Program

https://event.asme.org/Joint-Rail-Conference
Chair’s Welcome Message

On behalf of the Organizing Committee, I welcome you to the 2023 Joint Rail Conference. This year’s conference host is the beautiful Sheraton Inner Harbor Hotel that overlooks Baltimore’s busy and historic waterfront.

The JRC is an international rail transportation research conference, hosted in North America; we welcome our colleagues who have traveled from abroad. Our conference theme this year is Intelligent Railroading.

With the number of international crises dominating world events, the transportation industry urgently needs to address new approaches to tackle global warming, move people and commodities to provide successful commerce with our allied neighbors, advance social justice and equity, and respond to the health concerns of growing populations. These must be our focus tasks. Finding intelligent solutions and working deeper in the details to address these and other growing concerns is where we as researchers, engineers, suppliers, managers, policy makers, and students are working to build a better tomorrow for our progeny. Authors, we applaud your solutions. And for our audience, we believe that you will find that our program includes a wealth of progressive information.

Once again, the Joint Rail Conference includes our partners at ASME, IEEE, ASCE, AREMA, INFORMS, and TRB to provide this multidisciplinary conference. This year we also welcome our colleagues from ASME’s Safety Engineering and Risk Analysis Division (SERAD) to provide both paper presentations and a panel session that I’m sure you will find interesting.

We extend a warm welcome to each of our invited guest speakers who are prominent leaders in the transportation industry. The three days of the conference include both plenary and presentation sessions. In addition, the conference offers a technical tour of MTA’s Light Rail facilities in the Baltimore area.

While you are here, take in the sights of Baltimore’s Inner Harbor. There is so much to see and do, including visiting the National Aquarium, seeing the historic ships along the waterfront, visiting Fort McHenry National Monument that inspired the writing of “The Star-Spangled Banner,” and grab a hotdog at Oriole Park at Camden Yards, which is just a short walk from the host hotel. Enjoy your visit and thank you for attending this year’s conference!

Brian P Donohue
Conference Chair
Vice President, Transit and Rail Engineer
Sr. Technical Principal, EIT
WSP USA Inc.
<table>
<thead>
<tr>
<th>Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHAIR’S WELCOME MESSAGE</td>
<td>2</td>
</tr>
<tr>
<td>GENERAL INFORMATION</td>
<td>4</td>
</tr>
<tr>
<td>CONFERENCE SCHEDULE OVERVIEW</td>
<td>6</td>
</tr>
<tr>
<td>SPEAKERS</td>
<td>7</td>
</tr>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>9</td>
</tr>
<tr>
<td>TECHNICAL SESSIONS</td>
<td>10</td>
</tr>
<tr>
<td>AUTHOR INDEX</td>
<td>16</td>
</tr>
<tr>
<td>JRC 2023 TRACK ORGANIZERS</td>
<td>18</td>
</tr>
<tr>
<td>SPONSORS</td>
<td>19</td>
</tr>
<tr>
<td>SPONSOR ADS</td>
<td>20</td>
</tr>
<tr>
<td>JOINT RAIL CONFERENCE COOPERATING SOCIETY SPONSORS</td>
<td>23</td>
</tr>
<tr>
<td>HOTEL FLOOR PLANS</td>
<td>24</td>
</tr>
<tr>
<td>NOTES</td>
<td>25</td>
</tr>
</tbody>
</table>
ON SITE REGISTRATION AT THE SHERATON INNER HARBOR HOTEL

HOURS:
Tuesday, April 11
03:00 PM - 06:00 PM

Wednesday, April 12
7:00 AM - 05:00 PM

Thursday, April 13
07:00 AM - 05:00 PM

The following may register at the discounted Member rate(s) – Please contact Mary Jakubowski at jakubowskim@asme.org or onsite, at the registration desk if you are NOT a current ASME Member.

• ASME Members
• Authors, Session Chairs, Session Co-Chairs, Speakers
• ASME JRC Committee Members

Cooperating Societies include: APTA/IEEE/ASCE/AREMA/INFORM-RAS/NAS-TRB

AMERICAN SOCIETY OF MECHANICAL ENGINEERS INTERNATIONAL

Our Mission
Advancing engineering for the benefit of humanity.

Our Vision
The premier resource for the engineering community globally.

REGISTRATION REQUIREMENT:
Every presentation and panel presentation must identify a designated presenter. Every presenter must register and pay the applicable conference fees. If not, the presentation information will be removed from the conference program.

CANCELLATIONS:
All cancellation requests must be made in writing and emailed. Cancellations made through March 11, 2023, will receive a full refund, less a $100 administration fee. Refunds will be made within four weeks of the end of the conference. Refunds are not available beginning March 12, 2023. “No shows” are not refundable and are liable for the full registration fee.

ASME TRAVEL POLICY:
ASME is not responsible for the purchase of non-refundable airline tickets, or the cancellation/change fees associated with canceling a flight. ASME retains the right to cancel a course/conference up until 3 weeks of the scheduled presentation date.

ASME PRESENTER ATTENDANCE POLICY:
Paper information should not be used for citation purposes. According to ASME’s presenter attendance policy, if a paper is not presented at the conference, the paper will not be published in the official Archival Proceedings, which are registered with the Library of Congress, and are abstracted and indexed. The paper also will not be published in the ASME Digital Library and may not be cited as a published paper.

MEMBERSHIP:
All new registrants to the conference will receive a 4-month trial member. For everyone else, it is easy to apply, and the benefits include the fellowship and recognition from being associated with one of the largest engineering societies in the world. ASME members and student members, and members from select countries can receive a discount to the conference registration.

You can apply for ASME membership by registering online. Alternatively, you can call: 1-800-THE-ASME (800-843-2763) or outside North America 973-882-1167 and ASME will mail you an application, or you can e-mail to request an application.
General Information

For questions about the conference, hotel, and registration please contact:

Mary Jakubowski, CMP
Manager, Events Management
Tel: 212-591-7637
Email: jakubowskim@asme.org

“No shows” are not refundable and are liable for the full registration fee.

Please note: First time non-members who pay the full conference rate will be eligible for a 4-month trial membership in ASME. You can apply online by going to https://www.asme.org/about-asme/professional-membership.

TECHNICAL TOUR
MTA NORTH AVENUE YARD TECHNICAL TOUR

Date: Tuesday, April 11, 2023
Time: 1:30 pm – 4:30 pm*
Cost: $35.00
Maximum Attendees: 30

*Please meet in the hotel lobby by 12:45PM for a 1:00PM departure. We will return to the hotel at approximately 5:00PM. When we arrive at the Facility, we must check in at the 1st Floor Office. PPE Equipment (Hard Hats, Vests, and Sturdy Shoes are required).

During the tour we will visit inside the Shop where there are multiple service tracks with Inspection Pits, Car Hoists, Overhead Cranes, Turntables, and a Wheel Truing Machine. In addition, there is a Pantograph Inspection Platform for the Maintenance Workers to gain access to the top of the Light Rail Vehicle.

There is also a Car Wash Building, a Paint Shop, a Warehouse where all the Spare Parts are kept, a Radio Shop, Welding Shop and Wheel Set Repair Area, Locker Rooms, and a Break Room. Located upstairs are the Administrative Offices.

There are two Traction Power Substations—one to power trains in the Yard and one to power trains in and out of the Shop.

The ASME Rail Transportation Division is entirely composed of volunteers from the railroad industry. If you are interested in participating, please contact a conference organizer or Mary Jakubowski at jakubowskim@asme.org.

PROFESSIONAL DEVELOPMENT HOURS RECORD FORMS

Participation record forms will be provided upon request to conference attendees who need to track their number of professional development hours (PDHs). Forms are available at the conference registration desk. Conferees should check the rules of their appropriate State licensing body to see if participation in this conference will qualify for credit to maintain a P.E. license or other professional certification.

TAX DEDUCTIBILITY

Expenses of attending professional meetings have been held to be tax deductible as ordinary business expenses for U.S. citizens. Because of changes in the tax code, the current level of deduction is subject to change.

CONFERENCE KEYNOTE LUNCHEONS

All attendees are encouraged to meet and discuss ideas with industry peers at the Conference Luncheons which feature a guest Keynote on Wednesday and Thursday.

SPECIAL SESSION       WEDNESDAY, APRIL 12,2023
Loch Raven Room I  1:45pm - 3:15pm

ASME OPEN JOURNAL OF ENGINEERING – MEET THE JOURNAL EDITOR

Authors are invited to submit their full JRC papers to the ASME Open Journal of Engineering (AOJE) for consideration. For papers that are accepted to the journal, ASME is offering all authors a discounted member fee of $1700 per paper to publish their papers fully open access, regardless of membership status.
## Conference Schedule Overview

<table>
<thead>
<tr>
<th>EVENT</th>
<th>TIME</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tuesday, April 11</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TECHNICAL TOUR</td>
<td>01:30 PM – 04:30 PM</td>
<td>Hotel Lobby (Meet at 12:15 PM for 1:00 PM Departure)</td>
</tr>
<tr>
<td>REGISTRATION OPENS</td>
<td>03:00 PM – 06:00 PM</td>
<td>Harborview Gallery</td>
</tr>
<tr>
<td><strong>Wednesday, April 12</strong></td>
<td></td>
<td></td>
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<tr>
<td>REGISTRATION</td>
<td>03:00 PM – 06:00 PM</td>
<td>Harborview Gallery</td>
</tr>
<tr>
<td>WELCOME AND PLENARY SESSION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eric Gebhardt (Wabtec Corporation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRACK 1-1: TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)</td>
<td>09:00 AM – 10:30 AM</td>
<td>Camden I</td>
</tr>
<tr>
<td>TRACK 2-1: ROLLING STOCK (SPONSORED BY ASME RTD)</td>
<td>09:00 AM – 10:30 AM</td>
<td>Camden II</td>
</tr>
<tr>
<td>COFFEE BREAK</td>
<td>10:30 AM – 11:00 AM</td>
<td>Harborview Gallery</td>
</tr>
<tr>
<td>TRACK 2-2: ROLLING STOCK (SPONSORED BY ASME RTD)</td>
<td>11:00 AM – 12:30 PM</td>
<td>Camden II</td>
</tr>
<tr>
<td>TRACK 5-1: ELECTRIFICATION AND TRANSIT SYSTEMS (SPONSORED WITH APTA)</td>
<td>11:00 AM – 12:30 PM</td>
<td>Camden I</td>
</tr>
<tr>
<td>LUNCH AND KEYNOTE</td>
<td>12:30 PM – 1:45 PM</td>
<td>Harborview Ballroom I</td>
</tr>
<tr>
<td>TRACK 3-1: SIGNAL, COMMUNICATION, AND PTC SYSTEMS (SPONSORED BY IEEE)</td>
<td>1:45 PM – 3:15 PM</td>
<td>Camden I</td>
</tr>
<tr>
<td>TRACK 1-2: TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)</td>
<td>1:45 PM – 3:15 PM</td>
<td>Camden II</td>
</tr>
<tr>
<td>ASME OPEN JOURNAL</td>
<td>1:45 PM – 3:15 PM</td>
<td>Loch Raven I</td>
</tr>
<tr>
<td>COFFEE BREAK</td>
<td>3:15 PM – 3:45 PM</td>
<td>Harborview Gallery</td>
</tr>
<tr>
<td>NEW ROLLING STOCK TECHNOLOGY PANEL</td>
<td>3:45 PM – 5:15 PM</td>
<td>Loch Raven I</td>
</tr>
<tr>
<td><strong>Thursday, April 13</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REGISTRATION</td>
<td>07:00 AM – 05:00 PM</td>
<td>Harborview Gallery</td>
</tr>
<tr>
<td>CHALLENGES AND SOLUTIONS FOR SAFE OPERATION OF RAILROAD TRANSPORTATION PANEL</td>
<td>08:00 AM – 09:00 AM</td>
<td>Loch Raven I</td>
</tr>
<tr>
<td>TRACK 1-3: TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)</td>
<td>09:00 AM – 10:30 AM</td>
<td>Camden I</td>
</tr>
<tr>
<td>TRACK 4-1: SAFETY ENGINEERING AND RISK ANALYSIS (CO-SPONSORED WITH ASME SERAD)</td>
<td>09:00 AM – 10:30 AM</td>
<td>Camden II</td>
</tr>
<tr>
<td>COFFEE BREAK</td>
<td>10:30 AM – 11:00 AM</td>
<td>Harborview Gallery</td>
</tr>
<tr>
<td>TRACK 3-2: SIGNAL, COMMUNICATION, AND PTC SYSTEMS (SPONSORED BY IEEE)</td>
<td>11:00 AM – 12:30 PM</td>
<td>Camden I</td>
</tr>
<tr>
<td>TRACK 1-4: TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)</td>
<td>11:00 AM – 12:30 PM</td>
<td>Camden II</td>
</tr>
<tr>
<td>LUNCH AND KEYNOTE</td>
<td>12:30 PM – 1:45 PM</td>
<td>Harborview Ballroom I</td>
</tr>
<tr>
<td>Jannet Walker-Ford (WSP USA Inc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRACK 1-5: TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)</td>
<td>1:45 PM – 3:15 PM</td>
<td>Camden I</td>
</tr>
<tr>
<td>TRACK 2-3: ROLLING STOCK (SPONSORED BY ASME RTD)</td>
<td>1:45 PM – 3:15 PM</td>
<td>Camden II</td>
</tr>
<tr>
<td>COFFEE BREAK</td>
<td>3:15 PM – 3:45 PM</td>
<td>Harborview Gallery</td>
</tr>
<tr>
<td>TRACK 2-4: ROLLING STOCK (SPONSORED BY ASME RTD)</td>
<td>3:45 PM – 5:15 PM</td>
<td>Camden I</td>
</tr>
<tr>
<td>TRACK 1-6: TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)</td>
<td>3:45 PM – 5:15 PM</td>
<td>Camden II</td>
</tr>
</tbody>
</table>
2023 JOINT RAIL CONFERENCE WELCOME ADDRESS/PLENARY SESSION

Wednesday, April 12, 2023 - 8:00 AM – 9:00 AM

Eric Gebhardt
Executive Vice President and Chief Technology Officer, Wabtec Corporation

Biography:
As Executive Vice President and Chief Technology Officer, Eric is responsible for Wabtec’s global technology and investment strategy, new product development, and global engineering organization. A respected technologist with more than 30 years of experience, Eric built his career developing innovative technology solutions in power generation, battery storage, renewables, and distributed power. He comes to this role as former Managing Director of KCK-US, an investment firm focused on the energy, life science, and industrial sectors. Prior, he spent nearly 30 years with General Electric in a variety of global engineering and leadership roles where he was responsible for driving the strategic direction for product and portfolio development, including Chief Geo Officer of GE Power, Chief Product Management Officer for Energy Connections, Chief Platforms and Operations Officer for Current, and Chief Technology Officer for GE Oil & Gas, among others. Eric earned his Bachelor of Science degree in Aerospace Engineering from Georgia Institute of Technology, has received nine patents for his pioneering work across the energy sector, and is a member of the National Academy of Engineering.

Presentation Title:
The Future of Rail

Abstract:
Rail is the cleanest, safest, and most efficient way to move goods over land. Despite these clear benefits, the industry is looking to take the next step in reducing its environmental footprint and growing freight volumes. Advancements in digital solutions and alternative-power locomotives are converging to decarbonize the North American rail network, while also increasing capacity. Eric will discuss how the combination of improvements in freight rail utilization and developments in advanced locomotive technology can help the rail industry eliminate up to 120 million tons of GHG emissions per year.

2023 JOINT RAIL CONFERENCE WELCOME KEYNOTE SESSION

Wednesday, April 12, 12:30 PM – 1:45 PM

Kari Gonzales
President & CEO, MxV Rail

Biography:
Kari Gonzales is President & CEO of MxV Rail, the world’s premier rail research advisory. Since taking the role in 2021, Kari has spearheaded the company’s transformation from TTCI to MxV Rail.

Kari has been a part of MxV Rail, a subsidiary of the Association of American Railroads since 2000, advancing from a student intern to a research engineer, and then later assuming the role of Vice President and CFO. She leads the MxV Rail team with the advantage of 20 years’ service and experience in the rail industry. She is a mechanical engineer by training, holds an MBA, and was recognized by Progressive Railroading as a “Rising Star.” She was the inaugural candidate for the MxV Rail Railroad Exchange Program, spending a year at BNSF Railway’s Texas headquarters as a visiting professional. In addition, Kari serves on a number of community and industry boards.

Presentation Title:
Railroading into the Future

Abstract:
The introduction of new technology and innovative solutions to long-standing challenges is making today’s railroads safer, more efficient, and more reliable. Ms. Gonzales will provide insight into the ongoing technology developments in rail along with highlighting the need for new talent as we set the stage for the next generation of railroading. Additionally, Ms. Gonzales will provide an overview of MxV Rail’s transformation into new facilities and how the vision of the future will benefit railways globally.
2023 JOINT RAIL CONFERENCE WELCOME ADDRESS/PLENARY SESSION
Thursday, April 13, 2023 - 12:30 PM – 1:45 PM

Jannet Walker-Ford
Senior Vice President, National Transit and Rail Leader, WSP USA Inc.

Biography:
Jannet Walker-Ford is a nationally recognized transportation industry executive with WSP USA, a leading engineering and professional services consultancy. A tireless advocate for equity in transportation and the power of public transit to transform communities, Walker-Ford has more than two decades of diverse experience. Her expertise includes management consulting, technology, mobility, and transportation systems. She has served in an executive leadership capacity on programs and projects for large transit and transportation agencies across the U.S. and as the Deputy General Manager/Deputy CEO as well as the CIO at the Metropolitan Atlanta Rapid Transit Authority.

In her role with WSP, she serves as the senior vice president & national transit and rail business leader, responsible for leading and growing the firm’s business in national transit and rail markets including the national practices for freight delivery, passenger rail, systems, technical project delivery, bus rapid transit and zero emissions.

She serves on multiple national boards including the current Chair of WTS International and the APTA Executive Committee and has received numerous awards recognizing her success and advocacy.

Presentation Title:
From Intelligent to Intentional Railroading

Abstract:
Railroads have always played a vital role in building strong economies and connecting our nation. A strong advocate for resilient, equitable and transformative transportation systems, Jannet Walker-Ford will discuss how intelligent railroading extends beyond technology to the intentional planning, design and delivery of railroad systems that strengthen communities, advance equity, and provide resilient, sustainable solutions for our transportation challenges.
The organizers thank each of the speakers, and track and session chairs for their willingness to freely share their knowledge and experiences with our attendees. Also, we thank the following individuals and the organizations that they represent, who generously volunteered many hours, their expertise and dedication in planning this year’s event:

### 2023 JRC CO-CHAIRS

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  Conference Co-Chair
  Wabtec Corporation

- **Dan Blasko**
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- **Kevin Hale**
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  President

  **Mahantesh Hiremath**
  Past President

  **Thomas Costabile, P.E.**
  Executive Director/CEO
**WEDNESDAY, APRIL, 12**

**WELCOME ADDRESS**  
**THE FUTURE OF RAIL**  
**Loch Raven Room I**  
**8:00am - 9:00am**

Eric Gebhardt, Executive Vice President and Chief Technology Officer, Wabtec Corporation

**TRACK 2-1**  
**ROLLING STOCK (SPONSORED BY ASME RTD)**  
**Camden Room II**  
**9:00am - 10:30am**

Chair: Timothy Mast, Wabtec Corporation

- **Air Brake Performance of Very Long Trains (VLT) Under Different Train Configurations**  
  Extended Abstract: JRC2023-104077

- **On-Board Measurement of Wheel Impact Load**  
  Extended Abstract: JRC2023-104973
  Matthew Witte, MxV Rail; Yuqing Zeng, MxV Rail; Nicholas Wilson, MxV Rail

- **Passenger Railcar Procurement Paradigms: Challenges and Opportunities**  
  Extended Abstract: JRC2023-105108
  Stuart F. Trout, Independent Transportation Consultant

- **Cold Weather Performance of Freight Car Air Brake Systems**  
  Extended Abstract: JRC2023-105253
  Elton Toma, National Research Council Canada; Stephen Mackie, National Research Council Canada; Alok Jahagirdar, National Research Council Canada

**TRACK 2-2**  
**ROLLING STOCK (SPONSORED BY ASME RTD)**  
**Camden Room II**  
**11:00am - 12:30pm**

Chair: Brian Donohue, WSP USA Inc.

- **Geometric Contacts Between 3D Wheel-Rail Rigid Surfaces**  
  Extended Abstract: JRC2023-104985

- **Investigating the Contributing Factors to VSR Wheel Failures in North American Freight Railways Using Finite Element Analysis**  
  Extended Abstract: JRC2023-100929
Investigation Into Vehicle/Track Interaction Resulting into Derailments in Turnouts

Extended Abstract: JRC2023-103082

Ulrich Spangenberg, MxV Rail, Adam Klopp, MxV Rail, Arun Wickramasuriya, MxV Rail

TRACK 5-1
ELECTRIFICATION AND TRANSIT SYSTEMS (CO-SPONSORED WITH APTA)
Camden Room I 11:00am - 12:30pm

Chair: John Grantham, Atkins Global

Partial Electrification Strategies for Diesel Commuter Rail’s Climate Challenge

Extended Abstract: JRC2023-101801

John G. Allen, Independent Transportation Consultant, Alex Lu, Metro-North Commuter Railroad, Stuart F. Trout, Independent Transportation Consultant, John P. Aurelius, Independent Transportation Consultant

Reversible Thyristor Control Rectifier: New Technology for Traction System

Extended Abstract: JRC2023-104724

Vitaly Gelman, VG Controls, Moustapha Ouattara, WMATA

Zero Emission Rail Traction Technologies Review: A Comparative Technical and Operational Assessment

Extended Abstract: JRC2023-105058

Fábio Coelho Barbosa, FCB Research

The 2021 Brazilian Rail Act as a Tool for Rail Deregulation: General Guidelines and Perspectives

Extended Abstract: JRC2023-105061

Fábio Coelho Barbosa, FCB Research

LUNCH AND KEYNOTE
RAILROADING INTO THE FUTURE
Harborview Ballroom I 12:30pm - 1:45pm

Kari Gonzales, President & CEO, MxV Rail

TRACK 3-1
SIGNAL, COMMUNICATION, AND PTC SYSTEMS (SPONSORED BY IEEE)
Camden Room I 1:45pm - 3:15pm

Chair: David Thurston, Canadian Pacific Railway

Power Off! Challenges in Planning and Executing Power Isolations on Shared-Use Electrified Railways

Extended Abstract: JRC2023-101802


On Tunnel Gas Detection and Deformation Monitoring (TGDDM)

Extended Abstract: JRC2023-103086

Anthony Ho, University of Waterloo, Pin-Han Ho, University of Waterloo, David Thurston, Canadian Pacific Railroad, Rick Shaw, Canadian Pacific Railroad, Shunde Yin, University of Waterloo

Leveraging Track Circuit Data to Monitor Assets and Improve Railroad Operations

Extended Abstract: JRC2023-105078

Jeff Fries, Alstom

TRACK 1-2
TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)
Camden Room II 1:45pm - 3:15pm

Chair: Brennan Gedney, University of South Carolina

Generating Local Resonances in Free Rails with Piezoelectric Elements

Extended Abstract: JRC2023-104589

Yuning Wu, University of Utah, Keping Zhang, University of Utah, Peng Zhang, University of Utah, Ranting Cui, University of Utah, Xuan Zhu, University of Utah
Deep Autoencoder for Ultrasonic Guided Wave-Based Rail Defect Detection

Extended Abstract: JRC2023-104567

Yuning Wu, University of Utah, Xuan Zhu, University of Utah

Frontiers in Ultrasonic Rail Inspections: High-Speed Testing and Quantitative Hand-Held Verification

Extended Abstract: JRC2023-104987

Diptojit Datta, University of California, San Diego, Chengyang Huang, University of California, San Diego, Ali Zare Hosseinzadeh, University of California, San Diego, Izabela Batista, University of California, San Diego, Francesco Lanza Di Scalea, University of California, San Diego

2023 Grant Award – New Emerging Technology: Portable Laser Track Analyzer Device

Technical Presentation Only: JRC2023-109476

Peter Bartek, PB Innovations, LLC

NEW ROLLING STOCK TECHNOLOGY PANEL
Loch Raven Room I 3:45pm - 5:15pm

Moderator: Matthew Witte, MxV Rail

Composites in the Railcar Industry

Panel Presentation: JRC2023-104773

Kenneth Huck, Trinity Rail

Onboard Impact Wheel Measurements

Panel Presentation: JRC2023-105494

Todd Snyder, Amsted Digital Solutions

Railroad Machine Vision and Inspection Integration

Panel Presentation: JRC2023-106826

Brian Yeager, Norfolk Southern

Freight Car Draft System Failure Trends

Panel Presentation: JRC2023-110745

Selva Karunakaran, Union Pacific Railroad
CHALLENGES AND SOLUTIONS FOR SAFE OPERATION OF RAILROAD TRANSPORTATION PANEL

Loch Raven Room I 8:00am - 9:00am

Moderator: Jeremy Gernand, Penn State University

Recent Testing and Modeling Related to Risk and Safety During Railroad Transportation of Spent Nuclear Fuel
Panel Presentation: JRC2023-109477
Nicholas Klymyshyn, PNNL

Experimental Investigation of Safety- and Risk-Related Decision Making
Panel Presentation: JRC2023-109588
Jeremy Gernand, Penn State University

TRACK 1-3

TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)
Camden Room I 9:00am - 10:30am

Chair: Reza Naseri, University of South Carolina

Field Evaluation of Railway Dynamic Load Factors Through Instrumented Wheelset Measurements
Extended Abstract: JRC2023-101037
Danial Behnia, University of Alberta, Michael Hendry, University of Alberta

Experimental Investigation into the Relationship Between Track Stiffness Variations, Rail Defects, and Dynamic Rail-Wheel Forces Measured by Instrumented Wheelset
Extended Abstract: JRC2023-105616
Reza Mousapour, University of Alberta, Parisa Haji Abdulrazagh, Matrix Engineering & Trading Ltd., Mustafa Gul, University of Alberta, Michael Hendry, University of Alberta

Dynamic Amplification of Transit Loads due to Derailment Impact
Extended Abstract: JRC2023-105630
Nicholas Catella, Simpson Gumpertz & Heger, John Lobo, HDR, Robert MacNeill, Simpson Gumpertz and Heger, Glenn Gough, Siemens Mobility

Estimating Dynamic Response and Characteristics of Steel Truss Railroad Bridges Under Service Train Excitation Using Laser Vibrometer and Accelerometers
Extended Abstract: JRC2023-105378
Celso de Oliveira, University of Connecticut, Santosh Dhakal, University of Connecticut, Ramesh B. Malla, University of Connecticut

TRACK 4-1

SAFETY ENGINEERING AND RISK ANALYSIS (CO-SPONSORED WITH ASME SERAD)
Camden Room II 9:00am - 10:30am

Chair: Jeremy Gernand, Penn State University

Journal Bearing Developments for High Axle Load Applications
Extended Abstract: JRC2023-102286
Daniel Blasko, The Timken Company, Anthony Lucas, The Timken Company

Using Machine Learning to Quantify the Unbalanced Load Distribution’s Effect on Wood Crossties’ Condition
Extended Abstract: JRC2023-104819
Kenza Soufiane, University of Delaware, Allan M. Zaremsbki, University of Delaware, Joseph Palese, University of Delaware

Maximum Locomotive Horn Warning Time for Pedestrians Before Applying Passenger Train Emergency Brake
Extended Abstract: JRC2023-105558
Louis Rubenstein, Forensic Engineering Institute

Cell Phone Data Based Approach for Prevention of Trespass Casualties on Railroad Track
Extended Abstract: JRC2023-105671
**TRACK 3-2**
**SIGNAL, COMMUNICATION, AND PTC SYSTEMS (SPONSORED BY IEEE)**
Camden Room I 11:00am - 12:30pm

Chair: David Thurston, Canadian Pacific Railway

- **A Case for Railyard Automation Using GPS Satellites**
  Extended Abstract: JRC2023-105377
  Kshitij Saxena, KS Consulting

- **Conducting Efficient CBTC Capacity Analysis of Junctions Using Recovery as a Proxy Variable**
  Extended Abstract: JRC2023-103142
  Dennis Page, Hatch LTK, Ethan Call, Hatch LTK

- **Why Make the Shift to CBTC?**
  Extended Abstract: JRC2023-109032
  John Hofbauer, WMATA

**TRACK 1-4**
**TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)**
Camden Room II 11:00am - 12:30pm

Chair: Rakan Alturk, ENSCO, Inc.

- **Infrared Thermography and Thermographic Signal Reconstruction for Rail Defect Detection**
  Extended Abstract: JRC2023-104595
  Ranting Cui, University of Utah, Yuning Wu, University of Utah, Keping Zhang, University of Utah, Xuan Zhu, University of California, San Diego

- **Non-Contact Airborne Sonar Technology for In-Motion Tie Deflection Measurement**
  Extended Abstract: JRC2023-105064
  Ali Zare Hosseinzadeh, University of California, San Diego, Diptojit Datta, University of California, San Diego, Francesco Lanza Di Scalea, University of California, San Diego

**LUNCH AND KEYNOTE**
**FROM INTELLIGENT TO INTENTIONAL RAILROADING**
Harborview Ballroom I 12:30pm - 1:45pm

Jannet Walker-Ford, Senior Vice President, National Transit and Rail Leader, WSP USA Inc.

**TRACK 2-3**
**ROLLING STOCK (SPONSORED BY ASME RTD)**
Camden Room II 1:45pm - 3:15pm

Chair: Timothy Mast, Wabtec Corporation

- **Assessing the Efficacy of Railroad Bearing Reconditioning Through Service Life Performance Testing**
  Extended Abstract: JRC2023-104983
  Constantine Tarawneh, The University of Texas Rio Grande Valley, Veronica Hernandez, The University of Texas Rio Grande Valley, Javier Arroyo, The University of Nebraska-Lincoln, Heinrich Foltz, The University of Texas Rio Grande Valley, Dustin Clasby, MxV Rail

- **Effect of Heat Sink Positioning on Viability of Thermoelectric Energy Harvesting on Railcar Bearing Adapters**
  Extended Abstract: JRC2023-105034
  Danna Capitanachi Avila, The University of Texas Rio Grande Valley, Kevin Quaye, The University of Texas Rio Grande Valley, Constantine Tarawneh, The University of Texas-Pan American, Heinrich Foltz, The University of Texas Rio Grande Valley

- **Design and Implementation of a Load Sensor in a Bearing Adapter Assembly for Freight Railcar Applications**
  Extended Abstract: JRC2023-105122
**THURSDAY, APRIL, 13**

**Technical Sessions**

**TRACK 1-5**

**TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)**

Camden Room I 1:45pm - 3:15pm

Chair: Serkan Sandikcioglu, ENSCO, Inc.

- **Track Geometry Inspection Data Analytics for Anomaly Detection Using Unsupervised Machine Learning Techniques**
  
  Extended Abstract: JRC2023-104954

  Yueyan Gu, Virginia Tech, Farrokh Jazizadeh, Virginia Tech

- **Tie Reaction Measurement Under Static Loading Using Rail Mounted Strain Gauges**
  
  Extended Abstract: JRC2023-104964

  Rakan Alturk, ENSCO, Inc., Md. Fazle Rabbi, Oklahoma State University, Radim Bruzek, ENSCO, Inc., Theodore Sussmann, Volpe National Transportation Systems Center, Hugh Thompson, Federal Railroad Administration, Debakanta Mishra, Oklahoma State University

- **Photoelasticity Topology Optimization Technique**
  
  Extended Abstract: JRC2023-105418

  Avilasha BG, Dayanandasagar College of Engineering, Ramakrishna Ds, Jawaharlal Nehru National College of Engineering

**TRACK 2-4**

**ROLLING STOCK (SPONSORED BY ASME RTD)**

Camden Room I 3:15pm - 5:15pm

Chair: Brian Donohue, WSP USA Inc.

- **Intermittent Electrification with Battery Locomotives and the Post-Diesel Future of North American Freight Railroads**
  
  Extended Abstract: JRC2023-101800

  Alex Lu, Metro-North Commuter Railroad, John G. Allen, Independent Transportation Consultant, John P. Aurelius, Independent Transportation Consultant

- **Automatic Lightweight Structure Derivation for Rail Vehicles from Topology Optimization Results**
  
  Extended Abstract: JRC2023-102158

  Christian Gomes Alves, German Aerospace Center

**TRACK 1-6**

**Track Systems and Civil Infrastructures (Sponsored by ASCE)**

Camden Room II 3:15pm - 5:15pm

Chair: Dimitris Rizos, University of South Carolina

- **State of the Art and Current Practice on Temperature-Induced Rail-Structure Interaction in North America**
  
  Extended Abstract: JRC2023-104130

  Ying Tan, HDR, John Lobo, HDR

- **Automated Predictive Vehicle Dynamics Simulations for a Large-Scale Heavy Haul Network**
  
  Extended Abstract: JRC2023-105453

  Cory Hogan, ENSCO, Inc., Yangbo Liu, ENSCO, Inc., Yu Pan, ENSCO, Inc.

- **Comparison of Coupling Methods for Rapid TTI Simulations**
  
  Extended Abstract: JRC2023-105489

  Reza Naseri, University of South Carolina, Arya Datta, University of South Carolina, Brennan Gedney, University of South Carolina, Dimitris Rizos, University of South Carolina

- **Application of Statistical Methods to Identify Faulty Vehicles**
  
  Extended Abstract: JRC2023-103507

  Sven Scholz, University of Technology Dresden, Joerg Schuette, University of Technology Dresden

- **Model-Based-Systems-Engineering (MBSE) as a Gamechanger in the Development Process of Railway Vehicles**
  
  Extended Abstract: JRC2023-104755

  Gregor Malzacher, German Aerospace Center, Ehret Marc, Institute of System Dynamics and Control, Andreas Heckmann, German Aerospace Center
<table>
<thead>
<tr>
<th>AUTHOR LAST NAME</th>
<th>AUTHOR FIRST NAME</th>
<th>PAPER NUMBER</th>
<th>PAPER TITLE</th>
<th>SESSION NUMBER</th>
<th>DAY</th>
<th>TIME</th>
<th>ROOM</th>
</tr>
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<td>ALEJANDRO</td>
<td>ALVAREZ-REYES</td>
<td>10029</td>
<td>INVESTIGATING THE CONTRIBUTING FACTORS TO VSR WHEEL FAILURES IN NORTH AMERICAN FREIGHT RAILWAYS USING FINITE ELEMENT ANALYSIS</td>
<td>2-2</td>
<td>WEDNESDAY, APRIL 12, 2023</td>
<td>11:00 AM - 12:30 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>BERNARDINA</td>
<td>GUILLEN</td>
<td>10037</td>
<td>FIELD EVALUATION OF RAILWAY DYNAMIC LOAD FACTORS THROUGH INSTRUMENTED WHEELSET MEASUREMENTS</td>
<td>1-3</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>9:00 AM - 10:30 AM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>ROZZO</td>
<td>PERVINCIENZO</td>
<td>10030</td>
<td>VIBRATION-BASED APPROACH FOR THE ESTIMATION OF THE NEUTRAL TEMPERATURE IN CONTINUOUS WELDED RAILS</td>
<td>1-1</td>
<td>WEDNESDAY, APRIL 13, 2023</td>
<td>9:00 AM - 10:30 AM</td>
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<tr>
<td>LU</td>
<td>ALEX</td>
<td>10160</td>
<td>INTERMITTENT ELECTRIFICATION WITH BATTERY LOCOMOTIVES AND THE POST DIESEL FUTURE OF NORTH-AMERICAN FREIGHT RAILROADS</td>
<td>2-4</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>3:15 PM - 5:15 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>LU</td>
<td>ALEX</td>
<td>101901</td>
<td>PARTIAL ELECTRIFICATION STRATEGIES FOR DIESEL COMMUTER RAIL'S CLIMATE CHALLENGE</td>
<td>5-1</td>
<td>WEDNESDAY, APRIL 13, 2023</td>
<td>11:00 AM - 12:30 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>LU</td>
<td>ALEX</td>
<td>101862</td>
<td>POWER-OFF CHALLENGES IN PLANNING AND EXECUTING POWER ISOLATIONS ON SHARED-USE ELECTRIFIED RAILWAYS</td>
<td>3-1</td>
<td>WEDNESDAY, APRIL 13, 2023</td>
<td>1:45 PM - 3:15 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>GOMES ALVES</td>
<td>CHRISTIAN</td>
<td>101554</td>
<td>AUTOMATIC LIGHTWEIGHT STRUCTURE DERIVATION FOR RAIL VEHICLES FROM TOPOLOGY OPTIMIZATION RESULTS</td>
<td>2-4</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>3:15 PM - 5:15 PM</td>
<td>CAMDEN ROOM I</td>
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<tr>
<td>HARTMANN</td>
<td>CHRISTOPHER</td>
<td>102282</td>
<td>UTILIZING AUTOMATED VERTICAL RAIL DEFLECTION MEASUREMENT TECHNOLOGY TO QUANTIFY THE Soft Spot Risk AND PRIORITIZE MAINTENANCE</td>
<td>1-1</td>
<td>WEDNESDAY, APRIL 13, 2023</td>
<td>9:00 AM - 10:30 AM</td>
<td>CAMDEN ROOM I</td>
</tr>
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<td>BLASCO</td>
<td>DANIEL</td>
<td>102286</td>
<td>JOURNAL BEARING DEVELOPMENTS FOR HIGH AXLE LOAD APPLICATIONS</td>
<td>4-1</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>9:00 AM - 10:30 AM</td>
<td>CAMDEN ROOM I</td>
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<tr>
<td>JAIN</td>
<td>ASHISH</td>
<td>102526</td>
<td>APPLICATION OF DISTRIBUTED ACOUSTIC SENSING TECHNOLOGY FOR CONTINUOUS TRACK CONDITION MONITORING: CASE STUDIES AND RESULTS</td>
<td>1-4</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>11:00 AM - 12:30 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>SPRANGELENG</td>
<td>URIELI</td>
<td>103082</td>
<td>INVESTIGATION INTO VEHICLE/TRACK INTERACTION RESULTING INTO DELAMINATIONS IN TURNOUTS</td>
<td>2-2</td>
<td>WEDNESDAY, APRIL 13, 2023</td>
<td>11:00 AM - 12:30 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>HONG</td>
<td>PIN-HAN</td>
<td>101086</td>
<td>ON-TUNNEL GAS DETECTION AND DEFORMATION MONITORING (TGDDM)</td>
<td>3-1</td>
<td>WEDNESDAY, APRIL 13, 2023</td>
<td>1:45 PM - 3:15 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>PAGE</td>
<td>SEINNG</td>
<td>101942</td>
<td>CONDUCTING EFFICIENT CTRC CAPACITY ANALYSIS OF JUNCTIONS USING RECOVERY AS A PROXY VARIABLE</td>
<td>3-2</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>11:00 AM - 12:30 PM</td>
<td>CAMDEN ROOM I</td>
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<tr>
<td>SCHOLZ</td>
<td>SVEN</td>
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<td>APPLICATION OF STATISTICAL METHODS TO IDENTIFY FAULTY VEHICLES</td>
<td>2-4</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>3:15 PM - 5:15 PM</td>
<td>CAMDEN ROOM I</td>
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<td>POOLIYOUSEF</td>
<td>HAMED</td>
<td>104037</td>
<td>AIR BRAKE PERFORMANCE OF VERY LONG TRAINS (VLT) UNDER DIFFERENT TRAIN CONFIGURATIONS</td>
<td>2-1</td>
<td>WEDNESDAY, APRIL 13, 2023</td>
<td>9:00 AM - 10:30 AM</td>
<td>CAMDEN ROOM I</td>
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<tr>
<td>TAN</td>
<td>YING</td>
<td>104150</td>
<td>STATE OF THE ART AND CURRENT PRACTICE ON TEMPERATURE-INDUCED RAIL STRUCTURE INTERACTION IN NORTH AMERICA</td>
<td>1-6</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>3:15 PM - 5:15 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>ZHU</td>
<td>JUAN</td>
<td>104587</td>
<td>DEEP AUTENCODER FOR ULTRASONIC GUIDED WAVE-BASED RAIL DEFECT DETECTION</td>
<td>1-2</td>
<td>WEDNESDAY, APRIL 13, 2023</td>
<td>1:45 PM - 3:15 PM</td>
<td>CAMDEN ROOM I</td>
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<tr>
<td>ZHU</td>
<td>JUAN</td>
<td>104589</td>
<td>GENERATING LOCAL RESONANCES IN FREE RAILS WITH PIEZOELECTRIC ELEMENTS</td>
<td>1-2</td>
<td>WEDNESDAY, APRIL 13, 2023</td>
<td>1:45 PM - 3:15 PM</td>
<td>CAMDEN ROOM I</td>
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<tr>
<td>ZHU</td>
<td>JUAN</td>
<td>104595</td>
<td>INFRARED THERMOGRAPHY AND THERMOGRAPHIC SIGNAL RECONSTRUCTION FOR RAIL DEFECT DETECTION</td>
<td>1-4</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>11:00 AM - 12:30 PM</td>
<td>CAMDEN ROOM I</td>
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<tr>
<td>GELMAN</td>
<td>VITALY</td>
<td>104724</td>
<td>REVERSIBLE THYRISTOR CONTROL RECTIFIER: NEW TECHNOLOGY FOR TRACTION SYSTEM</td>
<td>5-1</td>
<td>WEDNESDAY, APRIL 13, 2023</td>
<td>11:00 AM - 12:30 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>MALZACHER</td>
<td>GREGOR</td>
<td>104705</td>
<td>MODEL-BASED SYSTEMS ENGINEERING (MBSE) AS A GAMECHANGER IN THE DEVELOPMENT PROCESS OF RAILWAY VEHICLES</td>
<td>2-4</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>3:15 PM - 5:15 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>HUCK</td>
<td>KENNETH</td>
<td>104773</td>
<td>COMPOSITES IN THE RAILCAR INDUSTRY                                                                                                                                           PANEL</td>
<td>WEDNESDAY, APRIL 13, 2023</td>
<td>3:45 AM - 5:15 PM</td>
<td>LOCH RAVEN ROOM I</td>
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<td>SOUFIANE</td>
<td>KENZA</td>
<td>104819</td>
<td>USING MACHINE LEARNING TO QUANTIFY THE UNBALANCED LOAD DISTRIBUTION'S EFFECT ON WOOD CROSSTEES' CONDITION</td>
<td>4-1</td>
<td>WEDNESDAY, APRIL 13, 2023</td>
<td>3:45 AM - 5:15 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>GU</td>
<td>YUHAN</td>
<td>104934</td>
<td>TRACK GEOMETRY INSPECTION DATA ANALYTICS FOR ANOMALY DETECTION USING UNSUPERVISED MACHINE LEARNING TECHNIQUES</td>
<td>1-5</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>1:45 PM - 3:15 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>ALTUNK</td>
<td>RAKAN</td>
<td>104964</td>
<td>TIE REACTION MEASUREMENT UNDER STATIC LOADING USING RAILMOUNTED STRAIN GAUGES</td>
<td>1-5</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>1:45 PM - 3:15 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>WITTE</td>
<td>MATTHEW</td>
<td>104973</td>
<td>ON-BOARD MEASUREMENT OF WHEEL IMPACT LOAD</td>
<td>2-1</td>
<td>WEDNESDAY, APRIL 13, 2023</td>
<td>9:00 AM - 10:30 AM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>TAKAMIN</td>
<td>CONSTANTINE</td>
<td>104983</td>
<td>ASSESSING THE Efficacy OF RAILROAD BEARING RECONDITIONING THROUGH SERVICE LIFE PERFORMANCE TESTING</td>
<td>2-3</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>1:45 PM - 3:15 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>GANTOS</td>
<td>FLORENTINA</td>
<td>104985</td>
<td>GEOMETRIC CONTACTS BETWEEN 3D WHEEL-RAIL RIGID SURFACES</td>
<td>2-2</td>
<td>WEDNESDAY, APRIL 13, 2023</td>
<td>11:00 AM - 12:30 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>DATTA</td>
<td>DEEPTI</td>
<td>104987</td>
<td>FRONTIERS IN ULTRASONIC RAIL INSPECTIONS: HIGH SPEED TESTING AND QUANTITATIVE HAND HELD VERIFICATION</td>
<td>1-2</td>
<td>WEDNESDAY, APRIL 13, 2023</td>
<td>1:45 PM - 3:15 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
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<td>PAPER NUMBER</td>
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<td>SESSION NUMBER</td>
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<td>CONSTANTINE</td>
<td>105034</td>
<td>EFFECT OF HEAT SINK POSITIONING ON VIABILITY OF THERMOELECTRIC ENERGY</td>
<td>2-3</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>1:45 PM - 3:15 PM</td>
<td>CAMDEN ROOM II</td>
</tr>
<tr>
<td>BARBOSA</td>
<td>FABIO</td>
<td>105058</td>
<td>ZERO EMISSION RAIL TRACTION TECHNOLOGIES REVIEW: A COMPARATIVE TECHNICAL</td>
<td>5-1</td>
<td>WEDNESDAY, APRIL 12, 2023</td>
<td>11:00 AM - 12:30 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>SHIN</td>
<td>MODCHUL</td>
<td>93600</td>
<td>EXPERIMENTAL STUDY ON THE IMPACT RESISTANCE OF HIGH-PERFORMANCE CEMENTITIOUS</td>
<td>1-1</td>
<td>WEDNESDAY, APRIL 12, 2023</td>
<td>9:00 AM - 10:30 AM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>BARBOSA</td>
<td>FABIO</td>
<td>105061</td>
<td>THE 2021 BRAZILIAN RAIL ACT AS A TOOL FOR RAIL DEREGULATION: GENERAL</td>
<td>5-1</td>
<td>WEDNESDAY, APRIL 12, 2023</td>
<td>11:00 AM - 12:30 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>HOSSENZADEH</td>
<td>ALIZARE</td>
<td>105064</td>
<td>NON-CONTACT AEROBorne SONAR TECHNOLOGY FOR IN MOTION TIE DEFLECTION</td>
<td>1-4</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>11:00 AM - 12:30 PM</td>
<td>CAMDEN ROOM II</td>
</tr>
<tr>
<td>FRES</td>
<td>JEFF</td>
<td>105078</td>
<td>LEVELING TRACK CIRCUIT DATA TO MONITOR ASSETS AND IMPROVE RAILROAD</td>
<td>3-1</td>
<td>WEDNESDAY, APRIL 12, 2023</td>
<td>1:45 PM - 3:15 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>TROUT</td>
<td>STUART F.</td>
<td>105098</td>
<td>PASSENGER RAILCAR PROCUREMENT PARADIGMS: CHALLENGES AND OPPORTUNITIES</td>
<td>2-1</td>
<td>WEDNESDAY, APRIL 12, 2023</td>
<td>9:00 AM - 10:30 AM</td>
<td>CAMDEN ROOM II</td>
</tr>
<tr>
<td>TARAWNEH</td>
<td>CONSTANTINE</td>
<td>105122</td>
<td>DESIGN AND IMPLEMENTATION OF A LOAD SENSOR IN A BEARING ADAPTER ASSEMBLY</td>
<td>2-3</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>1:45 PM - 3:15 PM</td>
<td>CAMDEN ROOM II</td>
</tr>
<tr>
<td>TOMA</td>
<td>ELTON</td>
<td>105203</td>
<td>COLD WEATHER PERFORMANCE OF FREIGHT CAR AIR BRAKE SYSTEMS</td>
<td>2-1</td>
<td>WEDNESDAY, APRIL 12, 2023</td>
<td>9:00 AM - 10:30 AM</td>
<td>CAMDEN ROOM II</td>
</tr>
<tr>
<td>SAKEMA</td>
<td>KSHITIJ</td>
<td>105237</td>
<td>A CASE FOR RAILYARD AUTOMATION USING GPS SATELLITES</td>
<td>3-2</td>
<td>WEDNESDAY, APRIL 12, 2023</td>
<td>11:00 AM - 12:30 PM</td>
<td>CAMDEN ROOM I</td>
</tr>
<tr>
<td>DE OLIVEIRA</td>
<td>CELSO</td>
<td>105278</td>
<td>ESTIMATING DYNAMIC RESPONSE AND CHARACTERISTICS OF STEEL TRUSS RAILROAD</td>
<td>1-3</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>9:00 AM - 10:30 AM</td>
<td>CAMDEN ROOM I</td>
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<tr>
<td>RIZOS</td>
<td>DIMITRIS</td>
<td>105401</td>
<td>FIELD IMPLEMENTATION OF STEREO VISION SYSTEM FOR INT AND LONGITUDINAL</td>
<td>1-1</td>
<td>WEDNESDAY, APRIL 12, 2023</td>
<td>9:00 AM - 10:30 AM</td>
<td>CAMDEN ROOM I</td>
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<td>RIZOS</td>
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<td>105489</td>
<td>COMPARISON OF COUPLING METHODS FOR FAST TRACK SIMULATIONS</td>
<td>1-6</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>3:15 PM - 5:15 PM</td>
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<td>SANDIKCIOGLU</td>
<td>SERKAN</td>
<td>105671</td>
<td>CELL PHONE DATA BASED APPROACH FOR PREVENTION OF TRESPASS CASUALTIES ON</td>
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<td>THURSDAY, APRIL 13, 2023</td>
<td>3:45 PM - 5:15 PM</td>
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<td>YEAGER</td>
<td>BRIAN</td>
<td>106226</td>
<td>RAILROAD MACHINE VISION AND INSPECTION INTEGRATION</td>
<td>PANEL</td>
<td>WEDNESDAY, APRIL 12, 2023</td>
<td>3:45 PM - 5:15 PM</td>
<td>LOCH RAVEN ROOM I</td>
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<tr>
<td>ROTHBAUER</td>
<td>JOHN</td>
<td>109332</td>
<td>WHY MAKE THE SHIFT TO CBTC?</td>
<td>3-2</td>
<td>WEDNESDAY, APRIL 12, 2023</td>
<td>3:45 PM - 5:15 PM</td>
<td>CAMDEN ROOM I</td>
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<tr>
<td>BARTEK</td>
<td>PETER</td>
<td>109476</td>
<td>2023 GRANT AWARD - NEW EMERGING TECHNOLOGY: PORTABLE LASER TRACK ANALYZER</td>
<td>1-2</td>
<td>WEDNESDAY, APRIL 12, 2023</td>
<td>1:45 PM - 3:15 PM</td>
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<tr>
<td>KLYMISHYN</td>
<td>NICHOLAS</td>
<td>109477</td>
<td>RECENT TESTING AND MODELING RELATED TO RISK AND SAFETY DURING RAILROAD</td>
<td>PANEL</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>8:00 AM - 9:00 AM</td>
<td>LOCH RAVEN ROOM I</td>
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<tr>
<td>GERMAN</td>
<td>JEREMY</td>
<td>105688</td>
<td>EXPERIMENTAL INVESTIGATION OF SAFETY- AND RISK-RELATED DECISION-MAKING</td>
<td>Panels</td>
<td>THURSDAY, APRIL 13, 2023</td>
<td>8:00 AM - 9:00 AM</td>
<td>LOCH RAVEN ROOM I</td>
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<tr>
<td>KARUNAKKARAN</td>
<td>SELVA</td>
<td>110745</td>
<td>FREIGHT CAR DRAFT SYSTEM FAILURE TRENDS</td>
<td>Panels</td>
<td>WEDNESDAY, APRIL 12, 2023</td>
<td>3:45 PM - 5:15 PM</td>
<td>LOCH RAVEN ROOM I</td>
</tr>
</tbody>
</table>
2023 SESSION ORGANIZERS

1-1 TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)
Dimitris Rizos, University of South Carolina

1-2 TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)
Brennan Gedney, University of South Carolina

1-3 TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)
Reza Naseri, University of South Carolina

1-4 TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)
Rakan Alturk, ENSCO, Inc.

1-5 TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)
Serkan Sandikcioglu, ENSCO, Inc.

1-6 TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)
Dimitris Rizos, University of South Carolina

2-1 ROLLING STOCK (SPONSORED BY ASME RTD)
Timothy Mast, Wabtec Corporation

2-2 ROLLING STOCK (SPONSORED BY ASME RTD)
Brian Donohue, WSP USA Inc.

2-3 ROLLING STOCK (SPONSORED BY ASME RTD)
Timothy Mast, Wabtec Corporation

2-4 ROLLING STOCK (SPONSORED BY ASME RTD)
Brian Donohue, WSP USA Inc.

3-1 SIGNAL, COMMUNICATION, AND PTC SYSTEMS (SPONSORED BY IEEE)
David Thurston, Canadian Pacific Railway

3-2 SIGNAL, COMMUNICATION, AND PTC SYSTEMS (SPONSORED BY IEEE)
David Thurston, Canadian Pacific Railway

4-1 SAFETY ENGINEERING AND RISK ANALYSIS (CO-SPONSORED WITH ASME SERAD)
Jeremy Gernand, Penn State University

5-1 ELECTRIFICATION AND TRANSIT SYSTEMS (CO-SPONSORED WITH APTA)
John Grantham, Atkins Global

2023 TRACK ORGANIZERS

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Chair: Dimitris Rizos, University of South Carolina

TRACK 2 - ROLLING STOCK (SPONSORED BY ASME RTD)
Chair: Timothy Mast, Wabtec Corporation

TRACK 3 - SIGNAL, COMMUNICATION, AND PTC SYSTEMS (SPONSORED BY IEEE)
Chair: David Thurston, Canadian Pacific Railway

TRACK 4 - SAFETY ENGINEERING AND RISK ANALYSIS (CO-SPONSORED WITH ASME SERAD)
Chair: Mohammad Pourgol-Mohammad, University of Maryland

TRACK 5 - ELECTRIFICATION AND TRANSIT SYSTEMS (CO-SPONSORED WITH APTA)
Chair: John Grantham, Atkins Global

PANEL - NEW ROLLING STOCK TECHNOLOGY PANEL
Chair: Matthew Witte, MxV Rail

PANEL - CHALLENGES AND SOLUTIONS FOR SAFE OPERATION OF RAILROAD TRANSPORTATION
Chair: Jeremy Gernand, Penn State University
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4. CAMDEN ROOM
4A. CAMDEN I
4B. CAMDEN II
5. HARBORVIEW GALLERY
6. HARBORVIEW BALLROOM
6A. HARBORVIEW I
6B. HARBORVIEW II
7. BOARD ROOM
8. SASSAFRAS
9. LOCH RAVEN GALLERY
10. LOCH RAVEN ROOM
10A. LOCH RAVEN I
10B. LOCH RAVEN II

SECOND LEVEL