System Health Condition Inspection, Monitoring, and Prognosis in Transportation—with Applications to Railway Engineering

Presenter: Dr. Moussa Hamadache

Abstract: At present, with the 4th Industrial Revolution and its associated rapid change in technology, industries, and societal patterns and processes (increased interconnectivity and smart automation); the efficient and safe operation of any advanced innovative machine should be a must. Transportation is an important and even crucial part of human life, and the monitoring and prognosis of urban infrastructure is safety-critical. This talk intends to highlight some recent and future innovative system health condition inspection, monitoring, and prognosis technologies within transportation (focusing on railway engineering) that are designed and tested toward their specific application(s) within their working conditions and environment. This achieved through test rigs, test benches, demonstrators, and/or field implementations.

Bio: Dr. Moussa Hamadache has an Engineer of State degree in Automation of Industrial Processes (summa cum laude) and a PhD in Electrical & Electronic Engineering with over 14 years of research experience gained in several international excellent research groups including:

- The Dependable Embedded Control System (DECS) Lab, Kyungpook National University, South Korea;
- The System Health & Risk Management (SHRM) lab, Seoul National University, South Korea;
- The MechVib, the Mechanics and Vibrations Research Group, University of Ferrara, Italy;
- The Birmingham Centre for Railway Research and Education (BCRRE), University of Birmingham (UoB), UK; and
- The Department of Automation of Industrial Processes & the Electrical Systems Engineering Department, Faculty of Technology, University of M'hamed-Bougara Boumerdes, Algeria.

His research interests lie in: System health condition monitoring; Fault detection and diagnosis; Prognostics and health management; Predictive and condition-based maintenance, Robotics (robots in manufacturing and robots in domicile); Signal processing and filtration; Control system and automation; Mechatronics systems including applications to railways.

Dr. Moussa Hamadache has several honors and awards including: Awarded the Korean Government Scholarship Program on 2008; Awarded 4 Student Best Paper Awards between 2014 and 2019, Awarded the Best Paper Award by the American Society of Mechanical Engineers (ASME) on 2020. His work has been included in various high quality, world-leading with international excellent publications, and he serves as a reviewer for several journals (such the IEEE Transaction in Industrial Electronics) and conferences. He is an Associate Fellow of the Higher Education Academy (UK).