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# Filtered Monte Carlo Simulation for Inverse Design Using JMP 8

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## ABSTRACT

The US Department of Defense has mandated a “capability-based” acquisition process that looks for top-down joint “capabilities” as opposed to bottom-up, stovepiped systems. Unfortunately, most computer-based design and optimization tools only function in a bottom-up or forward design mode where a set of input factors is progressively changed to observe a corresponding change in a set of responses. A new technique, called “Inverse Design” allows top-level capability-parameters to be treated as the independent variables. Statistical tests and advanced visualization are used to understand the complexities of the design space and promote cooperation between analysts and decision makers. This paper will review how JMP 8 can be used to perform the inverse design procedure, including experiment generation, surrogate model creation, Monte Carlo simulation, multidimensional visualization, and interactive filtering. In addition to summarizing the step-by-step process, the author will demonstrate the results of a case study using a notional military Long Range Strike system in the JMP 8 software.

**No paper was submitted for publication.**

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