

Automated and connected road transport

France's views on a possible approach of coordinating scenario libraries for safety assessment

Outline

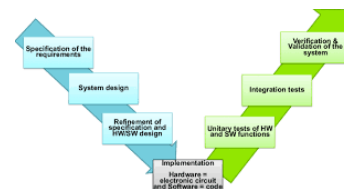
1. State of play at the international level
2. Rationale of French approach
3. Opportunities and challenges for a coordinated approach

Context and international overview

- Scenarios are at the forefront of safety assessment / test methods
 - as one of the five VMAD pillars + making the link between pillars
- Scenarios have the potential to address the complexity of assessing ADS performance across the diversity of possible ODDs
- The scenario approach is part of the EU ADS regulation
 - *“free from unreasonable risks [...] through: b) a scenario specific approach showing that the ADS will not increase the level of risk compared to a manually driven vehicle”*
- The scenario approach is covered in the ADS integrated document
 - *“The guidelines recommend the development of a scenario catalogue for use across five validation pillars”*
- Various industrial and research initiatives have been launched
 - *ADScene + MOSAR (FR), SafetyPool (UK), SAKURA (JP), PEGASUS (DE), StreetWise (NL), Fortellix (private),...*

Rationale of the French approach towards scenarios

- Scenario-based approach is central within France's safety demonstration process
- Rationale and features of the French approach :
 - Support completeness of reasonably foreseeable hazards
 - Support the conception and the validation phase
 - Use a step-by-step approach : 1) scenario generation ; 2) scenario selection
 - Combine 3 pillars (sources) : data-based, knowledge-based, combinatory-based



Data-based

Accident data bases

Real world data

Knowledge-based

Risk analysis

Combinatory-based

Descriptors' axis

Axis combination

- Support transparency, traceability and explicability of safety assessment methods
- Support proportionality of scenario use :
 - from generic ODDs to concrete deployment environments
 - from low to high severity + low to high exposure
 - from “duty of care” to immediate crash avoidance in expected responses

Opportunities and challenges in international coordination in scenario databases (1/2)

- ***What do we mean by scenario data base ?***
 - ***List of descriptors ?***
 - Scene / Hazards / (Response ?)
 - Other scenario attributes (severity, exposure)
 - ***Collected scenarios ?***
 - Projected on descriptors
 - Metadada (ex : collection source,...)
 - ***Test procedures*** implementing scenarios (incl. pass / fail criteriae ?)
 - ***Generation / Combination / Selection modules ?***
 - ***Governance features ?***
 - Requirements for database feeding ?
 - Access rules (incl. differentiated) ; Reuse conditions ?
 - Pricing policies...?

Opportunities and challenges in international coordination in scenario databases (2/2)

- ***What do we mean by “coordination” ?***
 - Common / inter-operable list of descriptors ?
 - Minimum list of metadata ?
 - Mutual access to collected scenarios ? (Scene / Hazards / Responses ?)
 - Mutual access to scenario quoting (e.g. severity, exposure)
 - Mutual access to generation / combination / selection modules ?
 - Mutual access to qualified scenario for testing purposes ?
 - Common access rules ? (e.g. special rights for Regulators ? Accident bureaux ?)
 - Common pricing principles ? (e.g. cost-orientation) ?
 - Standardized interfaces / APIs ?
 - References for quality levels ?
 - (e.g. completeness ? traceability ? data sources’ consistency / quality) ?

Thank you for your attention – more details available on FR work

<https://www.ecologie.gouv.fr/en/automated-vehicles>

Annex 1

French reference documents on scenario-based approach

Methodological documents available at:

<https://www.ecologie.gouv.fr/en/automated-vehicles>

https://www.ecologie.gouv.fr/sites/default/files/DGITM_Approche-par-scenarios-fevrier-2022-EN.pdf

https://www.ecologie.gouv.fr/sites/default/files/DGITM-L1-septembre_2022-EN.pdf

https://www.ecologie.gouv.fr/sites/default/files/DGITM_Approche-par-scenarios-fevrier-2022-EN.pdf

https://www.ecologie.gouv.fr/sites/default/files/DGITM-ODD_dezscriptors-juin_2022-EN.pdf

https://www.ecologie.gouv.fr/sites/default/files/DGITM-L1-septembre_2022-EN.pdf

<https://www.ecologie.gouv.fr/sites/default/files/DGITM-Articulation-GAME-SOTIF-scenarios-2023.pdf>

https://www.ecologie.gouv.fr/sites/default/files/DGITM-Utilisation-scenarios-NATM-fevrier_20231.pdf

Guideline documents available at:

<http://www.strmtg.developpement-durable.gouv.fr/>

Research scenario database (MOSAR) = application of methodological and technical principles

French industry scenario database (ADScene) = industrialization of MOSAR database

& national closed-access reference documents = scenario requirements