ArchitectECA2030

SC 3 Demo 3.3 Key Card

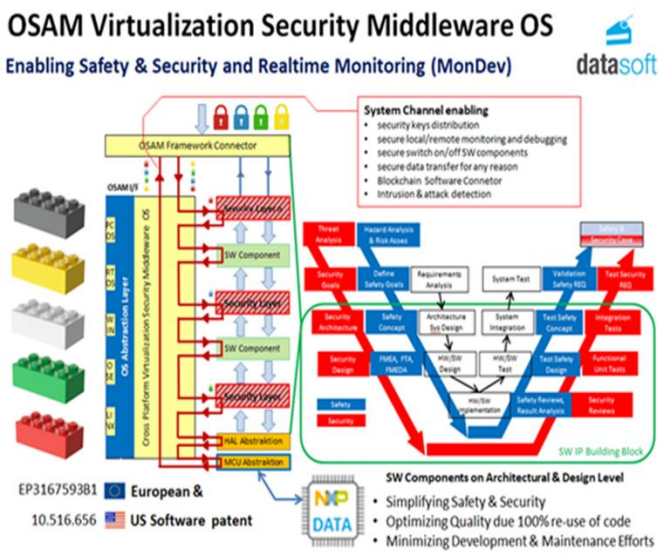
Built in Connectivity Components Aging Monitor (BIAM)

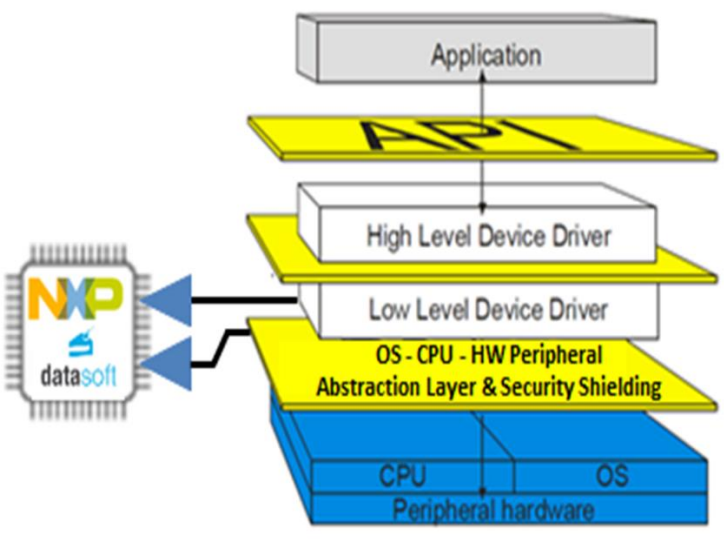
Main aim			
• *Develop the different type of aging monitors for IC lifetime monitoring and communicating via OSAM to car or clouds*			
Partner	NXP, DATA, INRIA		
ECS value chain	Research / Tier 1		
State-of-the-art		**Beyond SotA / Innovation**	**Targeted TRL**
• *The automotive product life time performance replies on specifying the different mission profiles based on the different applications inside Car.* • *IC reliability replies on production test and qualification result based on specific mission profiles prior mass production* • *In functional safety area, Fail-operational is the current requirement for IC.*		• *Models for relevant degradation (ageing) mechanisms.* • *Mon Dev for the different degradation mechanisms* • *SW/HW communication infrastructure to handle monitoring data*	TRL 3

Link to project objectives		
Objective	***Addressed (Y/N)***	***How***
O1 – Continuous robust design optimization for each part in the ECS value chain	N	
O2 – Framework for safety validation of ECS value chain	N	
O3 – Identification & management of residual risks over the entire ECS value chain	Y	
O4 – End-user acceptance by trustworthy ECS value chain	N	
O5 – Zero emissions, zero crashes, zero congestions by ECA2030-car	Y	

Joint demonstrator		**Linked supply chains (Y/N)**		**Considered MonDev layers**	
DEM3.1	**DEM3.2**	**SC1**	N	**System (S)**	N
		SC2	N	***Subsystem (SS)***	N
		SC3	Y	***Component (C)***	N
		SC4	N	***Subcomponent (SC)***	Y

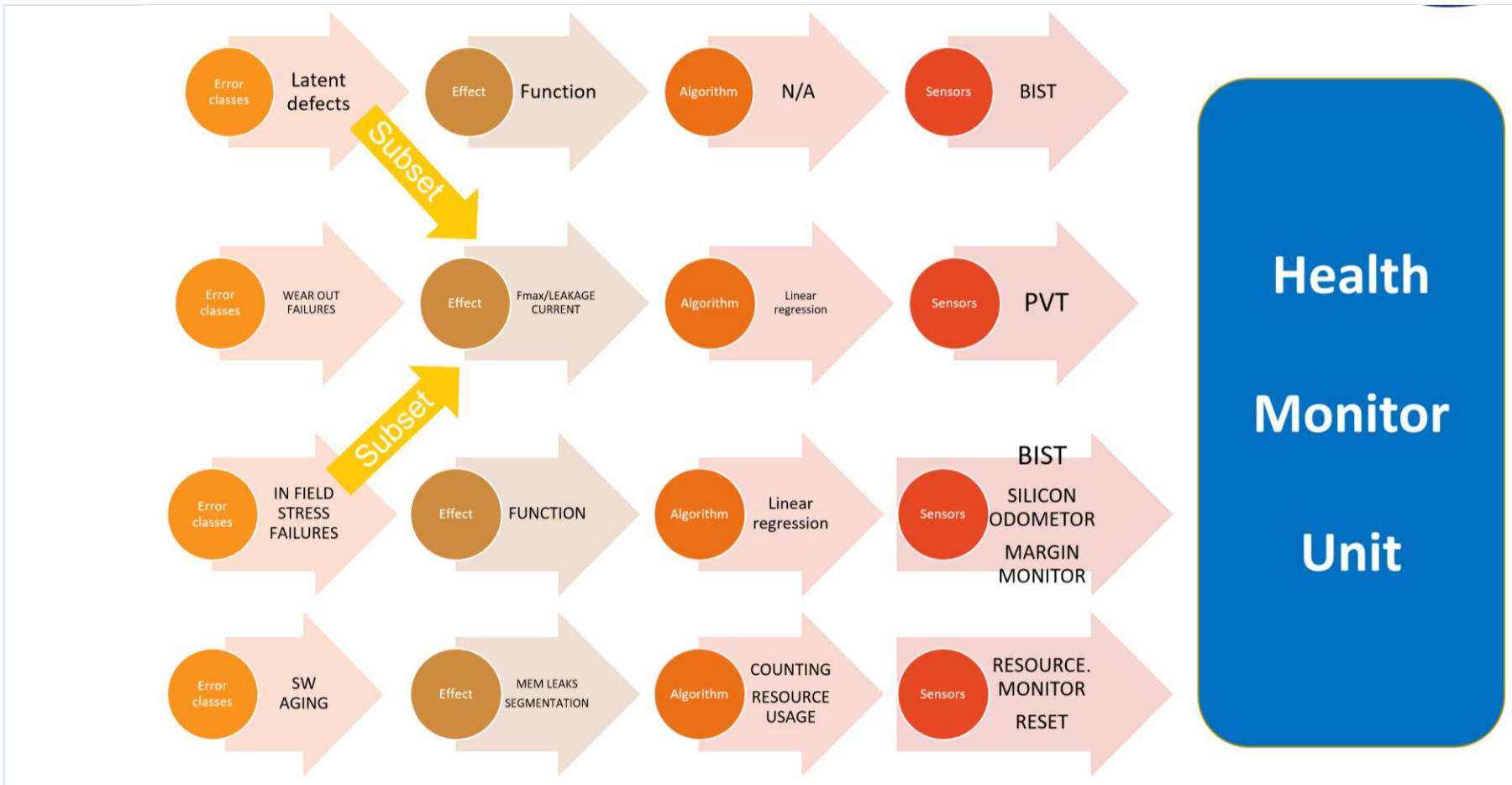
Setup





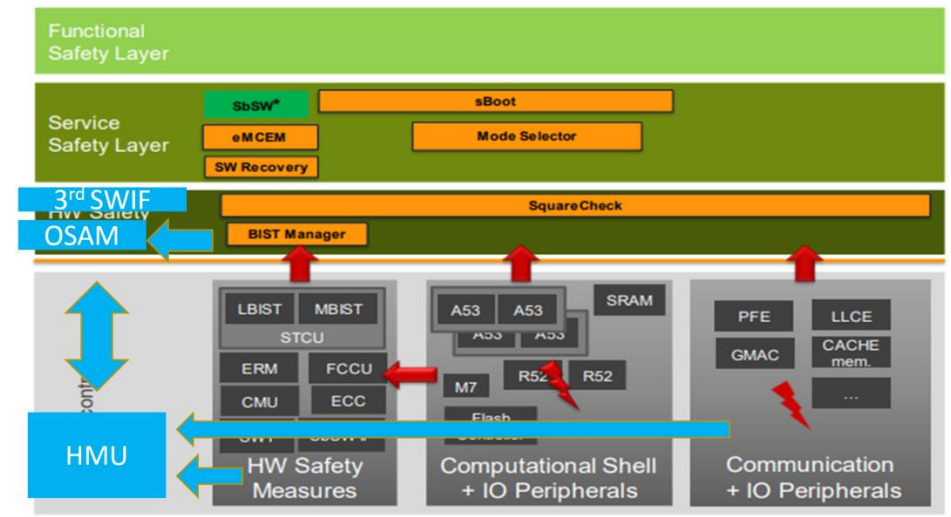
Benchmark scenario/mission/etc.

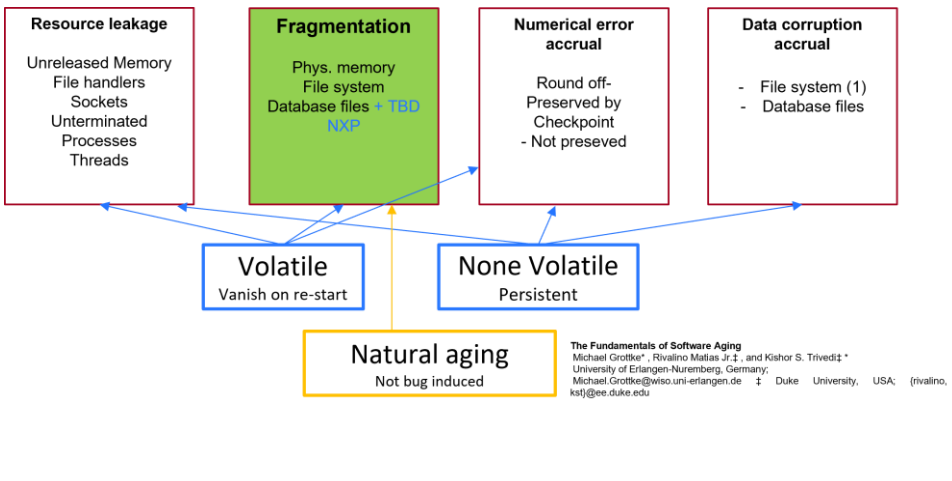
Residual risk optimization by combining hardware and software aging

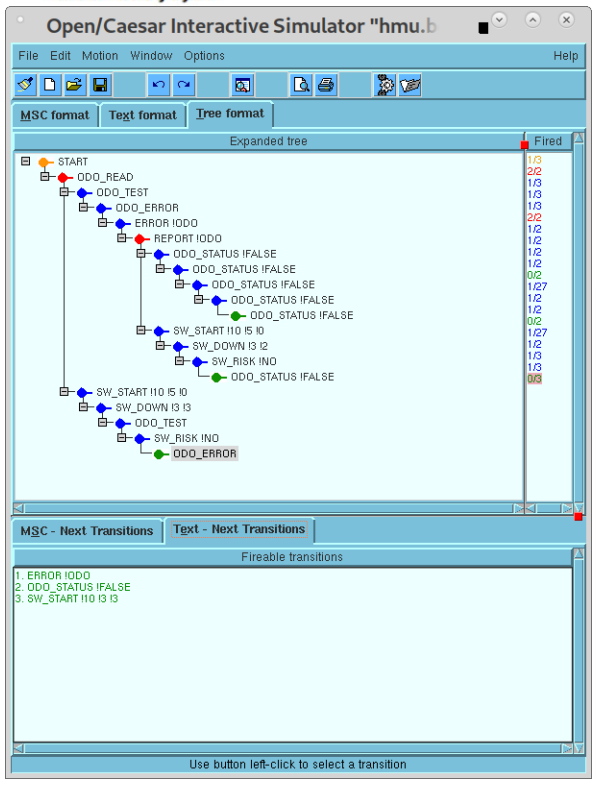


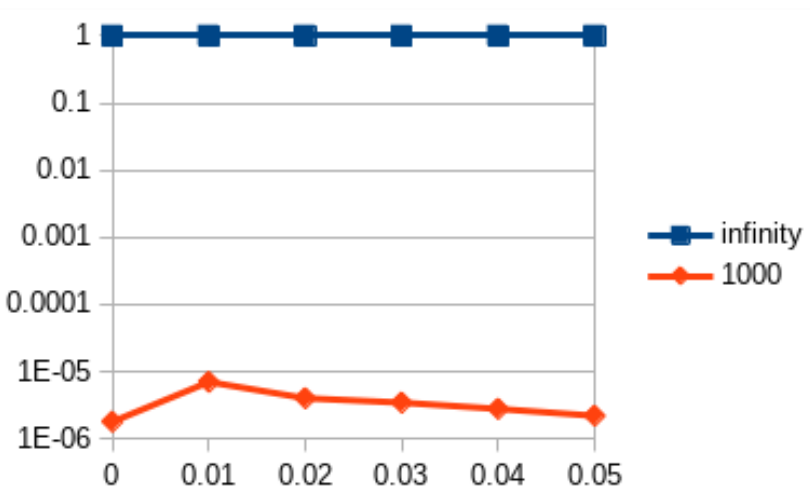
KPIs (related to requirements)	Baseline
KPIs which evaluate the success of the demonstrator • *Which parameters (variables) are being measured* • *How accurate can the RUL be predicted* • *What degradation mechanism are being considered/analysed* • *Which failure modes are being considered*	*Baseline for KPIs* • *2 types of aging monitors (PVT or Margin monitor, Resource Monitor)* • *±30 days* • *3 degradation mechanisms* • *2 failure modes (Functional fail and MEM leaks)*

Current status/demonstration









Impact	
Continuous reliability assessment and failure prediction using in-situ monitoring of degradation of mission critical electronics.	
Used standards	**Future standardization potentials**
• *ISO 26262: Road Vehicles – Functional Safety* • *ISO/PAS 21448: Road Vehicles – Safety of the intended functionality* • *IEC 61508: Functional safety of electrical/electronic/programmable electronic safety-related systems., (for industrial related applications)* • *AEC Q100: Failure mechanism based stress test qualification for integrated circuits*	Extending ISO 26262 (ASIL E covering residual risk increase over time)

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