On the Design of Performance Testing Methods for Active Safety Systems

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Henrik Eriksson

Henrik.Eriksson@sp.se

Applus IDIADA

SP your Science Partner

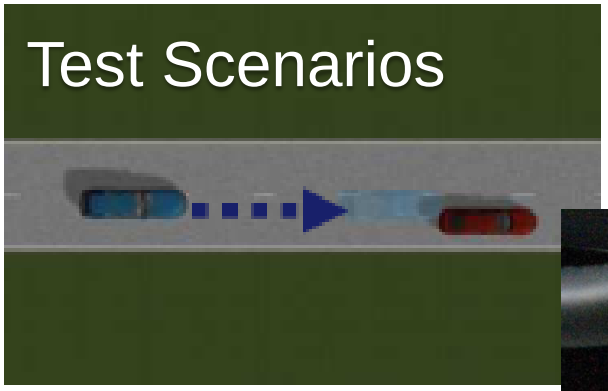
ika INSTITUT FÜR KRAFT-FAHR-ZEUGE RWTH AACHEN UNIVERSITY

Active Test

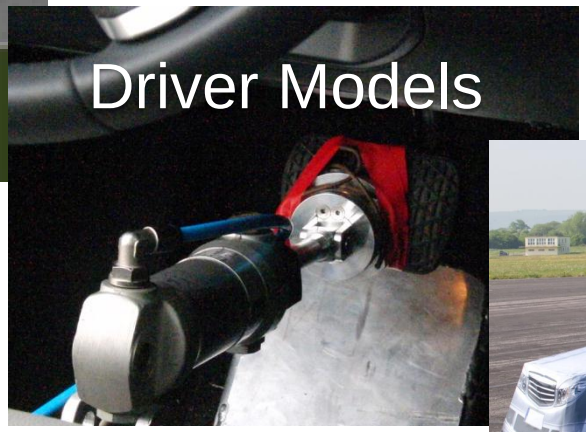
SEVENTH FRAMEWORK PROGRAMME

Performance Testing – Why and How?

- To be able to compare different systems
- To show value to customers
- To push development and fitting of active safety systems



[ASSESS]



[ABD]

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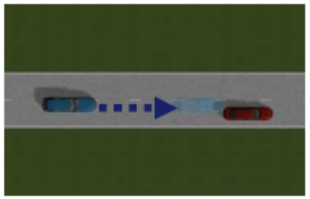
Examples of Test Scenarios

Test B1: Driving towards rear of slower driving car:

[ADAC]

Test-Nr.	v_ego [kph]	v_target [kph]	s_start [m]	a_co [m/s²]
B1_1	50	20	200	0
B1_2	100	60	200	0

[ASSESS]

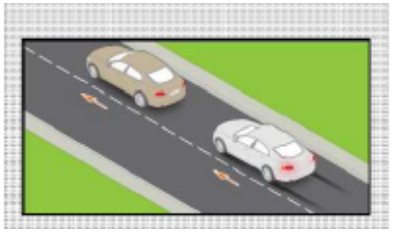


A1B: Urban scenario

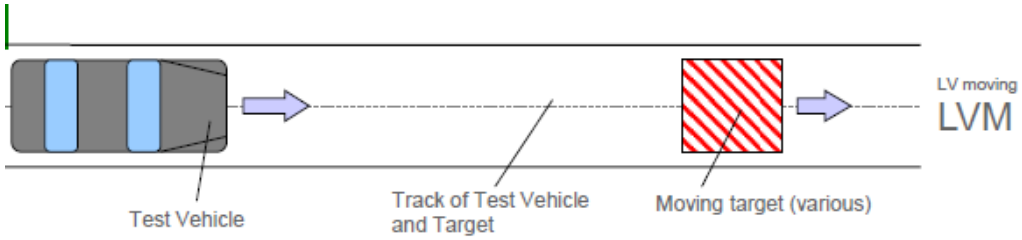
- Lead vehicle speed: 10 km/h
- subject vehicle speed: 50 km/h
- Initial distance based on TTC >> 3 s
- 50% lateral offset
- Driver reactions: A1B2: slow,A1B3: fast,A1B1: no

CCR3: Approaching a moving target at 20km/h

- Speed differential starting at 10km/h and increased in 10km/h increments if system avoids collision with car target
- Speed increased in 5km/h increments if collision occurs



[AEB]



Velocities [km/h]	v_0	$v_{rel.}$
Test vehicle	72	40
Target	32	

[vFSS]

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Test Scenarios – Comparison

Parameter	ADAC	AEB	ASSESS	eVALUE	vFSS	NHTSA	SAE
TV speed [km/h]	50 100	10+10n (n=0…5)	50 50 100	70 70	72 90	72	60 50
LV speed [km/h]	20 60	20	10 10 20	30 50	32 50	32	10 30
Offset	0	0	0 50% 0	0	0	0	0
Curvature	Straight	Straight	Straight	Straight Curve	Straight	Straight	Curve Straight
Reaction	No	No	No Slow Fast	No Slow Fast	No	No	No

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Harmonization platforms have been established in Europe

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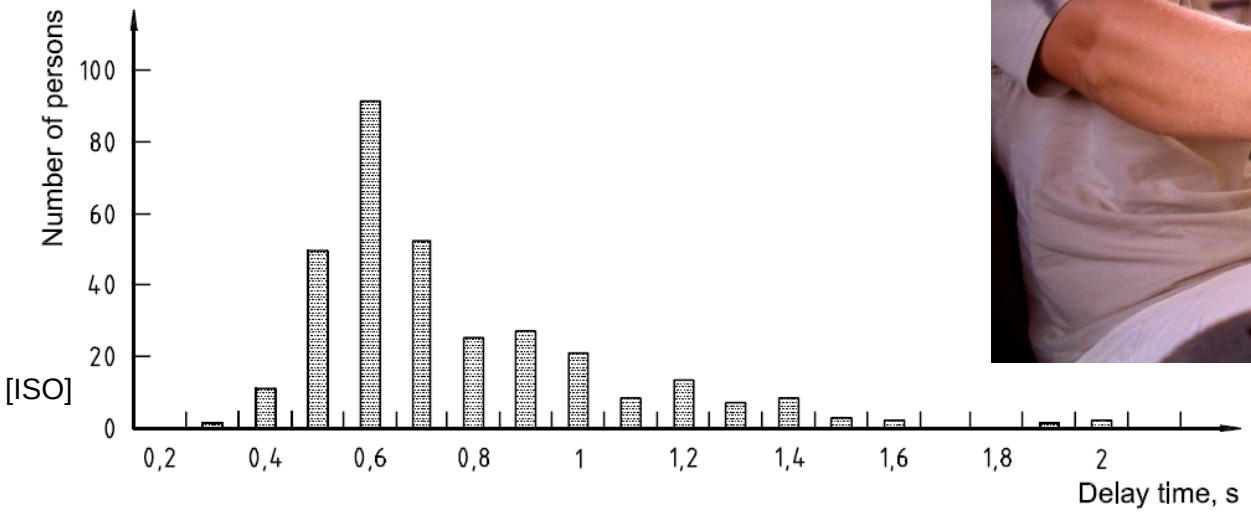
Driver Models



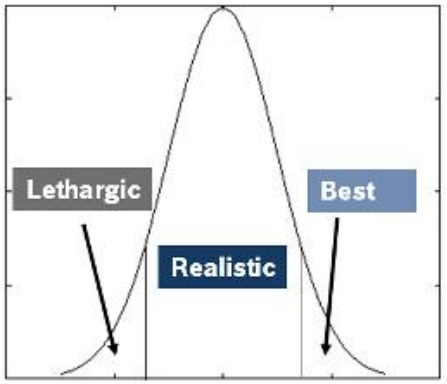
[ISO]

Realistic driver:
reaction times: 1s after acoustic warning / 0,7s after brake jerk, 80% deceleration

Best driver:
reaction times: 0,7s after acoustic warning / 0,4s after brake jerk, 100% deceleration

Lethargic driver:
reaction times: 2s after acoustic warning / 1,5s after brake jerk, 60% deceleration

Expected driver population



[Georgi et al.]

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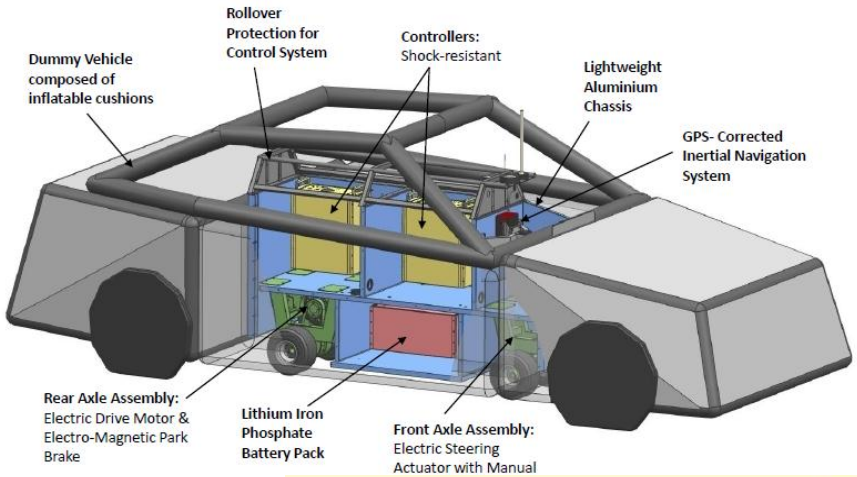
Targets (1)



[ABD]

photograph of a rear end

reflectors for Lidar systems

real license plates

small corner reflectors in the middle of the car

3 dimensional shape of the bumper

realistic shadow under the car

[ADAC]

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Targets (2)

[ASSESS]

[DRI]

[EVITA]

[Bertrand]

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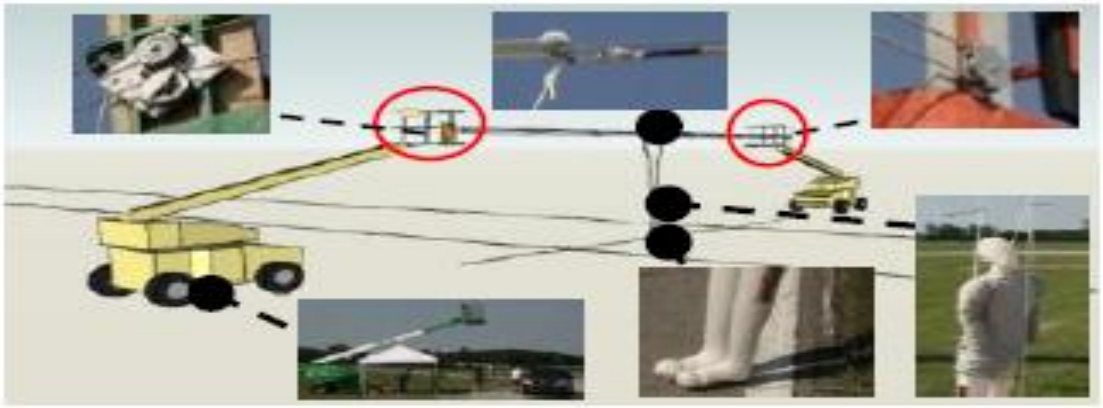
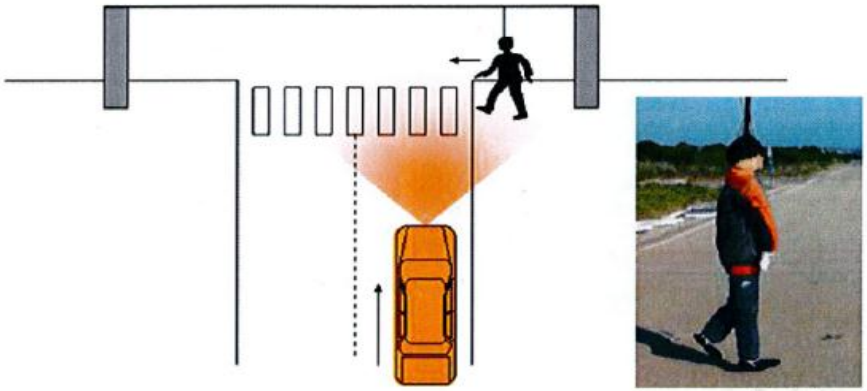
Targets (3)



[NHTSA]

[AEDesign]



[Idiada]

[DRI]

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ActiveTest's 3rd Workshop

Confirmed speakers from:
e.g.
ASSESS
AsPeCSS
OEMs
Research organizations
Suplliers

Demo at Autoliv's CarsonCity

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