

# Keynote

## The Story of AADL

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5 years ago the SAE AS-2C subcommittee started to work on the Architecture Analysis & Design Language (AADL) standard. AADL was targeted to address issues in mission and safety critical software-reliant systems, aka. Cyber-physical systems. AADL addresses the increasing challenges of such systems - the exponential increase in verification related software rework cost. Industry studies show that 70% of defects are introduced in requirements and architecture design, while 80% are discovered post-unit test. After a short history and summary of the challenges, the presentation highlights the expressive, analytical, and auto-generation capabilities of the AADL core language as well as several of its standardized extensions to address multiple quality dimensions and do so incrementally at different levels of fidelity. The presentation then illustrates these capabilities on several realistic industrial examples. The presentation concludes by outlining a four part improvement strategy: architecture-led requirement specification to improve the quality of requirements, architecture refinement and incremental virtual system integration to discover issues early, compositional verification through static analysis to address scalability, and incremental verification and testing throughout the life cycle as assurance evidence.

**Peter Feiler** is a 29 year veteran and Principal Researcher of the Architecture Practice (AP) initiative at the Software Engineering Institute (SEI). His current research interest is in improving the quality of safety-critical software-reliant systems through architecture-centric virtual system integration and incremental life cycle assurance to reduce rework and qualification costs. Peter Feiler has been the technical lead and main author of the SAE Architecture Analysis & Design Language (AADL) standard. He has a Ph.D. in Computer Science from Carnegie Mellon.

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