Standards for Connected and Autonomous Transportation: Nurturing the Era of e2e Mobility as a Service (MaaS)-2019

Introduction

Dr. Hermann Brand, European Standards Affairs Director, IEEE SA
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Welcome at 2\textsuperscript{nd} edition of

Nurturing the Era of e2e Mobility as a Service (MaaS): Standards for Connected and Autonomous Transportation

2 - 3 December 2019 | Munich, Germany
Standards evolve rapidly in response to technical innovations

To trade-off technology enablers for autonomous driving, including
- **Sensors** (camera, radar, LIDAR)
- **Positioning and HD maps**
- **Communication** (a-hoc, cellular, hybrid)
- **AI techniques** (machine learning/deep learning)

To build the Physical and Digital Infrastructure of road operators for autonomous vehicles

Safety First for AV
And operate secure to maintain a safe state

To evolve e2e System Architecture incl. Vehicle Platforms and enable Platform Businesses
- **Data driven engineering and operation**
- **Test solutions and validation methods**
Standards facilitate a smooth evolution of the automotive eco-system

There are issues which cannot be solved by a single company or by a closed circle of a few companies.

An open collaboration platform in a proven ‘safe-harbor’ legal framework for standardization is needed,

1. to build trust
2. to reduce risk and cost
3. to reduce complexity and options
4. to ensure a smooth evolution of value networks
5. to facilitate economies of scale
6. to enable interoperable solutions.
Some new standardization projects

• Framework of Knowledge Graphs (P2807),
• Framework and Requirements of Shared Machine Learning (P2830),
• Framework for Depp Learning Evaluation (P2841)
• Architectural Framework and Application of Federated Machine Learning (P3652.1)
• Standard for the Framework of Blockchain Use in Internet of Things (IoT) (P2418.1)
• Standard Data Format for Blockchain Systems (P2418.2)
• Standard for the Framework of Distributed Ledger Technology (DLT) Use in Connected and Autonomous Vehicles (P2418.4)
• Robot Task Representation (P1872.1)
• Standard for Autonomous Robotics (AuR) Ontology (P1872.2)
• 3D Map Data Representation for Robotics and Automation (P2751)
• Algorithmic Bias Considerations (P7003)
• Ontological Standard for Ethically Driven Robotics and Automation Systems (P7007)
• Standard for Ethically Driven Nudging for Robotic, Intelligent and Autonomous Systems (P7008)
Safety Standards Evolution Approach

Industry Connection: Assessment of Standardization Gaps for Safe Automated Driving (drafting stage)

IEEE standards

IEEE2846
IEEE P2851
IEEE P1228

Non-IEEE standards

ISO 26262 (automotive FuSa)
ISO 21448 (SOTIF)
UL 4600

Based on an idea of Riccardo Mariani
More projects are in the pipe. Time to get engaged!

Approved but not yet kicked off: for example

- A formal model of safe automated vehicle decision making (P2846)
- Exchange/Interoperability Format for Safety Analysis and Safety Verification of IP, SoC and Mixed Signal ICs (P2851)
- Software Safety (P1228)

In drafting stage: for example

- Automotive radar performance metrics and testing
- Secured safety

In exploration stage: for example

- Sensor data fusion and environmental model
- NLP interoperability
Workshop sessions

- **Purpose and scope of the workshop:**
  - **Inform** about some IEEE standards under development
  - **Identify** common pain points and related standardization needs

- **DAY 1:**
  - Session 1: *Hitting the Safety Spot – but Secured*
  - Session 2: *Data Driven Engineering*

- **DAY 2:**
  - Session 3: *Vehicle Platforms and Platform Business*
  - Session 4: *Technology Enablers for Autonomy – Vehicle Features and Infrastructure Capabilities*
  - Session 5: *Concluding Remarks and Next Steps*
Thank You
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Some important links

- IEEE SA Standards Board: [https://standards.ieee.org/about/sasb/index.html](https://standards.ieee.org/about/sasb/index.html)
- IEEE SA Membership: [https://standards.ieee.org/about/membership/index.html](https://standards.ieee.org/about/membership/index.html)
- Nurturing the Era of e2e Mobility as a Service (MaaS): Standards for Connected and Autonomous Transportation, 2 Dec 2019 (afternoon)- 3 Dec 2019, Munich, Germany: [https://standards.ieee.org/events/e2e-maas/index.html](https://standards.ieee.org/events/e2e-maas/index.html)
IEEE partners with a number of players to bring collective value

A must to leverage Network Effects and master the Digital Transformation

OCEANIS: Open Community for Ethics in Autonomous and Intelligent Systems, [https://ethicsstandards.org/](https://ethicsstandards.org/)