SynGenics Optimization System (SynOptSys)

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The SynGenics Optimization System (SynOptSys) software application optimizes a product with respect to multiple, competing criteria using statistical Design of Experiments, Response-Surface Methodology, and the Desirability Optimization Methodology. The user is not required to be skilled in the underlying math; thus, SynOptSys can help designers and product developers overcome the barriers that prevent them from using powerful techniques to develop better products in a less costly manner. SynOptSys is applicable to the design of any product or process with multiple criteria to meet, and at least two factors that influence achievement of those criteria.

The user begins with a selected solution principle or system concept and a set of criteria that needs to be satisfied. The criteria may be expressed in terms of documented desirements or defined responses that the future system needs to achieve. Documented desirements can be imported into SynOptSys or created and documented directly within SynOptSys. Subsequent steps include identifying factors, specifying model order for each response, designing the experiment, running the experiment and gathering the data, analyzing the results, and determining the specifications for the optimized system. The user may also enter textual information as the project progresses. Data is easily edited within SynOptSys, and the software design enables full traceability within any step in the process, and facilitates reporting as needed.

SynOptSys is unique in the way responses are defined and the nuances of the goodness associated with changes in response values for each of the responses of interest. The Desirability Optimization Methodology provides the basis of this novel feature. Moreover, this is a complete, guided design and optimization process tool with embedded math that can remain invisible to the user. It is not a standalone statistical program; it is a design and optimization system.

This work was done by Carol Ventresca, Michelle L McMillan, and Stephanie Globus of SynGenics Corporation for Glenn Research Center. For more information, download the Technical Support Package (free white paper) at www.techbriefs.com/tsp under the Software category.

Inquiries concerning rights for the commercial use of this invention should be addressed to NASA Glenn Research Center, Innovative Partnerships Office, Attn: Steven Fedor, Mail Stop 4–8, 21000 Brookpark Road, Cleveland, Ohio 44135. Refer to LEW-18924-1.