10th International Conference on Railway Operations Modelling and Analysis (ICROMA)

IAROR International Association of Railway Operations Research

RailBelgrade 2023

Conference Programme

Belgrade, Serbia, April 25th – 28th, 2023

Tuesday, April 25th		
10:30-11:00	REGISTRATION	
11:00-12:00	Mini Course I (Room 128): Crew Scheduling (Dennis Huisman)	
12:10-13:10	Mini Course II (Room 128): Capacity and Performance of Freight Railway Yards and Terminals (C. Tyler Dick)	
13:10-14:00	Lunch Break	
14:00-15:00	Mini Course III (Room 128): Multimodal Transportation System Simulation (Carlos Azevedo)	
15:10-16:10	Mini Course IV (Room 128): Railway Operations Modeling with Petri Nets (Sanjin Milinkovic)	
16:00-19:00	REGISTRATION	
16:30-18:30	**Welcome Reception**	
Wednesday, April 26th		
08:15-09:15	REGISTRATION	
09:15-10:15	**OPENING CEREMONY** (Room 125)	
		Prof. Dr. Nebojša Bojović, Dean of The Faculty of Transport and Traffic Engineering
		Prof. Dr. Rob Goverde, President of IAROR
		Prof. Dr. Vladan Đokić, Rector of the University of Belgrade
		Dr. Ansgar Brockmeyer, Executive Vice President Sales & Marketing, Stadler Rail AG
		Matej Zakonjšek, Director of Permanent Secretariat, Transport Community
		Dr. Jelena Begović, Minister of Science, Technological Development and Innovation, Republic of Serbia
		Goran Vesić, Minister of Construction, Transport and Infrastructure, Republic of Serbia
10:15-10:30	Coffee Break	
10:30-11:00	**KEYNOTE (Room 125):** MILP Reformulations for Train Timetabling and Dispatching: Recent Advancements (Carlo Mannino) *chair: Ivan Belosevic*	
11:10-12:30	Session 1.1A (Room 128): Timetabling I *chair: Ingo Hansen*	
11:10-11:30	*109*	Florian Fuchs and Francesco Corman. Joint Optimal Periodic Timetabling and Train Routing
11:30-11:50	*86*	Fangsheng Wang, Pengling Wang, Zixuan Zhu, Xiaofang Xiao and Ruihua Xu. Robust optimization of train timetable with short-turning strategy considering uncertain passenger demand and vehicle selection
11:50-12:10	*107*	Berenike Masing, Niels Lindner and Christian Liebchen. Periodic Timetabling with Integrated Track Choice for Railway Construction Sites
12:10-12:30	*39*	Wenyu Wang, Fangsheng Wang, Feng Zhou, Ling Hong and Ruihua Xu. Train dwell time analysis for urban rail transit stations based on random forest algorithm: A case study on Beidajie station of Xi'an Metro

11:10-12:30	Session 1.1B (Room 325): Emerging railway technologies	*chair: Francesco Corman*
11:10-11:30	*127*	Bisheng He, Yanbo Yin, Bo Jian Zhang, Peng Chen and Gongyuan Lu. An Agent-based Simulation System for the Operations of Railway Marshalling Yard
11:30-11:50	*68*	Michael Nold and Francesco Corman. Challenges and opportunities for the railway system in 2050: results from a survey of experts
11:50-12:10	*139*	Marko Kapetanović, Alfredo Núñez, Niels van Oort and Rob M.P. Goverde. Vehicle-to-Grid Concept for Hydrogen Fuel Cell Hybrid-Electric Regional Trains
12:10-12:30	*76*	Jakob Geischberger, Alessa Isberner and Norman Weik. Optimizing rollout strategies for migration to moving block signaling – a MINLP-based approach for on-board train integrity monitoring technology
11:10-12:30	Session 1.1C (Room 326): Passenger assignment	*chair: Lei Nie*
11:10-11:30	*19*	Renate J.H. van der Knaap, Menno de Bruyn, Niels van Oort, Dennis Huisman and Rob M.P. Goverde. Extracting Railway Passenger Demand Patterns from Origin-Destination Data for Developing Demand-Oriented Service Plans
11:30-11:50	*53*	Tianyin Zhao, Yongxiang Zhang, Qiyuan Peng, Qingwei Zhong, Shan Jiang and Siyu Zhang. A passenger-oriented optimization approach for scheduling additional high speed trains with flexible stopping
11:50-12:10	*93*	Songliang Zhang, Dewei Li and Yaqiong Zhao. Demand Responsive Service in Railway: A Framework to Realize by Flexible Train Timetable
12:10-12:30	*84*	Yongqiu Zhu and Francesco Corman. Information to passengers under overcrowding situations: good or not
12:30-13:20	Lunch Break	
13:20-13:50	**KEYNOTE (Room 125):** High-Speed Rail Transport Systems: Analysing, Modelling, and Evaluating (Milan Janić)	*chair: Ivan Belosevic*
14:00-15:20	Session 1.2A (Room 128): Railway performance I	*chair: Dario Pacciarelli*
14:00-14:20	*62*	Marta Leonina Tessitore, Giorgio Sartor, Marcella Samà, Carlo Mannino and Dario Pacciarelli. On the Fragility of a Train Timetable
14:20-14:40	*85*	Daniel Knutsen, Nils O. E. Olsson and Jiali Fu. Capacity Evaluation of ERTMS/ETCS Hybrid Level 3 using Simulation Methods
14:40-15:00	*88*	Emma Solinen and Anders Peterson. Increasing Robustness at Single-Track Lines using the Indicator Robustness in Passing Points
15:00-15:20	*134*	Jing Shan, Nikola Bešinović and Jörn Schönberger. Service quality assesment of international rail transport
14:00-15:20	Session 1.2B (Room 325): Railway safety analysis and risk assessment	*chair: Nikola Besinovic*
14:00-14:20	*38*	Bilal Üyümez, Miroslav Pejic, Christopher Tauchmann, Andreas Oetting and Kristian Kersting. Towards Safe Machine Learning Driven Railway Infrastructure Monitoring Systems
14:20-14:40	*122*	Milivoje Ilić, Norbert Pavlović and Ivan Belošević. Failure mode and effects analysis of rail turnouts under fuzzy environment
14:40-15:00	*138*	Chen-Yu Lin, Xinhao Liu and Christopher Barkan. Probabilistic Modelling of Optimal Placement Strategies of Hazardous Materials Railcars in Freight Trains
14:00-15:20	Session 1.2C (Room 326): Railway maintenance planning and scheduling	*chair: Pieter Vansteenwegen*
14:00-14:20	*23*	John Armstrong, John Preston, Peter Helm and Aleksandra Svalova. ACHILLES: Reducing Infrastructure Whole-Life Costs
14:20-14:40	*113*	Felix Prause, Ralf Borndörfer, Boris Grimm and Alexander Tesch. Approximating the Rolling Stock Rotation Problem with Predictive Maintenance by a State-Expanded Event-Graph
14:40-15:00	*29*	Thomas Schlechte, Christian Blome, Stefan Gerber, Stefan Hauser, Jens Kasten, Gilbert Müller, Christof Schulz, Michel Thüring and Steffen Weider. The Bouquet of Features in Rolling Stock Rotation Planning
15:00-15:20	*25*	Felix Lampe, Maren Maus, Lea Elfert and Nils Nießen. Influence of different prioritization approaches of maintenance and replacement measures on station infrastructure quality
15:20-15:50	Coffee Break	

15:50-17:10	Session 1.3A (Room 128): Railway capacity I	*chair: Norio Tomii*
15:50-16:10	*95*	Inneke Van Hoeck and Pieter Vansteenwegen. Solving the Timetabling and Routing with Order Constraints Problem to Optimize Railway Capacity Utilization
16:10-16:30	*67*	Jiaxi Li, Jonathan Preston, John Armstrong and Wuyang Yang. Evaluating Timetables' Capacity Utilisation with An Extended Event-activity Network Method
16:30-16:50	*47*	Christopher Szymula, Nikola Besinovic and Karl Nachtigall. Demand-based Capacity Assessment using Mixed Integer Programming
16:50-17:10	*119*	Nadine Friesen, Tim Sander, Karl Nachtigall and Nils Nießen. Modelling Time in the Timetable-Based Railway Network Design Problem
15:50-17:10	Session 1.3B (Room 325): Train delay prediction	*chair: Stéphane Dauzère-Pérès*
15:50-16:10	*89*	Thomas Spanninger and Francesco Corman. Non-stationarity in Train Delay Propagation Analytics Based on Markov Chains
16:10-16:30	*126*	Bisheng He, Fangzhen Shen, Yongjun Zhu, Andrea D'Ariano and Lufeng Chen. Train Delay Prediction via Transformer-based Deep Learning Model
16:30-16:50	*14*	Farid Arthaud, Guillaume Lecoeur and Alban Pierre. Transformeurs à Grande Vitesse
16:50-17:10	*69*	Baihan Huang, Joe Wright and Taku Fujiyama. Examining the Validity of Using Train Position Data for Railway Traffic Control by Machine Learning
15:50-17:10	Session 1.3C (Room 326): Energy saving in railways	*chair: Giorgio Medeossi*
15:50-16:10	*121*	Jacob Trepat Borecka, Nikola Besinovic and Francesco Corman. Real-time Mitigation of Power Peaks in Railway Networks using Train Control Measures
16:10-16:30	*96*	Songwei Zhu, Yihui Wang, Shaofeng Lu and Andrea D Ariano. Lagrangian relaxation based speed profile optimization for multiple trains under virtual coupling with operational state transition
16:30-16:50	*18*	Shin Ying Ng, Yan Cheng and Taku Fujiyama. Investigating freight train path inefficiency in view of reduction of pollutant emission
16:50-17:10	*105*	Alex Cunillera, Harm Jonker, Gerben Scheepmaker, Wilbert Bogers and Rob Goverde. Coasting advice based on the analytical solutions of the train motion model
17:30-19:00	**IAROR - Board meeting** (Board members only) **(Room 128)**	
Thursday, April 27th		
09:00-10:20	Session 2.1A (Room 128): Railway performance II	*chair: Francesco Corman*
09:00-09:20	*52*	Michelle Ochsner, Daria Ivina and Carl-William Palmqvist. Weather-Related Railway Infrastructure Failures in Sweden: An Exploratory Study
09:20-09:40	*92*	Bianca Pascariu, Balraj David, Paola Pellegrini and Grégory Marlière. Railway Traffic Optimization: Robustness to Driving Behaviour Noise
09:40-10:00	*94*	Grace Mukunzi, Emil Jansson and Carl-William Palmqvist. Restoration time for corrective maintenance on the Swedish railway network
10:00-10:20	*100*	Johan Högdahl and Markus Bohlin. Maximizing railway punctuality: A microsimulation evaluation of robust timetabling methods
09:00-10:20	Session 2.1B (Room 325): Railway traffic management and rescheduling I	*chair: Norio Tomii*
09:00-09:20	*116*	Konstantinos Rigos, Egidio Quaglietta and Rob M.P. Goverde. Goal-oriented Self-Organization in Railways
09:20-09:40	*80*	Bishal Sharma, Paola Pellegrini, Joaquin Rodriguez and Neeraj Chaudhary. Railway Rescheduling Considering Rerouting of Connecting Trains after Perturbations
09:40-10:00	*78*	Leo D'Amato, Federico Naldini, Valentina Tibaldo, Vito Trianni and Paola Pellegrini. Designing self-organizing railway traffic management
10:00-10:20	*90*	Nina D. Versluis, Paola Pellegrini, Egidio Quaglietta, Rob M.P. Goverde and Joaquin Rodriguez. An Approximate Conflict Detection and Resolution Model for Moving-Block Signalling by Enhancing RECIFE-MILP
09:00-10:20	Session 2.1C (Room 326): Line planning	*chair: Stefano Ricci*
09:00-09:20	*79*	Sara Gestrelius, Martin Joborn and Zohreh Ranjbar. Flexible trains in timetabled traffic
09:20-09:40	*72*	Hongda Wang, Lei Nie, Zhiyuan Yao and Zhenhuan He. Optimization of the Combination of Cycle Times for High-Speed Railway Network

09:40-10:00	*55*	Hailin Li, Lei Nie, Huiling Fu, Feng Gao and Huaibin Hu. Optimizing incomplete cyclic line plan in a rail network
10:00-10:20	*61*	Yuxin Mo and Lei Nie. Optimization of Periodic Train Timetable Considering Adding and Reducing Train Stops
10:20-10:35	Coffee Break	
10:35-11:35	Session 2.2A (Room 128): Disruption management	*chair: Rob Goverde*
10:35-10:55	*51*	Liyun Yu, Carl Henrik Häll, Anders Peterson and Christiane Schmidt. A MILP Model for Rescheduling Freight Trains under an Unexpected Marshalling-Yard Closure
10:55-11:15	*49*	Kai Liu, Jianrui Miao, Zhengwen Liao, Xiaojie Luan and Lingyun Meng. Dynamic constraint and objective generation approach for real-time train rescheduling model under human-computer interaction
11:15-11:35	*63*	Bowen Gao, Pieter Vansteenwegen, Dongxiu Ou and Decun Dong. Application of reversible tracks in real-time train rescheduling during partial blockages
10:35-11:35	Session 2.2B (Room 325): Railway alignment and network design	*chair: Paola Pellegrini*
10:35-10:55	*20*	Minhao Xu, Bin Shuai, Lei Guo, Liandong Li and Zhiwei Shao. Optimization of the Inspection Area Districting Plan for Comprehensive Inspection Trains
10:55-11:15	*81*	Stefano Gioia. Line Edge Graphs: a Methodology to Model and Determine Generic Lines, Line Plans and Line Type Services in Public Transport Planning
11:15-11:35	*136*	Alberte Castro, Gerardo Casal, Duarte Santamarina and Miguel Ernesto Vázquez-Méndez. Recreation of horizontal alignments with numerical optimization
10:35-11:35	Session 2.2C (Room 326): Rail yard operation and design	*chair: Peter Márton*
10:35-10:55	*44*	Jiaxi Zhao and C. Tyler Dick. Predicting and Measuring Service Disruption Recovery Time in Railway Gravity Hump Classification Yards
10:55-11:15	*42*	Jintang Shi, Haodong Li and Pieter Vansteenwegen. The shunting with service scheduling problem at a Chinese high-speed railway depot
11:15-11:35	*141*	Daniel Haalboom and Nikola Bešinović. Freight train scheduling for industrial lines with multiple Railway Undertakings
11:40-12:10	**KEYNOTE (Room 125):** Resilience in Railway Transport Networks: From Concepts to Applications (Nikola Bešinović)	*chair: Sanjin Milinkovic*
12:10-13:00	Lunch Break	
13:00-14:00	Session 2.3A (Room 128): Rolling stock and crew scheduling I	*chair: Ingo Hansen*
13:00-13:20	*15*	Zongran Li, Yao Chen, Yun Bai and Yaling Xiao. Asymmetric demand-oriented train scheduling and rolling stock circulation planning with skip-stop tactic: A Mixed integer linear programming approach
13:20-13:40	*31*	Manuel Bröchin, Reto Ramseier and Kaspar Schüpbach. Rolling Stock Planning with Maintenance Constraints by a Rolling Horizon approach
13:40-14:00	*111*	Rabii Zahir, Christiane Schmidt and Tomas Lidén. Shift Scheduling for Train Dispatchers
13:00-14:00	Session 2.3B (Room 325): Railway signalling and control systems	*chair: Christian Liebchen*
13:00-13:20	*27*	Steven Harrod. Lessons from ERTMS and PTC Implementation in Europe and the United States
13:20-13:40	*110*	Guillaume De Tiliere, Quentin De Cacheleu and Florian Bonet. Assessing the performance of tramway junctions with the mutualisation of rail signalling
13:40-14:00	*135*	Joelle Aoun, Rob M.P. Goverde, Roberto Nardone, Egidio Quaglietta and Valeria Vittorini. Analysis of Safe and Effective Next-Generation Rail Signalling Systems using a FTA-SAN Approach
13:00-14:00	Session 2.3C (Room 326): Rail freight transport I	*chair: Abhyuday*
13:00-13:20	*7*	Tommaso Bosi, Federico Bigi, Andrea D'Ariano and Francesco Viti. The Shunt-In Shunt-Out Problem in Rail Freight Transport: an Event-Based Simulation Framework for Sustainable Rolling Stock Management
13:20-13:40	*32*	Elias Dahlhaus. Generalized Train Marshalling from Practical View, Development of the Sorting Requirements and Heuristics
13:40-14:00	*101*	Niloofar Minbashi, Jiaxi Zhao, C. Tyler Dick and Markus Bohlin. Application of Simulation-assisted Machine Learning for Yard Departure Prediction

14:10-15:10	Session 2.4A (Room 128): Timetabling II	*chair: Anders Peterson*
14:10-14:30	*16*	Zhiyuan Yao, Lei Nie, Zhenhuan He and Jingzhe Zhou. A Rolling Horizon Approach to Dense and Heterogeneous Train Timetabling with Skip-Stop Strategy
14:30-14:50	*24*	Ambra Toletti, Florin Leutwiler, Jullian Jordi, Gabrio Caimi and Francesco Corman. Timetabling for Railways in Practice: Examples of Real-world Constraints
14:50-15:10	*33*	Alexander Kuckelberg. Microscopic routing for mixed granularity routing requests
14:10-15:10	Session 2.4B (Room 325): Driver Advisory Systems and ATO	*chair: Markus Bohlin*
14:10-14:30	*37*	Peiran Ying, Xiaoqing Zeng, Andrea D'Ariano, Dario Pacciarelli and Haifeng Song. Energy-efficient High-speed Train Driving Considering Neutral Zone and Time window
14:30-14:50	*21*	Ziyulong Wang, Egidio Quaglietta, Maarten Bartholomeus, Alex Cunillera and Rob Goverde. Conflict-free train path planning using ATO timing points
14:10-15:10	Session 2.4C (Room 326): Rail freight transport II	*chair: Sanjin Milinkovic*
14:10-14:30	*97*	Yuan Chen, Minyi Cai, Haodong Li and Jiaqi Ding. Data-driven based circular train design of railway freight transportation
14:30-14:50	*45*	Siqiao Li, Xiaoning Zhu, Pan Shang and Li Wang. Multi-objective Express Shipment Service Network Design for High-speed Railway Networks
14:50-15:10	*145*	Vladan Nikolic. Strategies for the Improvement of Rail Freight Transport Between the Republic of Turkey and Republic of Serbia: A Case Study Using A'WOT Model
15:10-15:50	Coffee Break	
15:10-15:50	Poster session (Hall II Floor)	*chair: Rob Goverde*
15:10-15:50	*30*	Tamme Emunds, Mariia Anapolska, Christina Büsing and Nils Nießen. Developing Event-Action Network Heuristics for Real Time Traffic Management in Urban Railway Transit
15:10-15:50	*56*	Bertram Ludwig and Philipp Kastberger. Towards Automated Railway Operations - TARO
15:10-15:50	*57*	Milan Dedík, Zdenka Bulková, Lumír Pečený and Martin Vojtek. Potential of the long-distance railway transport routes in the post-pandemic period in Europe
15:10-15:50	*60*	Yingsi Huang, Yuyan Tan, Yafeng Ma, Zizhen Zhao and Yaxuan Li. Railway Passenger Kilometers Forecasting with Combined Multi-Grey Neural Network Model
15:10-15:50	*59*	Atieh Kianinejadoshah and Stefano Ricci. Combined Lines-Nodes Capacity Assessment in Freight-Passengers Complex Railway Networks
15:10-15:50	*66*	Ruyue Zhao, Lingyun Meng, Nikola Bešinović, Jianrui Miao, Xiaojie Luan, Yihui Wang and Zhengwen Liao. Dynamic Train Priority Rescheduling Model with Mixed Passenger and Freight Traffic using A Rolling Horizon Solution Approach
15:10-15:50	*103*	Viera Klasovitá and Francesco Corman. Line Planning for Time-Varying Passenger Demand in Railways
15:10-15:50	*117*	Fabrizio Cerreto, Paola Pellegrini, Rémy Chevrier and Fabrizio Tavano. Assessing self-organization algorithms for railway traffic: the selection of three case studies for the SORTEDMOBILITY research project
15:10-15:50	*120*	Matea Mikulčić, Ivica Ljubaj and Zvonimir Zelenika. Initiating Wireless Railway Network Planning with FRMCS in Croatia
15:10-15:50	*128*	Diwen Shi and C Tyler Dick. Simplified Train Consist Planner to Drive Simulations of Alternative Energy Locomotive Deployment Strategies to Lower the Carbon Emissions of Freight Rail Transportation
15:50-17:10	Session 2.5A (Room 128): Timetabling III	*chair: Nils Nießen*
15:50-16:10	*46*	Louis Fourcade, Stéphane Dauzère-Péres, Juliette Pouzet and Vincent Chmielarski. Analyzing the impact of integrated train path selection and rolling stock planning in railway freight transportation
16:10-16:30	*54*	Wenhao Zhu, Tao Zhang, Zhipeng Ying and Lingyun Meng. Considering Dispatcher's Intention in Real-time Train Rescheduling Problem Under a Human-Computer Interaction Framework
16:30-16:50	*13*	Tao Han, Yuguang Wei, Huaixiang Wang and Yang Xia. Optimization of train timetabling for Container Trains under Passenger Transport Mode in Railway Corridors
16:50-17:10	*98*	Xiajie Yi, Grégory Marlière, Paola Pellegrini, Joaquin Rodriguez and Raffaele Pesenti. Coordinated train rerouting and rescheduling in large infrastructures

15:50-17:10	Session 2.5B (Room 325): Digital Automated Train Operation	*chair: Steven Harrod*
15:50-16:10	*5*	Zishuai Pang, Liwen Wang, Li Li and Qiyuan Peng. A Hybrid Machine Learning Model for Train Dwelling Time Prediction Addressing Passenger Flow Fluctuations
16:10-16:30	*26*	Adrian Wagner, Ulrich Pernull, Philipp Graf and Frank Michelberger. Impact of the Digital Automatic Coupling for single wagonload transport
16:30-16:50	*77*	Dimitris Kouzoupis, Ishan Pendharkar, Jonathan Frey, Moritz Diehl and Francesco Corman. Embedded Model Predictive Train Control
16:50-17:10	*43*	Steffen Schäfer, Lucas Greiner-Fuchs, Tobias Hofmeier, Philipp Koch and Martin Cichon. Virtual Validation Method of Automated On-Sight Driving Systems for Shunting Operations
15:50-17:10	Session 2.5C (Room 326): Railway simulation and digital twins	*chair: Andreas Schöbel*
15:50-16:10	*129*	Geordie Roscoe, Matthew Parkes and C. Tyler Dick. Evaluating the Potential for Platoons of Self-Propelled Autonomous Railcars (SPARCs) to Provide Short-Haul Intermodal Service on Low-Density Rail Corridors
16:10-16:30	*12*	Andrew Nash, Giorgio Medeossi and Mike Bagshaw. Agile Simulation: An approach for increasing optimisation in railway planning.
16:30-16:50	*125*	Zhuang Li, Hongxiang Zhang, Wen Wen, Bisheng He, Yuan Wang and Gongyuan Lu. Evaluating Car-to-Train Assignment Strategies for the Railway Marshalling yard using a Multi-Agent Simulation Approach
16:50-17:10	*82*	Dušan Jeremić and Sanjin Milinković. Single track dispatching using Petri nets
17:30-19:00	**IAROR - Business Meeting** (IAROR members only) **(Room 128)**	
Friday, April 28th		
09:00-10:00	Session 3.1A (Room 128): Railway capacity II	*chair: Joaquin Rodriguez*
09:00-09:20	*4*	Alex Wardrop. Understanding Railway Line Capacity
09:20-09:40	*36*	Nicola Coviello, Giorgio Medeossi, Thomas Nygreen, Paola Pellegrini and Joaquin Rodriguez. A multi-objective framework for strategic railway timetabling: integration of ant colony optimization and mixed integer linear programming
09:40-10:00	*70*	Alex Landex and Lars Wittrup Jensen. Capacity gains with virtual sub-sections in the ETCS Signaling System
09:00-10:00	Session 3.1B (Room 325): Rolling stock and crew scheduling II	*chair: Thomas Schlechte*
09:00-09:20	*73*	Shan Jiang, Yongxiang Zhang, Qiyuan Peng, Tianyin Zhao, Tao Feng and Jiawei Lu. Real-time train timetable and rolling stock circulation plan rescheduling in an urban rail transit network: an integrated optimization approach
09:20-09:40	*102*	Mariana De Almeida Costa, Tiago Alves, António Ramos Andrade and Francesco Corman. A Hybrid Bogie Maintenance Approach to Optimize Railway Fleet Availability
09:40-10:00	*99*	Arturo Crespo Materna, Cedric Steinbach, Andreas Oetting and Shanqing Chai. Towards a Generic Heuristic Approach for the Real-Time and Automatic Schedule Adjustment
09:00-10:00	Session 3.1C (Room 326): Rail freight transport III	*chair: Tyler Dick*
09:00-09:20	*71*	Peiran Han, Lingyun Meng, Nikola Bešinović, Xiaojie Luan, Zhengwen Liao, Jianrui Miao and Yihui Wang. Optimizing Resource Planning in Shunting Yard with Constraint Programming
09:20-09:40	*40*	Predrag Grozdanović, Miloš Nikolić, Milica Šelmić and Dragana Macura. Prediction of the Freight Train Energy Consumption with the Time Series Models
09:40-10:00	*8*	Gaurav Kumar and Akhilesh Kumar. Optimization Models for Rail Freight Operators: A Case Study of Indian Special Freight Train Operator
10:00-10:15	Coffee Break	
10:15-11:15	Session 3.2A (Room 125): Timetabling IV	*chair: Alex Wardrop*
10:15-10:35	*58*	Zhiwen Jiang, Yun Bai and Zongran Li. Cross-line Train Service Planning considering Passenger Travel Demand after Large Events
10:35-10:55	*48*	Jianhao Ge, Pengling Wang and Xiaofang Xiao. Timetable Optimization for Sharing-Corridor Metro Lines under Virtual Coupling
10:55-11:15	*142*	Tianqi Li, Lei Nie and Rob Goverde. Periodic train timetable expansion: An integrated model of multi-period train service selection and rolling stock circulation with time-varying passenger demand

10:15-11:15	Session 3.2B (Room 325): Passenger flows	*chair: Ivan Belosevic*
10:15-10:35	*28*	Nattanon Luangboriboon, Marcella Samá, Andrea D'Ariano and Taku Fujiyama. Assessment of Passenger Management Strategies within Public Transport Terminals
10:35-10:55	*65*	Yasufumi Ochiai. An algorithm to estimate dwell time of trains based on association rules for real-time train traffic prediction
10:55-11:15	*115*	Ruben A. Kuipers, Natchaya Tortainchai, Neba C. Tony and Taku Fujiyama. Dwell-time Station-Service analysis using Rasch analysis technique
10:15-11:15	Session 3.2C (Room 326): Rail governance and economics	*chair: Borna Abramović*
10:15-10:35	*3*	Igor Domeny, Anna Dolinayova, Michal Valla and Zuzana Zidova. The Issue of Fares Measures in Passenger Railway Transport in the Context of a Modal Share of Railway Transport
10:35-10:55	*132*	Predrag Jovanović, Miloš Nikolić and Dragana Macura. Selection of the Optimal Railway Public Services Regarding External Costs and Transport Market Structure
10:55-11:15	*140*	Nikola Ristić, Pavle Kecman and Predrag Jovanović. Optimal Allocation of Waste Transfer Facilities for Infrastructure Manager
11:20-12:00	Session 3.3A (Room 125): Timetabling V	*chair: Alex Landex*
11:20-11:40	*35*	Yuma Mouri, Kazushige Yonemoto and Norio Tomii. Evaluation of Delay Reduction Measures based on Visualization of Historical Train Traffic Records and Data-Driven Simulation
11:40-12:00	*131*	Fabrizio Cerreto. Station capacity assessment with probabilitstic approach: a case for Ringsted station in Denmark
11:20-12:00	Session 3.3B (Room 325): Train delay prediction and conflict detection	*chair: Pavle Kecman*
11:20-11:40	*11*	Ping Huang, Thomas Spanninger and Francesco Corman. A train delay propagation model based on Bayesian networks for probabilistic delay prediction
11:40-12:00	*41*	Florian Hauck, Albrecht Güth, Natalia Kliewer and David Rößler. Applying Generative Adversarial Networks to Generate Synthetic Train Trip Data for Train Delay Predictions
11:20-12:00	Session 3.3C (Room 326): Railway traffic management and rescheduling II	*chair: John Armstrong*
11:20-11:40	*64*	Ranfei Zheng, Jianrui Miao, Zhengwen Liao, Xiaojie Luan, Hongjun Ning, Lingyun Meng, Nikola Bešinovic and Rongbin Liu. A high-speed railway traffic control approach with local-rerouting and adaptive rescheduling range
11:40-12:00	*137*	Xiaoyu Hou, Xiaojie Luan, Zhengwen Liao, Jianrui Miao and Lingyun Meng. Dispatching Strategy for Cross-bureau and Cross-line Trains in Railway Network Operations
12:00-12:15	**CLOSING CEREMONY** (Room 125)	
12:15-13:00	Lunch Break	
13:15-17:00	**Technical Visit**	

SIDING PROGRAMME

Wednesday, April 26th	
Room 217 at 17:15	Company presentation: SHRail a D&T Division
Thursday, April 27th	
Room 217 at 10:35	Company presentation: SAOBRAĆAJNI INSTITUT CIP
Room 217 at 13:00	Company presentation: STADLER
Room 217 at 15:50	Company presentation: THALES Austria
Friday, April 28th	
Room 128 at 10:15	Panel Discussion: Intermodal and Rail Freight Transport in Western Balkan Region: Challenges and Opportunities

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