

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 the HA-003 and HA-004 rows.  
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	City Road	Normal conditions	Low speed	Country Road	Correctly used	Because the steering wheel warning vibration was too strong,a driver might loose control of the vehicle.
HA-002	Normal Driving	Highway	Normal conditions	High speed	City Road	Incorrectly used	Because the lane keeping assistance function takes control of the vehicle, a driver takes both hands off of the steering wheel and treats the vehicle as if it were autonomous .
HA-003	OM03 - Normal Driving	OS02 - City Road	EN06 - Rain (slippery road)	SD01 - Low Speed		IU01 - Correctly used	Normal Driving on City Road during Rain conditions with Low Speed ( Correctly used)
HA-004	OM03 - Normal Driving	OS03 - City Road	EN01 - Normal conditions	SD01 - Low Speed		IU02 - Correctly used	Normal Driving on City Road during Normal conditions with Low Speed ( Correctly used)

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 very high torque (above limit).	Collision with other vehicle.	High haptic feedback can affect driver's ability to steer as intended. The driver	The LDW function applies too high an oscillating torque to the steering wheel
Lane Keeping Assistance	Function always activated	the lane keeping assistance function is always activated	Collision with other vehicle.	incorrectly treating the car as a fully autonomous vehicle.	no add extra steering torque for a limited amount of time and
Lane Departure Warning	DV04 - Actor effect is too much	The LDW function applies an oscillating torque with very high	EV00 - Collision with other vehicle	High haptic feedback affects driver's ability to steer as intended.	The LDW function applies an oscillating torque with very high
Lane Departure Warning	DV04 - Actor effect is too much	The LDW function applies an oscillating torque with very high	EV01 - Collision with other vehicle	High haptic feedback affects driver's ability to steer as intended.	The LDW function applies an oscillating torque with very high

Hazardous Event Classification					
Exposure (of)	Rationale (for exposure)	Severity (of potential harm)	Rationale (for severity)	Controllability (of hazardous event)	Rationale (for controllability)
E3 - High probability	Driving on the highway	S3 - Life-threatening or fatal injuries	Normal driving on country roads during	C3-Difficult to control or uncontrollable	vibrate excessively with wild swings of the
E3 - High probability	Driving on Country Road	S3 - Life-threatening or fatal injuries	The driver is on a country road and	C2-Normally controllable	Because hands aren't on the wheel at high
E3 - Medium probability	The driver is on a city wet road. It happens often.	S1 - Light and moderate injuries	A low speed collision implies severity of	C3 - Difficult to control or	Controllability is C3 because the steering
E4 - High probability	The driver is on a city dry road. It always happen.	S1 - Light and moderate injuries	A low speed collision implies severity of	C3 - Difficult to control or	Controllability is C3 because the steering

Determination of ASIL and Safety Goals	
ASIL Determination	Safety Goal
C	Limiting the vibrational steering torque would help lower the risk to an acceptable
B	shall be time limited and additional teering torque shall end after a given time interval so that the driver cannot misuse the system for autonomous driing.
A	The oscillating steering torque from the lane departure warning function shall be limited.
B	The oscillating steering torque from the lane departure warning function shall be limited.