



21st Nordic Seminar on Railway Technology, Final program 20.6.2022

Tuesday 21 June 2022

8:30 – 10:00	Registration and coffee
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Opening session, 10:00 – 12:00	
10:00	Welcome, Dr. Heikki Luomala, Research Centre Terra, Tampere University
10:15	TUNI Greetings, Dean Antti Lönnqvist, Faculty of Built Environment, Tampere University
10:30	FTIA Greetings, Railway Traffic Director Markku Nummelin, Finnish Transport Infrastructure Agency
11:00	Building an Arena Over Existing Railway, Aarno Kinnunen, Aihioarkkitehdit Ltd, Finland

12:00 – 13:30	Lunch and exhibition
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Sponsor:



Vossloh Cogifer Finland Oy and Vossloh Rail Services Finland Oy

Exhibitors:



Parallel session 1, 13:30 – 14:50			
1.1. Super Structure & Turnouts	1.2. Intelligence	1.3. Condition Monitoring	1.4. Rolling Stock
Chair: Henri Seppälä	Chair: Ravdeep Kour	Chair: Stefan Marschnig	Chair: Kalle Vaismaa
Recent developments of mass-spring-systems <i>Walter Stahl</i> Chair and Institute of Road, Railway and Airfield Construction, Technical University of Munich, Munich, Germany.	AI driven Decision support system for different levels of Railway Automation <i>Sarbjee Singh and Matti Rantatalo</i> Division of operation and Maintenance Engineering, Luleå University of Technology, Sweden.	Online track condition monitoring based on bogie vibration data <i>Pekka Salmenperä¹, Marko Lehtosaari² and Antti Laiho³</i> ¹ VR FleetCare, ² Väylävirasto, ³ EKE Electronics Ltd. Finland	A backpropagation algorithm for use of renewable energy along railway lines <i>Angelo Compierchio, Phillip Tretten</i> Operation and Maintenance Engineering, Department of Civil, Environmental and Natural Resources Engineering, Luleå University of Technology Luleå, Sweden
Estimating risks of track buckling <i>Anders Ekberg and Elena Kabo</i> CHARMEC, Chalmers University of Technology, Gothenburg, Sweden	Introduction of ATO in Rail Freight: Attitudes and Views <i>Boban Djordjevic, Oskar Fröidh</i> KTH Royal Institute of Technology, Stockholm, Sweden	Multi-Source Railway Condition Data Analysis for Optimized Track Maintenance Planning <i>M. Silvast</i> Loram Finland Oy, Tampere, Finland.	Overhead contact wire wear: a heuristic model for Norwegian conditions <i>S. Derosa¹, P. Nåvik¹, A. Collina², G. Bucca² and A. Rønquist¹</i> ¹ Department of Structural Engineering, NTNU, Trondheim, Norway. stefano.derosa@ntnu.no ² Department of Mechanical Engineering, Politecnico di Milano, Milan, Italy.
Railway turnout support deterioration estimation under flooding condition using machine learning <i>Jessada Sresakoolchai, Sakdirat Kaewunruen and Mehmet Hamarat</i> Department of Civil Engineering, University of Birmingham, Birmingham, United Kingdom	iVRIDA: Intelligent Vehicle Running Instability Detection Algorithm for high-speed rail vehicles using sensor fusion and deep learning methods – A pilot study <i>Rohan R Kulkarni, Rocco Libero Giossi, Prapanpong Damsongsaeng, Alireza Qazizadeh and Mats Berg</i> Department of Engineering Mechanics, KTH Royal Institute of Technology, Stockholm, Sweden.	System for IOT Measurements of Ride Comfort <i>Lars-Ove Jönsson</i> Analytical Dynamics AB, Lund, Sweden	Statistical analysis of curve squeal based on long-term onboard noise measurements <i>Olle Eriksson¹, Peter T. Torstensson¹, Astrid Pieringer², Rickard Nilsson³, Martin Höjer⁴, Matthias Asplund⁵ and Anna Świerkoska⁶</i> ¹ Swedish National Road and Transport Research Institute (VTI), ² CHARMEC, Gothenburg, Sweden ³ Stockholm Public Transport (SL), ⁴ Tyréns Solutions AB, ⁵ Swedish Transport Administration (Trafikverket), Sweden ⁶ Sieć Badawcza Łukasiewicz, Railway Vehicles Institute "TABOR", Poznań, Poland
The effect of convex bearers on track geometry errors <i>Riku Varis, Tommi Rantala and Heikki Luomala</i> ¹ Faculty of Built Environment, Tampere University, Tampere, Finland	Demonstration and Evaluation of the Intelligent Video Gate Concept <i>Kordnejad¹, Nordmark¹, Kjellin², Aronsson², Garcia³, Castro vilabella³, Wohlrath⁴, Lengu⁵, Åkerfeldt⁶ and Bergstrand⁶</i> ¹ KTH, ² RISE, ³ Trafikverket, Stockholm, Sweden, ⁴ Indra, Madrid, Spain, ⁵ DB Cargo AG, Mainz, Germany, ⁶ Hitachi Rail, Genova, Italy		

14:50 – 15:20	Coffee and exhibition
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Parallel session 2, 15:20 – 17:00			
2.1. Vibration	2.2. Rails	2.3. Wheels	2.4. Maintenance
Chair: Roger Lundén	Chair: Sebastian Stichel	Chair: Anders Ekberg	Chair: Veronica Jägare
Modelling the railway induced ground vibrations in soft soil areas of Western Finland <i>Antti Pelho, Juho Mansikkamäki and Matti Hakulinen</i> AFRY Finland Oy, Tampere, Finland.	Predicting RCF crack initiation in rails using critical plane fatigue damage parameters <i>Jonathan F.W. Leung, Saeed Hossein Nia, Carlos Casanueva Perez, Mårten Olsson</i> KTH Royal Institute of Technology, Stockholm, Sweden	Prediction of Wheel-Wear for a Metro Vehicle <i>B. de Leeuw, S. Hossein-Nia and S. Stichel</i> Rail Vehicles, KTH, Stockholm, Sweden	Rail surface treatment - grinding vs milling in terms of equivalent conicity <i>M. Asplund¹, I. Persson², J. Wingren³, P. Söderström³, B. Dirks¹, M. Li¹, L.O. Jönsson⁴, A. Qazizadeh⁵ and M. Berg⁵</i> ¹ Trafikverket, ² AB DESolver, ³ Mechanical System, SJ AB, ⁴ Analytical Dynamics, ⁵ Rail Vehicles, KTH, Sweden
Vibration insulation solutions for track structures: the important role of insertion loss for specifications <i>Amy P. de Man</i> Knowledge Centre, edilon)(sedra bv, Haarlem, the Netherlands.	Statistical analysis of railway rail wear measurements <i>J. Rajamäki</i> Sweco PM Oy, Finland	Service life of wheels on regional trains <i>Magnus Lundgren</i> Atkins Sweden AB, Sweden	Evaluation of long-term maintenance of switches & crossings with respect to life-cycle costs and socio-economic impact <i>Ait-Ali A.¹, Pålsson B.², Odolinski K.¹, and Torstensson P.T.¹</i> ¹ The Swedish National Road and Transport Research Institute (VTI), Stockholm, Sweden. ² CHARMEC, Gothenburg, Sweden.
Noise and vibration mitigation on low-vibration track <i>Jannik Theyssen, Astrid Pieringer and Wolfgang Kropp</i> Applied Acoustics, Chalmers University of Technology, Gothenburg, Sweden.	Simulation and field tests of long term rail profile damage in a curve due to plasticity, wear and surface crack initiation Caroline Ansin, Björn A. Pålsson, Magnus Ekh, Fredrik Larsson, and Ragnar Larsson CHARMEC, Sweden	Influence of wheel and rail deterioration on wheelset fatigue life <i>Michele Maglio, Elena Kabo, Anders Ekberg</i> CHARMEC / Department of Mechanics and Maritime Sciences, Chalmers University of Technology, Gothenburg, Sweden.	Ballast condition assessment via tamping machine measurements <i>Stefan Offenbacher¹</i> Institute of Railway Engineering and Transport Economy, Graz University of Technology, Graz, Austria.
Comparison of the dynamic response between traditional and innovative railway track systems <i>Emil Aggestam¹ and Jens C. O. Nielsen²</i> ¹ Trafikverket, Gothenburg, Sweden. ² CHARMEC, Sweden.	Crack initiation criteria for deformed anisotropic R260 rail steel <i>Nasrin Talebi¹, Johan Alström¹, Magnus Ekh¹, Knut Andreas Meyer²</i> ¹ CHARMEC, Sweden ² Institute of Applied Mechanics, TU Braunschweig, Germany	Probability of rail break due to wheel-rail impact loads <i>Jens Nielsen, Thomas Abrahamsson and Anders Ekberg</i> CHARMEC, Gothenburg, Sweden	Instructions on Design and Implementation of Tamping on Finnish State Rail Network <i>Anton Aronen and Henri Seppälä</i> FTIA, Finland
Evaluation methods and in-situ measurements of Ground Vibration Boom <i>Heikki Luomala</i> TerraRail, Tampere University, Finland	Track Experiences with 400GHT[®] Grooved Rails <i>Lukas Prettnner</i> Productmanagement, voestalpine Schienen, Leoben, Austria.	Using wheel measurements in lifecycle management <i>Otto Sormunen¹, Curtis Wood¹ and Sami Kalevirta¹</i> ¹ Digital Services, VR FleetCare, Helsinki.	Long Term Effects of Reduced Track Tamping Works <i>S. Marschnig¹, M. Fellerger¹ and J. Neuhold¹</i> Institute of Railway Engineering and Transport Economy, Graz University of Technology, Graz, Austria.

19:00	Dinner, Restaurant Näsinneula
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Wednesday 22 June 2022

8:00 - 9:00	Registration
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Plenary session, 9:00 – 10:30	
9:00	Connecting Finland to European Railway Network, Markus Helelä, WSP
9:30	High Speed Line Plans in Finland, Managing Director Timo Kohtamäki, Suominera
10:00	New Tram in Tampere, Development Engineer Antti Haukka, Tampere Tramway Ltd

10:30-11:00	Coffee and exhibition
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Parallel session 3, 11:00 – 12:00			
3.1. Modelling	3.2. Brakes	3.3. Vehicle-track-interaction	3.4. Monitoring
Chair: Pauli Kolisoja	Chair: Amit Patwardhan	Chair: Mats Berg	Chair: Mika Silvast
Prediction of differential track settlement in transition zones using a non-linear track model <i>Kourosh Nasrollahi, Jens C. O. Nielsen, Jelke Dijkstra, and Magnus Ekh</i> CHARMEC, Sweden	Improved modelling of tread braked wheels using an advanced material model and brake rig test <i>Eric Voortman Landström, Tore Vernersson and Roger Lundén</i> Department of Mechanics and Maritime Sciences/CHARMEC, Chalmers University of Technology, Gothenburg, Sweden,	Predicting equivalent conicity by Gradient Index Profile <i>Ingemar Persson¹ and Lars-Ove Jönsson²</i> ¹ AB DESolver, Östersund, Sweden, ² Analytical Dynamics AB, Lund, Sweden,	The effect of water content on permanent deformations in railway structure <i>Juha Latvala and Heikki Luomala</i> Tampere University, Finland
Train load effect on a buried structure <i>Panu Tolla¹ and Kim Andersson-Berlin²</i> ¹ FTIA, Helsinki, Finland ² Profund Ltd, Turku, Finland	Tread braking and winter conditions <i>Tore Vernersson¹ and Roger Lundén¹</i> CHARMEC - Department of Mechanics and Maritime Sciences, Chalmers University of Technology, Gothenburg, Sweden.	Estimation of surface traction at high creepages and its application to prediction of wear, RCF and squeal noise <i>Elham Khoramzad, Saeed H-Nia, Carlos Casanueva, Mats Berg</i> Engineering Mechanics, KTH Royal Institute of Technology, Stockholm, Sweden	Application of a Robust Photogrammetry Method for Uplift Measurements of Railway Catenary Systems in Noisy Backgrounds <i>Tengjiao Jiang, Anders Rønquist, Gunnstein Thomas Frøseth</i> Dep of Structural Engineering, NTNU, Trondheim, Norway
Modelling the loading behaviour of railway structure <i>Marko Peltomäki, Heikki Luomala, Pauli Kolisoja</i> Tampere University, Finland	Wear of wheel treads and brake blocks at railway tread braking <i>Roger Lundén¹, Tore Vernersson¹ and Mandeep Singh Walia²</i> ¹ Chalmers University of Technology / CHARMEC, Gothenburg, Sweden ² Green Cargo, Solna, Sweden	Track-friendliness of freight wagons on the Finnish Rail Network <i>Muhammad Rizwanullah Shaik</i> TerraRail, Tampere University, Finland.	The railway catenary condition monitoring: a systematic mapping <i>Shaoyao Chen¹, Gunnstein T. Frøseth¹, Stefano Derosa¹, Albert Lau²</i> 1.Department of Structural Engineering, NTNU, Trondheim, Norway 2. Department of Civil and Environmental Engineering, NTNU, Trondheim, Norway

12:00 - 13:00	Lunch and exhibition
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Parallel session 4, 13:00 – 14:20		
4.1. Track Geometry	4.2. Intelligence	4.3. Maintenance
Chair: Jens Nielsen	Chair: Heikki Luomala	Chair: Stefano Derosa
Visualising track geometry deterioration modelling <i>Mikko Sauni, Heikki Luomala, Pauli Kolisoja and Tapio Nummi</i> Tampere University, Tampere, Finland.	Systematic Mapping Review on Railway Track Condition Monitoring 2016-2021 <i>Frida Carlvik, Albert Lau² and Gunnstein T. Frøseth³</i> ¹ Civil and Environmental Engineering, NTNU, Trondheim, Norway. ² Civil and Environmental Engineering, NTNU, Trondheim, Norway. ³ Structural Engineering, NTNU, Trondheim, Norway. gunnstein.	Universal Cost Model: railway system interdependencies in LCC analyses <i>C. Casanueva¹, R. Giossi¹, B. de Leeuw¹, I. Kaiser², J. Vinolas², and S. Stichel¹</i> ¹ Department of Engineering Mechanics, KTH, Stockholm, Sweden. ² School of Engineering, Nebrija University, Madrid, Spain.
Track geometry quality measurements from working machines <i>Eric G. Berggren¹, Mikael Pettersson², Mattias Mattsson³ and Björn Skatt³</i> ¹ EBER Dynamics AB, Falun, Sweden. ² MethoTech AB, Köping, Sweden, ³ Latronix AB, Täby, Sweden.	Cyber Resilient approach for Railways <i>Ravdeep Kour¹, Amit Patwardhan¹ and Ramin Karim¹</i> ¹ Division of Operation and Maintenance Engineering, Luleå University of Technology, Sweden.	Use of reserved capacity for basic maintenance in Sweden <i>Daria Ivina^{1,2}, Carl-William Palmqvist^{1,2}</i> ¹ Department of Technology & Society, Lund University, Lund, Sweden ² K2 Swedish Knowledge Centre for Public Transport, Lund, Sweden
A study on the use of Short-Time Fourier Transform (STFT) analysis for track geometry evaluations concerning cyclic irregularities <i>Martin Li</i> Trafikverket, Göteborg, Sweden.	Railway catenary digital twin: structure, representation and analytics <i>Amit Patwardhan¹, Adithya Thadur² and Ramin Karim³</i> Division of Operation, Maintenance and Acoustics Luleå University of Technology, Luleå, Sweden	Digitalizing supervision activities and documentation <i>François Got, Kevin Lane and Niko Klasila</i> Railway consulting department, Welado, Finland
Evaluating turnouts using post-positioned measuring car data inclusive the rail surface signal <i>M. Loidolt</i> Institute of Railway Engineering and Transport Economy, Graz University of Technology, Graz, Austria.	Railway Digitalization – Finnish Frontier <i>Heikki Kaaranen</i> Proxion, Finland.	Developing An Energy Labelling System for Rail Vehicles: A Survey of European Railway Stakeholders <i>Zhendong Liu¹, Mats Berg¹ and Tohmmmy Bustad²</i> ¹ KTH Royal Institute of Technology, Stockholm, Sweden. ² Trafikverket, Borlänge, Sweden.

14:20 – 14:50	Coffee and exhibition
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Closing session, 14:50 – 15:30	
14:50 – 15:20	Rail Baltica Project, Transport analyst Kristīne Malnača, RB Rail AS Rail Baltica
15:20 – 15:30	Closing words, Dr. Heikki Luomala, Research Centre Terra, Tampere University

List of participants

Name	Country	Name	Country	Name	Country	Name	Country
Aggestam, Emil	Sweden	Järveläinen, Markku	Finland	Liu, Zhendong	Sweden	Seppälä, Henri	Finland
Ait-Ali, Abderrahman	Sweden	Jönsson, Lars-Ove	Sweden	Loidolt, Markus	Austria	Shaik, Rizwanullah	Finland
Andersson-Berlin, Kim	Finland	Kaaranen, Heikki	Finland	Lundén, Roger	Sweden	Silvast, Mika	Finland
Ansin, Caroline	Sweden	Kaira, Tuomas	Finland	Lundgren, Magnus	Sweden	Šķēls, Pēteris	Latvia
Aronen, Anton	Finland	Kalevirta, Sami	Finland	Luomala, Heikki	Finland	Solehmainen, Janica	Finland
Asplund, Matthias	Trafikverket	Kalliainen, Antti	Finland	Lönnngren, Karl	Finland	Maciulevicius, Linas	Germany
Assemat, Antoine	Belgium	Karim, Ramin	Sweden	Nasrollahi, kourosh	Sweden	Maglio, Michele	Sweden
Beck, Michael	Sweden	Khoramzad, Elham	Sweden	Nevalainen, Esa-Pekka	Finland	Marschnig, Stefan	Austria
Berg, Mats	Sweden	Kivistö, Mika	Finland	Nielsen, Jens	Sweden	Myllymäki, Tuija	Finland
Berggren, Eric	Sverige	Kjellman, Jouko	Finland	Nokkonen, Nelli	Finland	Sormunen, Otto	Finland
Carlvik, Frida	Norway	Kolehmainen, Kimmo	Finland	Nummelin, Markku	Finland	Sresakoolchai, Jessada	United Kingdom
Chen, Shaoyao	Norway	Kolisaja, Pauli	Finland	Nurmi, Akseli	Finland	Stahl, Walter	Germany
Compierchio, Angelo	Sweden	Koller, Günther	Austria	Offenbacher, Stefan	Austria	Stichel, Sebastian	Sweden
de Leeuw, Bente	Sweden	Kordnejad, Behzad	Sweden	Oga, Jānis	Latvia	Takala, Mikael	Finland
de Man, Amy	Nederland	Kour, Ravdeep	Sweden	Patwardhan, Amit	Sweden	Talebi, Nasrin	Sweden
Derosa, Stefano	Norway	Kulkarni, Rohan	Sweden	Pelho, Antti	Finland	Tamošiūnas, Tadas	Lithuania
Djordjevic, Boban	Sweden	Kumar, Uday	Sweden	Peltokangas, Ossi	Finland	Tampio, Petri	Finland
Ekberg, Anders	Sweden	Kumari, Jaya	Sweden	Peltomäki, Marko	Finland	Theyssen, Jannik	Sweden
Frøseth, Gunnstein Thomas	Norway	Köning, Seija	Finland	Persson, Ingemar	SWEDEN	Toikkanen, Simo	Finland
Golds, Dāvis	Latvia	Lahnala, Valtteri	Finland	Pfeilstöcker, Mario	Österreich	Torstensson, Peter	Sverige
Got, François	Finland	Lahtinen, Maija	Finland	Pieringer, Astrid	Sweden	Troberg, Riina	Finland
Grönblom, Aki	Finland	Laiho, Antti	Finland	Prettner, Lukas	Austria	Tuovinen, Janne	Finland
Haukka, Antti	Finland	Lane, Kevin	Finland	Punkari, Katja	Finland	Vaismaa, Kalle	Finland
Heikkilä, Hannu	Finland	Latvala, Juha	Finland	Qazizadeh, Alireza	Sweden	Varis, Riku	Finland
Helelä, Markus	Finland	Lau, Albert	Norway	Rajamäki, Juho	Finland	Vernersson, Tore	Sverige
Immonen, Kari	Finland	Lehtikangas, Jori	Finland	Rantatalo, Matti	Sweden	Virtanen, Taiju	Finland
Ivina, Daria	Sweden	Lehtonen, Ville	Finland	Rautanen, Pekka	Finland	Vladička, Julius	Lithuania
						Voortman Landström, Eric	Sverige
Jaatinen, Markus	Finland	Lehtosaari, Marko	Suomi	Rolfen, Harald	Norway	Walia, Mandeep Singh	Sweden
Jansen, Michael	Nederland	Leung, Jonathan	Sweden	Saalasti, Teijo	Finland	Wood, Curtis	Finland
Jiang, Tengjiao	Norway	Levänen, Sami	Finland	Salmenperä, Pekka	Finland		
Juškevičienė, Dovilė	Lithuania	Li, Martin	Sweden	Sauni, Mikko	Finland		
Jälgare, Veronica	Sweden	Linden, Tuomas	Finland	savolainen, tero	Finland		