

VR&D Multidisciplinary Optimization

VisualDOC • DOT • BIGDOT

VR&D's Multidisciplinary Optimization software offerings include VisualDOC, DOT, and BIGDOT.

VisualDOC

VisualDOC is a multidisciplinary design, optimization, and process integration software. It uses a powerful intuitive graphical interface, along with gradient based and non-gradient based optimization, response surface (RS) approximate optimization, probabilistic analysis, and design of experiments (DOE) methods. VisualDOC interfaces easily to your own code or third-party analysis programs.

DOT - Design Optimization Tools

DOT is a general purpose numerical optimization software library which can be used to solve a wide variety of nonlinear optimization problems. If you require only an optimization engine to incorporate into your design software, DOT will serve that purpose.

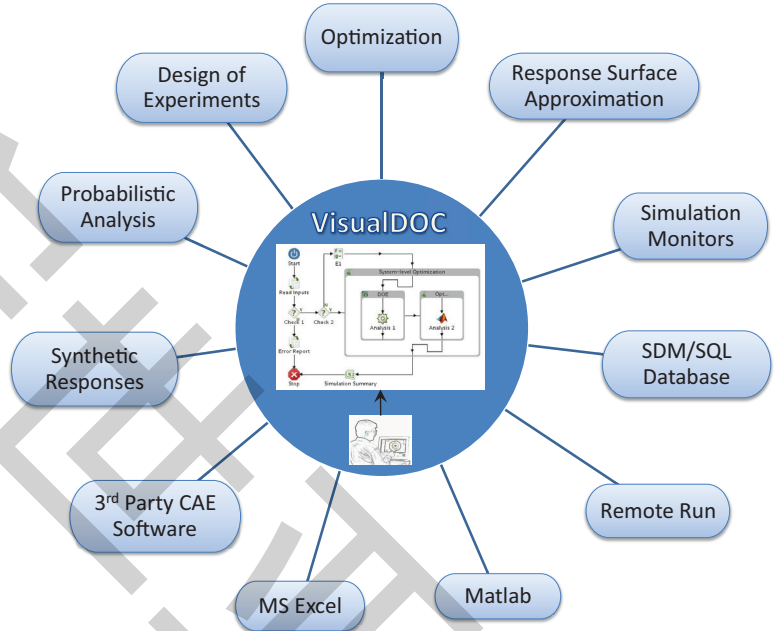
BIGDOT

BIGDOT is intended to solve very large, linear or nonlinear, constrained problems where gradient information is available. Problems in excess of three million design variables have been solved by BIGDOT.

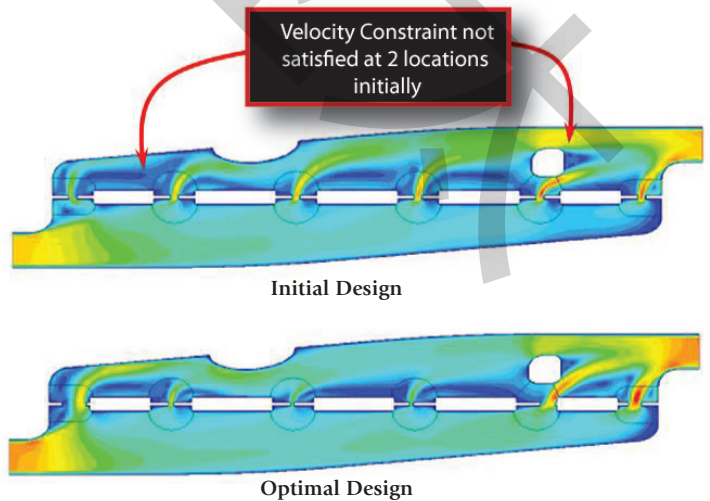
For more information on our optimization offerings contact us using the following email: visualdoc.info@vrand.com.

We offer free evaluations and unparalleled customer support.

Turbo Machinery - MDO - Fluid & Structural



CFD Optimization



VisualDOC (Screen Shot)

Approximated Equations

$$V = -5876.079972822077 + 15.756568611951 \times x_1 - 414.960353619704 \times x_2 + 21.363685990717 \times x_3 + 2934.463312564858 \times D + 0.257137914235 \times x_1 \times x_2 - 0.816440245887 \times x_1 \times x_3 + 9.334547284146 \times x_1 \times D - 0.570460388087 \times x_2 \times x_3 + 55.788072392085 \times x_2 \times D + 7.095570960289 \times x_3 \times D - 0.434265259565 \times x_1 \times x_2 - 0.258784276209 \times x_2 \times D - 0.4342810422 \times x_3 \times D - 311.438407279692 \times D^2$$

Input	Value
x1	0.01
x2	75.0
x3	75.0
D	0.5
0.5	9.5

Output	Value
V	-4490.1255
0.0	2237.9
Equi0	19.904894
-2.5	2.4
Equi45	3.5161247
-1.8	1.7
M	0.3332729
-0.1	0.3
S	-1.5403217
-0.7	-0.0
Loc	0.23643382
-58.8	4.7

VR&D Structural Optimization

GENESIS

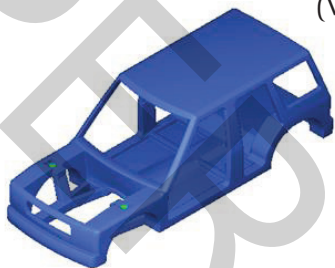
• Design Studio for GENESIS

• SMS

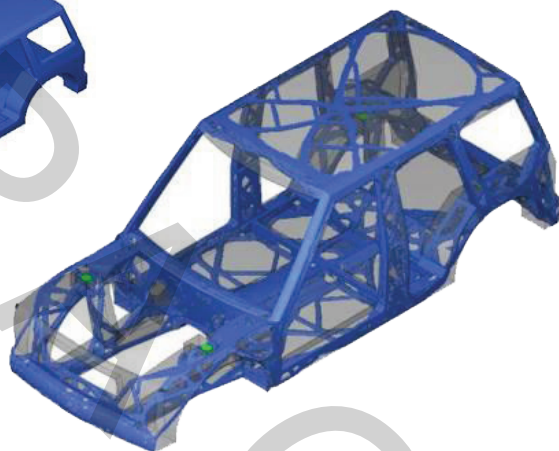
Brunel University
Formula Student Competition
Best Engineered Car - UK 2006
Image Provided Courtesy of:
GRM Consulting, UK



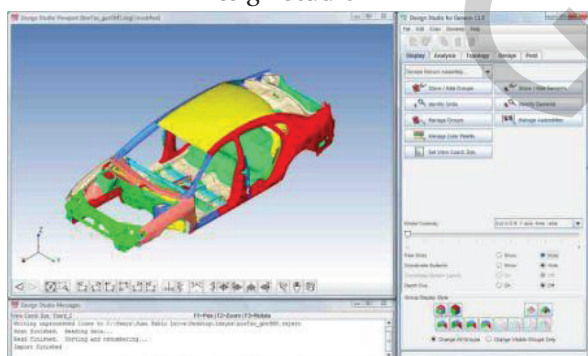
Full Body Topology
(Vehicle Body)



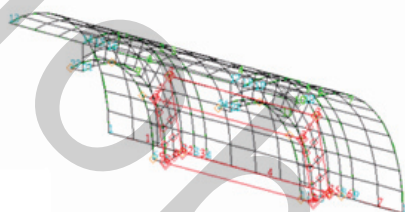
Click [here](#) to view the video demonstration



Design Studio



Shape and Sizing Optimization
(Missile Body)



VR&D's structural optimization software offerings include our GENESIS, Design Studio and SMS programs.

GENESIS

GENESIS is a fully integrated finite element analysis and design optimization software package. Analysis capabilities include static, normal modes, direct and modal frequency analysis, random response, heat transfer and system buckling. Shape, sizing, topography, topometry, freeform and topology optimization are the design options available to the user. Typically the optimization requires less than ten detailed finite element analyses, even for large and complex design tasks.

Design Studio for GENESIS

Design Studio for GENESIS is a design oriented pre- and post-processor graphical interface for GENESIS. Design Studio allows users to display finite element models and to easily create GENESIS design data. It allows users to display analysis as well as optimization results.

SMS

The SMS eigensolver may be added to existing NASTRAN installations to offer significant performance advantages over the default method when a large number of eigenmodes is required for a system with many degrees of freedom. Benchmark tests and user experiences have seen solutions times anywhere between 2 - 10 times faster when using SMS. SMS may also be embedded into your product/software.

For more information on our structural analysis or structural optimization offerings contact us using the following email: genesis.info@vrand.com.

We offer free software evaluations and unparalleled one-to-one customer support!

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