MULTI-BRAND TRUCK PLATOONING

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INTRODUCTION

Great achievements in platooning of passenger vehicles and heavy-duty vehicles

› German national KONVOI (2005 – 2009)
› SARTRE (2009 – 2012)
› COMPANION (2013 – 2016)
› European truck platooning challenge (2016)

Platoons are still single-brand
WHY DO WE NEED MULTI-BRAND PLATOONING?

› Truck platooning has a great potential to improve road safety, reduce emissions and increase transport efficiency.

› Significant advances in platooning technology have been made in the last decade, but to achieve wider acceptance and advance the deployment of truck platooning, a holistic multi-brand approach is required.

› This calls for cooperative automation on different hierarchical levels, encompassing automation of strategic, tactical, as well as operational functionalities.
FIRST STAGE PROPOSAL ART-03

With representatives from all stakeholders (OEMs, suppliers and research) we propose to:

1. Pave the way for the adoption of multi-brand truck platooning in Europe to improve fuel economy, traffic safety and throughput.
2. Demonstrate driving up to six differently branded trucks in a platoon under real world traffic conditions across national borders.
OBJECTIVES

› Inter-operable platooning
  Compatible to ensure correct and safe operation
  Generic solution

› Safe platooning
  Key aspect to ensure acceptance of platooning
  Fail-safe & fault-tolerant

› Real-life platooning
  Both on closed testing grounds and real life

› Embedded platooning
  Seamless integration into the logistic value chain
SAFETY ASPECTS IN PLATOONING

- **Functional safety** (focussing on wireless communications)
  - *Fault tolerance* against communication failures
    - “Dynamic time gap”: time gap is established based on object detection quality
  - *Fail safety* w.r.t. communication failures
    - Invoke collision avoidance functionality

- **Traffic safety**
  - Platooning algorithm is main means of safety
  - In addition:
    - Trajectory prediction of other vehicles (in particular cut-ins)
    - Acceleration profile prediction of preceding vehicles
  - Predicted profiles can be used either for platooning controller or for collision avoidance controller

Operational safety

Traffic safety

Functional safety

Fault tolerance (availability)

Fail safety
MAIN NEW CONCEPTS

1. White label truck
2. Hierarchical platooning
THE CONCEPT OF WHITE LABEL TRUCK

- Conceptual un-branded platoon truck
- Requirement specification, stating the minimum set of requirements for trucks to be able to be part of a multi-brand platoon
- Serve as the basis for a simulation model
- Essential for the specification of a generic safety concept and platoon coordination mechanism
CONCEPT OF HIERARCHICAL PLATOONING

Services Layer

Strategic Layer

Tactical Layer

Operational Layer
CONCLUSION

- Deployment of platooning
- Contribute to
  - reduction of GHG, traffic congestion and accidents
  - increase competitiveness of Europe’s logistics sector
  - world leading EU truck-OEMs

- By multi-brand platooning via definition of pre-standards and platooning levels
- Actual implementation in six differently branded trucks, driving in real, mixed traffic conditions.

Integration of final demo event in a future EU truck platoon challenge !?
THANK YOU FOR YOUR ATTENTION

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