

TOP TEN

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Research Area 3: Efficient & Resilient Systems

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Conceptual Design and Evaluation of a Device for Automatic Uncoupling of Railroad Wagons

Initiatives in Europe aim to drive innovation in the rail sector and to make transportation by train a more attractive alternative to trucks or planes. One of these new innovations in the rail cargo sector is the so-called Digital Automatic Coupler (DAC). It is set to replace the obsolete screw-couplers, which are currently used to connect cargo train wagons to each other, to improve the general efficiency of cargo transportation by rail and to act as an enabler for new technologies. This new coupling type automates the coupling between two wagons, but not the decoupling, which still has to be done manually. As such, to make use of the full potential of this new technology and to make a step towards a fully autonomous rail system, the decoupling is to be automated as well within marshalling yards.

The purpose of this research is to develop and evaluate a concept for a track-side device that can autonomously perform this task. A sensor concept to reliably identify and localise couplers is developed and tested, as pictured in the first image. A concept for the manual decoupling mechanism is proposed and constructed on a test bench, where a device to test the coupling localisation and automatic decoupling is also built, as pictured in the second image. The first results in this test environment are promising, so this system is to be tested on a DAC demonstrator train, to verify and evaluate its performance in realistic conditions.

