Day 1: Wednesday December 13, 2023

9:00 - 9:30  Session I: Welcome and Introduction

Allan M. Zarembski, Professor, Director, Railroad Research and Safety Program, University of Delaware
Dennis Assanis, President, University of Delaware (invited)
Jack Puleo, Chair, Civil and Environmental Engineering, University of Delaware
Anne Canby, Founder, OneRail and Chair of the Railroad Advisory Board at University of Delaware

9:30 Keynote Speaker:
Introduction: Allan M. Zarembski, Professor, University of Delaware
Keynote: Jeffrey M. Stevens, President, ENSCO, Inc.

10:00 - 12:00  Session II: Railroad and FRA Big Data Applications and Safety

Session Chair: Allan M. Zarembski, University of Delaware
Dustin K. Lange, Senior Director Engineering, Norfolk Southern, “Applying the Science: Putting Big Data to Work”
Yu-Jiang Zhang, Staff Director, Track and Structures Division, Office of Railroad Safety, FRA; “Track Safety Trend in the U.S.A. – 50 years in the making.”
Michael McBrien, Engineer – Track; Metro-North Rail Road; “Combining and Overlaying Track Inspections Systems to Achieve a State of Good Repair (SOGR)”
Stephen Love, CSX, “title to be announced”

12:00 to 1:00 - Lunch

1:00 - 3:15  Session IIIA: Big Data Applications and Case Studies: Railway Asset Management

Session Chair: Anne Canby, Chair- Railroad Advisory Board, University of Delaware
Mabby Amouie, Chief Data Scientist, Norfolk Southern, “Digital Train Inspection (DTI) at NS”
Christopher J. Rothschedl, Head Digital Services Competence Centre of Plasser & Theurer Jochen Nowotny, CEO, Track Machines Connected (Plasser & Theurer), “Domain Expertise vs. Artificial Intelligence: Do We Still Need Railway Engineers? Jay Baillargeon, Program Manager, FRA, Title to be announced
Joint Presentation of Amtrak and HNTB; Predicting Behavior of New Rolling Stock on an Existing Track Network;

3:15 to 3:30 - Break

3:30 - 5:15  Session IIIB: Big Data: Applications and Case Studies:

Session Chairman:
Neeraj Koul, FRA Chief Data Officer, “The Railroad Information Sharing Environment (RISE)”
David Dodsworth, RailInc. “to be announced”
Tetra-Tech; Development and implementation of a multi-year crosstie asset management system
ENSCO, to be announced

5:15 Day 1 sessions end
6:30 – 8:00 Cocktail Reception: Audion, STAR Campus, University of Delaware
GPS address: 100 Discovery Blvd., Newark, DE 19713

Day 2: Thursday, December 14, 2023
8:30- 10:30 Session IIIC: Applications and Case Studies:
Session Chairman: Joseph Palese, University of Delaware
Abdul-Rashid Zakaria, Thomas Oommen, University of Mississippi, Pasi Lautala, Michigan Technological University, Colin Brooks, Michigan Tech Research Institute, Hamed Kashani , Mika Silvast Loram Technologies; “UAV and hi-rail truck-based image analysis using deep learning for track substructure defect detection.”
Shahaf Rozanski, VP Product Management ; Cylus; “Safeguarding Rails and Unleashing Data: The Cybersecurity and Operational Potential of Rail Data in the Digital Age”
J. Riley Edwards, Assistant Professor, University of Illinois at Urbana-Champaign “title to be announced”
Asim Zaman, Rutgers University, "Artificial Intelligence Aided Trespassing Detection".

10:30 – 10:45 Break
10:45- 12:45 Session IV: Big Data Analysis Theory and Techniques
Session Chairman:
Mohammed Ahmed and Joseph Palese, University of Delaware, “Predicting Track Geometry Using Machine-Learning Methods”
Osman Mohammed and Joseph Palese, University of Delaware, Development of a 3D track quality index incorporating machine learning techniques and a multivariable normal distribution.”
Kenza Soufiane, University of Delaware, “The Effect of Adjacent Tie Condition on Wood Cross-tie Life”

12:45 Concluding Remarks
Allan M. Zarembski, Professor, Director, Railroad Research and Safety Program, University of Delaware
Anne Canby, Chair of the Railroad Advisory Board at University of Delaware

1:00 PM Program Ends
Modern Railways are making increasing use of new generation track inspection and operating technology to obtain more and more data on the condition of the track and equipment. This extensive amount of data, which includes data of increasing complexity as well as volume, has led to a condition known as “Big Data”, where the volume of data is such that traditional analysis techniques are no longer viable to efficiently make use of all of this large volume of data. Thus, important information is often buried in this “mountain” of data. Since railways need to convert this data into useable information to help them plan their capital maintenance programs, there is a need for the application of new and improved analysis techniques to make this conversion from data into information. One such area of improved data analysis is the use of “Big Data” statistical analysis techniques.

The 2023 conference is intended to expand on previous years’ conferences and introduce these new and emerging analysis techniques and to show how they can be applied to the large volume of inspection data collected by railways to improve their planning of the critical capital and maintenance programs. This year’s conference focuses on the railway’s specific needs and practical applications to date of “Big Data” analytics to include both infrastructure and rolling stock maintenance planning.