

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	Other Details (optional)	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	OS04 - Highway	EN06 - Rain (slippery road)	SD02 - High speed		IU01 - Correctly used	Normal driving on a highway with a wet slippery road at high speed and correctly used system.	Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic feedback	DV04 - Actor effect is too much	The LDW function applies an oscillating torque with very high torque (above limit).	EV00 - 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.	The LDW function applies too high an oscillating torque to the steering wheel (above limit).	E3 - Medium probability	The driver is driving on wet road in the highway, the probably is quite often.	S3 - Life-threatening or fatal injuries	the driver is traveling at high speed	C3 - Difficult to control or uncontrollable	If the lane departure warning function causes the steering wheel to vibrate excessively with swings of the steering wheel,most drivers would have difficulty controlling the vehicles.	C	The oscillation steering torque from the lane departure warning function shall be limited.	
HA-002				OM03 - Normal driving	OS04 - Highway	EN01 - Normal conditions	SD02 - High speed		IU01 - Correctly used	Normal driving on a highway with a dry good road at high speed and correctly used system.	Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic feedback	DV04 - Actor effect is too much	The LDW function applies an oscillating torque with very high torque (above limit).	EV00 - 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.	The LDW function applies too high an oscillating torque to the steering wheel (above limit).	E4 - High probability	The driver is driving on dry road in the highway, the probably is always.	S3 - Life-threatening or fatal injuries	the driver is traveling at high speed	C3 - Difficult to control or uncontrollable	If the lane departure warning function causes the steering wheel to vibrate excessively with swings of the steering wheel,most drivers would have difficulty controlling the vehicles.
HA-003	OM03 - Normal Driving	OS03 - Country Road	EN01 - Normal conditions	SD02 - High speed		IU01 - Correctly used	Normal driving on country roads during normal conditions with high speed (the driver is misusing the lane keeping assistance function as a fully autonomous function) and correctly used system.	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV03 - Function always activated	The LKA function add extra steering torque for a unlimited amount of time and continue providing extra torque.	EV00 - Collision with other vehicle	The driver treat the function as if were meant for fully autonomous driving, and then the driver could lose control of the vehicle and collide with another vehicle or with road infrastructure.	The LKA function applies too long extra steering torque(longer than limit)	E2 - Low probability	The driver is on a country road and misusing the system. That combination probably does not happen often	S3 - Life-threatening or fatal injuries	the driver is traveling at high speed	C3 - Difficult to control or uncontrollable	the lane keeping assistance was always on and had no time limit, so drivers could take both hands off the wheel. Because hands aren't on the wheel at high speeds, a vehicle accident would not be controllable.	B	The lane keeping assistance function shall be time limited and the additional steering torque shall end after a given time interval so that the driver cannot misuse the system for autonomous driving.	
HA-004	OM03 - Normal Driving	OS04 - Highway	EN01 - Normal conditions	SD02 - High speed		IU01 - Correctly used	Normal driving on highway roads during normal conditions with high speed (the driver is misusing the lane keeping assistance function as a fully autonomous function) and correctly used system.	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV03 - Function always activated	The LKA function add extra steering torque for a unlimited amount of time and continue providing extra torque.	EV00 - Collision with other vehicle	The driver treat the function as if were meant for fully autonomous driving, and then the driver could lose control of the vehicle and collide with another vehicle or with road infrastructure.	The LKA function applies too long extra steering torque(longer than limit)	E3 - Medium probability	The driver is on a highway road and misusing the system. That combination probably is often	S3 - Life-threatening or fatal injuries	the driver is traveling at high speed	C3 - Difficult to control or uncontrollable	the lane keeping assistance was always on and had no time limit, so drivers could take both hands off the wheel. Because hands aren't on the wheel at high speeds, a vehicle accident would not be controllable.	C	The lane keeping assistance function shall be time limited and the additional steering torque shall end after a given time interval so that the driver cannot misuse the system for autonomous driving.	