

INSTRUCTIONS:

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 t

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

Hazard ID	Situational Analysis			
	Operational Mode	Operational Scenario	Environmental Details	Situation Details
HA-001	OM03 - Normal Driving	OS04 - Highway	EN06 - Rain (slippery road)	SD02 - High speed
HA-002	OM03 - Normal Driving	OS03 - Country Road	EN01 - Normal conditions	SD02 - High speed
HA-003	OM03 - Normal Driving	OS04 - Highway	EN01 - Normal conditions	SD02 - High speed
HA-004	OM03 - Normal Driving	OS03 - Country Road	EN01 - Normal conditions	SD02 - High speed

he HA-003 and HA-004 rows.
work.

Other Details (optional)	Item Usage (function)
	IU01 - Correctly used
	IU02 - Incorrectly used
	IU01 - Correctly used
	IU01 - Correctly used

Situation Description
Normal driving on a highway during rain (slippery road) with high speed and correctly used system.
Normal driving on a country road during normal conditions with high speed and incorrectly used system.
Normal driving on a highway during normal conditions with high speed and correctly used system.
Normal driving on a country road during normal conditions with high speed and correctly used system.

Hazard Identification
Function
Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic feedback
Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane
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Deviation
DV04 - Over actuation
DV03 - Function is always activated
DV02 - Function unexpectedly
DV02 - Function unexpectedly

Deviation Details
The Lane Departure Warning function applies an oscillating torque with very high torque (above limit.)
Lane Keeping function is always activated
The camera sensor malfunctions the Lane Departure Warning function continue to be activated.
The camera sensor malfunctions and the Lane Keeping Assistance function continue to be activated.

Hazardous Event (resulting effect)
EV00 - Collision with other vehicle.
EV00 - Collision with other vehicle.
EV00 - Collision with other vehicle.
EV00 - Collision with other vehicle.

Event Details
Oscillating steering wheel could cause the driver to lose control and hit another vehicle or stationary object
Driver could over rely on the assistance system in domains where it isn't intended to function
The Lane Departure Warning continue to be activated and start executing random torque to the steering wheel
The Lane Keeping Assistance continue to be activated starting executing random torque to the vehicle making the

Hazardous Event Description
The Lane Departure Warning function applies an oscillating torque with very high torque (above limit.)
The driver does not use the function properly.
The Lane Departure Warning start acting randomly since it is receiving invalid camera data
The Lane Keeping Assistance start acting randomly since it is receiving invalid camera data

Hazardous Event Classi
Exposure (of situation)
E3 - Medium probability
E2 - Low probability
E2 - Low probability
E2 - Low probability

ification
Rationale (for exposure)
Fairly common environment and condition
Likely enviroment but unlikely operating condition
Likely enviroment but unlikely operating condition
Likely enviroment but unlikely operating condition

Severity (of potential harm)	Rationale (for severity)
S3 - Life-threatening or fatal injuries	Collitions at high speed could cause fatal injuries.
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Controllability (of hazardous event)
C3 - Difficult to control or uncontrollable
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Rationale
(for controllability)
Hard to control the vehicle with the steering wheel oscillating
Difficult to regain control of the vehicle is resonable time if the driver isn't paying attention
Have to continuously correct errant vehicle corrections
Have to continuously correct errant vehicle corrections

Determination of
ASIL
Determination
C
B
B
B

of ASIL and Safety Goals
Safety Goal
The oscillating steering torque from the Lane Departure Warning function shall be limited.
The Lane Keeping Assistance function shall be time limited, and additional steering torque shall end after a given time
The Lane Departure Warning function shall be deactivated if there is a camera malfunction
The Lane Keeping Assistant function shall be deactivated if there is a camera malfunction

