



# IDEA League

# 2016

AACHEN, GERMANY

**RAJALI MAHARJAN**

Mobility Summer School 2016

# Safe, Environmental and Economic Transport

September 26-30, 2016

RWTH Aachen University, Germany

# List of Participant Universities

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## IDEA League

Politecnico Di Milano, Italy

Chalmers University of Technology, Sweden

RWTH Aachen University, Germany

ETH Zurich University, Switzerland

TU Delft, Netherland

## ASPIRE LEAGUE

Tokyo Institute of Technology, Japan

Korea Advanced Institute of Science and Technology, Korea

Hong Kong University of Science and Technology, Hong Kong

Tsinghua University, China

Nanyang Institute of Technology, Singapore

# Program Content

## IDEA League

A focused network of leading European universities of science and technology

TU Delft  
ETH Zürich  
RWTH Aachen  
Chalmers  
Politecnico di Milano

### 26.09.2016 – DAY 1:

#### Program:

- 13:00 – 14:00 Arrival and registration of participants
- 14:00 – 15:00 Welcome at RWTH Aachen University  
Prof. Dr. Klee (vice rector RWTH Aachen University)  
Dr. Urban (vice director ika, RWTH)
- 15:00 – 15:30 IDEA League presentation  
Sjoerd Bastiaansen, IDEA League
- 15:30 – 18:00 Introduction of participants
- 18:00 – 19:30 Free time and check-in at Ibis Budget Hotel
- 19:30 Dinner

### 27.09.2016 – DAY 2:

#### Program:

- 08.30 – 09:00 Assembly
- 09:00 – 09:30 Organisational issues and timeline
- 09.30 – 11:00 Lecture: "Economic and Environmentally friendly Lightweight design"  
Dr. Tim Ellringmann, McKinsey & Company
- 11:00 – 12:30 Lecture: "A suppliers view of the challenges for passenger car and commercial vehicle automated driving"  
Dr. Andree Hohm and Jörg Lütznier, Continental
- 12:30 – 13:30 Lunch
- 13:30 – 15:00 Lecture: "Optimized & Active Aerodynamics on HD trucks"  
Patrick Bütterling, Institut für Kraftfahrzeuge, RWTH
- 15:00 – 17:30 Introduction to the group work
- 18:00 – 19:30 Guided tour of ika (Institut für Kraftfahrzeuge) (Optional)
- 19:30 Dinner

### 28.09.2016 – DAY 3:

#### Program:

- 08.30 – 09:00 Assembly
- 09:00 – 10:30 Lecture: "Platooning – Chances for Reducing CO<sub>2</sub>"  
Jens Kotte, Forschungsgesellschaft Kraftfahrwesen Aachen
- 10:30 – 12:00 Lecture: "Connected Driving – Potential to improve safety and efficiency"  
Kevin Schulte, Institut für Kraftfahrzeuge, RWTH
- 12:00 – 13:30 Group Work: Development of a Technology Roadmap for a Commercial Vehicle OEM
- 13:30 – 14:30 Lunch
- 14:30 – 17:30 Group Work: Development of a Technology Roadmap for a Commercial Vehicle OEM
- 18:00 – 19:30 Guided City Tour of Aachen
- 19:30 Dinner

### 29.09.2016 – DAY 4:

#### Program:

- 05:00 Meeting at RWTH Main Building and bus transfer to Hannover
- 10:00 – 16:00 Guided tours and individual fair time
- 16:00 Meeting at the parking and bus transfer to Aachen
- 21:00 Dinner (optional)

### 30.09.2016 – DAY 5:

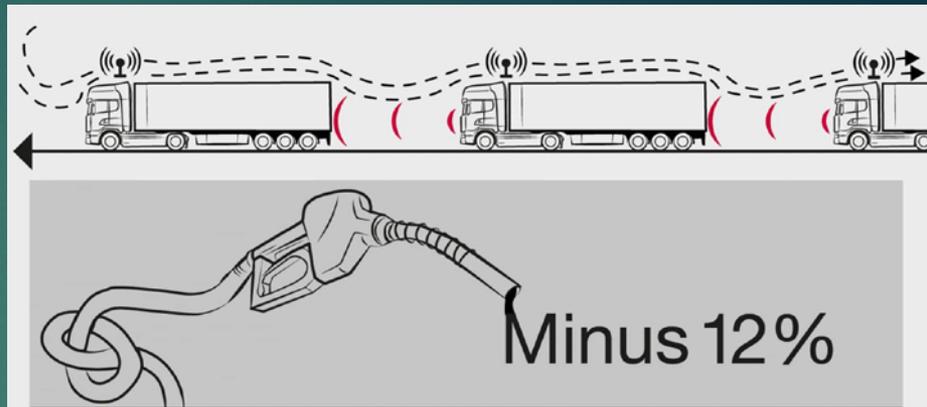
#### Program:

- 08.30 – 09:00 Assembly
- 09:00 – 12:00 Competition (Group Work Results)
- 12:00 – 12:30 Award ceremony and end of Summer School
- 12:30 – 13:30 Working Lunch (optional)

# Program Content

- ▶ Platooning
- ▶ Hybrid Electric Vehicle
- ▶ Battery Electric Vehicle
- ▶ Light-Weight Design
- ▶ Ergonomics
- ▶ Aerodynamics
- ▶ Drive Trains
- ▶ Automation and Connectivity

# Interdisciplinary Learning



Aerodynamics

Platooning



Automation and Connectivity

# Interdisciplinary Learning

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## Hybrid Electric Vehicle (HEV)

HEV is a type of hybrid vehicle and electric vehicle that combines a conventional internal combustion engine propulsion system with an **electric** propulsion system.

## Battery Electric Vehicle (BEV)

BEV is a type of vehicle in which, battery is used to power the propulsion.

## Drive Trains

The system in a motor vehicle which connects the transmission to the drive axles.

## Light-Weight Design

## Ergonomics

## “Development of a Technology Roadmap for a Commercial Vehicle OEM”

# Group Work

## Market Analysis



Fig 3: Amount of freight transported by our sold vehicles (2015) in 2016

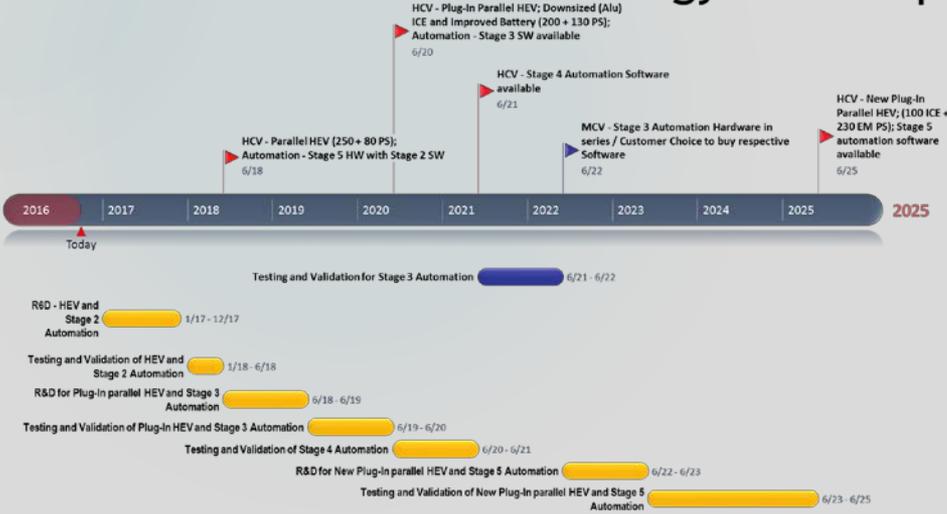
## Automation and Connectivity

### Solution and Implementation

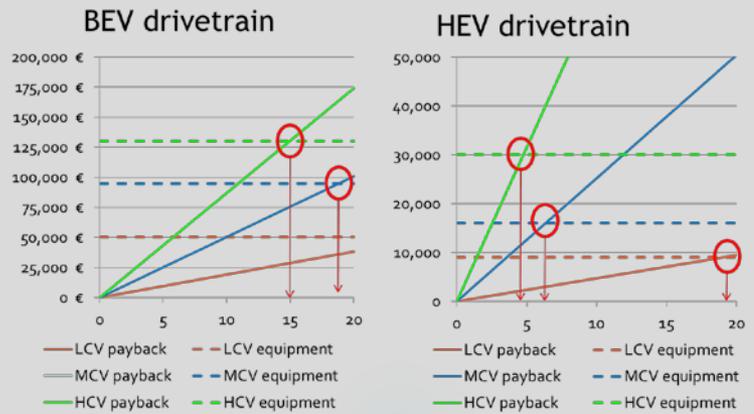
- Solutions
  - HCV: hardware for stage 3, software for stage 2 in 2018. Software upgrade to stage 3 in 2020.
  - MCV: hardware for stage 3 and customer choice to buy up to stage 3 software in 2022.
  - LCV: hardware and software for stage 1 in 2019.
- Risks
  - Slow regulation changes
  - Slow technological development
  - Change in expected customer needs
- Chances and benefits
  - Faster than expected technological development
  - Different automation configurations
  - Gain in experience to ensure faster implementation



## MCV and HCV - Technology Roadmap



## Payback periods



→ Payback period for BEV beyond lifetime  
 → Payback of HEV well reachable, even with slightly changing input parameters

# Why I applied for this program?

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DIVERSITY

INDUSTRIAL  
ENGINEERING

INTER-CULTURAL  
EXPERIENCE

COUNTRY  
EXPERIENCE

INTERNATIONAL  
DEVELOPMENT  
ENGINEERING

LIVING YOUR  
FEARS

TESTING YOUR  
ABILITIES

LEARNING ABOUT  
UNIVERSITIES FIRST  
HAND

PLATFORM FOR  
SHARING KNOWLEDGE

DIVERSIFIED  
LEARNING

# Conclusion

- ▶ Seek to Learn.

This is the only time you can be proud of not knowing and have someone teach you. Once you graduate you will be the one teaching.

- ▶ Explore your Horizon.

Wonderful opportunity to know what you know and what you don't.

- ▶ Take advantage of Opportunities surrounding you.

Welcome to >>> IAA 2016

NEW MOBILITY WORLD  
LOGISTICS



Eingang Entrance    Eingang Entrance    Eingang Entrance    Aussteller Exhibitor    Eingang Entrance    Eingang Entrance





















# Application Procedure & Requirements

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## Requirements:

- Should be enrolled in PhD course.
- Ability to speak fluent English.

Thank You.