



IEEE International Conference on Intelligent Transportation Systems Conference

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Special Session on Computational Intelligence and Machine Learning for Transport Health Management

Organizers: Graziela P. Figueredo, University of Nottingham, United Kingdom; Isaac Triguero, University of Nottingham, United Kingdom; Alexandre G. Evsukoff, Federal Univeristy of Rio de Janeiro, Brazil; Robert I. John, University of Nottingham, United Kingdom

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Important Dates:

Submission Deadline: 15th April 2018

Notification Acceptance: 2nd July 2018

Paper Submission:

You should follow the [IEEE International Conference on Intelligent Transportation Systems Submission Web Site](#).

Description:

The aim of this special session is to serve as a forum for the exchange of ideas and discussions on recent and new trends in computational intelligence and machine learning applied to transport health management. This includes the application of Fuzzy logic, neural networks, evolutionary computation and their integration with machine learning and data mining techniques to tackle transportation problems. Topics such as control, maintenance, repair, overhaul, anomaly detection, early-fault detection, information visualisation, scheduling, data analysis and incident/accident prevention are research subjects widely employed to promote good health of the transportation network. The objective is to provide the highest acceptable level of transport safety, availability and economy.

Intelligent transportation health management research therefore aims at supplying appropriate monitoring and intelligent algorithms to enable early detection of equipment fault and subsequent deployment of optimal maintenance and knowledge dissemination. Accurate gathering, fusion, storage, processing, interpretation and display of the information provided by sensors and tracking devices coupled with accurate prediction and optimal prescription of maintenance activities lead to successful, cost-effective systems.

From this viewpoint, the aim of this special session is to explore Computational Intelligent methods and Machine Learning techniques in any part of the management process to promote safety, economy and reliability across the transport network. Real-world applications are also

welcome. We encourage authors to submit original papers as well as preliminary and promising work in the topics of this special session.

Scope and Topics:

The topics of this special session include computational intelligence methods for dealing with intelligent transport health management. These include handling data-level difficulties, control and monitoring vehicle and infrastructure for different modes of transportation, predicting and detecting faults, maintenance prescription and improving methods in areas such as:

- Deep learning, data analytics, data classification, multiple classifier systems for transport health
- Big sensor data, data streams and concept drift
- Vehicle data retrieval, data fusion
- Data reduction, data interpretation, data visualisation
- Control
- Simulation
- Early fault detection
- Anomaly detection
- Hot spot detection
- Smart roads
- Fuzzy systems, fuzzy metrics, fuzzy control
- Maintenance and repair optimisation, preventive maintenance, condition-based maintenance
- Real-world applications

Short biography of the organizers:

Graziela P. Figueredo is a Senior Research Data Scientist at the Advanced Data Analysis Centre (ADAC) at The University of Nottingham. The focus of her research is the development and application of techniques for systems simulation and intelligent data analysis. Her first PhD focused on developing an immune-inspired algorithm for instance selection in large data sets, at the Federal University of Rio de Janeiro. Her second PhD, completed at the University of Nottingham, focused on the translation of simulation approaches for immunology problems. She has been working with data analysis and simulation methods for a wide range of areas, including academic, medical and industrial partners. GF has published articles in leading journals, such as Plos ONE, the BMC Transactions in Bioinformatics, and international conferences, such as the IEEE Big Data SE. Her research interests include artificial immune systems, knowledge discovery in databases, bio-inspired computing and multi-scale modelling and simulation.

Isaac Triguero received his M.Sc. and Ph.D. degrees in Computer Science from the University of Granada, Granada, Spain, in 2009 and 2014, respectively. He is currently an Assistant Professor in Data Science at the School of Computer Science of the University of Nottingham. He has published more than 30 international journal papers as well as more than 25 contributions to conferences. He is an associate editor of the Machine Learning and Knowledge Extraction journal. He is also a reviewer of more than 30 international journals. He has acted as Program Co-Chair of the IEEE Conference on Smart Data (2016), the IEEE Conference on Big Data Science and Engineering (2017), and the IEEE International Congress on Big Data

(2018). He has acted as guest editors for special issues in journals such as Cognitive Computation, and Big Data Analytics. His research interests include data mining, data reduction, biometrics, optimization, evolutionary algorithms, semi-supervised learning, bioinformatics and big data learning.

Alexandre Evsukoff has experienced with the entire data science life cycle and most of the technology available to capture, store and process data in high performance platforms, model, analyze and visualize datasets of any size, structure or complexity. Project coordinator in many R&D projects in data science applications under contract with several industries such as oil and gas, energy and telecommunications. More than 15 years of academic experience in the leading Brazilian Graduate School of Engineering (Coppe).

Robert I. John received the B.Sc. (Hons.) degree in mathematics from Leicester Polytechnic, Leicester, U.K., the M.Sc. degree in statistics from UMIST, Manchester, U.K., and the Ph.D. degree in Fuzzy Logic from De Montfort University, Leicester, U.K., in 1979, 1981, and 2000, respectively. He worked in industry for 10 years as a mathematician and knowledge engineer developing knowledge based systems for British Gas and the financial services industry. Bob spent 24 years at De Montfort University. He has over 150 research publications of which about 50 are in international journals with over 6000 citations. Bob joined the University of Nottingham in 2013 where he heads up the research group ASAP in the School of Computer Science. The Automated Scheduling, Optimisation and Planning (ASAP) research group carries out multi-disciplinary research into mathematical models and algorithms for a variety of real world optimisation problems. He is also a member of LUCID.

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