IoT, Big Data and AI Applications to Railway Systems

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Abstract

Railway systems were born over 200 years ago, firstly in the UK. Their world-wide adoptions has been terribly sensational, from light-rail, metro, suburban, highspeed to freight systems. Over the past decades, most focuses in railway operations have been placed on RAMS (reliability, availability, maintainability, safety). Despite the fact that railway is the most environment-friendly mode of transport, its decision-making systems could still be relatively niche, non-interconnected, noninteractive, unsystemics, and perhaps unsustainable. This presentation will highlight recent progress of research and development on the Internet of Things (IoT), Big Data analytics, and Artificial Intelligence with real-world applications to railway systems. The session will discuss advanced sensor technologies used to collect essential digital data sets in railway systems such as customer experience, passenger safety, mechanical responses, actions, environmental loads and burdens. Recent trends and progress in the applications of machine learning to railway industry will be demonstrated to enhance not only system efficiency or effectiveness, but also sustainable development to its full potential.

Biography

Dr. Sakdirat Kaewunruen is a Reader in Railway and Civil Engineering at the University of Birmingham, United Kingdom. He has over 20 year experience in both railway industry and academia. He is a Fellow of Engineers Australia, a chartered engineer in both civil and structural engineering, an academic panel member of Permanent Way Institute, and a specialty chief editor of Frontiers in Built Environment. He has authored and co-authored over 500 technical publications, sit on 12 Editorial Boards and is a member of ISO and BSI standard committees for railway applications.