

Use Cases of Merit for AI in Simulation

Thursday 11 December 2025 11:20 (25 minutes)

This talk looks at how AI is changing the way we do simulation and design, with CFD-driven digital twins as the central thread and nuclear systems as a motivating example. Rather than treating AI as a black box “accelerator,” we’ll focus on how different strands of AI (especially geometric deep learning) can be used to work with our existing numerical methods and engineering judgment. In particular, we’ll look at how models that operate directly on meshes, fields, and graphs open new possibilities for CFD, turbulence modeling, and coupled multi-physics problems. We’ll anchor the discussion in two complementary perspectives. The first is strategic: where does AI realistically fit into our simulation roadmaps (for example, the 2030 vision for CFD and digital twins)? The second is practical: a case study which illustrates specific ways AI can support engineering teams today, from guiding sampling and optimization campaigns to improving diagnostics and decision support. Because this is a safety-relevant domain, we will spend time on how to use these tools responsibly (as we want these complex models to make more explainable predictions to engineers rather than data scientists alone). We’ll also briefly touch on foundation models and generative AI in engineering—what is hype, what is real, and how these models might add value for scientific and engineering tasks. Overall, the emphasis is on realistic, engineering-minded use of AI that enhances, rather than replaces, traditional simulation and expertise.

Country or International Organisation

United States of America

Affiliation

Siemens Digital Industries Software

Speaker’s email address

justin.hodges@siemens.com

Author: HODGES, Justin

Presenter: HODGES, Justin

Session Classification: Vendor Session

Track Classification: Simulation and Data Integration