E-Learning Training in Railway Engineering
The SIGMA RAIL Project
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The SIGMA RAIL Project (2015-2018)

► **Erasmus+ EU Programme ✓**
  
  ❖ Key 1: Learning mobility of individuals
  
  ❖ **Key 2: Cooperation for innovation and the exchange of good practices ✓**
  ▪ Strategic partnerships in the field of education, training, and youth
  ▪ Knowledge alliances
  ▪ Sector skills alliances
  ▪ **Capacity building in the field of higher education ✓**
  ▪ Capacity building in the field of youth
  
  ❖ Key 3 (Support for policy reform)

► **Objective : to design and produce e-learning material for railway infrastructure maintenance**

► **8 academic partners from Europe and Maghreb**

SAMI 2018
February 7-10, 2018
Košice and Herl'any, Slovakia
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- Partners
- Genesis of the project
- Objective and deliverables
- Example of the Politecnico di Milano - Department of Mechanical Engineering’s online course: Catenary, third rail and battery
- Future works

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Partners (1): UVHC, France
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Partners (2): ENPC, France

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Partners (3): POLIMI, Italy
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Partners (4): UNL, Portugal

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Partners (5): ENSMR, Morocco
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Partners (6): UM5-R, Morocco
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Partners (7): UTM, Tunisia
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Partners (8): UMA, Tunisia

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Genesis (1)

Needs

Opportunity

RATP
2014-2020
UfM

ERASMUS+
EU Programme
Key 2 CBHE

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Objective

E-Learning Training Program in Railway Engineering

- serious game
- online courses
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Deliverables (1) : Ontologies

ONTOLOGIES

training program
serious game
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Deliverables (1): Ontologies
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Deliverables (1) : Ontologies

Serious Game Ontology Model

Having a scenario, that will present different objects to the trainee. The engine will automatically choose which object should be presented based on the profile of the trainee by querying the ontology.
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Deliverables (2): Serious Game

serious game

- master and engineering students & lifelong learning
- maintenance of railway infrastructure
- 3 macro-levels: information taking / detection, identification / diagnosis, decision-making: planning & action

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## INTRODUCTION TO THE MAINTENANCE OF GUIDED TRANSPORT INFRASTRUCTURE

1. Introduction to railway
2. Railway platform, geotechnical engineering, water drainage, underlayment
3. Track geometry, track gauge
4. Switches, crossings
5. Ballast
6. Ballast track, concrete track
7. Wooden sleeper, concrete sleeper, smart sleeper
8. Rail (rail welding, long welded rail, fastenings, tramway rail, grooved rail, etc.)
9. Construction works: tunnels, bridges, viaducts, rail trenches, stations
10. Catenary, third rail and batteries
11. Energy, electrification, alternating/direct current, diesel
12. Principles of signalling
13. Signalling evolution: ERTMS, CBTC
14. Telecommunication, passenger information systems, intelligent train
15. Diagnosis of anomalies of civil engineering elements
16. Failures and malfunctions of electrical systems
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Deliverables (3): An example of online course

- Excerpt of the Polimi’s online course
- *Catenary, third rail and batteries*
- Prof. Stefano Bruni and Dr. Marco Carnevale (Politecnico di Milano, Dipartimento di Meccanica: http://www.mecc.polimi.it/en/)

Thanks to Céline, Camille, & Cyrille from the University of Valenciennes’s teaching digital production Team
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Future works

► **Short time**
  - Completion of the e-learning material production
  - Subjectives assessments by third parties for feedback to the designers

► **Medium time**
  - External evaluation of the e-learning material
  - Accreditation of the SIGMA RAIL training program at National levels
  - Accreditation of the SIGMA RAIL at the European Union level

► **Long time**
  - English subtitling
  - Extending of the training program
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Project reference number - 561986-EPP-1-2015-1-FR-EPPKA2-CBHE-SP