Newsletter of the European Working Group
"Multicriteria Aid for Decisions"

Bulletin du Groupe de Travail Européen
"Aide Multicritère à la Décision"

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Consultancy Companies

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ESTECO

ESTECO was created in 1999 to transfer the knowledge acquired by its founders while working on an European Union sponsored project on Design Optimization (FRONTIER) into a successful commercial product. It took ESTECO almost two years to deliver on its promises, turning a research-stage product into a world-class, industrial-strength, multiobjective optimization platform: modeFRONTIER. Along the way, our initial staff of experts in optimization techniques, numerical analysis and information technology has been expanded to acquire new skills and to position ourselves as ideal partners for engineering companies interested in taking full advantage of their human and computational resources.

Product Information

modeFRONTIER is a multiobjective optimization and design environment, written to allow easy coupling to almost any computer aided engineering (CAE) tool whether commercial or in-house. As the name suggests, modeFRONTIER provides an environment which allows product engineers and designers to integrate their various CAE tools, such as CAD, Finite Element Structural Analysis and Computational Fluid Dynamics (CFD) software. Using a variety of state-of-the-art optimization techniques, ranging from gradient-based methods to genetic algorithms, the process or design of interest can be optimized by specifying objectives and defining variables which affect factors such as geometric shape and operating conditions. modeFRONTIER in effect becomes a wrapper around the CAE tool, performing the optimization by modifying the value assigned to the input variables, and monitoring the outputs.

Process Integration

Running an analysis tool within the modeFRONTIER framework is extremely straightforward. There are no extra interfaces to license; rather just one generic interface which can be used for virtually any CAE tool. There are also direct interfaces for Excel, Matlab and Simulink; these programs can be used in their own right to perform an analysis, or to control another tool. The same process integration techniques can be used to link different CAE applications; for example, modeFRONTIER has been used to perform a fluid-structure interaction analysis, where a CFD program and a non-linear FEM program were coupled. modeFRONTIER has been successfully run with a large number of commercial CAE and in-house tools, ranging from CAD software to FEM and CFD programs.

Design Optimization

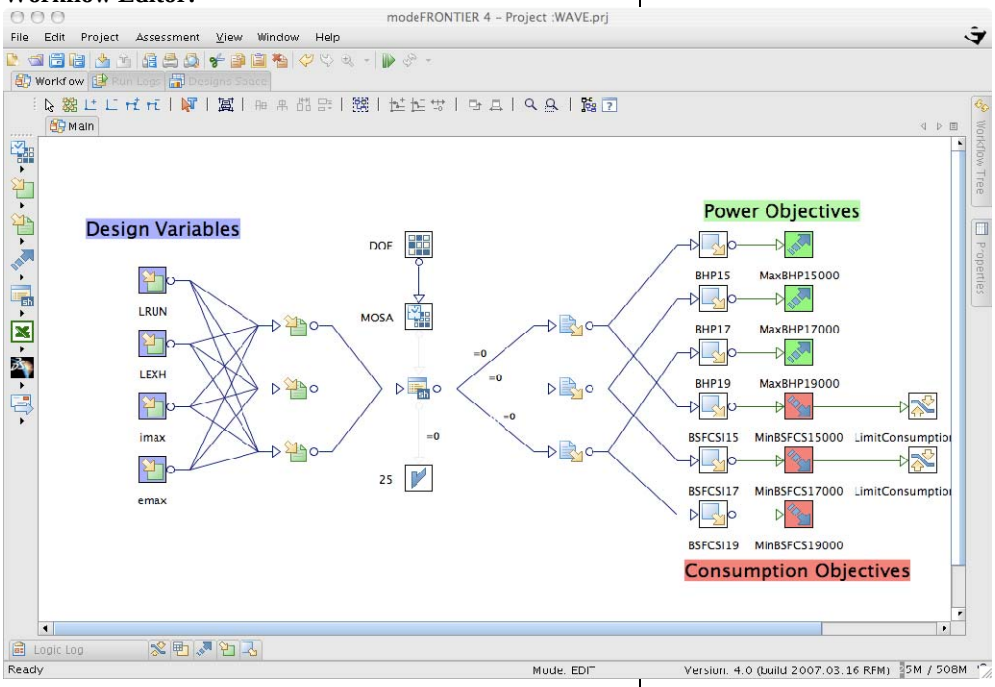
modeFRONTIER features the most recent optimization techniques available today in literature. Ranging from Design of Experiments to Direct Optimizers.
Modules:
Preliminary Exploration Methods (DOE);

1. Schedulers (ranging from Multi-objective Genetic Algorithms to Simplex methods)
2. Metamodeling (Response Surface Methods, like Neural Networks to Gaussian Processes)

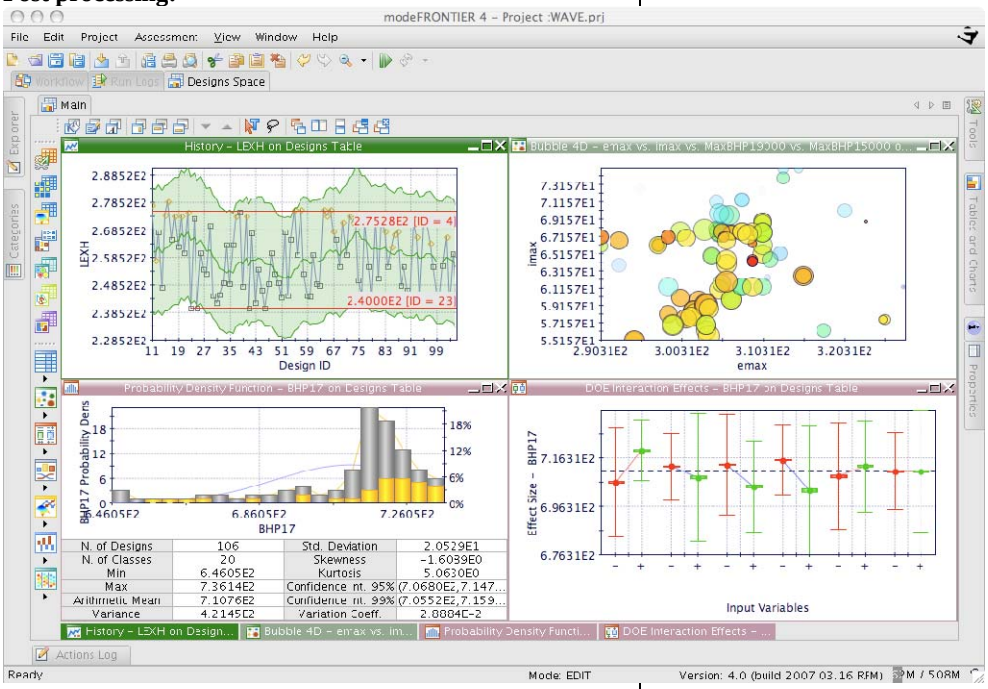
3. Decision Support Tools
4. Robust Design Optimization
5. Charting and Assessment tools (from standard plots to very sophisticated multi dimensional scaling)

Screenshots

Workflow Editor:



Post processing:



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