

## **The Application of Optimization and Robustness Technology to a Martian Lander Concept**

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**ABSTRACT**

Optimization and robustness technologies provide a gateway for the rapid assessment of an engineering design. Following the development of a design concept, optimization technology can automatically modify design variables of the system (i.e. airbag geometry, vent area etc.) to achieve the optimum performance characteristics.

Once the design has been optimised, a robustness assessment can be performed. This culminates in the determination of a probability value which provides a scientific basis to quantify the success of a design concept. Many industries require the risk of an engineering operation to be quantified in order to convince licensing authorities or key decision makers. There are fewer clear cut cases where a design is required to perform in an alien environment (i.e. wind velocity, rock height, pitch attitude etc.).

The paper showcases new and innovative technology available in Altair HyperStudy to determine optimization and robustness assessments using a minimum amount of LS-DYNA runs.