Call for Papers - SRToITS2023: International Workshop on Safety/ Reliability/ Trustworthiness of Intelligent Transportation Systems (SRToITS2023)

SRToITS2023 is in conjunction with SAFECOMP2023

Scope

A mix of intelligent transportation systems (ITSs, e.g. the automated car/ bus/metro/train, etc.) and regular transportation systems (RTSs) in future traffic networks challenges the safety, reliability and trustworthiness of ITSs, as well as the holistic safety of traffic networks. Hence, it is crucial to understand the risks of such mixed traffic networks where ITSs and RTSs are both involved, with mutual interactions. The risks can be caused by the following aspects: the complexity of operational tasks that ITSs have to deal with has been grossly underestimated, the artificial intelligence (AI) technology-based decision making is not reliable enough, ITSs lack a thorough and correct understanding of human driver behaviors and intentions in mixed scenarios, etc. With this in mind, there are many important issues that need to be investigated to facilitate ITSs performing tasks safely and properly, and assure the safety of traffic networks.

Topics of the workshop

Contributions are sought in (but are not limited to) the following topics:

- Functional safety of ITSs,
- Safety of the Intended Functionality (SOTIF),
- Reliability/ interpretability /trustworthiness of AI based systems,
- Scenario/model based V&V,
- Risk assessment of scenario-based virtual testing,
- Ways to assess the criticality of operational scenarios,
- Safety, security and performance issues of the coordination between automated vehicles and smart infrastructures,
- Understanding of human driver behaviors and intentions,
- Implications from regulatory entities,
- Challenges of road safety considering a mix of automated vehicles and regular ones in future roadways,
- Challenges of intelligent moving block operation in railways.

Workshop Chairs:

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Workshop Committees

Organization Committee:

- Ci Liang, Harbin Institute of Technology, China. (liangci321@hit.edu.cn)
- Mohamed Ghazel, Université Gustave Eiffel (ex IFSTTAR), France. (mohamed.ghazel@univ-eiffel.fr)
- Guo Zhou, SCANIA, Sweden. (guo.zhou@scania.com)

Program Committee:

- Ci Liang, Harbin Institute of Technology, China.
- Martin Törngren, KTH Royal Institute of Technology, Sweden.
- Fredrik Törner, Volvo Car Corporation, Sweden.
- Christian Berger, Chalmers University of Technology, Sweden.
- Yusheng Ci, Harbin Institute of Technology, China.
- Nour-Eddin El Faouzi, Université Gustave Eiffel (ex IFSTTAR), France.
- Mohamed Ghazel, Université Gustave Eiffel (ex IFSTTAR), France.
- Thierry Denoeux, Université de Technologie de Compiègne, France.
- Olivier Cazier, Chez Conseil en Infrastructures de Transport Environnement, Circulation Sécurité, France.
- Zhanbo Sun, Southwest Jiaotong University, China.
- Rui Wang, Beijing Jiaotong University, China.
- Yonggang Wang, Chang'an University, China.
- Peng Chen, Beihang University, China.

Workshop Format

SRToITS2023 will be a full-day workshop with a mix of keynotes (we plan to host two keynotes), high-quality paper presentations and discussion sessions. **The preferred format is F2F (in-person participation), but online participation will also be possible in exceptional cases.**

Tentative schedule:

9.00-9.30	Keynote	25 min Presentation + 5 min Q&A
9.30-9.50	Regular paper presentation	One: 15 min Presentation + 5 min Q&A
9.50-10.00	Break	
10.00-11.00	Regular paper presentation	Three: 15 min Presentation + 5 min Q&A for each
11:00-13:00	Lunch break	
13.00-13.30	Keynote	25 min Presentation + 5 min Q&A
13.30-13.50	Regular paper presentation	One: 15 min Presentation + 5 min Q&A
13.50-14.00	Break	
14.00-15.00	Regular paper presentation	Three: 15 min Presentation + 5 min Q&A for each
15.00-15.10	Break	
15.10-15.50	Regular paper presentation	Two: 15 min Presentation + 5 min Q&A for each
15.50-16.20	Discussion	
16.20-16.30	Summary	

Submission

Full research papers, reports on research projects, as well as industrial experience reports from work in progress are welcome. Workshop proceedings will be provided as complementary book to the SAFECOMP Proceedings in Springer LNCS. Papers (6 - 12 pages) will be reviewed by at least three reviewers. Please keep your paper format according to SPRINGER LNCS style guidelines (http://www.springer.com/computer/lncs?SGWID=0-164-6-793341-0) (use Microsoft Word if possible). For accepted papers, we also have the intention to invite extended versions for publishing in a special issue of our collaborative journal "SAE International Journal of Connected and Automated Vehicles".

Submission will be via EasyChair: https://easychair.org/conferences/?conf=srtoits2023

Deadlines:

- **Full paper submission:** ~~02~~ **10** May, 2023
- **Notification of acceptance:** ~~25~~ **28** May, 2023
- **Camera-ready Submission:** 05 June, 2023
- **Workshop:** 19 September, 2023

Keynotes

Keynote speaker 1: *Martin Törngren* is a Professor in Embedded Control Systems at the Department of Engineering Design at KTH Royal Institute of Technology since 2002. In 1994 he received the SAAB-Scania award for qualified contributions in distributed control systems, and in 2004 the ITEA achievement award 2004 for contributions to the EAST-EEA project. From 1999 to 2004 he served as the Chairman of the Swedish real-time systems association, and he has represented KTH as a core partner in the EU networks of excellence in embedded systems design, Artist2 and ArtistDesign, and in the Artemis industrial association. He is the director of the TECoSA Swedish national competence center on Trustworthy Edge Computing Systems and Applications. His main research interests lie in safety and complexity management of automated and connected cyber-physical systems.

Title: Automated driving safety - when is an automated vehicle ready for the road?

Abstract: Automated driving is a fascinating endeavor, representing a big leap in capabilities and complexity. The enormous investments into automated vehicles (AVs) have led to a rapid technological advancement with tremendous impact in the automotive and beyond. Yet, many challenges remain as the hype cycle has taken us through the trough of disillusionment. This talk will address the question of "when an AV is ready for the roads" with respect to acceptable risks, from philosophical, technical and societal viewpoints. In this talk I will attempt to summarize the current state of affairs and discuss some of the key remaining hurdles. Introducing automated vehicles at a somewhat large scale, beyond very limited operational design domains (ODDs), requires the advancement of approaches for cost-effective development, operations and their integration, to pave the

way for trustworthy AVs. Key ingredients in development includes new system architectures and methodologies, including for verification and validation where model-based engineering will play an important role. The integration to form "trustworthy DevOps" requires the consideration of the whole life-cycle of activities (beyond primary functions being automated), ODD and operations engineering, and the provisioning of integrated AV and smart infrastructure designs. The talk will also give highlights of research at KTH along these strands including ongoing initiatives towards open research testbeds including AD-EYE (https://www.adeye.se/) and TECoSA (https://www.tecosa.center.kth.se/).

Keynote speaker 2: ***Olivier Cazier*** is currently the founder of the company Chez Conseil en Infrastructures de Transport Environnement&Circulation Sécurité, specializing in reliability, availability, maintenance and safety for Railway, and a senior consultant for modernizing Railways lines in Eastern France and Occitania. He has been the Head of the Department Technological and Process Innovation of SNCF Network. He has been a member of the Scientific Committee and organization Committee of GeoRail 2011, 2014, 2017. His main interests lie in safety and security of transportation, FDMS, and innovation for intelligent transportation systems.

Title: Using Monte Carlo and stochastic models to understand rare accident mechanisms and improve safety

Abstract: Designing an "intelligent" transportation system requires, in order to make it safe, to understand the mechanisms that may lead to relevant accidents. But in a modern transportation system, accidents or even incidents are very rare, and it takes hundreds or thousands of years of observation to be able to confirm that the required safety levels are fulfilled. In addition, if accidents are very rare, it is difficult, almost not impossible, to observe accident mechanisms and to have feedback on safety analyses. However, when we know the overall behavior of a system and its laws of operation, it is possible to model the system by Monte Carlo based models, or in the simplest cases by stochastic models, and use these models to diagnose the causes of the events. A good example of the application of Monte Carlo and stochastic models is the railway crossing: the common belief is that the main cause of accidents is the error or carelessness of the motorized driver. However, a stochastic model shows that this hypothesis is not consistent with accident statistics that the causes resulting in accidents at low-traffic-flow crossings are very different from those at busy crossings and that an effective intelligent accident prevention system will have to be introduced to take into account the various causes. This talk will address the Monte Carlo and stochastic based methodologies and their applications in rare accident /corner case analysis in Railways.

Contacts (workshop and program committee chairpersons):

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