Learn to apply SOTIF principles for ADAS and AV systems according to ISO 21448

Autonomy safety training helps engineers achieve safety of the intended function for autonomous vehicles

Course overview

This 2.5-day training course establishes guiding principles and practical best-practices for autonomous vehicle safety as described in the ISO 21448 standard – "Road vehicles – Safety of the intended functionality." The course agenda closely aligns to the ISO 21448 standard, and the relevant certification is for autonomous and semi-autonomous (or 'automated driver assist') systems, ranging from Society of Automotive Engineers (SAE) autonomy levels 1-5. Several group exercises and work examples are included to illustrate key concepts on relevant real-world automotive technologies and systems.

Training topics

- Introduction to advanced driver assistance systems (ADAS) and autonomous vehicles (AV)
- Safety of the Intended Function (SOTIF)
- The ISO 21448 framework for SOTIF
- ADAS and AV system specification and design
- Hazard identification and risk analysis
- Acceptance criteria, validation targets and validation effort using rationale such as:
  - Globalement au moins aussi bon or "globally at least as good" (GAMAB)
  - "As low as reasonably practicable" (ALARP)
  - "Minimal endogenous mortality" (MEM)
- Analysis of functional insufficiencies and triggering conditions using various methods such as failure modes and effects analysis (FMEA), fault tree analysis (FTA), and systems theoretic process analysis (STPA)
- Functional modifications to reduce SOTIF risks
- Developing a complete verification and validation strategy
- Verification: evaluating known hazardous scenarios using scenario testing at the system and vehicle levels
- Validation: evaluating unknown hazardous scenarios using simulation and test
- Defining a criteria for SOTIF release and the associated SOTIF release process
- Operating phase activities necessary for post-release implementation in the field
- An introduction to other relevant safety standards in ADAS and AV
- Process-oriented requirements for safety development processes
- Wrap-up and discussion topics

Optional UL Certified Autonomy Safety Professional Exam

Participants who complete the full 2.5-day of training are eligible to take a two-hour certification exam in the afternoon of the third day. Those who pass the exam are individually certified as a *UL Certified Autonomy Safety Professional (UL-CASP)* in ISO 21448.

Upon the successful completion of the *UL-CASP* exam, participants will receive a certificate and badge that they can use to demonstrate their competence in the ISO 21448 AV safety standard. The certification is good for three years, after which individuals may recertify.

Objectives

Upon successful completion of this workshop,
you will be able to:

- Understand the fundamentals of SOTIF according
  to the ISO 21448 framework in order to comprehend
  and construct development processes for ADAS
  and AV systems that achieve SOTIF

- Perform hazard analysis and risk assessment in
  accordance with ISO 21448, including definition
  of acceptance criteria for validation of ADAS and
  AV systems

- Analyze systems with respect to both triggering
  conditions and functional insufficiencies, and
  derive scenario testing to fully develop and verify
  performance in the face of such conditions

- Develop a verification and validation strategy
  to address both known and unknown hazardous
  scenarios through a combination of testing methods
  and techniques applied at the system level and
  vehicle level

- Understand the role of simulation, vehicle scenario
  test and vehicle field/fleet test in the creation of
  a complete verification and validation argument

Target audience

- AV hardware and software developers
- Simulation engineers working with
  ADAS and AV verification
- Test and validation engineers
- Project and product leaders
- Compliance engineers

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