ECS SRA Chapter 1
Transport & Smart Mobility
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Organised by:
AENEAS, ARTEMIS-IA, EPoSS, ECSEL-JU & European Commission
Associated organiser:
EUREKA
Motivation

**EU Auto Industry:**
- Employment: 13.3 Mio people (6.1% of workforce)
- 6.8% of EU GDP
- 54 Bio private R&D investment

**Auto Semicon:**
- 5 in top 10 are EU
- > 35% market share
Motivation

Safe and Secure Mobility
More than tripling the semi value per car
(from $380 in 2017)

The same applies in other domains:

SHIPS
TRAINS
PLAINS
New: Share of Embedded SW in Vehicles exponential increasing

Electronics, sensors and especially embedded SW and AI are key technologies in next gen vehicles.

Source: McKinsey&Company
New: Share of Embedded SW in Vehicles exponential increasing

R&D in companies is shifting from classical disciplines to (embedded) SW and data

Source: Strategy & analysis
(https://www.strategy-business.com/feature/Software-as-a-Catalyst?gko=7a1ae)
But there are still remaining hardware priorities for covering the challenges

- **Sensing** modalities like radar, lidar, camera with increasing performance
- **Communication** needs are massively expanding (like in-car or wireless networking)
- **Processing** needs continue to grow massively (general purpose as well as dedicated accelerators like for AI/ML or sensor processing)
- **Intelligent control systems** (battery & energy management)
Key Challenges

- Clean, affordable and sustainable propulsion
- Secure connected, cooperative and automated mobility and transportation
- Interaction between humans and vehicles
- Infrastructure and services for smart personal mobility and logistics.
Clean, affordable and sustainable propulsion

- Energy Efficient Architectures (HW/SW)
- Energy & Power Storage & Management
- Control Strategies & Predictive Health
- Smart Sensors & Actuators
- NEW : Maritime : Multi-Fuel Engines
Secure, connected, cooperative & automated mobility and transportation

- Environment recognition
- Localization, Maps & Positioning
- Control Strategies (incl. Artificial Intelligence)
- Communication Inside & Outside
- Swarm Data Collection & Continuous Updating
- Functional Safety & Fail-Operational Architectures
- NEW : Smart & Autonomous Ships & Connected Maritime Systems incl. Automated Transport
Interaction between humans and vehicles

- Driver Activities & Vital Signs Monitoring
- Future Human Interaction Technologies & Concepts
- “Online” Personalization of Vehicles
- Smart mobility for
  - Elderly, very you or non-technical-afin people
  - Digital natives
  - Handicapped people
Infrastructure and services for smart personal mobility and logistics

- V2X incl. security & reliable availability
- Guidance Systems (Remote drones, trucks, ships, …)
- Mobility Platforms for “Mobility as a Service”
- Predictive & Remote Maintenance
- Efficient Logistics in Freight & Goods
Summary

Source: KMPG Mobility 2030 analysis
Multi-modal traffic of the future?
Thank you for your Attention