Elektrobit

UDACITY

Safety Plan Lane Assistance

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Document history

Date	Version	Editor	Description
3/1/18	0.1	Ken Overholt	Initial draft
3/3/18	0.2	Ken Overholt	Candidate for final release
3/8/18	1.0	Ken Overholt	Final Release
3/9/18	1.1	Ken Overholt	Updated Measures

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Introduction

Purpose of the Safety Plan

The purpose is to provide an overall framework for the Lane Assistance item and to assign roles and responsibilities for functional safety for this item.

Scope of the Project

For the lane assistance project, the following safety lifecycle phases are in scope:

Concept phase
Product Development at the System Level
Product Development at the Software Level

The following phases are out of scope:

Product Development at the Hardware Level
Production and Operation

Deliverables of the Project

The deliverables of the project are:

Safety Plan
Hazard Analysis and Risk Assessment
Functional Safety Concept
Technical Safety Concept
Software Safety Requirements and Architecture

Item Definition

The lane assistance item alerts the driver that the vehicle has accidentally departed its lane and attempts to steer the vehicle back towards the center of the lane. It has two main functions:

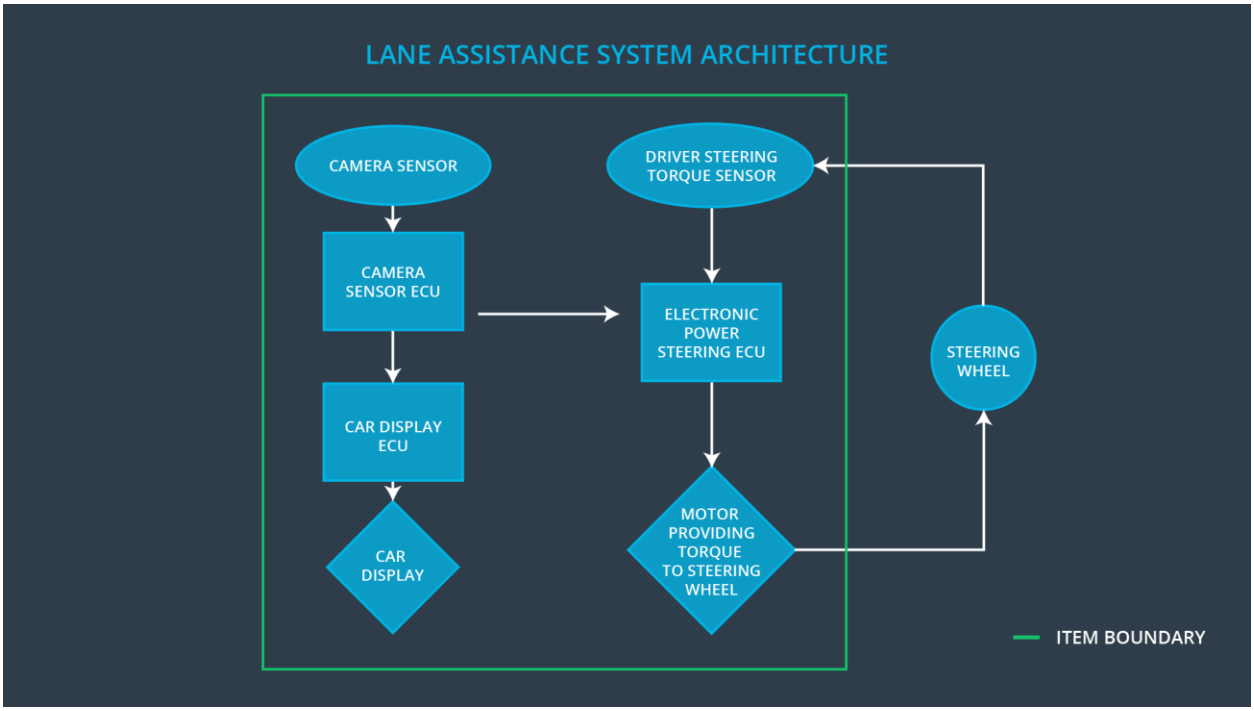
1. Lane departure warning

2. Lane keeping assistance

The lane departure warning function shall apply an oscillating steering torque to provide the driver a haptic feedback.

The lane keeping assistance function shall apply the steering torque, when active, in order to stay in the ego lane.

The camera subsystem, the electronic power steering subsystem, and the car display subsystem are all responsible for each of the functions.



Goals and Measures

Goals

The goal of the project is to reduce risk for the lane-keeping assistance feature to acceptable levels.

Measures

Measures and Activities	Responsibility	Timeline
Follow safety processes	All team members	Constantly
Create and sustain a safety culture	Safety Manager	Constantly
Coordinate and document the planned safety activities	Safety Manager	Constantly
Allocate resources with adequate functional safety competency	Project Manager	Within 2 weeks of start of project
Tailor the safety lifecycle	Safety Manager	Within 4 weeks of start of project
Plan the safety activities of the safety lifecycle	Safety Manager	Within 4 weeks of start of project
Perform regular functional safety audits	Safety Auditor	Once every 2 months
Perform functional safety pre-assessment prior to audit by external functional safety assessor	Safety Manager	3 months prior to main assessment
Perform functional safety assessment	Safety Assessor	Conclusion of functional safety activities

Safety Culture

Safety has the highest priority among competing constraints like cost and productivity. Processes ensure accountability such that design decisions are traceable back to the people and teams who made the decisions. The organization motivates and supports the achievement of functional safety through rewards. The organization penalizes shortcuts that jeopardize safety or quality. The teams who design and develop a product are independent from the teams who audit the work. The company design and management processes are clearly defined. Projects have the necessary resources including people with appropriate skills. Intellectual diversity is sought after, valued, and integrated into processes. Communication channels encourage disclosure of problems.

Safety Lifecycle Tailoring

For the lane assistance project, the following safety lifecycle phases are in scope:

1. The Concept phase which includes the item definition, initiation of the safety lifecycle, hazard analysis and risk assessment, and the functional safety concept.
2. Product Development at the System Level
3. Product Development at the Software Level

The following phases are out of scope:

1. Product Development at the Hardware Level
2. Production and Operation

Roles

Role	Org
Functional Safety Manager - Item Level	OEM
Functional Safety Engineer - Item Level	OEM
Project Manager - Item Level	OEM
Functional Safety Manager - Component Level	Tier 1
Functional Safety Engineer - Component Level	Tier 1

Functional Safety Auditor	OEM or external
Functional Safety Assessor	OEM or external

Development Interface Agreement

1. The purpose of the Development Interface Agreement is to delineate the design and production responsibilities between the OEM and Tier 1 supplier.

2. The OEM is supplying a functioning lane assistance system. The Tier 1 company needs to analyze and modify the various sub-systems from a functional safety viewpoint.

Confirmation Measures

Confirmation measures serve two purposes:

1. Confirm that a functional safety project conforms to ISO 26262
2. Confirm that the project really does make the vehicle safer

The confirmation review ensures that the project complies with ISO 26262. As the product is designed and developed, an independent person will review the work to make sure ISO 26262 is being followed.

The functional safety audit checks to make sure that the actual implementation of the project conforms to the safety plan.

The functional safety assessment confirms that plans, designs, and developed products achieve functional safety.