless networks, and resource allocation and security in mesh networks for 4G technology. His recent contribution in the form of a co-authored introductory text book on Introduction to Wireless and Mobile Computing has been widely accepted throughout the world and fourth edition is in press. The book has been reprinted both in China and India and translated in to Korean and Chinese languages. His co-authored book on Ad hoc and Sensor Networks, 2nd edition, has been published in spring of 2011. A co-edited book entitled, Encyclopedia on Ad Hoc and Ubiquitous Computing, has been published by the World Scientific and co-authored books entitled Wireless Sensor Networks: Deployment Alternatives and Analytical Modeling, and Innovative Approaches to Spectrum Selection, Sensing, On-

Demand Medium Access in Heterogeneous Multihop Networks, and Sharing in Cognitive Radio Networks have being published by Lambert Academic. He is a founding Editorial Board Member, International Journal on Distributed Sensor Networks, International Journal of Ad Hoc and Ubiquitous Computing (IJAHUC), International Journal of Ad Hoc & Sensor Wireless Networks and the Journal of Information Assurance and Security (JIAS). He has served as an editor of the IEEE Computer magazine, and the IEEE Transactions on Computers, the Journal of Parallel and Distributed Systems and the International Journal of High Speed Computing. He has been the Program Chair and General Chair for numerous international conferences and meetings. He has received numerous certificates from the IEEE Computer Society. He was awarded a Third Millennium Medal, by the IEEE for his outstanding contributions. He has delivered keynote speech at 34 different international conferences. He has published over 655 papers, given 52 different tutorials and extensive training courses in various conferences in USA, and numerous institutions in Taiwan, Korea, Jordan, UAE, Malaysia, and India in the areas of Ad hoc and Sensor Networks and Mesh Networks, including security issues. He has graduated 70 PhDs and 58 MS students. He has been named as an ISI Highly Cited Researcher, is a Fellow of the IEEE, the ACM, the AAAS and the World Innovation Foundation, and a recent recipient of 2008 IEEE CS Harry Goode Award. Recently, in June 2011, he was selected as the best Mentor for Doctoral Students at the University of Cincinnati. Recently, he has been inducted as a charter fellow of the National Academy of Inventers. He has also been elected a Fellow of the IACSIT (International Association of Computer Science and Information Technology), 2013.

Muhammad Sajjad received his MS degree in Computer Software Engineering in 2008 from National University of Sciences and Technology, Pakistan. From 2008 to 2012, he served as a lecturer in different renowned universities of Khyber Pakhtunkhwa, Pakistan, where he provided additional duties other than teaching such as project coordinator and supervising research activities of BS and MS students. In 2012, he joined Intelligent Media Lab (IM Lab) as a research associate while enrolling as a PhD student in Sejong University, Seoul, South Korea. In IM Lab, he worked on various projects related to image superresolution, image quality assessment, video summarization and prioritization, and mixed reality. He also assisted his professor while writing research project proposal, supervising MS and newly inducted PhD students, and various other tasks related to teaching and management. After completing his PhD in 2015, he joined back his home university, Islamia College Peshawar (Public Sector University). Currently, he is working as an assistant professor in computer science department, Islamia College Peshawar. He is also the leading researcher of digital image processing lab in computer science department, where many BS, MS, and PhD students are working on various projects such image/video retrieval, steganography, digital watermarking, and medical imaging analysis etc. under his supervision. In addition, he is also in charge of quality enhancement cell, playing an active role in capacity building, improving teaching quality, and enhancing academia. Moreover, he is in strong research collaboration with IM lab where he assist his professor (supervisor), remotely supervising and guiding PhD and Master students in various tasks such as proposing new ideas, giving his valuable suggestions during experiments, and providing support in writing and revising project proposals and research papers. He has published 40+ papers in peer-reviewed international journals and conferences such as Information Fusion, Neurocomputing, Sensors, Journal of Visual Communication and Image Representation, Multimedia Tools and Applications, Computers in Biology and Medicine, Journal of Medical Systems, Signal, Image and Video Processing, Bio-Medical Materials and Engineering, KSII Transactions on Internet and Information Systems, NBIS 2015, MITA 2015, and PlatCon 2016. He is serving as a professional reviewer for numerous well-reputed journals such as Journal of Visual Communication and Image Representation (11), Future Generation Computer Systems (4), Journal of SuperComputing (2), Signal Image and Video Processing (5), Multimedia Tools and Applications (5), ACM Transactions on Embedded Computing Systems (5), and Enterprise Information Systems (3).

Michael Sheng is a full Professor and Head of Department of Computing at Macquarie University. Before moving to Macquarie, Michael spent 10 years at School of Computer Science, the University of Adelaide (UoA). Michael holds a PhD degree in computer science from the University of New South Wales (UNSW) and did his post-doc as a research scientist at CSIRO ICT Centre. From 1999 to 2001, Sheng also worked at UNSW as a visiting research fellow. Prior to that, he spent 6 years as a senior software engineer in industries. Prof. Sheng has more than 390 publications as edited books and proceedings, refereed book chapters, and refereed technical papers in journals and conferences including ACM Computing Surveys, ACM TOIT, ACM TOMM, ACM TKDD, VLDB Journal, Computer (Oxford), IEEE TPDS, TKDE, DAPD, IEEE TSC, WWWJ, IEEE Computer, IEEE Internet Computing, Communications of the ACM, VLDB, ICDE, ICDM, IJCAI, CIKM, EDBT, WWW, ICSE, ICSOC, ICWS, and CAiSE. Dr. Michael Sheng is ranked by Microsoft Academic as one of the Top Authors in Services Computing (ranked the 7th All Time). He is the recipient of the AMiner Most Influential Scholar Award on IoT (2007-2017), ARC Future Fellowship (2014), Chris Wallace Award for Outstanding Research Contribution (2012), and Microsoft Research Fellowship (2003). He is a member of the IEEE and the ACM.

Javier Del Ser received his first PhD degree (cum laude) in Electrical Engineering from the University of Navarra (Spain) in 2006,and a second PhD degree (cum laude, extraordinary PhD prize) in Computational Intelligence from the University of Alcal´a (Spain) in 2013. He is currently a Research Professor in Artificial Intelligence and leading scientist of the OPTIMA (Optimization, Modeling and Analytics) research area at TECNALIA, Spain. He is also an adjunct professor at the University of the Basque Country (UPV/EHU),an invited research fellow at the Basque Center for Applied Mathematics(BCAM), an a senior AI advisor at the technological startup SHERPA.AI. He is also the coordinator of the Joint Research Lab between TECNALIA,UPV/EHU and BCAM, and the director of the TECNALIA Chair in Artificial Intelligence implemented at the University of Granada (Spain). His research interests are in the design of Artificial Intelligence methods for data mining and optimization applied to problems emerging from Industry 4.0, Intelligent Transportation Systems, Logistics and Health, among others and is an Associate Editor of several tier-one journal in the related areas, such as Information Fusion, Swarm and Evolutionary Computation and Cognitive Computation. He is an IEEE Senior Member and a recipient of the Bizkaia Talent prize for his research career.