IEEE P2846: Assumptions for Models in Safety-Related Automated Vehicle Behavior

July - December 2020 Status Report

Accomplishments

While the COVID-19 pandemic has impacted the Working Group's ability to meet in-person, overall we still made great strides in developing this standard during these challenging times. Here are some of our key accomplishments during this time period:

- Utilized a set of five task forces operating in parallel to develop targeted content for the initial draft of the standard
- Circulated the initial draft with member entities for review and comment
- Conducted a week-long virtual face-to-face meeting to resolve the comments and produce a second draft
- Established liaison agreements with ISO and SAE
- Added the following new members: AMD, Aurora, Fortellix, NIST, Nuro, and Rivian
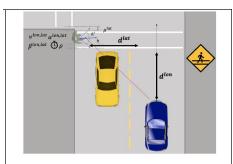
Major Sections of Draft Standard

The core content produced by the task forces which currently comprise the draft standard is organized into three major sections.

Ego vehicle turning left at intersection, and another road user is blocking visibility of potential incoming pedestrians at crosswalk

Scenarios & Assumptions: Identifies a set of scenarios that cover safety-relevant driving situations that an AV may encounter in operations on public roads and within each scenario, what are the minimum set of assumptions that shall be considered in order to increase driving safety. As the figure illustrates, the minimum set of reasonably foreseeable assumptions defined by this standard includes properties of other road users, such as velocity v, heading h, rate of change of the heading angle h', braking capabilities β, and response times ϱ.
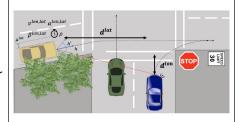
Common Attributes of Suitable Safety-Related Models: The WG conducted a literature review of contributed safety-related models including RSS, SFF, Rulebooks, and others. The reviewed models apply formal methods. Based on this literature review, the WG identified a set of common attributes observed among the reviewed literature. This attribute list may be different for other types of models such as ML models.

Ego vehicle turning right at intersection with limited visibility due to static and dynamic objects in the scene

Conformance Methods for Assumptions Used in Safety-Related Models: Identifies methods for various design and testing processes, that can demonstrate whether the implementation of a safety-related model conforms to the minimum set of required reasonably foreseeable assumptions defined in the standard.

Wrap-Up & More Information

The third draft of the standard is currently going through a subsequent round of updates and the WG is targeting the second quarter of 2021 to submit the standard for balloting with the IEEE Standards Committee and to simultaneously initiate a 60-day public review period. The goal is for this standard to be officially published by the end of 2021. For more information and a schedule of upcoming meetings please see our public site or contact one of the Working Group officers.