Simulation-based Development and Testing of Automated Driving

Supported by:



on the basis of a decision by the German Bundestag





Traceability Software Demonstrator TRACY

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Motivation & Needs

Assure Compliance

- distill & store information
- support processes
- revision safety, auditing

Driving Efficiency

- search & reuse
- front-loading
- automation
- collaboration

Traceability

"relating artifacts" [ISO 10007, 24765 etc.]



Handle Complexity

- impact
- maturity
- tracking & steering
- changes

Safeguard Quality

- right information, in time etc.
- consistency
- completeness

Traceability in SET Level Context









Traceability Cookbook



Derive an agreed stack of methods,

add a consolidated process and

flavor the result with mature **know-how**.

Put everything on an integration platform,

link artifacts in diverse sources systems,

and network artifacts.



Traceability Software Demonstrator TRACY

PROSTEP's neutral web-based software provided to SET Level and VV Methods

- Support Engineering & Testing of safety-critical systems
 - completeness, correctness, safety
- Realize a **powerful but thin layer** on-top of the relevant systems

TRACY reduces complexity by creating a smart information network over existing systems and data repositories.

Smart cross-x linking of **artifacts**, persisting **relationships** and **rationales**, change **impact** analyses, coverage **analyses**, project **status** analyses, **reuse** of components, **automation**, neutral **data exchange** etc.



SET Level



	lmpact Analyses	Traceability	Change Management	Quality Improvement	Collaboration
	Configuration Management	Baselining	Reuse & Efficiency	Maturity	Reporting & Auditing
\checkmark					

TRACY: Architecture





TRACY: Creating Traceability





Simulation-based Development and Testing of Automated Priving

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W	WELCOME - PLEASE SELECT YOUR TOOLS:				
	A Project List Manage Projects Select the desired project; work on Process and Task details.	Templates View available templates See information types for a template.	Cockpit Your Details View your projects and Tasks.		
	START Q. Search Find entities	START	START Drganisations Onen the Organisation overview		
	Look for entities in the database.	See the list of People involved.	See Project Partners, Sites, and Departments.		
P	lease note: Some Features are currently not available.				

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Home 💙 Project List

PROJECT LIST

Title ↑↓		Project ID ↑↓	Project Manager / Organisation $\uparrow \downarrow$	
OsiPedestrian MS2		PR-OsiPD-MS2	Thomas Bleher	
SUC1 Criticality Analysis M	si Proje	T-MS1	Arun Das	
SUC1 Criticality Analysis M	s2 (Process-Temp	ts IT-MS2	Arun Das	
SUC2 Full Vehicle Test MS1		/T-MS1	СМ	
SUC2 Full Vehicle Test MS2		PR-FVT-MS2	СМ	
SUC3 Component Test MS	1	PR-CT-MS1	ME	
SUC3 Component Test MS2	2	PR-CT-MS2	ME	
	Sho	wing 1 to 7 of 7 entries	> >> 20 V	
CREATE NEW PROJECT	COPY PROJECT IN	APORT FROM STMD		
create	reuse c	ollaborate (STMD)		

Home > Project List > PR-PR-CRIT-MS2

STRUCTURE VIEW	SUC1 Criticality Analysis MS2
✓ ♣ SUC1 Criticality Analysis MS2	Pro-
Credible Simulation Process	Max Process
✓ ฆ Analysis Phase	Widnagement
?≡ Analyze Simulation Task & Objectives	Project ID: PR-CRIT-MS2 Project Manager: Arun Das
🚝 Verify Analysis	Start Date: 01.04.2020 Target Date: 31.03.2021
✓ /≡ Requirement Phase	This project has been created from template 'credible-simulation-process-project'
₹■ Define Requirements for Simulation Integration	Description: This project covers the development of SUC1 for MS2.
₩ Define Requirements for Simulation Models	
Set The Sequirements for Parameters	
₽ Define Requirements for Test Cases	A.
Set The Sequirements for Simulation Environment	
₹■ Define Requirements for Quality Assurance	- Graph
🚝 Verify Requirements	Filters: VISUalization v 17 qualifiers selected v 22 relationship types selected v APPLY
> /≣ Design Phase	Depth levels Filt Show max. depth:
> 🚝 Implementation Phase SUC1 MS2	- intering
> 🚝 Execution Phase	💻 SUC1 Спісалу Алаукеми2
> 🚝 Evaluation Phase	
> 🚝 Fulfillment Phase	Credible Simulation Pocees
Process Navigation	CI-CRSSP DECI-CRS
Slide 11	Implement Nace Simulation-based Development and Testing of Automated Driving



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Home 💙 Create Baseline

Baseli	ine				
— — Ba	asics	Create		Generate	
Cr Descri	reator: Jane P. Miller	Baseline	Created At: 31.	Report	
Rati	onale: For demonstration purposes of	only			
— — Ba	aseline items				
	120 baseline items out of 120 selected,	select individually or SELECT AI	L		
	Name ↑↓	Description $\uparrow\downarrow$	ltem Type ↑↓	Last Modification $\uparrow\downarrow$	Status ↑↓
	OsiPedestrian	This project implements a pedestrian f	model	26.03.2021 11:08:35	OPEN
	SUC1-EV01	Das Kritikalitätsmaß TTC muss ausgewertet werden können.	requirement	25.03.2021 16:53:16	OPEN
	SUC1-EV02	Das Kritikalitätsmaß PET sollte ausgewertet werden können.	requirement	25.03.2021 16:53:16	OPEN
	SUC1-EV03	Ein TCC Kritikalitätsobserver muss implementiert und angebun	requirement	25.03.2021 16:53:16	OPEN
	SUC1-EV04	Ein PET Kritikalitätsobserver sollte implementiert und angeb	requirement	25.03.2021 16:53:16	OPEN
	SUC1-EV05	Die Auswertung der Einflüsse Sichtverdeckung sowie initial G	requirement	25.03.2021 16:53:16	OPEN
	SUC1-EV06	Es müssen exemplarisch kritische Szenarien aufgezeigt werden…	requirement	25.03.2021 16:53:16	OPEN
		Eine visuelle Auswertung sollte	requirement	Simulation-based	Development and Tes

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Summary

- TRACY supports Engineering & Testing of safety-critical systems
- TRACY follows the Credible Simulation Process and the SET Level Methodology
- TRACY forms a smart information network, and thereby realizes traceability
- TRACY implements the relevant standards
- PROSTEP will transform TRACY into a software product after the project's end





SETLevel



ENABLING CREDIBLE SIMULATION

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