

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										Hazard Identification				Hazardous Event Classification				Determination of ASIL and Safety Goals	
	Operational Mode	Operational Scenario	Environmental Details	Situation Details	Item Usage (function)	Situation Description	Function	Deviation	Deviation Details	Hazardous Event (resulting effect)	Event Details	Hazardous Event Description	Exposure (of situation)	Rationale (for exposure)	Severity (of potential harm)	Rationale (for severity)	Controllability (of hazardous event)	Rationale (for controllability)	ASIL Determination	Safety Goal
HA-001	OM03 - Normal Driving	OS03 - Highway	EN06 - Rain (slippery road)	SD02 - High speed	IJ01 - Correctly used	Normal driving on a highway during rain (slippery road) with high speed and correctly used system	The lane departure warning function shall apply an oscillating steering torque to provide the driver a haptic feedback	DEV4 - Actor effect is too much	The LDW function applies an oscillating torque with very high torque (above limit)	EV08 - Collision with other vehicle	High haptic feedback can affect driver's ability to steer as intended. The driver could lose control of the vehicle and collide with another vehicle or with road infrastructure	Torque to the steering wheel is too high	E3 - Medium probability	Highway driving is part of regular driving however, rain does not occur often	S3 - Life threatening or fatal injuries	On highway speed of vehicle is expected to be high	C3 - Difficult to control or uncontrollable	Excessive vibration will make it difficult for most drivers to loose control	C	The oscillating steering torque from the lane departure warning function shall be limited
HA-002	OM03 - Normal Driving	OS02 - Country Road	EN01 - Normal conditions	SD02 - High speed	IJ02 - Incorrectly used	Normal driving on country roads during normal conditions with high speed (the driver is misusing the lane keeping assistance function as an autonomous function)	The lane keeping assistance function shall apply the steering torque when active in order to stay in current lane	EV03 - Function always activated	The driver misuses the function by taking both hands off the wheel and incorrectly treating the car as a fully autonomous vehicle	EV08 - Collision with other vehicle	The driver misuses the function by taking both hands off the wheel and incorrectly treating the car as a fully autonomous vehicle which may lead to crashes	Lane keeping function is activated always	E2 - Low probability	Driving in the country road may not happen often	S3 - Life threatening or fatal injuries	On highway speed of vehicle is expected to be high	C3 - Difficult to control or uncontrollable	Vehicle accident would not be controllable as the driver's hands are not on the steering	B	The lane keeping assistance function shall be time limited and the additional steering torque shall end after a given timer interval so that the driver cannot misuse the system for autonomous driving
HA-003	OM03 - Normal Driving	OS03 - Highway	EN01 - Normal conditions	SD02 - High speed	IJ02 - Incorrectly used	Normal driving on a highway during normal conditions with high speed (the driver is misusing the lane keeping assistance function as an autonomous function)	The lane keeping assistance function shall apply the steering torque when active in order to stay in current lane	DEV8 - Function always activated	The driver misuses the function by taking both hands off the wheel and incorrectly treating the car as a fully autonomous vehicle	EV08 - Collision with other vehicle	The driver misuses the function by taking both hands off the wheel and incorrectly treating the car as a fully autonomous vehicle which may lead to crashes	Lane keeping function is activated always	E4 - High probability	Highway driving is part of regular driving, hence occurs frequently	S3 - Life threatening or fatal injuries	On highway speed of vehicle is expected to be high	C3 - Difficult to control or uncontrollable	Vehicle accident would not be controllable as the driver's hands are not on the steering	D	The lane keeping assistance function shall be time limited and the additional steering torque shall end after a given timer interval so that the driver cannot misuse the system for autonomous driving
HA-004	OM03 - Normal Driving	OS05 - Mountain Pass	EN03 - Fog (degraded view)	SD01 - Low speed	IJ01 - Correctly used	Normal driving on a mountain pass during fog (degraded view) with low speed and correctly used system	The lane departure warning function shall apply an oscillating steering torque to provide the driver a haptic feedback	DEV4 - Actor effect is too much	The LDW function applies an oscillating torque with very high torque (above limit)	EV08 - Collision with other vehicle	High haptic feedback can affect driver's ability to steer as intended. The driver could lose control of the vehicle and collide with another vehicle or with road infrastructure	Torque to the steering wheel is too high	E1 - Very low probability	Mountain pass driving occurs very infrequently for most of the drivers	S3 - Life threatening or fatal injuries	On mountain pass while the speed of the vehicle is low the possibility of falling off the cliffs exists	C3 - Difficult to control or uncontrollable	Excessive vibration will make it difficult for most drivers to loose control	A	The oscillating steering torque from the lane departure warning function shall be limited