

INSTRUCTION

Fill out the hazard analysis and risk assessment below.

HA-001 should be for the lane departure warning function as discussed in the lecture.

HA-002 should be for the lane keeping assistance function as discussed in the lecture.

Then come up with your own situations and hazards for the lane assistance system. Fill in the HA-003 and HA-004.

When finished, export your spreadsheet as a pdf file so that a reviewer can easily see your work.

Hazard ID	Situational Analysis						
	Operational Mode	Operational Scenario	Environmental Details	Situation Details	Other Details (optional)	Item Usage (function)	Situation Description
HA-001	Normal Driving	Highway	Rain (Slippery Road)	High Speed		Correctly Used	normal driving on a highway
HA-002	Normal Driving	Country Road	Normal Conditions	High Speed		Incorrectly Used	Normal driving on country roads during normal conditions with
HA-003	Normal Driving	City Road	Snowfall (degraded view)	Low speed		Correctly Used	normal driving on a city road
HA-004	Normal Driving	Off Road	Normal Conditions	Low speed		Correctly Used	normal driving off road during normal conditions with low speed and

rows.

Hazard Identification					
Function	Deviation	Deviation Details	Hazardous Event (resulting effect)	Event Details	Hazardous Event Description
Lane Departure Warning (LDW)	Actor Effect is too much	The LDW function applies an oscillating torque with	Collision with other vehicles	High haptic feedback can	The LDW function applies too high an
Lane Keeping Assistance (LKA) function shall apply the steering torque	Function always activated	The lane keeping assistance function is not limited in time duration which leads to misuse as	Collision with other vehicles	System is not desiged to drive the vehicle autonomously	The LKA function does not disengage when the driver removes his or her hands from the steering
Lane Departure Warning (LDW)	Function not activated	The LDW function fails to detect vehicle leaving lane	Collision with other vehicles	Driver expects LDW function to	The LDW does not function, i.e. a warning is
Lane Departure Warning (LDW) function shall apply an oscillating steering torque to	Actor Effect is wrong	The LDW function inadvertnly activates and applies steering torque	Front collision with obstacle	An unexpected steering torque input can cause the driver to loose control of	Driver does not expect a external steering torque input when system is disabled

Hazardous Event Classification						Determination of ASIL and Safety Goals	
Exposure (of situation)	Rationale (for exposure)	Severity (of potential harm)	Rationale (for severity)	Controllability (of hazardous event)	Rationale (for controllability)	ASIL Determination	Safety Goal
E3	Driving on the highway in the	S3	the driver is traveling at high	C3	the steering wheel jerking	ASIL C	the oscillating steering torque from the lane departure
E2	The driver is on a country road and misusing the system. That	S3	the driver is traveling at high speed	C3	The malfunction was that the lane keeping assistance was	ASIL B	the lane keeping assistance function shall be time limited and the additional steering torque shall end after a given
E2	Snowfall occurs a few times a	S1	the driver is traveling at low	C2	Driver has hands on wheel	QM	the system shall be deactivated if camera is obscured by snow
E1	Average Driver rarely drives off road	S2	the driver is traveling at low speed, but off road. Therefore the presence of	C2	Recovering controllability may be more difficult offroad	QM	design shall prevent system from inadvertently engaging