Day 1: Wednesday December 11, 2019

8:30 - 10:00  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)
   Levi Thompson, Dean, College of Engineering, University of Delaware (invited)
   Sue McNeil, Chair, Department of Civil and Environmental Engineering, University of Delaware
   Anne Canby, Director, OneRail and Chairman of the Railroad Advisory Board at University of Delaware

   Keynote Speaker
   Introduction: Allan M Zarembski, University of Delaware
   Keynote: Jeffrey D. Kneuppel, P.E. General Manager, Southeastern Pennsylvania Transportation Authority (SEPTA)

10:00 to 10:15 - Break

10:15-12:00  Session II: Railroad and FRA Big Data Applications and Needs
   Session Chair: Allan M. Zarembski, University of Delaware
   Milad Hosseinipour, Amtrak “Finding the needle in the haystack: Using machine learning as a pre-processing tool to focus on what matters”
   Michael Messner, Assistant Director of Roadway Planning, BNSF, “Modeling the Degradation of Gage and Cant”
   Antonio Merheb, MRS Logistica, Brazil, “Moving from repair of failure to pro-active maintenance using Emerging Data Techniques: A Practical Application in Heavy Haul Railroad”
   Stephen C. Love, Manager of Inspection & Records CSX Transportation
   Jay Baillargeon, Program Manager, FRA, “Update on FRA’s Predictive Analytics Research”
   Tim Stark, University of Illinois at Urbana-Champaign, Hugh Thompson, FRA, “Track Geometry Defects Using Site-Specific Fouled Ballast Monitoring”

12:15 to 1:15 - Lunch

1:15-3:00    Session IIIA: Big Data Applications and Case Studies: Railway Infrastructure Asset Management
   Session Chair: Joe Palese
   Krzysztof Wilczek, Head of Track Analytics, Plasser & Theurer, “Use cases of big data technology in track Maintenance”
   Michael Liesenfelt, GREX, “Classifying Railroad Crossties from X-Ray Images Using an Artificial Intelligence Approach”
   Andrew Smith, Rail and Transit Solutions Executive, and Robert Henderson, Rail and Transit Consultant, Bentley, “Big Data Driven Decisions to Transform Track Maintenance”
Erland Tegelberg, Strukton Rail, “Effective Asset Management and Exciting New Big Data Sources”
Jacki VanDerWesthuizen, ENSCO

3:00 to 3:15 - Break

3:15 - 5:00 **Session IIIB: Big Data: Applications and Case Studies: Rolling Stock Asset Management**
  Session Chairman: Anne Canby
  Krishna Prashant Jarugumilli, CNRail, Improved Data Prediction from Hot Box Detectors
  Nenad Mifatovic, Senior Data Scientist, Alstom, “Challenges and Solutions for Log Analytics in Transportation”
  Eric Pelli, Director of Rail Systems, Collins Aerospace, “Driving Railroad Optimization with Improved Data Management and Analytics”

5:00 Day 1 sessions end
6:30 – 8:00 Cocktail Reception:
  Atrium, STAR Campus, University of Delaware

**Day 2: Thursday, December 12, 2019**
8:00 Introduction to Day Two: Nii Attoh-Okine, University of Delaware

**8:15- 10:15 Session IIIC: Applications and Case Studies:**
  Session Chairman: Nii Attoh-Okine; University of Delaware
  John Schmid, Parsons Transportation Group and Peer Vanderzee Lifespan, “Don’t Replace Your Bridge Too Soon”
  Joseph Palese, Senior Scientist, University of Delaware, “Application of Data Analytics to Rail Wear Forecasting”
  David Zavetz, Software Systems Architect, Alstom, “Big Data at the Wayside”
  Trefor Williams, Professor, Rutgers University, and John Betak, Collaborative Solutions LLC, “Using LDA Topic Modelling to Identify Themes in British and American Railroad Accidents”

10:15 – 10:30 Break

10:30- 12:15 **Session IV: Big Data Analysis Theory and Techniques**
  Session Chairman: Qing He, SUNY Buffalo
Allan M Zarembski, University of Delaware, “Probabilistic Relationship for development of a severe track geometry defect based on Ballast Condition as Measured by GPR“

Xiang Liu, Assistant Professor, Rutgers University “Artificial Intelligence-Aided Broken Rail Derailment Risk Analysis”

Qing He, SUNY Buffalo, “Subway Rail Inspection with Onboard Sensors”

Hai Huang, Penn State Altoona, “Fouling Identification Through Statistical Pattern Recognition On SmartRock Data”

12:15 Concluding Remarks

Allan M. Zarembski, Professor, Director, Railroad Research and Safety Program, University of Delaware
Anne Canby, Chairman of the Railroad Advisory Board at University of Delaware

1:00 PM Program Ends

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PLATINUM SPONSORS:

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“Big Data” in Railroad Maintenance Planning 2019
University of Delaware
Newark, DE
December 11-12, 2019

Converting the “Mountain” of Data Collected by Railway Systems into Effective Maintenance Planning Information with a Focus on Railway Needs and Practical Applications

Sponsored by:
University of Delaware’s Railroad Engineering and Safety Program
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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 2019 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.