Contribution ID: **24** Type: **Poster**

Accelerating Design Space Exploration Through High Performance Compute Enabled Simulation

Tuesday 4 November 2025 13:35 (5 minutes)

The Centre for Modelling & Simulation (CFMS) is an independent Research & Technology Organisation, based in Bristol, specialising in accelerating industry through modern digital engineering techniques. One area of focus is developing models and simulations to accelerate the design of novel complex systems, which requires developing a deep understanding of the impact that design parameters have on the system. This poster will detail CFMS'approach to design space exploration to improve understanding, which couples efficient sampling methods, High Performance Compute (HPC) scale simulations and automation tools and techniques for model execution. The application of this approach to two examples will be presented. Firstly, to validate candidate designs and perform process optimisation of large scale additive manufacturing of components that can cost upwards of £100k and take weeks to build; and secondly, to multiscale modelling of composite assemblies to perform uncertainty quantification to understand the effect that manufacturing variation at the microscale can have on the part performance on the macroscale. Using HPC enabled simulation for design space exploration allows engineers to get more information faster, accelerating the design process and finding novel solutions not previously considered.

Confirm eligibility

Authors: BALLISAT, Alex (CFMS); TUMELTY, Joanna (CFMS); GRIFFIN, Jory (CFMS); ALDEN, Will (CFMS)

Session Classification: Poster Session

Track Classification: Poster