Special Issue on "Emerging techniques for the management of uncertainty in computational traffic models"

Scope of Topics and Interest

Reliability of predictions made by traffic simulation models and artificial transportation systems, has become a major concern recently with the increasing use of complex models in real world applications. To deal with such problems, the scientific community has started to shift focus from the adequacy of models themselves, to issues related to management of the system/model uncertainty, which in-turn, are attracting the attention of many academic communities, becoming part of a rising transversal discipline in simulation modelling.

Models in the field of traffic simulation and artificial transportation systems, in particular, are often complex systems with diverse types of inputs and parameters. A few of these can be directly measured in the real world, while suitable probability density functions need to be estimated for most others. Such processes are essential to replicate measured conditions and account for the variability in the real world. Originally, this involved trial-and-error type approaches, however in the last decade processes for the management of uncertainty in simulation models have become formalised. Additionally, tools and frameworks have been developed for systematic calibration and validation of models, and sensitivity analysis is now receiving increasing attention as the main tool for providing the necessary feedback on the whole process, and additional insight into the model properties and behaviours.

Recently, the EUCOST Action 'MULTITUDE', has been promoting a coherent vision and harmonised approaches to cope with such problems, and building on suchachievements,this call aims at gathering papers on methodologies for the management of uncertainty in traffic simulation and artificial transportation systemsand their practical application.These include, but are not limited to:

- On-line and off-line calibration
- Risk assessment in decision making
- Disaggregate and aggregate calibration of microscopic traffic flow models
- Time dependent OD matrix estimation and prediction
- Uncertainty quantification: probabilistic frameworks and uncertainty settings, Monte Carlo simulations and other propagation methods
- Global sensitivity analysis: variance-decomposition methods, screening methods, meta-modelling, etc.
- Model validation

Manuscript Submission & Publication

Prospective authors are invited to submit contributions reporting on their current research on the above topics. Each paper will be analyzed by at least three reviewers of IEEE T-ITS according to their technical quality, relevance, results and contributions. Manuscripts must be submitted electronically at http://mc.manuscriptcentral.com/t-its .

Important Dates

Tentative schedule for the Special Issue is as follows:

- First submission deadline: July 1st, 2013.
- Notification of first decision: Oct 15th, 2013.
- Revision submission deadline: Dec 15th, 2013.
- Notification of final decision: Apr 1st, 2014.
- Final manuscript deadline: Apr 15th, 2014.
- Issue of Publication: June 2014.

Guest Editors

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