Automated and Connected Driving Challenges
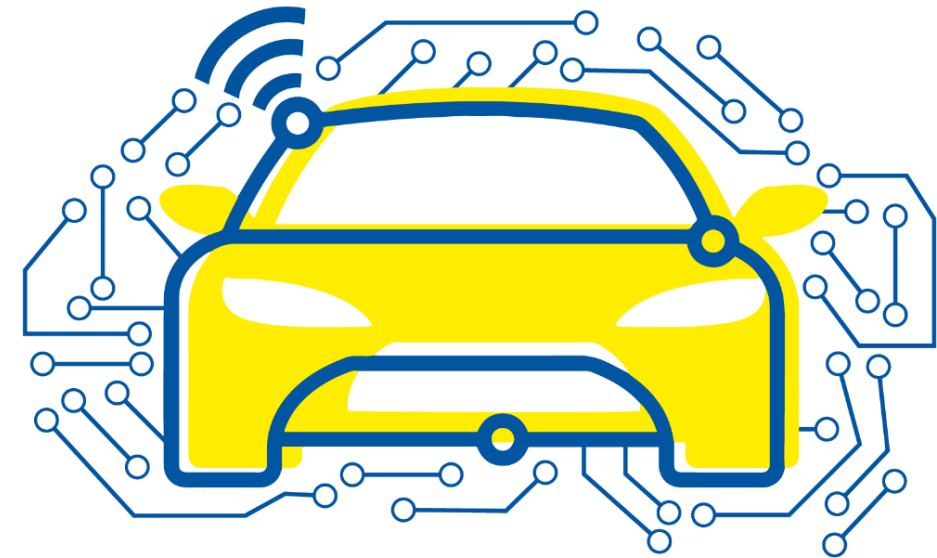
Section 5 – Connected Driving

Introduction

Categories of Functions

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Introduction – Categories of Functions

Categories of Functions

Cooperative functions	Collective functions	Supportive functions

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Cooperative functions	Collective functions	Supportive functions
Exchange of **data** **between** individual connected **entities** for **decentral** data processing in individual connected agents to **enable cooperation**		

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Cooperative functions	Collective functions	Supportive functions

Cooperative functions

Exchange of
data

between individual connected **entities**

for **decentral** data processing

in individual connected agents

to **enable cooperation**

Cooperative perception:
Include environment information of other connected entities into the ego vehicle environment model

Cooperative planning:
Include other vehicles' planned behavior into ego vehicle planning

Categories of Functions

Cooperative functions	**Collective functions**	**Supportive functions**
Exchange of **data**	**Collection** of **data**	
between individual connected **entities**	**from** individual connected **entities**	
for **decentral** data processing	for **central** data processing	
in individual connected agents	in (edge) clouds	
to **enable cooperation**	to **distribute** processed **collective** data	

Cooperative perception:
Include environment information of other connected entities into the ego vehicle environment model

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Cooperative functions	**Collective functions**	**Supportive functions**
Exchange of **data**	**Collection** of **data**	
between individual connected **entities**	**from** individual connected **entities**	
for **decentral** data processing	for **central** data processing	
in individual connected agents	in (edge) clouds	
to **enable cooperation**	to **distribute** processed **collective** data	
Cooperative perception: Include environment information of other connected entities into the ego vehicle environment model	**Collective perception**: Make available a collective environment model to all vehicles based on connected entities' perception data	
Cooperative planning: Include other vehicles' planned behavior into ego vehicle planning	**Collective planning**: Plan behavior for all connected agents centrally	

Introduction – Categories of Functions

Categories of Functions

Cooperative functions	Collective functions	Supportive functions
Exchange of **data**	**Collection** of **data**	**Provision** of **data** or **processing power**
between individual connected **entities**	**from** individual connected **entities**	**by** connected **infrastructure**
for **decentral** data processing	for **central** data processing	as a **service**
in individual connected agents	in (edge) clouds	of the infrastructure
to **enable cooperation**	to **distribute** processed **collective** data	to **support** connected agents
Cooperative perception: Include environment information of other connected entities into the ego vehicle environment model	**Collective perception**: Make available a collective environment model to all vehicles based on connected entities' perception data	**Traffic control** Provide current and future states of traffic control systems such as traffic lights or speed limit signs to connected road users
Cooperative planning: Include other vehicles' planned behavior into ego vehicle planning	**Collective planning**: Plan behavior for all connected agents centrally	**Function offloading**: Process sensor data in powerful (edge) cloud instead of locally in vehicles