

Joseph W. Palese, Ph.D., MBA, P.E.
Senior Scientist
Department of Civil and Environmental Engineering
The University of Delaware
Newark, DE 19716

EDUCATION

Ph.D. in Civil Engineering, The University of Delaware, Newark, DE, 2019

Thesis: A Data Driven Approach to Rail Wear Modeling

Advisor: Dr. Allan M. Zarembski

Master Business Administration, Rowan University, Glassboro, NJ, 1998

Master of Civil Engineering, The University of Delaware, Newark, DE, 1990

Thesis: Structures Continuously Supported by a Viscoelastic Foundation

Advisor: Dr. Arnold D. Kerr

Bachelor of Civil Engineering, The University of Delaware, Newark, DE, 1988

PROFESSIONAL HISTORY

9/2017 – Present **University of Delaware**

*Senior Scientist/Program Manager: Railroad Engineering and Safety Program/Assistant
Director UD DOT RailTeam UTC*

Development and management of independent and externally funded research programs for the Railroad Engineering and Safety Program to include research into track degradation, Big Data analysis of railroad condition, track failure and maintenance planning, and other related railroad areas.

Manage US DOT Tier 1 University Transportation Center in collaboration with University Nevada Las Vegas and Virginia Tech. Co-advise students for high speed rail related research. Conduct independent research.

2007 – 8/2017

Harsco Rail

Senior Director Engineering Analysis & Technology

Maintenance management and planning for railways and transit systems. Development of numerous software applications for the railway industry, including real time data acquisition, track component behavior modeling,

planning and analysis models, database development and several other applications.

Development and implementation of inspection technologies on freight and passenger railways worldwide. Successful implementation of risk-based safety oriented software for ultrasonic testing requirements, rail replacement, track/train dynamics, etc.

Managed several Federal Railway Administration Broad Agency Announcement research projects, from proposal writing, contract negotiations, engineering and report writing.

Managed a staff of ten people in multiple disciplines of engineering and responsible for profit and loss of a \$2M+ business unit.

1990 -
2007

ZETA-TECH Associates, Incorporated, Cherry Hill, New Jersey

1997-2007: Vice President Engineering Analysis & Technology

Development of software applications for the railway industry, including real time data acquisition, track component behavior modeling, planning and analysis models, database development and several other applications.

Development and implementation of software applications on freight and passenger railways worldwide. Successful implementation of risk-based safety oriented software for ultrasonic testing requirements, rail replacement, track/train dynamics, etc.

Responsible for software development and implementation group.

Instrumental in development and implementation of growth oriented strategies for consulting engineering through technology and innovation.

1994-1997: Manager Engineering Analysis & Technology

Managed a group of engineers to provide railway engineering consulting for track component degradation analysis, and forecasting.

Developed several track inspection tools and commercial analysis software for track component degradation and forecasting. Performed multiple track asset maintenance plans for railways worldwide.

1990-1994: Project Engineer

Performed analytic engineering activities for railway related projects including rail defect Weibull analysis, stress analysis of track components, asset management of track components (degradation/failure analysis, life cycle costing analysis, etc.).

Developed several cost benefit models for various track components based on life cycle costing that allowed railway suppliers and railways to identify optimal track components under various operating conditions.

1988 -
1990

University of Delaware

Graduate Research Assistant

Advised by Dr. Arnold D. Kerr

Co-wrote a computer program for the Federal Highway Department on the blow-up of concrete pavements.

Masters thesis: Structures Continuously Supported by a Viscoelastic Foundations

June 1986 -
Sept. 1988
(Summer/Winter)

Adams Rehmann and Heggan Associates, Hammonton, New Jersey

Civil Engineer

Performed analysis and design for land subdivision including hydraulic analysis for stormwater management and road design. Estimation of quantities for land development projects.

PROFESSIONAL AFFILIATIONS

Registered Professional Engineer: New Jersey

Member, American Railway Engineering Maintenance-of-Way Association

Member, AAR Transportation Technology Center Inc. Research Advisory Board – 2013 - 2017

HONORS AND AWARDS

Recipient of the Davis Fellowship from University of Delaware

Member of Tau Beta Pi and Chi Epsilon honor societies

Recipient of AAR Fellowship in Railroad Engineering

CONFERENCE ORGANIZED

Co-organizer: “Big Data in Railroad Maintenance Planning”, University of Delaware, 2022-2014

PUBLICATIONS

Refereed Journals

1. Palese, J.W. “A Method for Using Transformed Track Deflection Data to Assess Dynamic Forces at Railway Track Stiffness Transitions”. *Transportation Infrastructure Geotechnology*, January 2023. <https://doi.org/10.1007/s40515-023-00274-6>

2. Palese, M., Pei, T., Zarembski, A. M., Qiu, T., Shen, C. and Palese, J. W. , “Risk Assessment Framework for Statistical Analysis of Cut Slopes using Track Inspection Videos and Satellite Imagery”, submitted to *GeoRisk Journal*, September 2022.
3. Soufiane, K., Zarembski, A. M., Palese J. W., “The Contribution of Crosstie Condition as Represented by Local Track Stiffness to the Wheel Load Distribution”, *Journal of Transportation Infrastructure Geotechnology*, November 2022, <https://doi.org/10.1007/s40515-022-00263-1>
4. Palese, M., Zarembski, A. M., Huang, H., Palese, J. W., “Ballast Particle Dynamic Response as a Function of Subgrade Support using Statistical Methods”, *Journal of Construction and Building Materials*, Volume 325, March 2022; doi.org/10.1016/j.conbuildmat.2022.126772
5. Soufiane, K. , Zarembski, A. M., and Palese, J. W., Effect of Adjacent Support Condition on Premature Wood Crosstie Failure” *Journal of Transportation Infrastructure Geotechnology*, May 2021. DOI doi.org/10.1007/s40515-021-00168-5
6. Musazay, Jubiar, Zarembski, A. M. and Palese, J. W., “Determining Track-Induced Lateral Thermal Expansion Forces on A Curved Railway Track” *Proc IMechE Part F: Journal of Rail and Rapid Transit*, February 2021. DOI 10.1177/0954409721995318
7. Cronin, J. J., Zarembski A. M., Palese J. W., “Prediction of Rail Defect Development using Parametric Bootstrapping Modified Weibull Equations”, submitted to *Proc IMechE Part F: Journal of Rail and Rapid Transit*, September 2020.
8. Palese, J. W., Zarembski, A. M., & Attoh-Okine, N. O. (2019.). Methods for aligning near-continuous railway track inspection data. *Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and Rapid Transit*, 0(0), 0954409719860718. <https://doi.org/10.1177/0954409719860718>
9. Yurlov, D., Zarembski, A. M., Attoh-Okine, N., Palese, J. W., & Thompson, H. (2019). Probabilistic Approach for Development of Track Geometry Defects as a Function of Ground Penetrating Radar Measurements. *Transportation Infrastructure Geotechnology*, 6(1), 1–20. <https://doi.org/10.1007/s40515-018-0066-x>
10. Alsahli, A, Zarembski, A. M., Palese, J. and Euston W. (2019), Investigation of the Correlation between Track Geometry Defect Occurrence and Wood Tie Condition, *Journal of Transportation Infrastructure Geotechnology*, Volume 6, Issue 3, September 2019, ISSN: 2196-7202 (Print) 2196-7210 (Online)
11. Zarembski, A. M., Palese, J. W., Hartsough, C. H., Ling, H. I., Thompson, H. (2017) “Application of Geocell Track Substructure Support System to Correct Surface Degradation Problems Under High Speed Passenger Railroad Operations”, *Journal of Transportation Infrastructure Geotechnology*, Volume 4 (4) 106-125, December 2017, DOI 10.1007/s40515-017-0042-x
12. Zarembski, A. M., Palese, J. W., & Euston, T. L. (2017). Correlating Ballast Volume Deficit with the Development of Track Geometry Exceptions Utilizing Data Science Algorithm. *Transportation Infrastructure Geotechnology*, 4(2), 37–51. <https://doi.org/10.1007/s40515-017-0039-5>
13. Palese, J. W. and Zarembski, A. M., “Rail Grinding for Rail Transit Systems” 'Engineering' a Journal of the Chinese Academy of Engineering (CAE). December 2015.

14. Palese, Joseph W., Wright Thomas W., “Risk-Based Ultrasonic Rail Test Scheduling on Burlington Northern Santa Fe”, published The Permanent Way Institution – Journal and Report of Proceedings, 2001 Vol 119, Part 2
15. Palese, Joseph W., Wright, Thomas W., “Application of a Risk Based Ultrasonic Test Frequency Scheduling System on Burlington Northern Santa Fe”, TONE: Volume 5: Nondestructive Testing & Evaluation (NDT&E) for the Railroad Industry, 2000.
16. Zaremski, A. M., Palese, J. W., and Marten, J. H. "The Effect of Improved Rail Manufacturing Process on Rail Fatigue Life". American Railway Engineering Association, Bulletin 733, Volume 92, December 1991.

Conference – Paper Published in Proceedings and Presentation

1. Soufiane, K, Zaremski, A. M. and Palese, J. W., “Effect of Failing Adjacent Crossties on Tie-Life: A Machine Learning Model”, *International Heavy Haul Railways Conference*, Rio de Janeiro Brazil, August 2023
2. Soufiane, K, Zaremski, A. M. and Palese, J. W.,”Using Machine Learning to Quantify the Unbalanced Load Distribution’s Effect on Wood Crossties’ Condition”, *Proceedings of the 2023 Joint Rail Conference, JRC2023*, April 11-14, 2023, Baltimore, MD, US
3. Hartsough, C., Palese, J. W. Dragland, T., Thompson, H., and Sussman, T.,”Utilizing Automated Vertical Rail Deflection Measurement Technology to Quantify Soft Spot Risk and Prioritize Maintenance”, *Proceedings of the 2023 Joint Rail Conference, JRC2023*, April 11-14, 2023, Baltimore, MD, US
4. Palese, J. W. and Zaremski, A. M., “Predicting Rail Transverse Profile Shape Using 2D ARIMA Modeling”, *American Railway Engineering and Maintenance of way Association Annual Conference*, Denver CO, August 2022
5. Palese, M., Zaremski, A. M., Palese, J. W., “Relative Risk Assessment of Cut Slopes Using Track Inspection Videos and Object Detection.”, *American Railway Engineering and Maintenance of way Association Annual Conference*, Denver CO, August 2022
6. Palese, M., Zaremski, A. M., Palese, J. W., “Landslide Risk Assessment in Cut Locations Using Right of Way Videos and Artificial Intelligence”, *American Society of Mechanical Engineers Joint Rail Conference 2022*, April 2022, Baltimore MD
7. Zaremski, A. M., Palese, J. W., Nguyen, M., “Forecasting Track Geometry Degradation Using GPR Based Ballast Condition”, *American Society of Mechanical Engineers Joint Rail Conference 2022*, April 2022, Baltimore MD
8. Zaremski, A. M., Palese, J. W., Attoh-Okine, N, Nguyen, M. and Thompson, H, “Can Track Geometry Degradation be Predicted by GPR Measured Ballast Conditions”, *American Railway Engineering and Maintenance of way Association Annual Conference*, Virtual Conference, September 2021.
9. Zaremski, A. M., Palese, J. W., Soufiane, K., Grissom, G., “Effect of Tie Condition Distribution on Life Expectancy of Wood Crosstie”, *American Railway Engineering Association Annual Conference*, Dallas, TX, September 2020

10. Merheb, A., Palese, J, Zarembski, A. M. and Bernucci, L., “Evaluation of continuous vertical track deflection and stiffness on track degradation”, *International Heavy Haul Association STS Conference*, June 2019, Narvik, Norway.
11. Zarembski, A. M., Yurlov, D., Palese, J., Attoh-Okine, N., “Determination of Probability of a Track Geometry Defect based on GPR Measured Subsurface Conditions Using Data Analytics” WCCR 2019, Tokyo, Japan, November, 2019.
12. Palese, J. W., Zarembski, A. M., and Ebersole, K. ,”Stochastic Analysis of Transit Wheel Wear and Optimized Forecasting of Wheel Maintenance Requirements”, *Proceedings of the 2019 Joint Rail Conference, JRC2019*, April 9-12, 2019, Snowbird, UTAH, US
13. Palese, J. W., Zarembski, A. M. and Attoh-Okine,N, “ Development and Application of a Next Generation Rail Wear Model”, American Railway Engineering Association Annual Conference, Chicago, IL, September 2018
14. Zarembski, A. M., Yurlov, D., Palese J. W., Attoh-Okine N, and Thompson, H, “Relationship between Track Geometry Degradation and Subsurface Condition as Measured by GPR”, American Railway Engineering Association Annual Conference, Chicago, IL, September 2018
15. Palese. J. W., Hartsough C. H., Zarembski A. M., Thompson, H., Ling, H. L. Pagano. W. , “ Life Cycle Benefits of Subgrade Reinforcement Using Geocell on a High Speed Railway- A Case Study”, American Railway Engineering Association Annual Conference, Indianapolis, IN, September 2017
16. Palese, J.W., Newman, G.R., Farritor, S., Hartsough, C.M., (2017). “Quantifying Track Substructure Performance Using Continuous and Autonomous Vertical Track Deflection Data” Proceedings of the 2017 IHHA Conference. Cape Town, South Africa.
17. Hartsough, C.M., Palese, J.W., DiVentura, S., Zhang, J. (2017). “An advanced methodology for developing grinding patterns to efficiently address corrugation removal and establish profile” Proceedings of the 2017 IHHA Conference. Cape Town, South Africa.
18. Palese, J.W., DiVentura, S., Hill, K., Maurice, P., (2017). “Optimizing tamper efficiency through the integration of inertial based track geometry measurement.” Proceedings of the ASME/IEEE 2017 Joint Rail Conference. Philadelphia, PA, USA.
19. Palese, J.W., Zarembski, A.M., Hartsough, C.M., Thompson, H., Palese, M.E., (2017). “A study on subgrade pressure differential over regions of known substructure transitions as it related to track geometry.” Proceedings of the ASME/IEEE 2017 Joint Rail Conference. Philadelphia, PA, USA.
20. Hartsough, C., Zhang, J., Palese, J.W., DiVentura, S. (2017). “A method for the measurement and efficient removal of rail corrugations for the subsequent reestablishment of profile” Proceedings of the ASME/IEEE 2017 Joint Rail Conference. Philadelphia, PA, USA.
21. Palese, J.W., C.M. Hartsough, G. Schmitzer, et al., “Rail Lifecycle Improvement through the Application of Dynamic Grind Pattern Generation on a Heavy Hail Railroad in Brazil.” Proceedings of the AREMA 2016 Annual Conference & Exposition. Orlando, FL, August 2016

22. Hartsough, Christopher M., J. Palese, G. Schmitzer, J. Espindola, and T. Viana, "Optimized Rail Grinding Through Dynamic Positioning and Powering of Grinding Motors." Proceedings of the 2016 Joint Railway Conference. Columbia, SC, April 2016
23. Palese, J.W., Zarembski, A.M., Hartsough, C.M., Ozturk, S., "Use of Switch Profile Data for Enhanced Analysis of Wheel Rail Behavior at the Switch Point", Proceedings of the 2015 IHHA Conference, Perth, Australia, June 2015.
24. Euston, T.L., Zarembski, A.M., Hartsough, C.M., Palese, J.W., "Analysis Of Wheel-Rail Contact Stresses Through A Turnout", 2012 ASME Joint Rail Conference, Philadelphia, PA, April 2012
25. Zarembski, A.M., Palese, J.W., Euston, T.L., Scheiring, W.R., "Development and Implementation of Automated Switch Inspection Vehicle", 2011 AREMA Annual Conference, Minneapolis, MN, September 2011
26. Bonaventura, C.S., Zarembski, A.M., Palese, J.W., "Determination of Optimum Intervention Time for Track Surfacing Based on Economic Minimization of Maintenance Costs", IHHA 2011, Calgary, Canada
27. Zarembski, A.M., Euston, T.E., Palese, J.W., "Development, Implementation, and Validation of an Automated Turnout Inspection Vehicle", IHHA 2011, Calgary, Canada, June 2011
28. Palese, J.W., Zarembski, A.M., "A Total Rail Maintenance Strategy for HAL Railways", IPWE, India, 2010.
29. Zarembski, A.M., Palese, J.W., "Evaluation of the Effectiveness of Rail Grinding on Reducing Rail Defects on North American Class 1 Railroad", AREMA 2010 Annual Conference and Exposition, Orlando, FL, August 2010
30. Bonaventura, C.S., Zarembski, A.M., Palese, J.W., "Switch and Crossing Inspections and Maintenance Management Using Handheld Computers", 4th IET International Conference on Railway Condition Monitoring (RCM 2008), Derby, UK, June 2008
31. Palese, J.W., Zarembski, A.M., "The Economics Of Heavy Axle Loads:Costs, Benefits, And Engineering Issues", ExpoRail 2007, India, October 2007
32. Palese, J.W., Maurice, P. "The Drone – An Unmanned Chase Tamper", AREMA 2007 Annual Conference & Exposition, Chicago, IL, September 2007
33. Zarembski, A.M., Palese, J.W., "Use of Risk Management in Improving Track Safety", AREMA 2007 Annual Conference & Exposition, Chicago, IL, September 2007
34. Zarembski, A.M., Gauntt, J.C., Grissom, G.T., Palese, J.W., "Field Demonstration of the Use of Track Strength Data to Optimize Tie Replacement Requirements", AREMA 2007 Annual Conference & Exposition, Chicago, IL, September 2007
35. Zarembski, A.M., Palese, J.W., "Improving Track Safety with New Generation Risk Management Tools", RT&S Risk Management Conference, March 2007
36. Zarembski, A.M., Palese, J.W., "Managing Risk on the Railway Infrastructure", World Congress of Railroad Research, Montréal, Canada, June 2006
37. Zarembski, A.M., Euston, T.L., Palese, J.W., "Use of Track Component Life Prediction Models in Infrastructure Management", AusRail Conference and Exhibition, Sydney, November 2005

38. Bonaventura, C.S., Holfeld, D.R., Zarembski, A.M., Palese, J.P., “Test Results of a Modified Turnout Designed to Increase Diverging Route Speeds Without Increasing Lead Length”, 2005 AREMA Annual Conference, Chicago, IL, September 25-28, 2005
39. Zarembski, A.M., Palese, J.P., “Characterization of Broken Rail Risk for Freight and Passenger Railway Operations”, 2005 AREMA Annual Conference, Chicago, IL, September 25-28, 2005
40. Bonaventura, C.S., Zarembski, A. M., Palese, J.W., “TrackSafe: A Track Geometry Car Based Real-Time Dynamics Simulator”, ASME 2005 Joint Rail Conference, Pueblo, CO, March 16-18, 2005.
41. Palese, J.W., Euston, T. L., Zarembski, A.M., “Use of Profile Indices for Quality Control Grinding”, AREMA 2004 Annual Conference & Exposition, Nashville, TN, September 19-22, 2004.
42. Bonaventura, C.S., Palese, J.W., Zarembski, A.M., “Performance of a Track Geometry Car-Real-Time Dynamics Simulator using Multiple Vehicle, 2003 ASME International Mechanical Engineering Congress and Exposition (IMECE’03), Washington, DC, November 16-21, 2003.
43. Bonaventura, C.S., Zarembski, A.M., Palese, J.W., Holfeld, D.R., “Increasing Speeds through the Diverging Route of a Turnout without Increasing Lead Length”, 83rd TRB Annual Meeting, Washington, DC, January 11-15, 2004.
44. Bonaventura, C.S., Palese, J.W., Zarembski, A. M., “Field Evaluation and Deployment of a Track Geometry Car Based Real-Time Dynamics Simulator”, AREMA 2003 Annual Conference & Exposition, Chicago, IL, October 5-8, 2003.
45. Zarembski, A.M., Palese, J.W., “Risk Based Ultrasonic Rail Test Scheduling: Practical Applications in Europe and North America”, Conference Contact Mechanics and Wear of Rail/Wheel Systems (CM2003), Gothenburg, Sweden, June 2003.
46. Bonaventura, C.S., Palese, J.W., Zarembski, A.M., “Real-Time Prediction of Railway Vehicle Response to the Interaction with Track Geometry”, International Heavy Haul Conference, May 2003.
47. Zarembski, A.M., Parker, L.A., Palese, J.W., Bonaventura, C., “Computerized Tie Condition Inspection and Use of Tie Condition Data in Cross-Tie Maintenance Planning”, International Heavy Haul Conference, May 2003.
48. Zarembski, A.M., Parker, L.A., Palese, J.W., “Use of Comprehensive Tie Condition Data in Cross-Tie Maintenance Planning and Management on the BNSF”, accepted for publication, American Railway Engineering Maintenance Association Annual Technical Conference, September 2002.
49. Zarembski, A.M., Palese, J.W., & Katz, Leonid, “Reduction of Dynamic Wheel/Rail Impact Forces at Grade Crossings Using Stiffness Transitions”, American Society of Mechanical Engineers, 2001 ImechE Congress, New York, NY, November 2001.
50. Zarembski, A.M., Palese, J.W., & Bell, J.G., “Limiting High Speed Dynamic Forces on the Track Structure; The Amtrak Acela Case”, American Railway Engineering Maintenance Association Annual Technical Conference, September 2001.
51. Palese, Joseph W., Wright Thomas W., “Risk-Based Ultrasonic Rail Test Scheduling on Burlington Northern Santa Fe”, American Railway Engineering Maintenance Association Annual Technical Conference, 2000.
52. Bonaventura, Clifford S., Palese, Joseph W., Zarembski, A.M., “Intelligent System for Real-Time Prediction of Railway Vehicle Response to the Interaction with Track Geometry”, 2000 ASME/IEEE Joint Railroad Conference, April 2000.

53. Palese, Joseph W., Holfeld, Donald R., "Tie Planning Tools for the Track Inspector", American Railway Engineering Maintenance Association Track & Structures Annual Conference, 1999.
54. Zaremski, A. M., Palese, Joseph, J. W., Katz, Leonid, "Implementation of a Dynamic Rail-Highway Grade Crossing Transition", Transportation Research Board Annual Meeting, Washington, D.C., January 1999.
55. Zaremski, A. M., Thornton, D., Palese, J. W., Forte, N., "Development and Implementation of RailGraph; "A Field Deployable Rail Maintenance Management Tool", American Railway Engineering Maintenance Association Annual Technical Conference, Accepted for Publication, 1998.
56. Zaremski, A. M., Holfeld, D. R., and Palese, J. W., "Derailment of Transit Vehicles in Turnouts", Transportation Research Board Annual Meeting, Washington, D.C., January, 1997.
57. Zaremski, A. M., Palese, J. W., "Rail Maintenance Planning Using Computerized Rail Forecasting Models", Conference on Track Maintenance Practices on Suburban and Mass Transit Railways, Hong Kong, June 1993

Conference – Presentation Only

1. Palese, J.W., Mohamed, O., "Development of a Multi-Dimensional Time-Based Track Safety and Quality Index Research Update", University of Delaware Conference on Big Data in Railroad Maintenance Planning, Newark, DE, December, 2022.
2. Palese, J.W., "Application of Data Analytics to Rail Wear Forecasting", University of Delaware Conference on Big Data in Railroad Maintenance Planning, Newark, DE, December, 2019.
3. Palese, J.W., "Rail Wear Forecasting and Classification", University of Delaware Conference on Big Data in Railroad Maintenance Planning, Newark, DE, December, 2018.
4. Palese, J.W., "Research Update on a Next Generation Rail Wear Model", UNLV Symposium: Railroad Infrastructure Diagnosis and Prognosis, Las Vegas, NV, October, 2018.
5. Palese, J.W., "Using Big Data to Develop a Rail Wear Forecasting Model: An Update", University of Delaware Conference on Big Data in Railroad Maintenance Planning, Newark, DE, December, 2017.
6. Palese, J.W., "Use of Big Data in Rail Wear Forecasting", University of Delaware Conference on Big Data in Railroad Maintenance Planning, Newark, DE, December, 2016.
7. Palese, J.W., "Grinding in the Era of Big Data", University of Delaware Conference on Big Data in Railroad Maintenance Planning, Newark, DE, December, 2015.
8. Palese, J.W., "Large Scale Data Analysis Techniques in Grinding Planning and Management", University of Delaware Conference on Big Data in Railroad Maintenance Planning, Newark, DE, December, 2014.
9. Palese, J.W., Zaremski, A.M., "Practical Applications of Risk Based Ultrasonic Rail Test Scheduling in Europe and North America, Asset Management for Railway Infrastructure Asia 2005, Singapore, February 23-24, 2005.

10. Zarembski, A. M., Holfeld, D. R., and Palese, J. W., "On the Derailment of Rail Vehicles Through Turnouts; A Review of Derailment Causes and Mechanisms". American Railway Engineering Association Turnout Symposium, Chicago, IL, August 1996.

Other Publications

1. Zarembski, A. M., Palese, J. W., Soufiane, K. and Grissom, G., "How Do Failed Adjacent Ties Effect the Life of Wood Crossties", Railway Track & Structures, October 2021.
2. Palese, J.W., PhD Dissertation - "A Data Driven Approach to Rail Wear Modelling", University of Delaware, August 2019.
3. Hartsough, C.M., J. Palese, G. Schmitzer, J. Espindola, T. Viana, R. Santos, "Dynamic grind pattern generation and long term profile sustainability when applied to a heavy haul rail line." Poster Presentation, 2017 IHHA Conference. Cape Town, South Africa.
4. Zarembski, A.M., Palese, J. W., "Does Rail Grinding Reduce Rail Defects", RT&S, February 2011
5. Zarembski, A.M., Palese, J.W., "Improving Track Safety with New Generation Risk Management Tools", Railway Track & Structures, September 2007
6. Zarembski, A.M., Palese, J.W., Euston, T.L., "Using Real Time Quality Control to Manage Rail Grinding", interface The Journal of Wheel/Rail Interaction (www.interfacejournal.com/features/07-06), July 2006
7. Zarembski, A.M., Bonaventura, C.S., Palese, J.W., "Real Time Analysis of Track Geometry to Control Derailment Risk", Rail Quarterly/LeRail, June 2006
8. Zarembski, A.M., Palese, J.W., Bonaventura, C.S., "Use of Hand Held Computers (PDAs) for Track Inspection and Maintenance" ("Utilisation d'ordinateurs de poche (PDA) pour le contrôle et la maintenance des voies"), LeRail, February/March 2006
9. Zarembski, A.M., Palese, J.W., "Management of Broken Rail Risk" ("Gestion du risqué de rupture du rail"), LeRail, January 2006
10. Zarembski, A.M., Palese, J.W., Euston, T.L., "Monitoring Grinding Effectiveness Using Grinding Quality Indices", Railway Track & Structures, June 2005
11. Zarembski, A.M., Palese, J.W., "Assessing and Managing Risk on the Railway Track", International Railway Journal, May 2005.
12. Bonaventura, C.S., Zarembski, A.M., Palese, J.W., Holfeld, D.R., "Increasing Speeds through the Diverging Route of a Turnout Without Increasing Lead Length, Railway Track & Structures, July 2004
13. Grissom, G.T., Palese, J.W., "Field Demonstration of the Use of Track Strength Data to Optimize Tie Replacement Requirements for High Speed Operations", published Crossties Magazine, Nov/Dec 2002."
14. Zarembski, A.M., Palese, J.W., Bell, J.G., "Controlling Track Forces during Introduction of New Height Speed Trains", International Railway Journal, October 2001.
15. Palese, Joseph W., & Zarembski, Allan M., "BNSF Tests Risk-Based Ultrasonic Detection", published Railway Track & Structures Magazine, February 2001.
16. Palese, Joseph W., "Temperature Effects on Welded Rail", Live Stream, September/October 1998.

17. Palese, Joseph W., “RTA Introduces Tie Life Program”, Crossties Magazine, May/June 1998.
18. Palese, J.W., “SelecTie II Helps Railroads Make Solid Economic Designs”, Crossties Magazine, May/June 1997.
19. Palese, J.W., Masters Thesis - "The Analysis of Structures Supported by Visco-Elastic Foundations", University of Delaware, September 1990.

Select Research and Technical Reports

1. Palese, JW, Lasisi, A, “Development of a Practical Risk Framework for Railway Bridge Stiffness Transitions”, University of Delaware UTC Report, August, 2020.
2. Zarembski, A.M., Yurlov, D., Palese, J.W., Attoh-Okine, N., “Relationship Between Track Geometry Defects and Measured Track Subsurface Condition”, US DOT FRA Research Report, February 2020.
3. Palese, J.W., Zarembski, A.M., Attoh-Okine, N., “The Laplace Distribution in Railway Track Degradation – A Case Study for Rail Wear ", University of Delaware UTC Report, September 2019.
4. Palese, J.W., Zarembski, A.M., Attoh-Okine, N., “Stochastic Determination of Rail Wear Rates ", University of Delaware UTC Report, October 2019.

PATENTS

US2018/0057029 A1 – INERTIAL TRACK MEASUREMENT SYSTEM AND METHODS

US2015/0111472 A1 - GRINDING MOTOR AND METHOD OF OPERATING THE SAME FOR RAIL APPLICATIONS

US2013/0064273 A1 – AUTOMATED TURNOUT INSPECTION

SPONSORED RESEARCH

University of Delaware

“Development of a Practical Risk Framework for Railway Bridge Stiffness Transition Maintenance and Upgrade”, Center for integrated Asset Management for Multi-Modal Transportation Infrastructure Systems: Region 3 University Transportation Center, (4/2019-4/2020), \$48,323, PI – J.W. Palese, Co-PI – A.M. Zarembski

“Big Data Analysis of the Relationship Between M-Rail measurements and the Development of Track Geometry Defects on MRS Logistica”, MRS Logistica Railway, Brazil, (6/2019 – 6/2020), \$50,000, PI – J.W. Palese, Co-PI – A.M. Zarembski

“Development of Rail Wear Analysis Framework”, AMTRAK, (9/2019-9/2021), \$121,312, PI – J.W. Palese, Co-PI – A.M. Zarembski

“Development of a Multi-Dimensional Time-Based Track Safety and Quality Index (TSQI) and Defect Risk Model in Support of Autonomous Track Geometry Inspection”,

FRA BAA Program, (9/2020-9/2023), \$238,551, PI – J.W. Palese, Co-PI – A.M. Zarembski

“Development of a Prototype a Smart Hy-Rail Wheel”, Rail Safety - IDEA Program, (9/2022-3/2024), \$99,985, PI – J.W. Palese, Co-PI – A.M. Zarembski

“Assessment of New Composite Ties”, Blue Ocean Composites, (2/2023-8/2023), \$73,873, PI – J.W. Palese, Co-PI – A.M. Zarembski

“University of Delaware – Development and Implementation of HBCU Based Railroad Engineering Program for Underrepresented Communities (CRS2022000610)”, CRISI Grant, (3/2023-3/2027), \$4.6M, PI – A.M. Zarembski, Co-PI – J.W. Palese, Co-PI – M. Head

Recent Relevant Research as Principal Investigator

From 1990 to 2017, obtained and managed over \$10M of ongoing railway related research activities from government agencies, private entities, and organic growth activities.

“Development of a Pre-Grind Inspection Vehicle”, \$1.6M, RUMO in Brazil, for Harsco Rail, 2017

“Categorizing Track Mud Spot Risk by Measurement of Vertical Track Deflection”, \$234,129, Federal Railroad Administration for HARSCO Rail, 2016

“Field Demonstration of Geocell Track Substructure Support System Under High Speed Passenger Railroad Operations”, \$182,591, Federal Railroad Administration for HARSCO Rail, 2015

“Development of a Low Cost Non-Contact Track Geometry System”, \$500,000, HARSCO Rail, 2015

“Development of Rail Grinding Automation Software”, \$350,000, Harsco Rail, 2014

“Development of an Automated Switch Inspection Vehicle”. \$400,000, Harsco Rail, 2013.

COURSES TAUGHT

Term	Course Number-Title	Role
Fall 2014-19	CIEG 417/617 – Railroad Engineering	TA/Part Time Lecturer
Spring 2015-19	CIEG 418/618 – Introduction To Railroad Safety and Derailment Engineering	TA/Part Time Lecturer
Spring 2016-17	CIEG 318 – Introduction to Railroads	TA/Part Time Lecturer

Spring 2017	CIEG 418/618 – Introduction To Railroad Safety and Derailment Engineering	TA/Part Time Lecturer
July 2017	Short Course – “Railroad Engineering” at The Technion, Israel	Lecturer
Dec. 2018/19	Short Course – “Big Data in Railroad Maintenance Planning”	Lecturer
Fall 2020-22	CIEG 417/617 – Railroad Engineering	Part Time Lecturer
Spring 2020-23	CIEG 418/618 – Introduction To Railroad Safety and Derailment Engineering	Part Time Lecturer
Summer 2021	Short Course – Inspection of Continuously Welded Rail and Determination of Rail Neutral Temperature (RNT)” for Metro North	Lecturer
Spring 2023	CIEG 318 – Introduction to Railroads	Part Time Lecturer
May. 2023	Short Course – “Introduction to Data Science for Railway”	Lecturer

STUDENTS ADVISED

Undergraduate

Tyler Bernstein, 2019

Masters

Kyle Ebersole, MCE 2019 (Co-Advised with Dr. Zarembski)

Kenza Soufiane, MCE 2021 (Co-Advised with Dr. Zarembski)

Michael Nguyen, MCE 2021 (Co-Advised with Dr. Zarembski)

Osman Mohamed, MCE anticipated 2023 (Co-Advised with Dr. Zarembski and committee member)

Mohammed Ahmed, MCE anticipated 2023 (Co-Advised with Dr. Zarembski and committee member)

Mohammed Alzhrani, MCE anticipated 2023 (Co-Advised with Dr. Zarembski and committee member)

Doctor of Philosophy

Kenza Soufiane, PhD anticipated 2023 (Co-Advised with Dr. Zarembski and committee member)

Abel Ayele, PhD anticipated 2024 (Co-Advised with Dr. Zarembski and committee member)