



**Thesis Topic**

**Artificial Intelligence for Autonomous and Cooperative Driving in Smart-Railways**

**Motivation**

RAILS is a EU research project aiming at investigating the potential of Artificial Intelligence (A.I.) in the rail sector. One of the Work Packages defined in the project will address techniques for autonomous and cooperative driving, including virtual coupling. The project will address those techniques in terms of state-of-the-art technologies, methods and tools for vehicle-to-vehicle communication, control algorithms and dependability analysis via model checking and stochastic evaluation.

**Tasks**

The thesis will address an in depth literature review of autonomous driving for rail-based intelligent transportation systems. The student will also investigate technology transfer from other sectors (e.g., automotive platooning, ADAS, artificial vision, etc.) to railways. Finally, the student will define roadmaps for the adoption of autonomous driving techniques to railway control systems, specifically in the context of ERTMS/ETCS and applicable RAMS standards.

**Prerequisites \***

Mandatory: Good knowledge about computer science and embedded systems. Good grades and high interest.

Recommended: Bachelor degree, courses about formal methods, MDE, modeling and simulation.

**We offer you**

- Preliminary meeting to clarify objectives and requirements.
- Guidance, support and study materials (slides, lecture notes, technical books, research papers, etc.) on related topics.
- Modeling and simulation tools as required.

**Time frame**

- (to start as soon as possible)

**Supervisor(s)**

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