AUTOmated driving Progressed by the Internet Of Things

This project has received funding from the European Union’s H2020 research and innovation programme under Grant Agreement No 731993
Vehicle centric and Cloud approaches
New connectivity paradigm: Cloud and IoT

- V2X approach - vehicle centric
  - limited scope: only device with compatible connectivity
  - Limited functionalities – missing connected devices diversity – “mere” data (no filtering / augmentation)

- Cloud IoT approach – augmented data provided as a service
  - Connectivity agnostic
  - Semantics enhancing device representation (metadata)
  - 2 levels management: device and context
    - “Augmented” data representation out of the context management
    - E.g. traffic jam or other hazards / traffic : environment events from individual Things’ data
  - Easy cross domain service integration - aggregation
  - Standardised data models - platform openness – higher cyber-security
IoT to transform automated driving

Vehicle IoT integration

IoT Device

Autonomous driving functions

Local Dynamic Map (LDM)

Data fusion

Vehicle IoT enabled platform

AD+IoT Communication (3G/4G, ITS-G5, LTE-V2X)

In vehicle sensors

IoT platform
interconnecting things based on existing and evolving interoperable information and communication technologies

IoT eco-system
of objects of the physical world, which are capable of being identified and integrated into communication networks

Objects provide data to IoT
platform using
IoT standardised
protocols

Objects are created virtually in the IoT platform

AUTOPilot IoT platform develops applications using data from IoT data sources

AUTOPilot applications enable services that support autonomous driving

AUTONOMOUS DRIVING progressed by IoT

no V2V / V2I
Perspective of IoT for automated driving

• Current use cases (AUTOPILLOT)
  • Enhance driving environment perception for the AD DDT and RT HD maps update
  • Provide SaaS/PaaS for mobility (OEM vehicle management platform or MaaS)

• Future usages
  • Driven by usage of AI and data analytics in the IoT cloud platforms
  • Enabled by future Cellular network performances:
    • Massive IOT providing more information for the AD functions – (mMTC)
    • Higher data rates (eMBB) allowing high volume data representation (videos)
    • Lower latency (URLLC) and MEC enabling
    • use of IoT for RT DDT in the vehicle and DDT combined with Infrastructure control
IoT BigData for Automated driving

• Hybrid approach for access to BigData:
  1. Centric approach for OEMs:
     • Sensitive data with relevance only for OEM
     • Contains vehicle specific data
       • Cannot be shared (confidential)
       • Long term relevance for analytics and deep learning for instance
  2. Distributed and open data access
     • Essential for sharing safety relevant data (e.g. CAM/DENM data)
       • It is as important for each user that other vehicles get as much useful data as my vehicle get – accident may occur from another vehicle
       • Data consolidation for higher integrity
     • 2 levels of time relevance
       • For open data access – only short term relevance for cooperative and automated driving
         • Disable access to “older data”
       • Older data has relevance for investigation in case of incident/accident
         • Limited access – only for relevant organisations (police/justice – insurance)
         • Similar as the situation with the signalling data in TelCo networks
Thank you

François Fischer
AUTOPILOT project coordinator

Senior manager Innovation and Development

ERTICO – ITS Europe
Avenue Louise 326
B-1050 Brussels Belgium
www.ertico.com
Tel: +32 (0)2 400 07 96 (direct)
f.fischer@mail.ertico.com