

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 2nd 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



EC H2020 EPoSS SRA 2017

To evolve e2e System Architecture incl. Vehicle Platforms and enable Platform Businesses

- Data driven engineering and operation
- Test solutions and validation methods

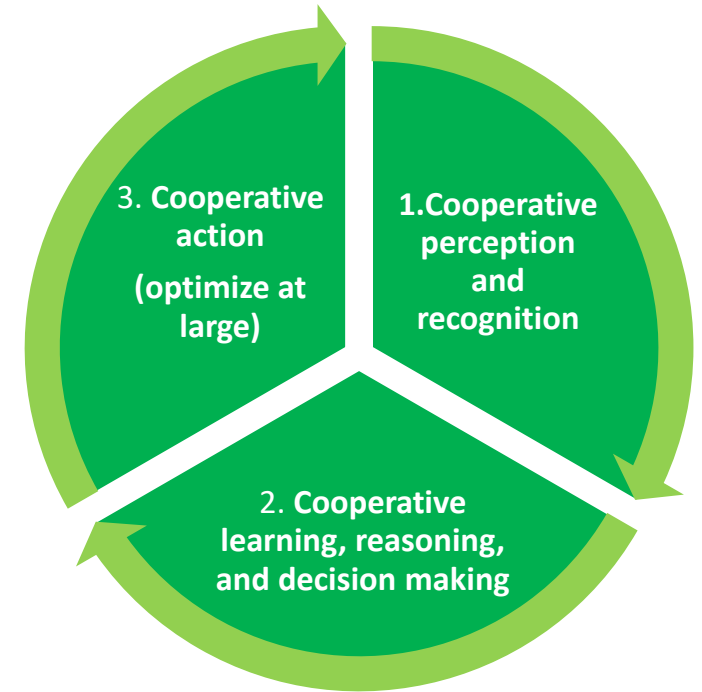
To trade-off technology enablers for autonomous driving, including

- **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



sense-plan-act cycle extended

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**.

REMINDER!



Some new standardization projects

- Framework of Knowledge Graphs (P2807),
- Framework and Requirements of Shared Machine Learning (P2830),
- Framework for Deep 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)

Get involved now!

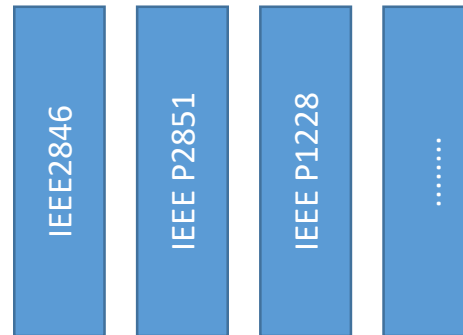


Safety Standards Evolution Approach

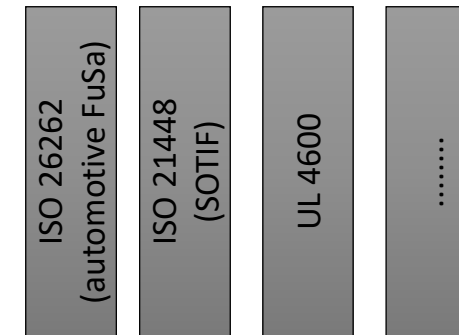


Industry Connection: Assessment of Standardization Gaps for Safe Automated Driving (drafting stage)

IEEE standards



Non-IEEE standards



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

Get engaged now!



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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**IEEE STANDARDS
ASSOCIATION**



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Some important links

- IEEE Standards Association (IEEE SA): <https://standards.ieee.org/>
- IEEE SA Standards Board: <https://standards.ieee.org/about/sasb/index.html>
- IEEE SA Membership: <https://standards.ieee.org/about/membership/index.html>
- IEEE-SA Ethernet & IP @ Automotive Technology Day, 24 Sep 2019 - 25 Sep 2019, Detroit, MI, USA; <https://standards.ieee.org/events/automotive/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>

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/>

