

Vehicle Activities at the KIT

Visit of a Delegation in the Tempus-Project
29th of April 2010

Institute of Vehicle System Technology (FAST), Chair of Mobile Machines (Mobima)
Director: Prof. Dr.-Ing. Marcus Geimer



KIT – University of the State of Baden-Württemberg and
National Research Center of the Helmholtz Association

www.kit.edu

Agenda

- Welcoming
- Research activities of vehicle science at the KIT
- Institute of Vehicle System Technology

2

29.04.2010

Prof. Dr.-Ing. Marcus Geimer
Visit of a Delegation in the Tempus-Project

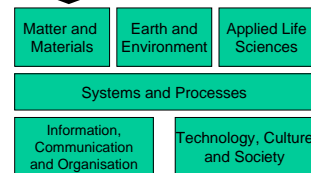
Institute of Vehicle System Technology (FAST)
Chair of Mobile Machines (Mobima)

Initiative of Excellence

Centers and Fokuses



Competence Areas



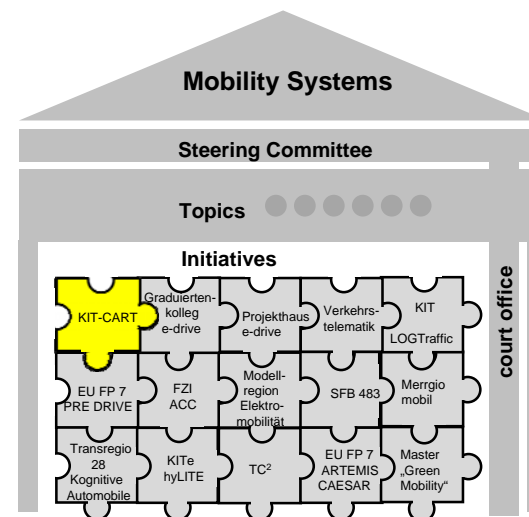
3

29.04.2010

Prof. Dr.-Ing. Marcus Geimer
Visit of a Delegation in the Tempus-Project

Institute of Vehicle System Technology (FAST)
Chair of Mobile Machines (Mobima)

Focus „Mobility Systems“



- Model of a „Dynamic“ Holding
- Common strategic planing of research, education and innivation
- Politische Vertretung nach innen und außen
- about 800 researcher, i.e. 250 full-time equivalents.

4

29.04.2010

Prof. Dr.-Ing. Marcus Geimer
Visit of a Delegation in the Tempus-Project

Institute of Vehicle System Technology (FAST)
Chair of Mobile Machines (Mobima)

KIT-CART

- clusters and coordinates the vehicle and mobility competence of "Universität Karlsruhe (TH)" and "Forschungszentrum Karlsruhe".
- works interdisciplinary: more than 30 institutes and facilities from the faculties for mechanical engineering, electrical engineering and information technology, informatics, structural engineering, geosciences and environmental sciences as well as from the economics
- generates comprehensive answers to actual and future automotive questions
- with appropriate teams of researchers adapted to the respective subjects
- from a single source.

KIT-CART focuses on

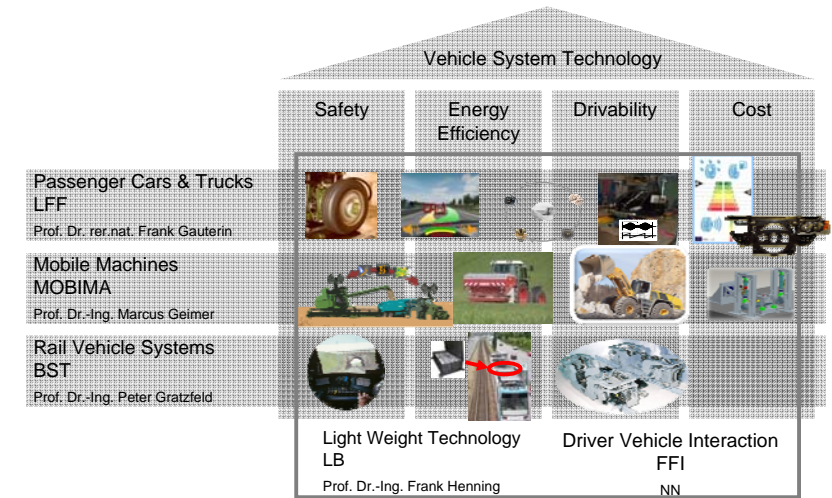
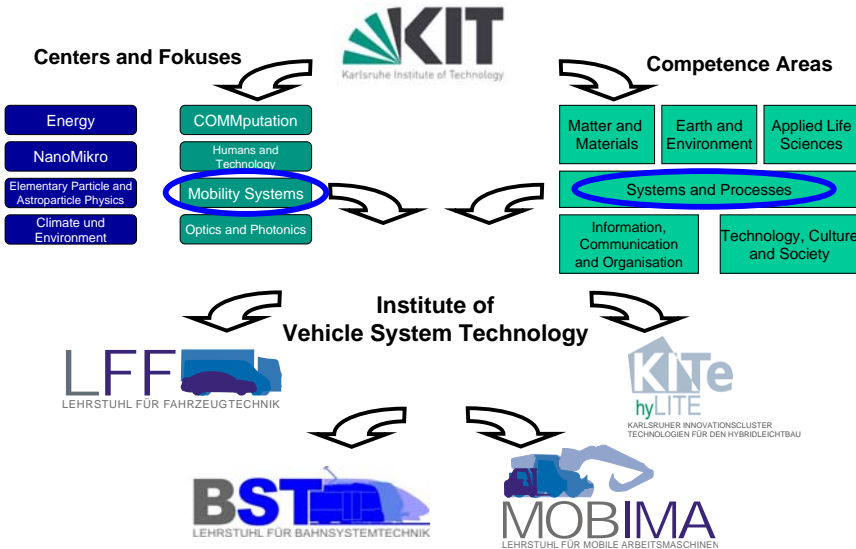
- energy efficiency and emissions reduction
- safety
- usability and comfort

KIT-CART uses the approach of an interdisciplinary system view, to ensure consistency of the solutions for vehicles and traffic:

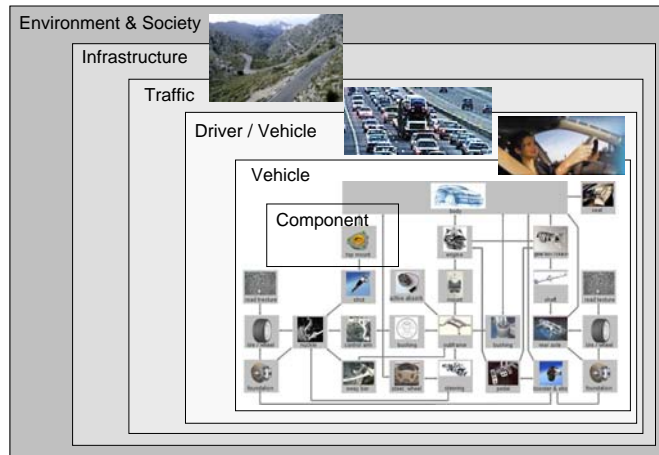
- vehicle as mechatronic system
- human vehicle interaction
- vehicle in traffic
- vehicle in society and environment



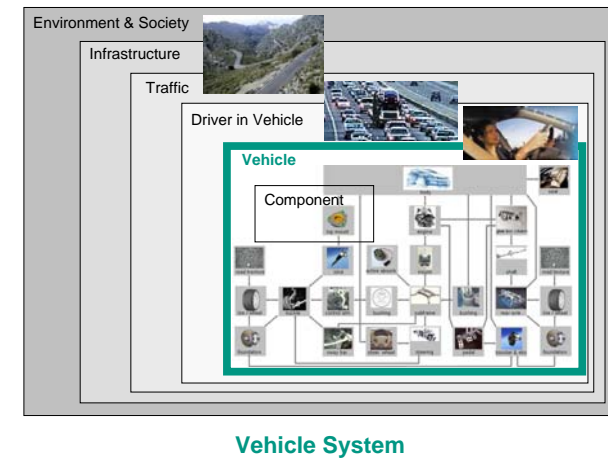
- Welcoming
- Research activities of vehicle science at the KIT
- Institute of Vehicle System Technology



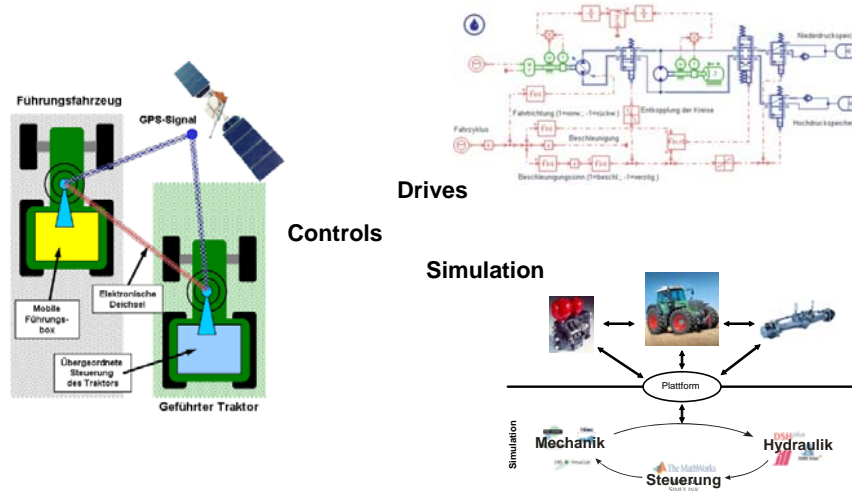
■ Vehicle System Technology



■ Vehicle System Technology



FAST-Mobima Research



13 29.04.2010 Prof. Dr.-Ing. Marcus Geimer
Visit of a Delegation in the Tempus-Project

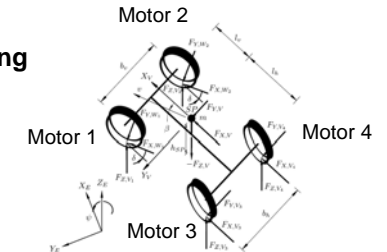
Institute of Vehicle System Technology (FAST)
Chair of Mobile Machines (Mobima)



FAST-LFF Research



e-Torque Vectoring



Hybrid Racing Car 911 GT3 R Hybrid



1. Leistungselektronik
2. Portalfahrer mit zwei Elektromotoren
3. Hochleistungs-Box
4. Elektrischer Schwungradspeicher
5. Leistungselektronik

14 29.04.2010 Prof. Dr.-Ing. Marcus Geimer
Visit of a Delegation in the Tempus-Project

Institute of Vehicle System Technology (FAST)
Chair of Mobile Machines (Mobima)

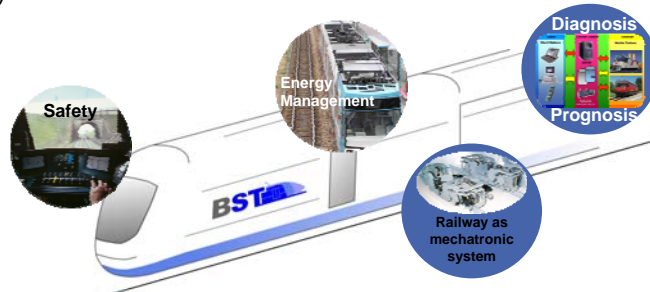


FAST-BST Research



Main Topics of Research Areas

- Railway as mechatronic system
- Energy Management
- Diagnosis / Prognosis
- Safety



15 29.04.2010 Prof. Dr.-Ing. Marcus Geimer
Visit of a Delegation in the Tempus-Project

Institute of Vehicle System Technology (FAST)
Chair of Mobile Machines (Mobima)



FAST-LB Research



Kite hyLITE

Karlsruhe Innovation Cluster for Hybrid Lightweight Solutions

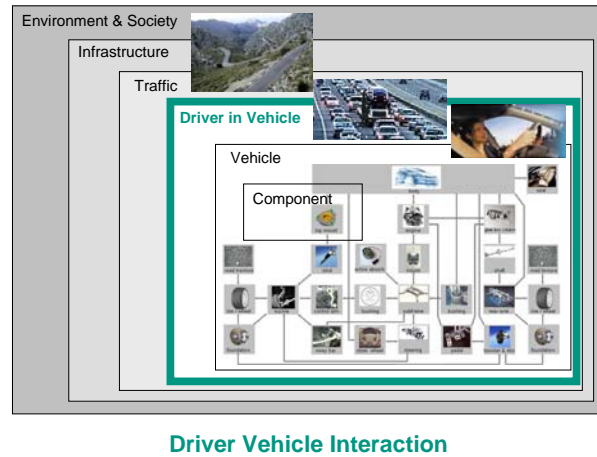


16 29.04.2010 Prof. Dr.-Ing. Marcus Geimer
Visit of a Delegation in the Tempus-Project

Institute of Vehicle System Technology (FAST)
Chair of Mobile Machines (Mobima)

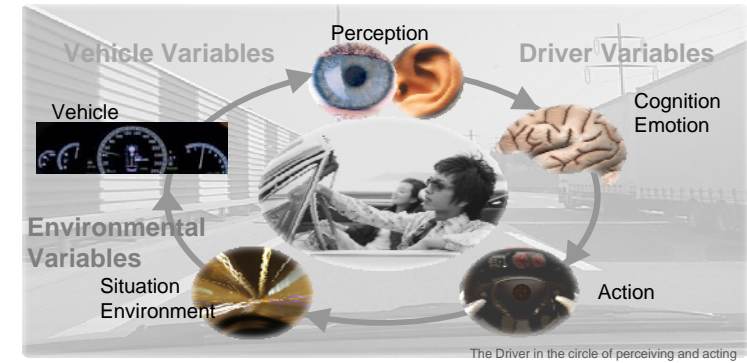


Vehicle System Technology



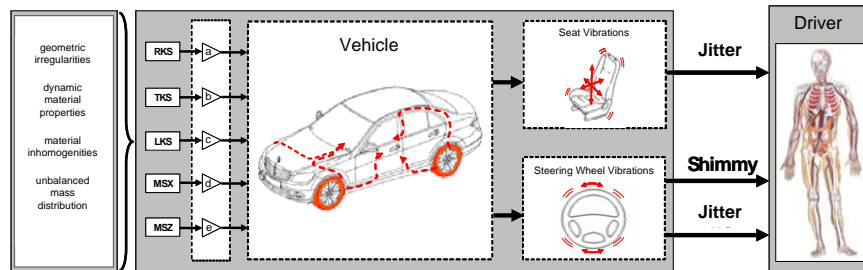
Driver Vehicle Interaction:

- Subject of the research:
Perceiving – Decision Taking – Taking Action in Vehicles
- Main Topic: What does the driver need to drive safe, energy efficient and with ease?



Driver - Vehicle Interaction – Example: Ride Comfort

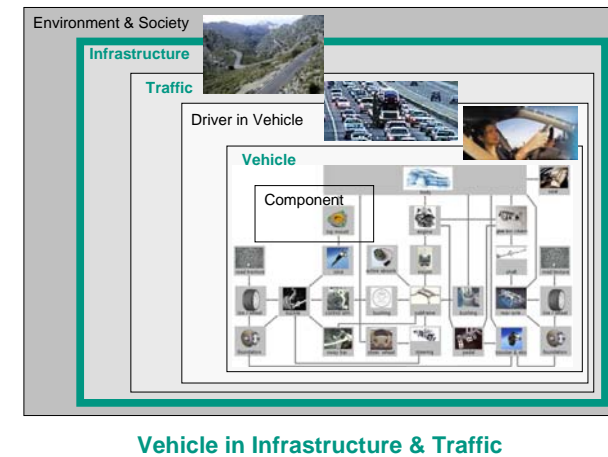
Examination of tire and wheel properties influencing ride comfort



Targets:

- Influence on forces and moments at the wheel
- Efficient preparation of wheels
- Transfer paths
- Precise detection of vibrations at seat and steering wheel

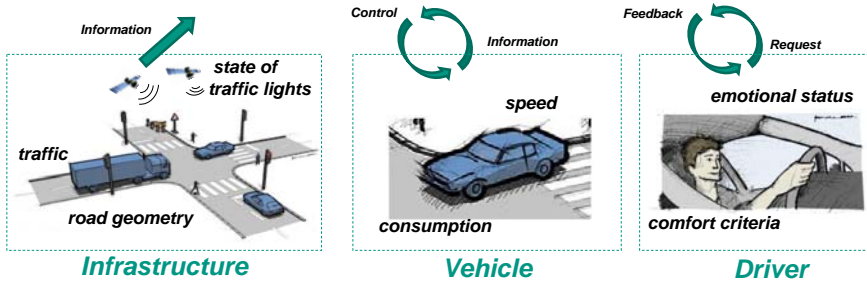
Interdisciplinary System View



■ Vehicle in Infrastructure & Traffic – Example: Vehicle operation strategy to save fuel, save travel time and reduce emissions

Analyze and optimize operation of vehicle

- Recommendation of route
- Gear selection
- Engine operating point
- Avoidance of frequent braking

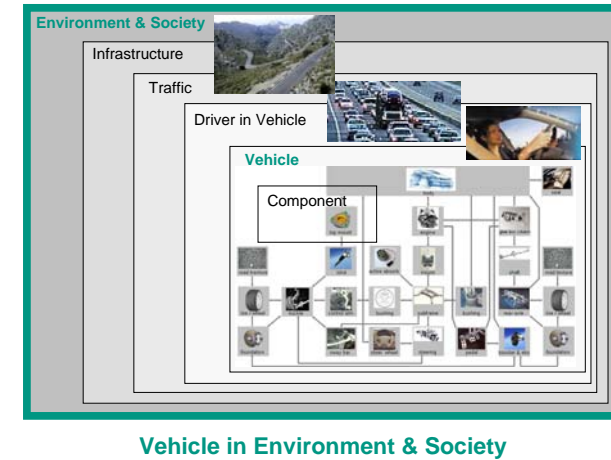


21

29.04.2010

Prof. Dr.-Ing. Marcus Geimer
Visit of a Delegation in the Tempus-ProjectInstitute of Vehicle System Technology (FAST)
Chair of Mobile Machines (Mobima)

■ Vehicle System Technology



22

29.04.2010

Prof. Dr.-Ing. Marcus Geimer
Visit of a Delegation in the Tempus-ProjectInstitute of Vehicle System Technology (FAST)
Chair of Mobile Machines (Mobima)

23

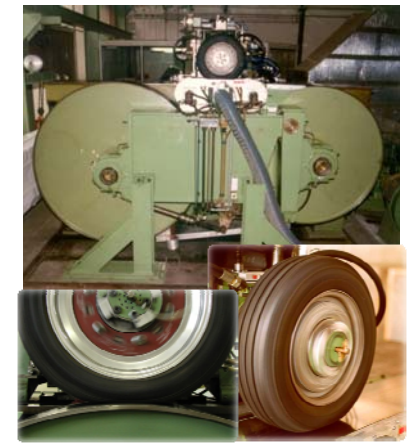
29.04.2010

Prof. Dr.-Ing. Marcus Geimer
Visit of a Delegation in the Tempus-ProjectInstitute of Vehicle System Technology (FAST)
Chair of Mobile Machines (Mobima)

Internal Drum Test Bench



Flat Track



24

29.04.2010

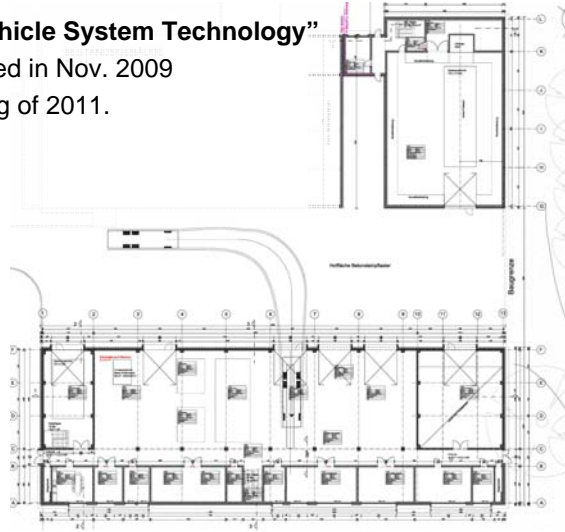
Prof. Dr.-Ing. Marcus Geimer
Visit of a Delegation in the Tempus-ProjectInstitute of Vehicle System Technology (FAST)
Chair of Mobile Machines (Mobima)

■ New Lab Building “Vehicle System Technology”

Construction work started in Nov. 2009

To be finished beginning of 2011.

Total size >2000 m².



25

29.04.2010

Prof. Dr.-Ing. Marcus Geimer
Visit of a Delegation in the Tempus-Project

Institute of Vehicle System Technology (FAST)
Chair of Mobile Machines (Mobima)



26

29.04.2010

Prof. Dr.-Ing. Marcus Geimer
Visit of a Delegation in the Tempus-Project

Institute of Vehicle System Technology (FAST)
Chair of Mobile Machines (Mobima)

