Title: LGR Effectively Explores Nearly Ten Thousand Possible Component Designs

Brief: Using LGR on ATS-2 hardware, we have simulated the performance of nearly ten thousand possible component designs, allowing designers to map and assess the design space prior to experimental testing.

LGR is an ASC/ATDM project at Sandia National Laboratories which effectively uses ATS-2 hardware to simulate the performance of certain components. For a 2D component simulation LGR is fast enough to complete a physics-based simulation in a less-than 30 seconds on an NVIDIA V100 GPU. This allowed our team to complete nearly ten thousand simulations in the span of 36 hours using only one node of ATS-2 hardware. A useful map of the design space performance can be constructed from the data, allowing component designers to explore this space quickly and identify areas to downselect with prototypes and experiments.
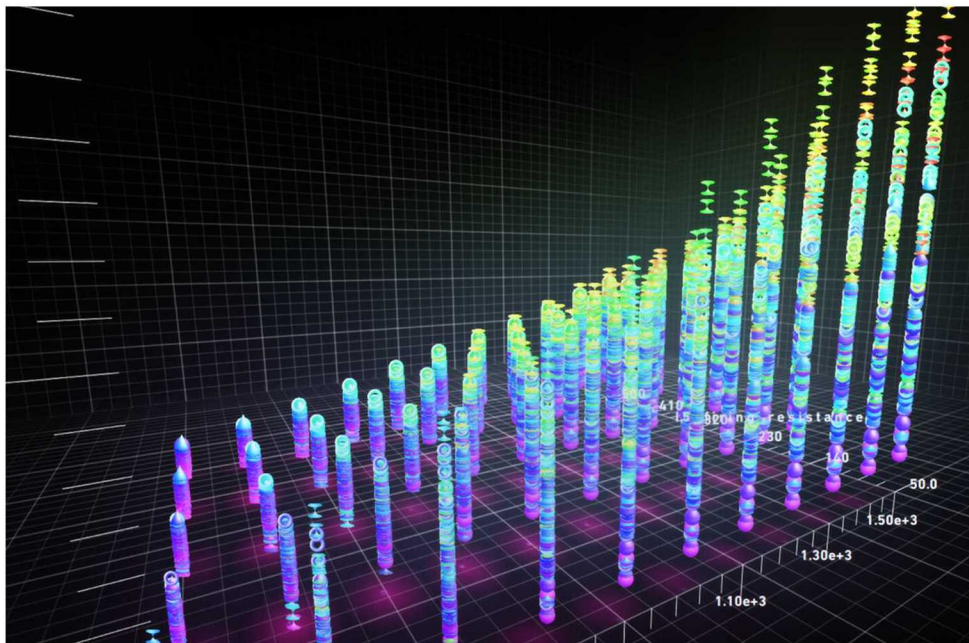(POC: Daniel Ibanez, daibane@sandia.gov)

Figure: MEDEA visualization of a component's design space. The x- and y-axes contain design input information and the z-axis represents a performance metric. Additional design input variables are assigned to color and shape attributes to help visualize different aspects of component performance. Component designer interaction with the visualization allows for rapid reduction in the number of design options to be further explored.