

Safety Assessment and Monitoring in the AUTotech.agil/Project

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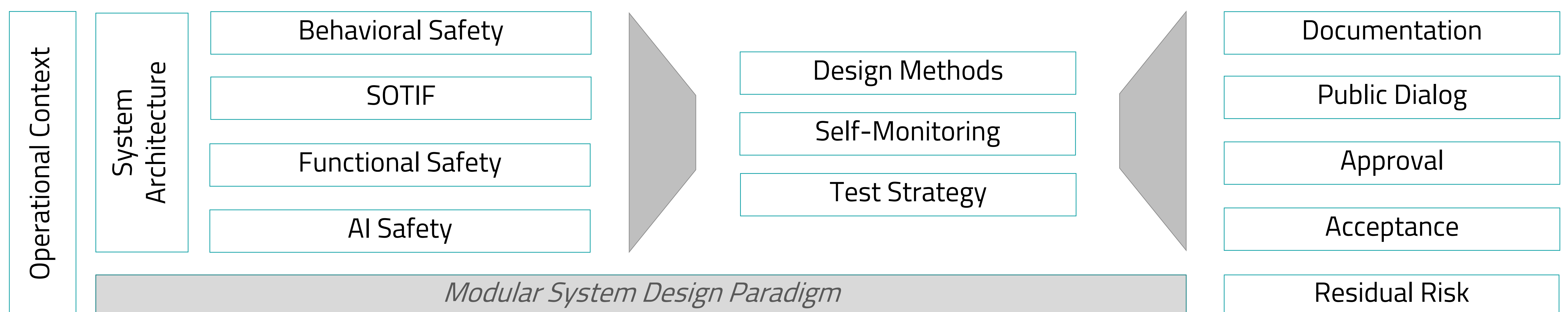
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The
AUTotech.agil
Project

On this poster, we present aspects that are addressed in the publicly funded project AUTotech.agil. In the project, an open software and hardware architecture for the mobility system of the future will be designed. The consortium consists of 17 institutes from 9 German universities, 9 large companies and 3 SMEs under the leadership of the Institute for Automotive Engineering (ika) at RWTH Aachen University. The project duration is 36 months, from October 2022 to September 2025 and hence, the project is still in an early stage.

Our Approach Towards A Holistic Safety Assessment

- Holism regarding lifecycle, tech stack, relationship between stakeholders and design



Modular System Design, Testing and Approval

- AUTotech.agil focuses on modularization on different levels, e.g. service-oriented architecture (ASOA) and containerized software/services
- Modular system design as a design paradigm allows components to be integrated interchangeably if interfaces are properly defined
- Modularization may partially reduce testing effort to newly integrated modular components

AI Safety

- AI-based methods require new approaches towards safety assessment / assurance
- Estimation of uncertainty in neural networks, incl. calibration / conformalization
- Design of explainable AI (XAI):
Intermediate and white-box Models for black box interpretation / approximation
- Consideration of dataset optimization / robustness:
Data augmentation, tests for training data completeness

Runtime Self-Monitoring

- System-Level Monitor:
Abstracting low-level diagnosis and monitoring towards a system-level monitor by exploiting multi-architectural viewpoints
- Potential to monitor system-level performance indicators
- AI Monitoring: OOD (Out-of-Distribution) detection, runtime uncertainty estimation