# Collision Avoidance, Virtual Coupling of Trains, Autonomous Trains –

Novel Train Localization Methods for Next Generation Railways

Talk by Dr. Sc. Stephan Sand, DLR Institute of Communications and Navigation, Tuesday, October 19th, 04:00 p.m. (Zoom link: please contact thomas.zwick@kit.edu)

Although rail transport is mostly a very safe and highly energy-efficient means of transport, road transport is the main mode of transport. In EU-27, 76% of all goods and 83% of all passengers are transported on roads. To shift more traffic to rail, the railroads of the future must become more attractive and competitive by implementing innovations in both rolling stock and infrastructure. Hence, academia and industry are researching new applications such as collision avoidance, virtual coupling of trains, and autonomous driving trains. Key technologies for these applications are radio communications and train localization.

This talk will present the current state of the art in radio communications for trains and in train localization, and provide insights into research in these areas. Special attention will be given to the accurate, reliable and redundant localization of trains.
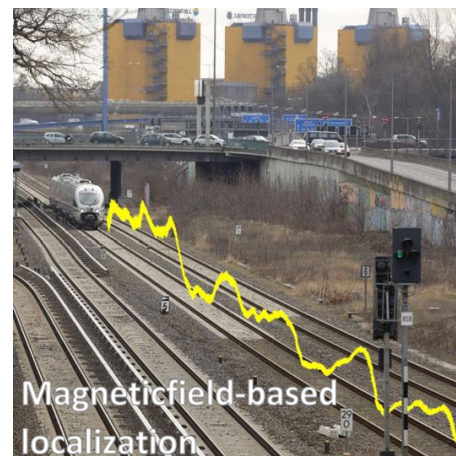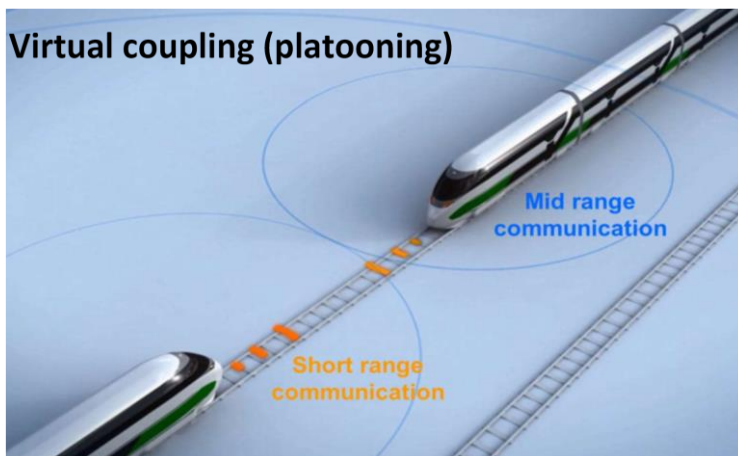
Stephan Sand received the M.Sc. in Electrical Engineering from the University of Massachusetts, Dartmouth, USA in 2001, the Dipl.-Ing. in Communications Technology from the University of Ulm, Germany in 2002, and the Dr. sc. ETH Zürich in Wireless Communications from the ETH Zurich, Switzerland in 2010. Since 2002, he has been researching wireless communications and multi-sensor navigation at the Institute of Communications and Navigation of DLR in Oberpfaffenhofen, Germany. Since 2014 he is leading the Vehicular Applications Group researching novel systems that combine robust navigation and wireless communications technologies for road users and railways. Dr. Sand has authored and co-authored more than 100 publications, has obtained several patents, and actively contributes to standardization of vehicular and railway communications.