



UIC TRAINRAIL HACKATHON



How can railways be resilient
in the face of pandemics?



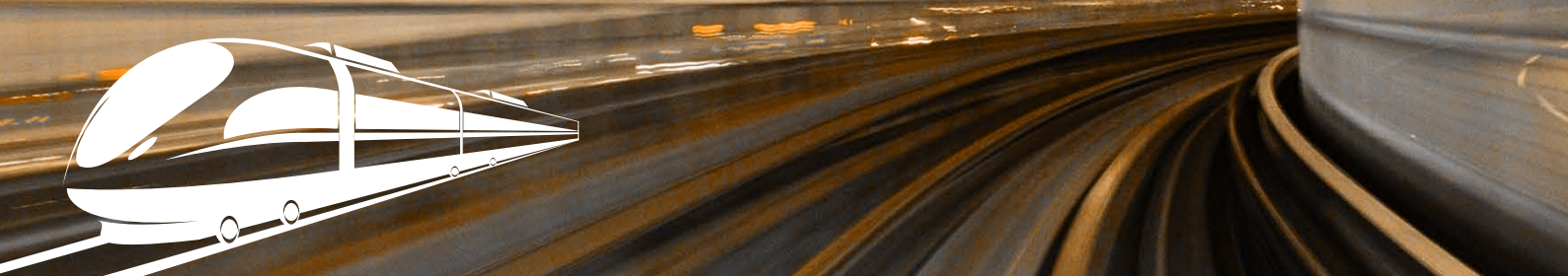
29 November 2022
PARIS, UIC HQ





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INTRODUCTION

What is a Hackathon?

Hackathon is an event where a group of designers, engineers, programmers, etc. meets to develop new ideas, offer innovative solutions to practical industry problems and manufacture product prototypes. There will be exhibitions and communications organized on a given topic during the event.

Hackathon is an event where people from different backgrounds communicate and cooperate together in technological development. These activities can promote mutual learning of knowledge and technologies in other related fields. Rapid development activities are also conducive to improving the analysis, design and capacities of participants. The Hackathon is NOT a competition in the traditional sense, but rather a gathering of creative minds. Competition with other manufacturers in the business of Hackathon is mainly to increase the fun.

- Hackathon requires participants to brainstorm and collaborate and finally work out a product
- Hackathon is one of the increasingly popular events among young people all over the globe.
- Hackathon creates opportunities for young people and prepare them into global leaders.
- Hackathon addresses global issues and help creating a sustainable world.

TrainRail Hackathon 2021 - 2022

Theme: How can railways be resilient in the face of pandemics?

The upheavals caused by the COVID-19 pandemic are a major source of stress, insecurity and questions for everyone and put to the test the most robust health, economic and financial systems. In this context, to bounce back and cope with this difficult situation, companies have sought to demonstrate resilience and adaptability, by developing creative and innovative solutions. The theme chosen for this international hackathon: “How can railways be resilient in the face of pandemics?” », is appropriate in view of the current global health situation.

This Hackathon offers to participants and rail enthusiasts the opportunity to imagine the future and develop solutions for railway operators to better face pandemic situations. The solutions sought can be applied in the various sectors of activity of these companies.

The Hackathon includes various themes and activities, such as: training, customer service on board trains and in stations, maintenance workshops, management of suspicious cases, communication and information, etc.

Young talents from railway companies and universities to find innovative solutions. Through this competition, they use their knowledge, intelligence and expertise to reinvent our ways of doing things in this sector of activity in order to face a scourge such as COVID-19.



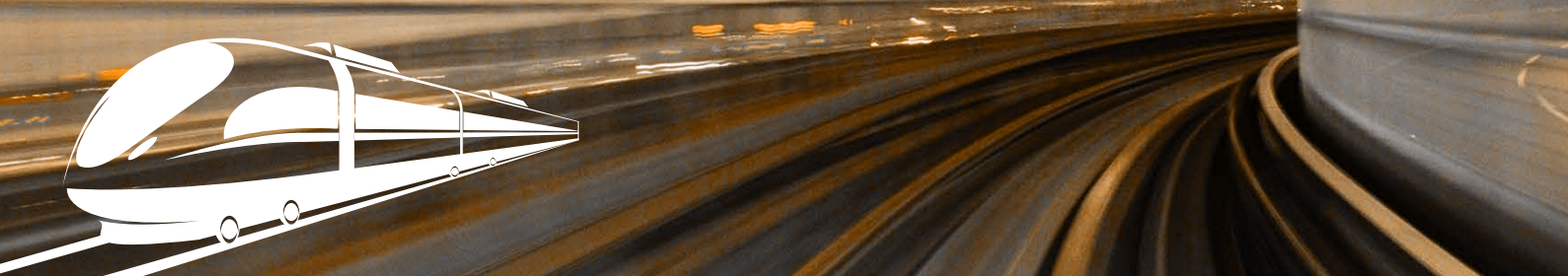
Goals

The goals of the hackathon are to:

- Raise younger generations' awareness regarding the link between developing rail transit and the United Nations Sustainable Development Goals (SDGs).
- Enhance their understanding about the spirit of innovation.
- Develop their competence in working with personalities of diverse backgrounds, which will thus prepare them to become world leaders and thinkers in contributing to a sustainable world.
- Strengthen cultural exchange among their countries, setting the foundation for the future development of international relations.
- Support the challenges of railway companies and education and training establishments with creativity
- Promote start-ups
- Mobilise the best internal and external talents
- Turn an idea into reality

Final selected teams are invited to attend the World Congress on Rail Training (WCRT 2022) held at the UIC headquarters in Paris, from 30 November to 2 December.

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TRAINRAIL HACKATHON PROGRAMME

Tuesday 29 November 2022

8:30-9:00	Registration	Hall
9:00-9:15	Opening & Welcome	Plenary room/ Louis Armand
9:15-10:30	<p>Project presentation - 20 minutes per presentation</p> <p>Project 1 - Virtual Railway Ecological Solution Online Muhua ZHANG, Zixuan WU, Yujia MA, Yue GU, Qing PENG, Syed Waqar Hussain SHAH Southwest Jiaotong University (Asia-Pacific)</p> <p>Project 2 - Railway Foldable Container Online Keyi LI, Ruifan LUO, Yue FENG, Yuqing ZHANG, Danyu WANG Changsha Freight Center of China Railway Company (Asia-Pacific)</p> <p>Project 3 - A Simulation Training System for High-speed Railway Tunnel Maintenance Online Haiyun REN, Hongqi LEI, Ying GAO, Jiwei HE, Hua FANG, Yunhong FANG Wuhan High-speed Railway Vocational Skills Training Duan (Asia-Pacific)</p>	
10:30-11:00	Coffee Break	
11:00-12:30	<p>Project presentation - 20 minutes per presentation</p> <p>Project 4 - Train, Station and Infrastructure Automatic Safety & Cleaning System On site Fabiano FUMAGALLI & Cristiano MAJORCA, FS Philip MORTIMER, Truck Train Development</p> <p>Project 5 - Intelligent passenger flow management system On site Yasser HADDAM, Université Internationale de Rabat (UIR) - Maroc Rachid LAROSSI EL ALAMI, Anass MANDOUR, Office National des Chemins de Fer du Maroc (ONCF) - Maroc Chaïmae TOUBALI, Ecole Mohammedia d'Ingénieurs (EMI) - Maroc Aurel V.J YOUBI MIBAMBO, Société d'exploitation du Transgabonais (SETRAG) - Gabon</p> <p>Project 6 - For the rail passengers a risk score will be calculated and train passengers will be seated according to this risk score On site Halil TATAROĞLU, Elif ŞEN, Muti KARA & Nihat GÜNEŞ, Bilkent University Rıdvan Kutay SIVRİ, METU Bilge İrem ÖZKIR, Hacettepe University</p> <p>Project 7 - X-Gate: IoT-Based Proximity Technology On site Mahnaz SOHRABÍ, Islamic Republic of Iran Railways (RAI) Hossein ASGARÍ, Dadeh Pardazan Farabin Vira (X-Gate) Mahdi SOHRABÍ, Iran Road Maintenance & Transportation Organization (RMTO) Minoo SOHRABÍ, Assan Motor (GBG) Mozhdeh YAZDANÍ, Cheshmkhaneh</p>	Plenary room/ Louis Armand
12:30-12:45	Hackathon Closing	
12:45-13:45	Lunch	Hall
13:45-15:00	Deliberation of the jury	Room 201

Wednesday 30 November 2022

9:30-9:45	Hackathon Awards	Plenary room/ Louis Armand
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TRAINRAIL HACKATHON FINAL JURY



Lucie Anderton
*Head of Sustainability
UIC*



Meryem Belhaj-Clot
*Deputy HR Director
and Head of HR
Development
UIC*



Arpad Domjan
*Senior Project- /
Key-Account-Manager
International Business
DB Training, Learning &
Consulting*



Miguel Faro Viana
*Academy Director
Infraestruturas de
Portugal - IP*



Jos Gabriëls
*Learning and
development manager
RailCenter*



Barbara Grau
*Senior Advisor
European &
International HR Affairs
SNCF*



Özgür Turay Kaymakçı
*Associate Professor
Çanakkale Onsekiz
Mart University (COMU),
Electronic Engineering
Department*



Marleen van de Kerkhof
*Rail Ambassador
European Year of Youth
Railforum & Jonge
Veranderaars*



Jun Li
*Director of SWJTU
Computer Lab
Southwest Jiaotong
University*



Philippe Lorand
*Senior Advisor, High-
Speed Rail, Passenger
UIC*



Marin Marinov
*ESSCM Research lead, Dr,
ASTONrail Project Coordinator,
Deputy Programme Director,
Lecturer, FHEA, PGDip in T&L
Engineering Systems & Supply Chain
Management, Aston University*



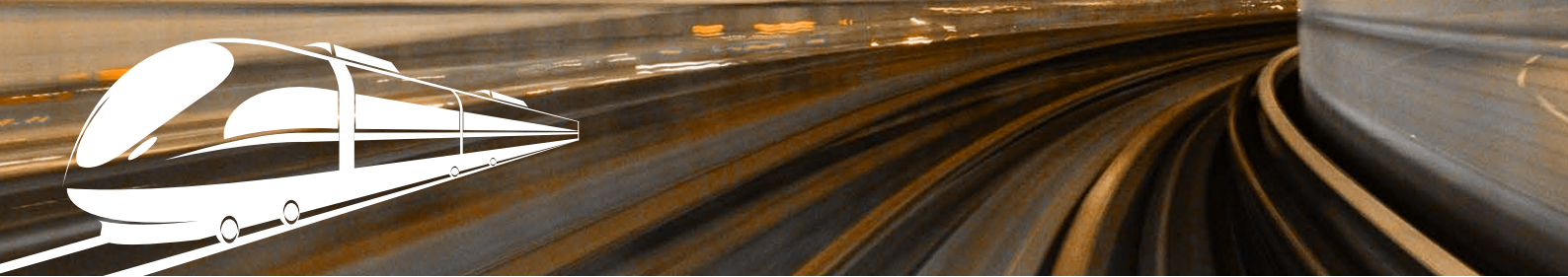
Vito Pagliarisi
*International HR
Ferrovie dello Stato
Italiane*



Karim Eddine Chennouf
*Président du Directoire
IFF*



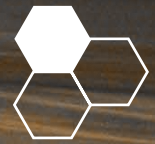
Ling XIN
*Deputy Dean, Tianyou
Railway Institute
Southwest Jiaotong
University*



REGIONAL TRAINRAIL HACKATHON BRIEFINGS & WINNING PROJECTS

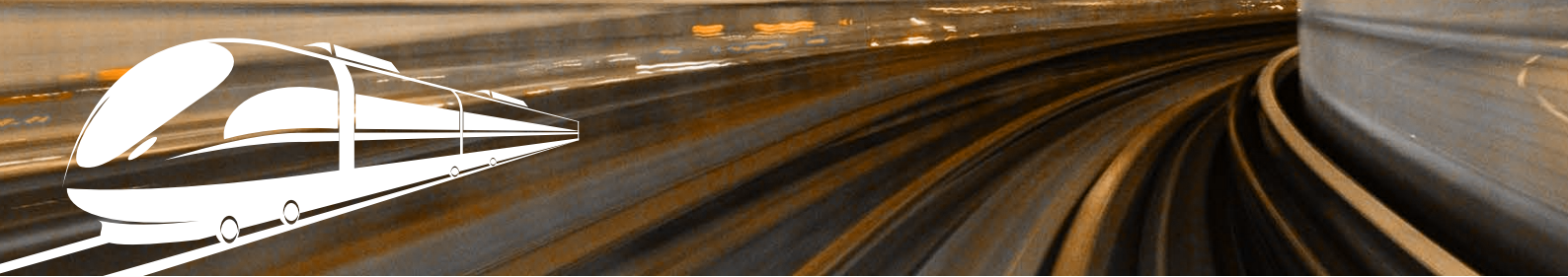
Within the question of “How can rail be resilient in the face of pandemics?” 87 groups composed of talented young people from the Asian-Pacific, Africa, Europe, and Middle East regions created and presented their projects on reinforcing the railway sector. Due to the pandemic, the competitions were held in a hybrid format, both online and in-person.





TrainRail Hackathon Regional Winning Projects

Project	Participant	Company/University
Europe		
Train, Station and Infrastructure Automatic Safety & Cleaning System	Fabiano Fumagalli	Ferrovie dello Stato - FS
	Cristiano Majorca	
	Rúben Camilo	Infraestruturas de Portugal
	Tiago Lipari Pinto	Truck Train Development
	Philip Mortimer	
Asian-Pacific		
Virtual Railway Ecological Solution	Muhua ZHANG	Southwest Jiaotong University
	Zixuan WU	
	Yujia MA	
	Yue GU	
	Qing PENG	
	Syed Waqar Hussain SHAH	
Railway Foldable Container	Keyi LI	Changsha Freight Center of China Railway Company
	Ruifan LUO	
	Yue FENG	
	Yuqing ZHANG	
	Danyu WANG	
A Simulation Training System for High-speed Railway Tunnel Maintenance	Haiyun REN	Wuhan High-speed Railway Vocational Skills Training Duan
	Hongqi LEI	
	Ying GAO	
	Jiwei HE	
	Hua FANG	
	Yunhong FANG	
Africa		
Intelligent passenger flow management system	Yasser HADDAM	Université Internationale de Rabat (UIR) - Maroc
	Rachid LAROUCSI EL ALAMI	Office National des Chemins de Fer du Maroc (ONCF) - Maroc
	Anass MANDOUR	
	Chaïmae TOUBALI	Ecole Mohammedia d'Ingénieurs (EMI) - Maroc
	Aurel V.J YOUBI MIBAMBO	Société d'exploitation du Transgabonais (SETRAG)- Gabon
Middle-East		
For the rail passengers a risk score will be calculated and train passengers will be seated according to this risk score.	Halil TATAROĞLU	Bilkent University
	Elif ŞEN	
	Muti KARA	
	Nihat GÜNEŞ	METU
	Rıdvan Kutay SIVRİ	
	Bilge İrem ÖZKIR	
X-Gate: IoT-Based Proximity Technology	Mahnaz SOHRABİ	Islamic Republic of Iran Railways (RAI)
	Hossein ASGARİ	Dadeh Pardazan Farabin Vira (X-Gate)
	Mahdi SOHRABİ	Iran Road Maintenance & Transportation Organization (RMTO)
	Minoo SOHRABİ	Assan Motor (GBG)
	Mozhdeh YAZDANİ	Cheshmkhaneh



TrainRail Hackathon European Region

In the context of the working meeting of the Erasmus+ ASTONRail project at the University of Zilina, the competition has allowed participants from Portugal, Poland, Switzerland, Spain, UK and Italy to present the results of the work they have carried out. The European Regional TrainRail Hackathon was organised by the UIC and ASTONRail and sponsored by the School of Industrial Engineering of the University of Malaga (UMA).

During the competition on 26 November 2021, all teams demonstrated a high level of quality in their proposals and in the commitment to offer resilient solutions. Among them, participants from Portugal, UK and Italy won the first prize with their project focusing on “Train, Stations and Infrastructure: Automatic Safety & Cleaning System”.





European Regional Winning Project

MONARCH SYSTEM

Train, Station and Infrastructure Automatic Safety & Cleaning System

Impact of the COVID pandemic

In Europe, passenger traffic volumes dropped by roughly 48% in terms of passenger-kms, due to restrictions on mobility and the consequent decrease in demand. Currently, two years after the outbreak, the demand is still below the 2019 levels. A survey made by the European Investment Bank showed how people are worried about their health: 67% of respondents feels in danger using public transport, and this still affects the upturn in demand.

Lesson learned

Rail passenger transport is a key service, but it has a high potential risk of contagion. Consequently, minimizing that risk makes people feel safe to start over travelling by train when pandemics occur. MONARCH SYSTEM Train, Station and Infrastructure Automatic Safety & Cleaning System.

Project

The Monarch System is a holistic approach. Before the outbreak of the pandemic event, rail companies should maintain a proactive risk management approach, updating their emergency protocols, as well as providing training in the use of new technologies. "The future belongs to those who prepare for it today". The Monarch System aims at making railway companies resilient in the event of a pandemic, also treasuring the lesson learned from the management of Covid-19. Actions should focus on containing, if not eliminating, contagions, on the one hand, using UV-C technologies to eradicate the virus both in train carriages and stations, and, on the other, monitoring the access to railways and limiting the access to trains.

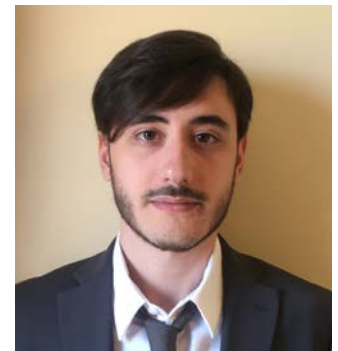
UV-C technology

LED UV-C is an available technology able to eliminate the virus present on air and surfaces, directly or indirectly, with low energy consumption and little maintenance required, both in train carriages and stations. We propose the use of portable UV-C equipment, exploring the possibility of installing a UV kit as fixed item in each rail vehicle and, eventually, station. The upsides of our solution The Monarch System, being a ready-to-use and SDGs aligned prototype, is a turnkey solution for every company willing to answer to pandemic operation issues effectively.

A long-term view

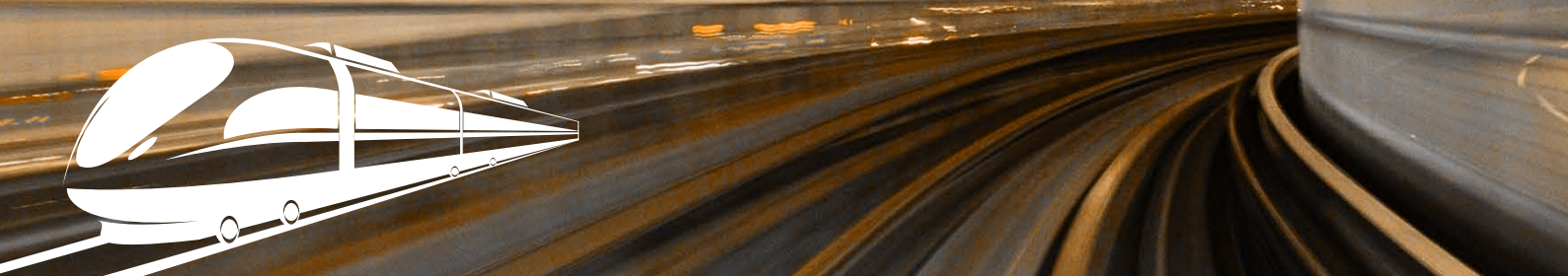
The Monarch System is a holistic approach. We believe that, before the outbreak of the pandemic event, rail companies should maintain a proactive risk management approach, updating their emergency protocols, as well as providing training in the use of new technologies.

"The future belongs to those who prepare for it today."



Rüben Camilo
Fabiano Fumagalli
Tiago Lipari Pinto
Cristiano Majorca
Phil Mortimer





TrainRail Hackathon Asian-Pacific Region

On December 24-26, 2021, the First TrainRail Hackathon in Asia-Pacific Region was successfully held in Southwest Jiaotong University, Chengdu, China, both online and offline. On the 25th of December, the opening ceremony of the Competition was held in Southwest Jiaotong University. Feng Xiaoyun, vice president of TrainRail Committee and also vice president of the University, and Mr. Miguel Faro Viana, Chairman of UIC Talent & Expertise Development Platform (TEDP) and Mr. Evgeny Zarechkin on behalf of UIC TrainRail delivered speeches respectively and expressed their expectation for the good performance of the contestants in the Asia-Pacific region.

There are 18 sub-competition venues nationwide, with more than 300 contestants from 8 countries including Pakistan, Russia, Yemen, Laos, Afghanistan, Ukraine, Rwanda and China, forming 65 teams. All teams simultaneously launched a two-day Hackathon activity. After 48 hours of fierce competition, 18 teams were selected as awards winners. Among them, Teams from Southwest Jiaotong University, Guangzhou Railway Group Changsha Freight Center, and Wuhan High-Speed Railway Vocational Training Center won the first prize.





Asian-Pacific Regional Winning Project

1 Virtual Railway Ecological Solution

Railway enthusiasts (railfans) are a group of non-industry people with an understanding and love of railways. In the context of the COVID-19 pandemic, it is difficult for railfans to conduct offline activities to interact with the railway industry as they used to (e.g., riding on trains with special significance, visiting locomotives with special features, etc.). However, it is possible for railfans to maintain continuity of interaction even without leaving home with the solution provided by this project! The solution works with the railway industry to bring railfans a complete and comfortable digital railway experience and a safe and trustworthy online communication space:

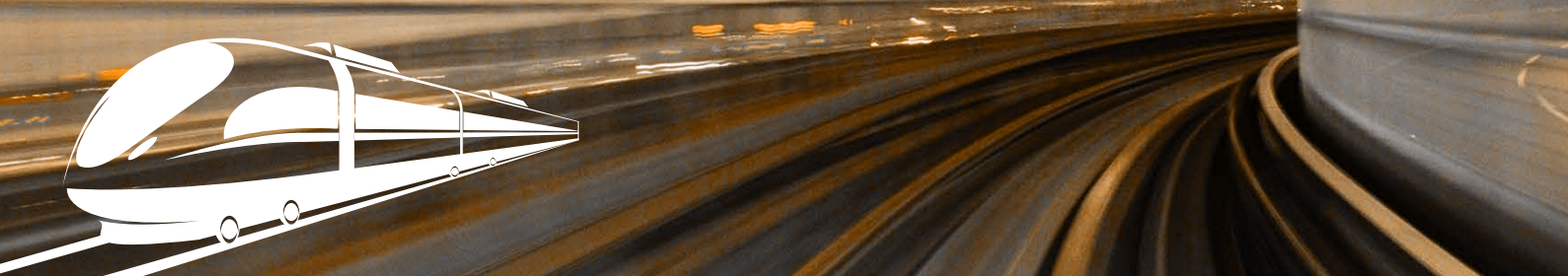
We offer digital content for various train simulation games containing locally specific routes and rolling stock on our own digital content sales and encrypted distribution platform (RWC Platform); We operate online forum and online virtual railway company platform that allows railfans to experience the entire train driving process from sign-on to sign-off

in a simulation game, and to compete with other railfans in terms of mileage, passenger revenue, freight revenue and so on. We developed train driving simulator hardware based on open-source software (RAGLINK+ CabViewer Project) and made it available to the whole community, taking the basic train driving simulator hardware from a pricey piece of professional equipment to a computer peripheral that every railfans can own. We hope to energize the railway industry with the motivation of railfans, so that everyone's strength can feed and drive the railway industry forward.

We likewise have our long-term goal: bringing in specialized technical support from railway college and relying on open-source software and hardware projects based on existing resources to provide a low-cost (or even free) remote railway training service solution for developing countries and bringing more fresh energy and value from railfans to the railway industry.



Qing PENG
Muhua ZHANG
Zixuan WU
Yujia MA
Yue GU
Syed Waqar Hussain SHAH



2 Railway Foldable Container

Since COVID-19 pandemic, China Railway Express has grown exponentially. Before the outbreak in 2020, the transfer ratio of outbound international train and inbound train is 1:2, and up to now it has risen to 1:3, which means for every three containers sent to Europe, only one will return with cargo. This brings about several problems, firstly, empty containers overstock in Europe, and meanwhile the transport capacity for returning containers cannot meet the needs, thus, the rental fee of container will double or even triple. To solve the mentioned problems, a new foldable container specialized for railway transit has been created.

Combining the foldable container with Mortise and Tenon technique, the team has invented the railway typical foldable container.

The railway typical foldable container takes 1/5 space of a regular one, and 6 empty ones can be carried by one train wagon. Different climate conditions must be taken into consideration, for example, once a Siberian gale has blown off empty containers during certain railway transit, so how to secure the folded

container firmly is the crux of railway typical foldable containers. In order to ensure the transportation safety, the Swallow-tail Lock by applying Chinese traditional Mortise and Tenon joint technique was created, which has saved countless Chinese ancient architectures from earthquakes, to reinforce foldable containers, resisting forces in multiple directions.

There are two models to optimize the transport capacity by folding containers. One is to fold 6 foldable containers on one train wagon, the other is to pile a folded one above a full container with cargo.

It has several advantages. Firstly, the transport security is ensured. With the Swallow-tail Lock, several folded containers can be piled and secured as a whole that will be much more stable. Moreover, the process of folding is simple. Secondly, it both solves the problem of overstocking containers in Europe and enhance railway transport capacity. Thirdly, it helps decrease the transportation cost a lot, and the railway transport capability is expanded and sustained.



Danyu WANG
Yue FENG
Keyi LI
Yuqing ZHANG
Ruifan LUO



3 A Simulation Training System for High-speed Railway Tunnel Maintenance

A simulation training system have been developed based on 3D and VR technologies for tunnel maintenance of high-speed railway, in order to meet the challenges on space and organizational limitations of high-speed railway training due to COVID-19 pandemic, and to further address the difficulties in practical training such as equipment, funding, space, and structures of training model. Furthermore, the system is a cloud-based platform which adheres to the principle of security and compatibility while utilizing the asynchronous Ajax technology combined with highly efficient cache and end-to-end encryption to achieve high performance and stability.

For the equipment cognition training, by utilizing 3D panorama + 3D model technology, the system fully reproduces the high-speed railway tunnel structures and the real environment, as well as the interior structures of the high-speed railway tunnels, the structures of the auxiliary facilities and the characteristics of typical damages, to enable the trainees to acquire accurate and three-dimensional experience. Additionally, the system adopts standardized data format and its modular update which can real-time track the new technologies, new techniques, and new equipment of high-speed railway tunnels, to keep the training model up with the latest trends of technologies.

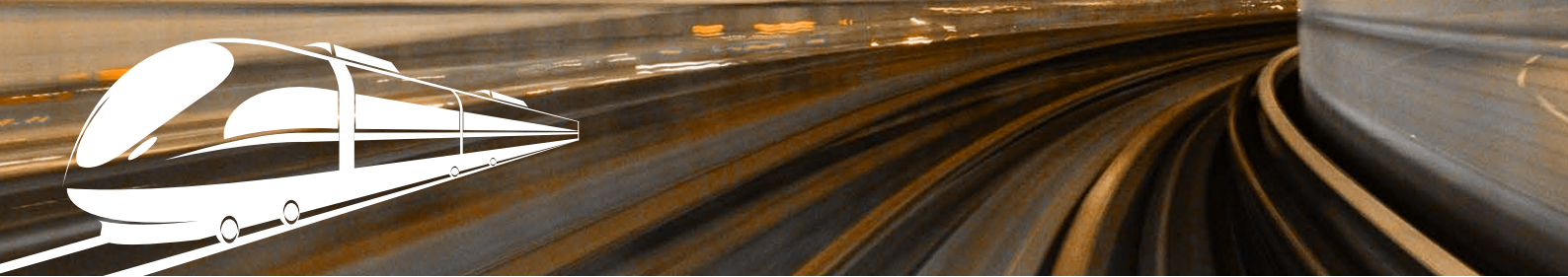
For the practical operation training, the system, supported by 3D high-speed railway tunnels and the VR technology, establishes the virtual simulation scenario with real-time interaction, so that it can achieve remote millimetre-level positioning, hand-to-hand cooperation, face-to-face instruction and multi-person interaction, providing the trainees a series of field operations such as maintenance process drill, troubleshooting, equipment operation and maintenance, as if trainees are personally in-person on the scene, making remote, interactive and immersive skill training come true.

In summary, the system addresses 4 issues:

- It addresses the difficulty in training organization in the context of the pandemic by organizing remote, immersive training.
- It achieves remote and multi-person interaction (including dialogue and communication) in high-speed railway training for the first time.
- It addresses the issue of large equipment investments and low utilization in practical training.
- It addresses, by panoramic reproduction, some of the difficulties in reproducing high-speed railway damages and faults and in preventive drills.

Jiwei HE
Hua FANG
Ying GAO
Haiyun REN
Yunhong FANG
Hongqi LEI





TrainRail Hackathon African Region

On 19 February 2022, 7 teams representing 6 African countries took turn to present and defend their projects in front of a committee of experts chaired by Mr Smouni, DGA/ONCF. The competition proved to be exciting with highly motivated young candidates who prepared their projects well and produced prototypes and 3D simulations under the supervision of 5 professional coaches.

3 teams distinguished themselves and were awarded by the members of the jury. The first winning team is invited to present their project "Intelligent pandemic resilient passenger flow management system" in the International Hackathon Final Competition representing the African region.





Africa Regional Winning Project

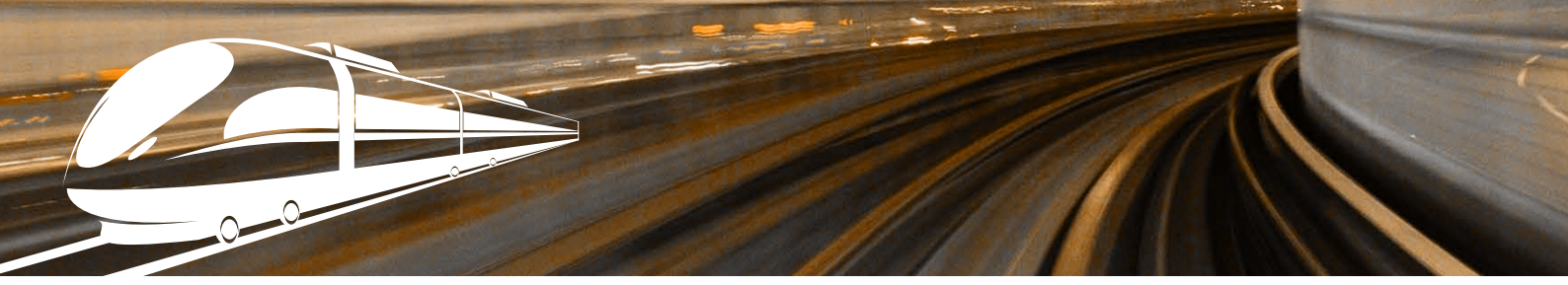
Intelligent passenger flow management system

Our project is a system through which, cameras and sensors (monitoring and regulating movements) provide a reliable and real-time view of the movements and volume of travellers in stations, on platforms and on-board trains. Thus, there is a possibility of sharing data in real time with travellers so that they can prepare in advance and better manage their journeys (avoid rush hours, avoid congested places in the station, know in advance the possible waiting times in station) in addition to the possibility of sharing on the displays in the station the average waiting time (in the counter area). The main goal of this solution is to alleviate the highlight risk in real time, based on social distancing recommendations, crowd movement patterns and area size, quickly identify congested areas and take the necessary precautions to minimize the risk of contamination, have a better orientation of passenger flow thanks to rapid intervention by agents and effective updating of signage (review the layout of queues and adjust it if necessary), improve the responsiveness of

operators by directing cleaning teams to the places where cleaning (disinfection) is most needed, offer predictive information on passenger density and movements, for better future planning, provide a real-time adjustment, based on waiting times at the platforms, train arrival times and boarding times, so that travellers reach the platform at the optimal time and to know how factors such as time of day or day of week, or other events, affect passenger behaviours. Furthermore, our project will be having many features such as a personalized guidance in all areas of the station, dashboards and alerts adapted to the needs of each station, adapt staff to demand with AI-powered lane opening forecasts and recommendations, integrated queue management, forecasting and capacity planning tool, heat map, an app for travellers connected to the system and specially alerting users when the density threshold of a defined area is exceeded (according to current guidelines: more than 1m distance, more than 4 people together).




Anass Mandour, Chaïmae Toubali, Aurel V.J Youbi Mibambo, Rachid Laroussi El Alami, Yasser Haddam



TrainRail Hackathon Middle East Region


On 28 June 2022, 10 teams presenting different Middle East railway organisations, companies and universities have participated in the Regional Hackathon organised by the UIC, the TCDD and the MERTCe. Among them, the participants from the teams focusing on the project “For the rail passengers a risk score will be calculated, and train passengers will be seated according to this risk score” have distinguished themselves and was awarded by the jury. The second winning team will also take part in the International TrainRail Hackathon Final Competition to present their project “A Contactless Authentication and Ticket Management System based on IoT & Smartphones”.



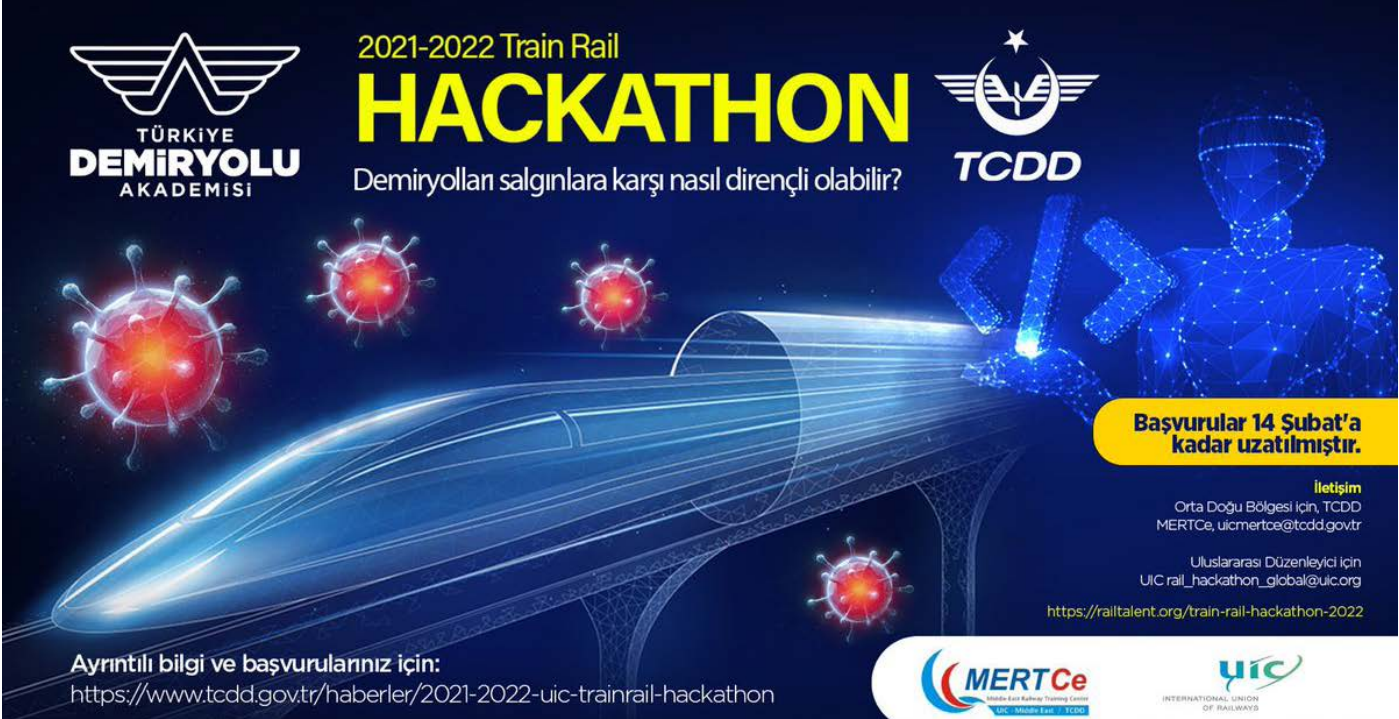


**TÜRKİYE
DEMİRYOLU
AKADEMİSİ**

2021-2022 Train Rail
HACKATHON
Demiryolları salgınlara karşı nasıl dirençli olabilir?



TCDD




**Başvurular 14 Şubat'a
kadar uzatılmıştır.**

İletişim
Orta Doğu Bölgesi için, TCDD
MERTCe, uicmertce@tcdd.gov.tr


Uluslararası Düzenleyici için
UIC rail_hackathon_global@uic.org

<https://railtalent.org/train-rail-hackathon-2022>

Ayrıntılı bilgi ve başvurularınız için:
<https://www.tcdd.gov.tr/haberler/2021-2022-uic-trainrail-hackathon>



MERTCe
Middle East Railway Training Centre
UIC - Middle East - TCDD



UIC
INTERNATIONAL UNION
OF RAILWAYS



Middle East Regional Winning Project

1 For the rail passengers a risk score will be calculated, and train passengers will be seated according to this risk score

Comfortable and safe. With these properties, railways have been an indispensable way of transportation, bringing people together all around the world. However, in the face of the pandemic, gathering people in a car became a risk factor that threatened the safety and comfort of trains. Smart-Seat is a specially designed and program-backed algorithm in accordance with European Transport Safety Council's (ETSC) safe travel documentation that aims to minimize this risk factor.

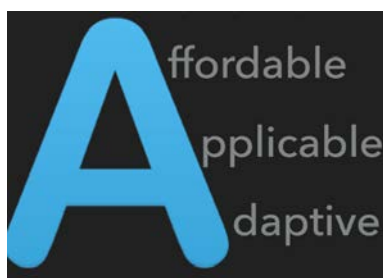
How Does It Work?

In order to arrange the seating plan most safely, Smart-Seat calculates two risk points for all passengers on board: The risk of transmission and the risk of being hospitalized. Data inputs such as vaccination rates, the number of cases in the departure city, and the passenger's vaccination history are used to estimate the possibility of this passenger transmitting the disease. The second risk point is calculated with the assistance of a computer program. The program takes input from the health record service and, considering the passenger's age, sex, chronic diseases, and medical history, assigns a risk score that indicates the risk of being hospitalized for this disease. After calculating the risk scores program finds the best seating plan for this journey.

3A's We Value For This Project:

Affordable:

Being aware of the fact that pandemics have created a serious burden on economies, Smart-Seat is designed to be an affordable solution. The affordability of Smart-Seat gives a chance to use this solution all around the world regardless of the economic condition.



Applicable:

Considering that pandemics are a global problem, the solution we would find should also be a global one. That's why we developed a solution applicable to all railway systems.

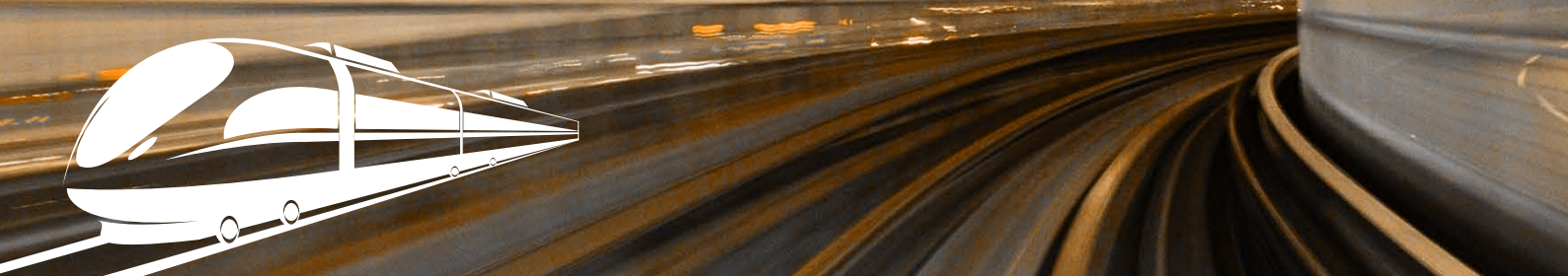
Adaptive:

Since pandemics and the railway sector are incredibly dynamic, the solution to be found must also be suitable for this dynamism. For this reason, Smart-Seat is designed to be able to adapt to numerous infectious diseases and possible new findings about them.



Halil Tataroğlu, Elif Şen, Muti Kara,
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2 A Contactless Authentication and Ticket Management System based on IoT & Smartphones

Nowadays, NFC technology is widely used in public transportation ticket management through digital payment on smartphones (for single-journey tickets) and physical cards (for multi-journey tickets). But the main problem of NFC is the lack of authentication of the passenger who is not necessarily the payer/card holder.

Entrances of stations and trains are the first points of user interaction with rail systems. One of the fundamental concerns of rail crisis management about pandemic outbreaks is the inefficiency of identifying high-risk travellers at main points.

To solve this problem, X-Gate technology is designed based on smartphones and IoT technology as a health and authentication passport to be replaced with all types of NFC tickets and ensure the resiliency and sustainability of railways. X-Gate is a revolution for rail ticket management and a real-time antivirus for entrance and ticket control gates that verifies users' health and authentication at the moment.

X-Gate for promoting railways resiliency in pandemics:

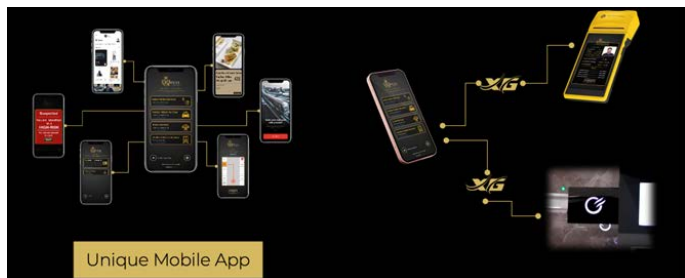
- Online passenger health status inquiries (i.g., tests and vaccinations records)
- Real-time passenger health status detection by integrating with thermal cameras (for body temperature) and ID cameras (for face recognition)
- Connecting to CCTV for mask control
- Public or private announcements for passengers who violate health regulations

- Ability to apply specific algorithms for a particular pandemic to determine the risk-level of travelers and separate their wagon

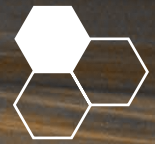
X-Gate economic features and development capabilities:

- Monetization based on advertising and gamification
- Indoor positioning and proximity marketing
- Value-added services by a dedicated multi-functional application
- Smart rail facilities via integration with in-station and on-board facilities.

Moreover, X-Gate is faster and more reliable than conventional ticketing systems and easy to maintain and update. X-Gate user engagement and revenue-making potential cover all the costs of its maintenance and updating as a powerful and permanent solution to deal with future pandemics.



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 Mahnaz Sohrabi
 Abolfazl Asgari
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 Minoo Sohrabi,
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6TH UIC WORLD CONGRESS ON RAIL TRAINING, TALENT AND DEVELOPMENT

Brief programme

Tuesday 29 November

17:00-20:00	Registration	Hall
17:30-20:00	Welcome Cocktail	Hall

Wednesday 30 November 2022

8:00-9:00	Registration	Hall
9:00-10:30	Opening Ceremony Hackathon Awards	Plenary room / Louis Armand
10:30-11:00	Coffee Break	Hall
11:00-11:40	Theme 1: Responding to Covid-19	Plenary room / Louis Armand
11:40-12:30	Theme 2: Innovation & Technologies	
12:30-13:30	Lunch	Hall
13:30-18:00	Technical visits	

Thursday 1 December 2022

	Plenary room / Louis Armand	List room
9:00-10:30	Theme 3: Training Simulators & Virtual Reality	Theme 4-1: International & national structures for training and education
10:30-11:00	Coffee Break	Coffee Break
11:00-12:30	Theme 4-2: International & national structures for training and education	Theme 5: Future skills strategy in an international framework
12:30-13:30	Lunch	Lunch
13:30-15:00	Theme 6: HR Training Lifecycle	Theme 7: Learning Technology
15:00-15:30	Coffee Break	Coffee Break
15:30-16:45	Theme 8: Gamification	Theme 9: Virtual Learning Environment
19:30-21:30	Gala dinner - Le Train Bleu, Gare de Lyon	

Friday 2 December 2022

9:00-10:30	Theme 10: Towards a sustainable management of skills and human resources	Plenary room / Louis Armand
10:30-11:00	Coffee Break	Hall
11:00-11:30	Presentation REPAIR Project - Recognising Emerging Practices Anticipating Industry Renewal	Plenary room / Louis Armand
11:30-12:00	Future skills for sustainable railways	
12:00-12:30	Congress Closing	
12:30-14:00	Lunch	Hall



UIC-P'S ACTIVITIES INCLUDE:

- logistics, ensuring the safety of people and property,
- services provided by qualified audiovisual technicians,
- rental of its control rooms and interpreting booths,
- rental of UIC's conference centre, hosting various types of events (private sector, industry and private companies nationally and internationally, as well as film shoots).



UIC-P hosts around 250 meetings and between 18,000 and 20,000 customers annually. UIC-P's personnel is available to all UIC employees as well as customers and strives to keep UIC facilities safe and help the organisation to achieve its objectives.





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