

Instrumentation, Analysis & Testing Exhibition

17 May 2022, Silverstone Race Circuit

Instrumentation and Measurement in the Future Digital World



MINI SEMINAR PROGRAMME



10.30 - 10.50am **Development of Digital Twins in Practice** – John Ahmet Erkoyuncu - Cranfield University

Digital twins focus on the feedback loop between a physical asset/process and its digital representation. This allows to not only offer optimisation suggestions on cost, performance and other targets, but also aims to enable feedback to the physical asset or associated processes to make improvements. Whilst there is growing interest across sectors to develop digital twins, there are a lack of approaches that have been proposed to developing them. This talk will offer a step by step process to create digital twins through working examples (e.g. gear box) developed in collaboration with industry. The process will also offer insights in to how to address challenges in their development, and how to demonstrate value. The talk will also discuss the skills requirements within this context.



11.30 - 11.50am **Digital Twins in Manufacturing** - Jonathan Eyre - AMRC

Digital twins are frequently mentioned in discussions but what does it mean to have a digital twin? This session will provide an overview of the current state of digital twins, the types of technology that should be considered to enable digital twins and finally how they are being exploited in industry.



12.15 - 12.35pm **Model-based System Testing: Embed virtual simulation within physical testing for model-based development** - Roland Pastorino, Siemens

Get inspired by means of real examples on how Model-based System Testing can help to shorten development time using Digital Twins. Vehicles must accommodate a growing number of variants, provide increased energy efficiency and exceed previous performance and reliability. To meet these expectations while minimizing development costs and cycles, the role of simulation continues to grow. The development methodology has evolved from test-centric to a model-based development (MBD) approach, but its practical realization relies on the quality of the models. Model-based System Testing (MBST) is a framework of engineering solutions that optimally balances the combined use of test and simulation. It enhances productivity of the MBD approach and provides better engineering insights. MBST solutions help test and simulation engineers enhance vehicle performance, including vehicle dynamics, acoustics and ride comfort for complex mechatronic and smart systems.



1.30 - 1.50pm **The Digital Future of NPL** - Daniel Povey - National Physical Laboratory

As the UK's National Measurement Institute (NMI), part of the core mission of the National Physical Laboratory (NPL) is to maintain the chain of traceability to the SI. However, with digitalisation at the fore of transformations throughout industry, it has never been more important for NMIs to be ready to provide support. As part of our goal to help UK industry get the most from the opportunities that digitalisation brings, and to make NPL a truly digital NMI, the Digital Calibration and Verification project is an exciting example of NPL's own development. From machine-readable calibration certificates to the trialling of remote verification of X-ray photoelectron spectroscopy measurements, capability is evolving at NPL.



2 - 2.20pm **Digital twinning for assisted and Automated Driving** - Valentina Donzella - WMG

The path towards higher levels of automation (L3+) in vehicles requires new development and testing approaches, leveraging the full potential of digital tools to deliver dependable, viable, and desirable solutions. Moreover, system complexity of vehicles is growing exponentially, and OEMs and suppliers are facing new challenges to hit the market faster - while ensuring the safety of functionalities and operations. In this context, simulations and simulation based testing are becoming the only feasible approach for an early validation of systems and an essential tool to accelerate time to market whilst considering safety requirements. In this presentation, the WMG Intelligent Vehicle Group will present an innovative approach to Digital Twinning for the simulation and validation of Assisted and Automated Driving Systems, fusing state-of-the-art research with industrial solutions.

To pre-register: info@e-i-s.org.uk | www.e-i-s.org.uk