

# modeFRONTIER

Monitoring the results of your simulation team and need to be always updated on the status?

DATA VIEWER

PICK YOUR PROFILE

OPTIMEAZY

Facing time or computational resource barriers or have a scarce knowledge of the design problem characteristics?

Dealing with very complex, multidisciplinary problems?

MULTI DISCIPLINE DESIGN

DATA EXPLORER

Are you an expert in Design Space Exploration and RSM-based what-if analysis?

Are you the team domain expert focusing on single-discipline simulations?

SINGLE DISCIPLINE DESIGN

AUTOMATION DESIGNER

In charge of integrating and automating multiple disciplines in a single workflow?

## modeFRONTIER

	profile	functionalities	interface		
			mS	mP	mF
DATA SPACE	DATA VIEWER	Analytics charts [ VIEW ]	✓		
	DATA INSPECTOR	Analytics charts [ VIEW AND EDIT ]	✓		
	DATA INTELLIGENCE	Analytics tools	✓		
	DATA EXPLORER	Analytics tools Design Space Exploration	✓	✓	✓
PROCESS & OPTIMIZATION	AUTOMATION DESIGNER	Workflow [CREATE , EDIT , RUN] Integration package medium		✓	✓
	SINGLE DISCIPLINE DESIGN	Workflow [CREATE , EDIT , RUN] Analytics tools Design Space Exploration Integration package medium	✓	✓	✓
	MULTI DISCIPLINE DESIGN	Workflow [CREATE , EDIT , RUN] Analytics tools Design Space Exploration Robust Design & MCDM Integration package large	✓	✓	✓
	OPTIMEAZY	piLOPT workflow [CREATE , EDIT , RUN] Integration package small	✓	✓	✓

### LEGEND

Analytics charts:  
statistics charts

Analytics tools:  
statistics charts  
MVA (clustering + SOM\*)  
RSM

\* Self-Organizing Maps

Design Space Exploration:  
DOE workflows  
Sensitivity Analysis

Integration Packages: \*  
SMALL: 1 any CAD/CAE node  
MEDIUM: 3 any CAD/CAE nodes  
LARGE: 10 any CAD/CAE nodes

\* Choose your nodes every time you set a project

Robust Design  
& Decision Making:  
MORDO  
MCDM

piLOPT workflow:  
DOE  
piLOPT  
1 Integration Node

### EXTRA Toolbox

» CAP  
» GRID  
» EASYDRIVER

NPE Packages  
» SMALL (64)  
» MEDIUM (512)  
» LARGE (1024)

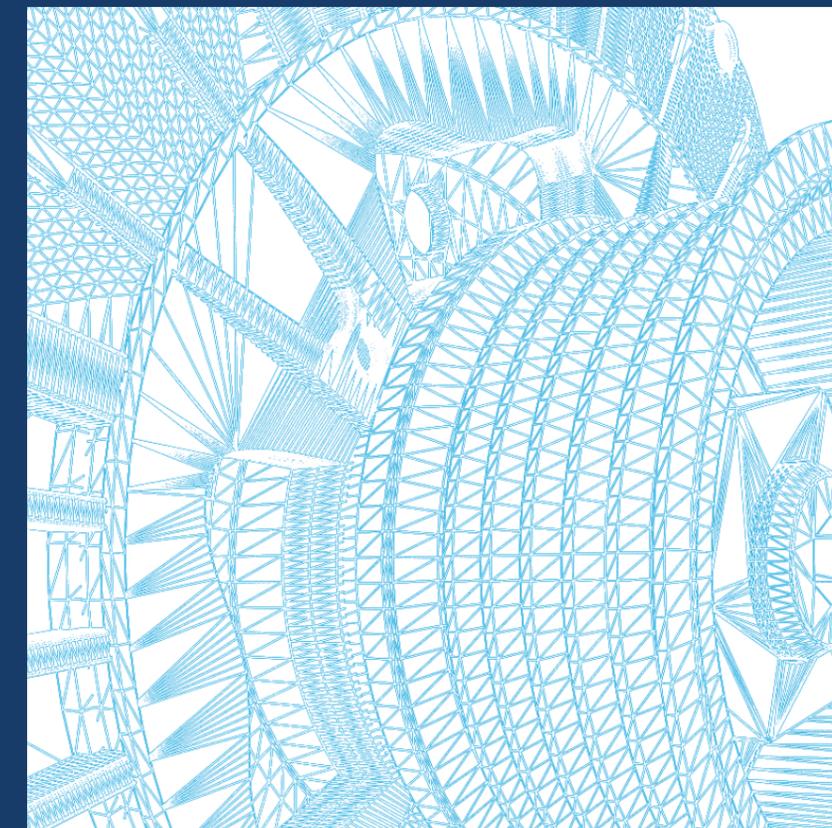
modeFRONTIER streamlines the design process with powerful workflows, innovative algorithms and sophisticated post-processing tools. Its multidisciplinary design enabling technology, critical to successful new product development today, keeps it at the forefront of engineering technology.

New User Profiles enable multidisciplinary engineering practices to consolidate specialized expertise and streamline teamwork by allocating software resources where needed.

Depending on the step of the engineering problem at hand, it is now possible to access different functionalities within the same installation through dedicated modules (modeSPACE and modePROCESS) or directly in modeFRONTIER, according to the profile of the user.

## The Innovative Optimization Environment with Modular, Profile-based Access

Discover how the philosophy behind modeFRONTIER benefits your entire organization by reducing complexity, improving efficiency and cutting development time.



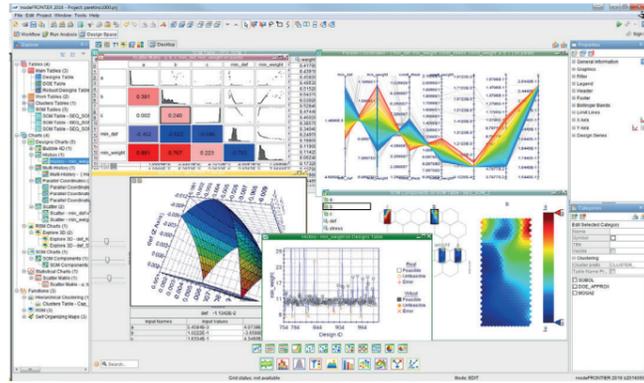
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modeFRONTIER is a product of





Understanding the data trends and attributes impacting the design space, is crucial to the preliminary design exploration and the post-processing phases of the often-large amount of data generated at runtime.

The four profiles available for the DATA SPACE area provide a tailored set of tools to perform design data analysis and mining required at each step.

**DATA VIEWER**

**Understand complex datasets in modeSPACE**



Analysts can prepare for design reviews and show data using sophisticated, interactive charts while other team members continue their work using modeFRONTIER. At the same time managers can monitor the status of the design process by viewing results in modeSPACE, without affecting the work process.

**DATA INSPECTOR**

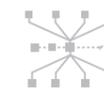
**Post-processing essentials at your fingertips**



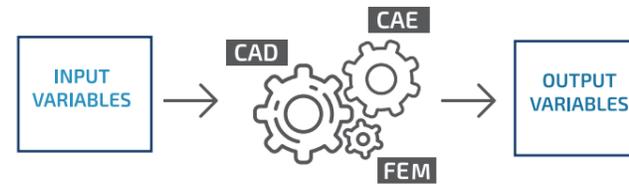
When basic data analysis is needed, the Data Inspector profile provides the complete set of modeFRONTIER post-processing charts included in the modeSPACE standalone application.

**AUTOMATION DESIGNER**

**Get your MDO workflow into shape**



Integrating the different physics domains involved in MDO (Multidisciplinary Design Optimization) studies requires specific expertise. Integration experts can build, edit and run efficient multidisciplinary workflows for the team, accessing modeFRONTIER or the modePROCESS application.



**SINGLE DISCIPLINE DESIGN**

**Enhanced design solutions for domain experts**



When focusing on a single analysis domain, users can create, edit and run single discipline optimization projects exploiting the whole range of modeFRONTIER algorithms together with up to three direct integration nodes. By including domain-specific tools in the workflow, created directly through modeFRONTIER or through modePROCESS, engineering teams can exploit the prediction capability of simulations further. Advanced analytics tools guide designers and let them concentrate exclusively on relevant design parameters. Product performance targets are reached sooner, reducing manual iterations and respecting critical design constraints.

**modeSPACE**

The design space environment is now also available as a standalone application - modeSPACE - that enables efficient license and role management within teams. This module includes the sophisticated set of modeFRONTIER tools for data analysis and investigation of problem characteristics both in the post-processing and in the pre-optimization phase.

**modeSPACE**

**modePROCESS**

modePROCESS is an independent desktop application intended for describing processes in the form of graphical workflows, that specify which parameters and simulations are required to solve an engineering design problem.

**modePROCESS**

**DATA INTELLIGENCE**

**Make the most out of advanced data analysis**



Sometimes data needs more focus. Analysts can now create and edit post-processing charts, train RSMs (Response Surface Methods), and exploit advanced MVA (Multi-Variate Analysis) tools, directly from the standalone module. The improved RSM wizard, now including the automatic training feature, assists the user in the creation of highly accurate response models to be exploited for interactive what-if analysis and response prediction. Also, the new RSM Evaluation Chart helps compare metamodels based on the approximation quality.

**DATA EXPLORER**

**Full-scale design space exploration**



DOE (Design of Experiments) experts can now set up and execute a Design Exploration Workflow in modeFRONTIER and also enjoy the full set of tools dedicated to data analysis in the modeSPACE module. The new Sensitivity Analysis Tool, the RSM Evaluation Chart and the improved RSM wizard offer an environment tailored to effective design space exploration. This reliable support base assists analysts in understanding multidisciplinary attribute roles, finding correlations, performing impact analysis by executing the automatically-trained metamodels or carrying out advanced MVA.

**MULTI DISCIPLINE DESIGN**

**Unlock the power of MDO**



The most complete profile dedicated to teams dealing with complex, multifaceted design projects, often involving the closely interrelated engineering of systems and subsystems. Unlock the full power of modeFRONTIER and create, edit and run highly-structured multidisciplinary optimization projects with the support of the best-in-class MDO platform. modeFRONTIER provides new advanced features for project complexity handling, such as the dedicated panel for workflow setting (Workflow Global Properties), the Design Space Node, the improved Subprocess Node and many more.

**OPTIMEAZY**

**Find the optimum with one click**



For users seeking a rapid but sophisticated optimization experience, Optimeazy offers a tailored license module to run one-click optimization projects with the ESTECO proprietary algorithm pilOPT. Create, edit and run workflows - accessing modeFRONTIER or modePROCESS - to run preliminary optimization or save time when knowledge of the problem characteristics is scarce. The hybrid, multi-strategy pilOPT algorithm needs only a reduced number of runs to reach the optimum, making the use of computational resources more efficient.