Roadmaps for A.I. integration in the rail Sector

Fact Sheet

Project Information

RAILS
Grant agreement ID: 881782
Status
Ongoing project

Funded under
H2020-EU.3.4.8.

Overall budget
€ 299,953,75

EU contribution
€ 299,953,75

Coordinated by
CONSORZIO INTERUNIVERSITARIO NAZIONALE PER L'INFORMATICA
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Project description

Revitalising the railways is a key goal of the EU’s transport policy. Modernising the sector – notably through the introduction of new technology – is necessary if rail is to be able to compete successfully with other modes of transport. The EU-funded RAILS project will investigate the potential of AI approaches in the rail sector. It will draft roadmaps for future research in next-generation signalling systems, operational intelligence and network management. Bringing together research institutions in four countries in Europe, the project will involve PhD students to support research in AI within the rail sector. Paving the way for the development of the new Railway 4.0 the
Within the rail sector, paving the way for the development of the new Railway 4.0, the project will research emerging threats and certification issues to be addressed.

Objective

"The overall objective of the RAILS research project is to investigate the potential of Artificial Intelligence (A.I.) approaches in the rail sector and contribute to the definition of roadmaps for future research in next generation signalling systems, operational intelligence, and network management. RAILS will address the training of PhD students to support the research capacity in A.I. within the rail sector across Europe by involving research institutions in four different countries with a combined background in both computer science and transportation systems. RAILS will produce knowledge, ground breaking research and experimental proof-of-concepts for the adoption of A.I. in rail automation, predictive maintenance and defect detection, traffic planning and capacity optimization. To that aim, RAILS will combine A.I. paradigms with the Internet of Things, in order to leverage on the big amount of data generated by smart sensors and applications. The research activities will be conducted in continuity with ongoing research in railways, but the methodological and technological concepts developed in RAILS are expected to stimulate further innovation providing new research directions to improve reliability, maintainability, safety, security, and performance. With respect to safety, emerging threats and certification issues will be addressed when adopting A.I. in autonomous and cooperative driving, based on the concepts of "explainable A.I." and "Trustworthy AI". With respect to cyber-physical threat detection, innovative approaches will be developed based on A.I. models like Artificial Neural Networks and Bayesian Networks together with multi-sensor data fusion and artificial vision. Resilience and optimization techniques based on genetic algorithms and self-healing will be addressed to face failures and service disruptions as well as to increase efficiency and line capacity. All those techniques will pave the way to the development of the new "Railway 4.0".

Field of science

/natural sciences/computer and information sciences/artificial intelligence
/natural sciences/computer and information sciences/artificial intelligence/computational intelligence

Programme(s)

Topic(s)
Call for proposal
H2020-S2RJU-OC-2019

Funding Scheme
Shift2Rail-RIA - Research and Innovation action

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