Company overview

ESTECO is an independent software company, highly specialized in numerical optimization and simulation process and data management.

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ESTECO SOFTWARE TECHNOLOGY

Our technology inspires companies to create, capture and cultivate engineering knowledge.

© ESTECO SpA

modeFRONTIER helped achieve five-star Euro NCAP for head protection.

The overall optimization process allowed us to reduce 6% of the crash deformation compared to the conventional aluminum hood and satisfy Head Injury Criterion target values.

OSAMU ITO | Assistant Chief Engineer |
Technology Research Division
Honda R&D Co. Ltd.

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Our values

INNOVATIVE

Our development is at the forefront of technology

FLEXIBLE

We respond quickly to customers' demand

RELIABLE

Continuous development and on-time delivery

INDEPENDENT

We integrate with any software

© ESTECO SpA

Our people

Our staff is our strength

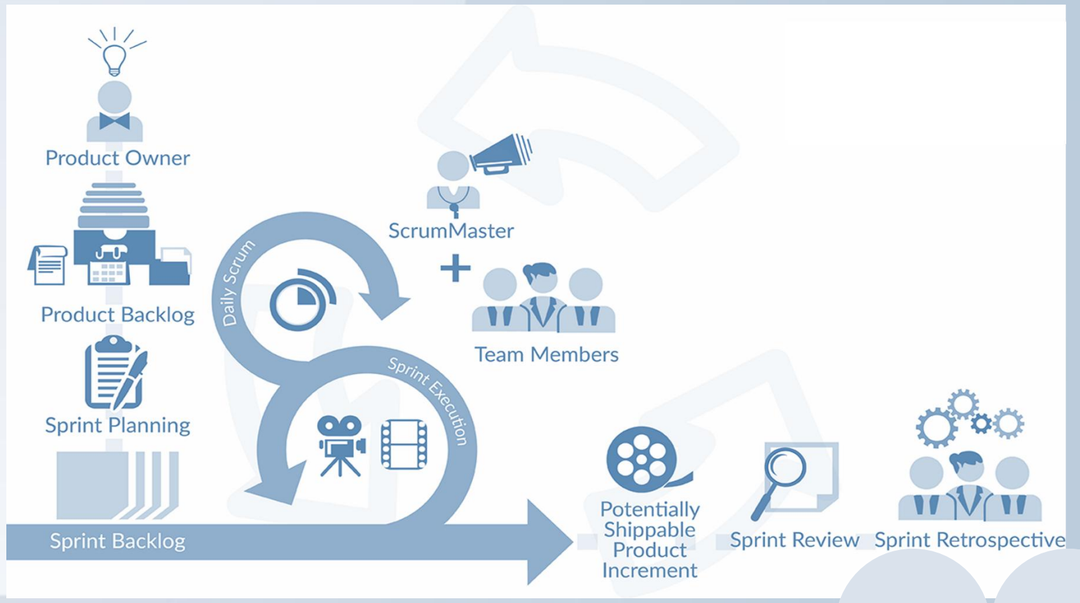
- 180+
professionals
- 50+%
with a postgraduate or master degree
- 17%
with a PhD
- 25%
women

© ESTECO SpA

Our philosophy

“Continuous development will change organizations as much as Agile did.”

HARVARD BUSINESS REVIEW
May 04, 2018



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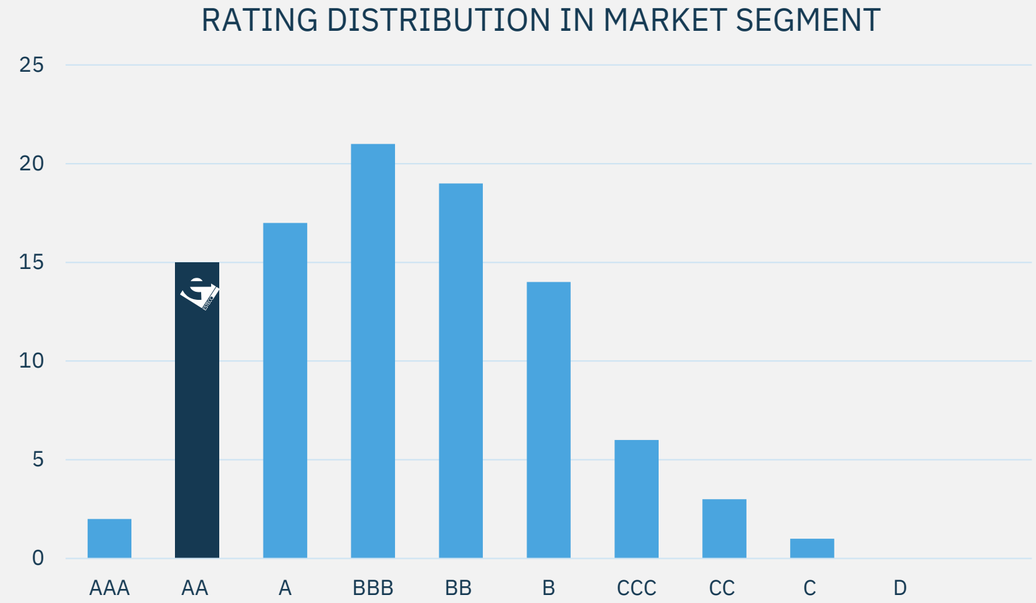
Our stable growth

(data related to ESTECO HQ Italy only)

	Revenue [k€]	Default probability	Confidence	Rating
2020	9879	0,11%	100%	AA
2021	10700	0,10%	100%	AA
2022	11700	0,10%	100%	AA
2023	11813	0,10%	100%	AA
2024	12700	0,10%	100%	AA



We provide modularity, standardization and interoperability within the engineering design process.

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ESTECO Technologies

Simulation Process and Data Management

Simulation Process Integration and Automation

Design Optimization

Business Process Management

HPC and Cloud

AI Data-Driven Modeling

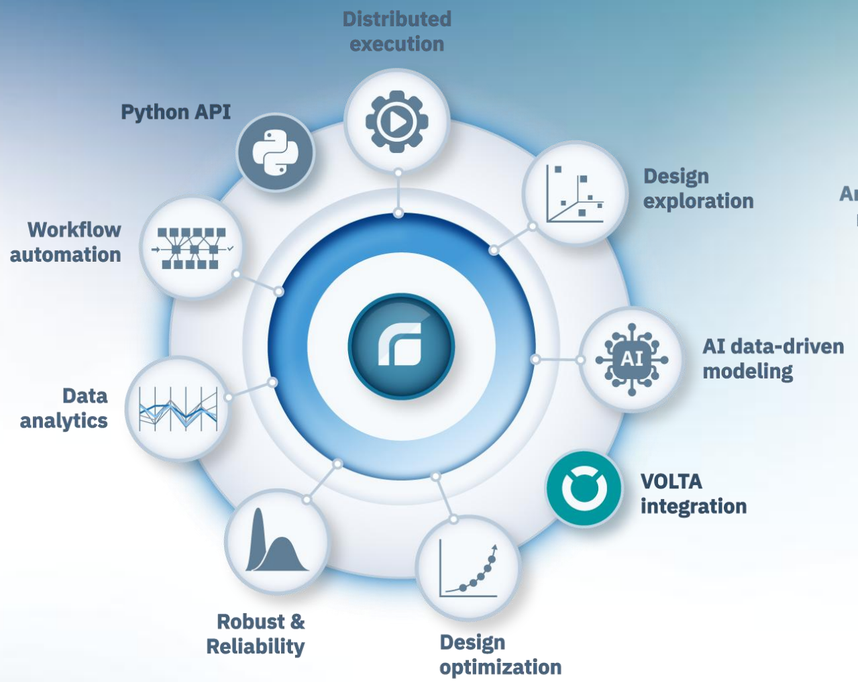
Robust Design and Reliability

Response Surface Models

Simulation Data Analytics

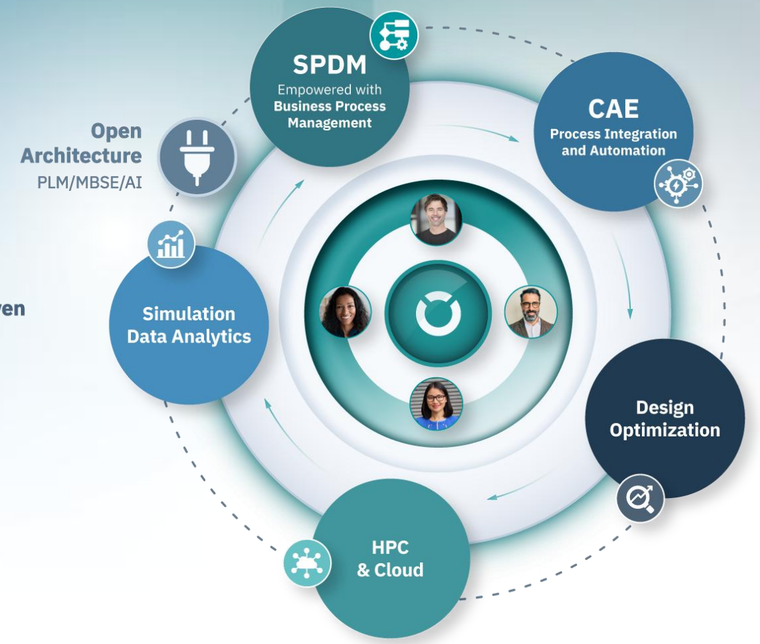
Model-based systems engineering

Our products



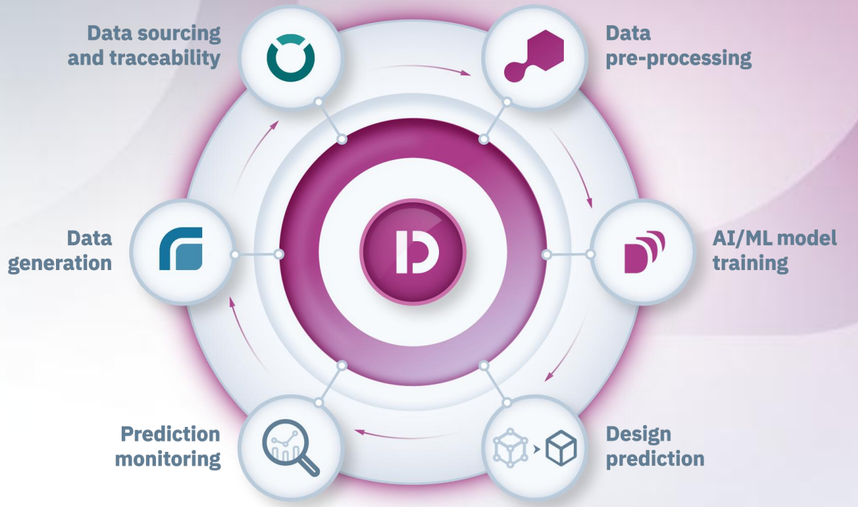
modeFRONTIER

modeFRONTIER is the leading software solution for simulation process automation and design optimization.



VOLTA

VOLTA is the digital engineering platform for simulation process and data management (SPDM) and design optimization.

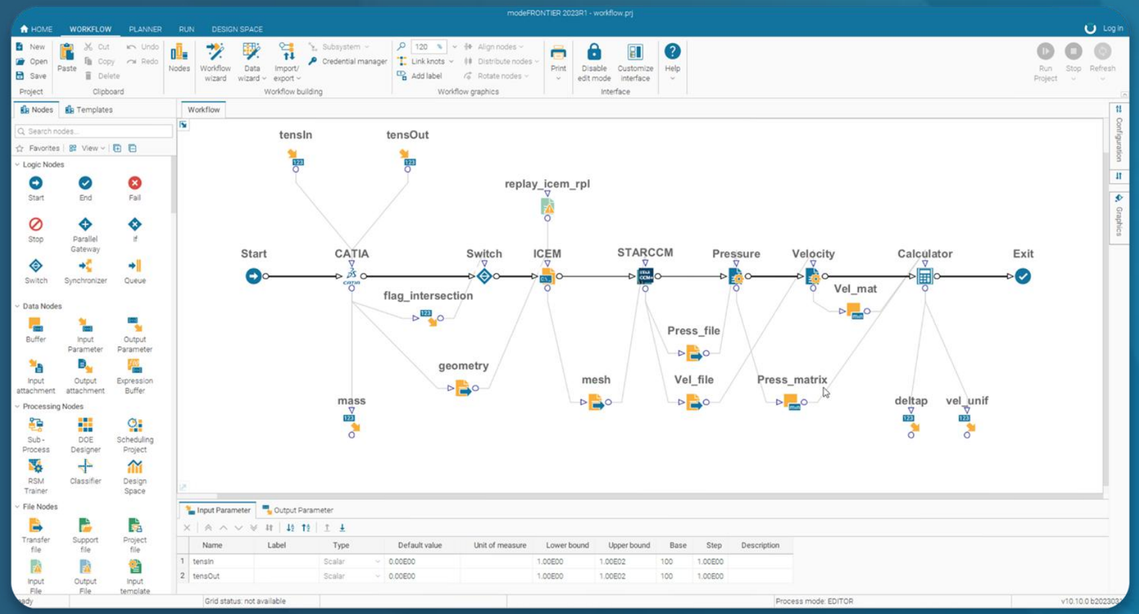


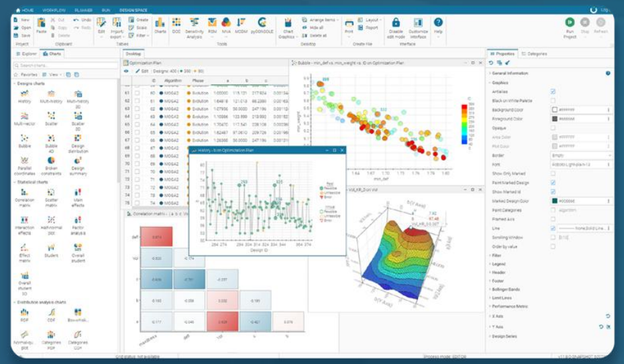
nDAI

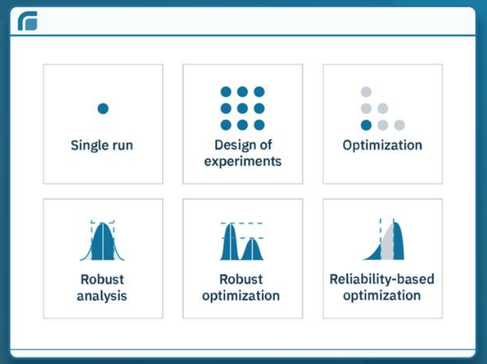
The AI engineering platform for instant design predictions, sustainable AI/ML training and data governance.

modeFRONTIER

The vendor agnostic software for process automation and design optimization.





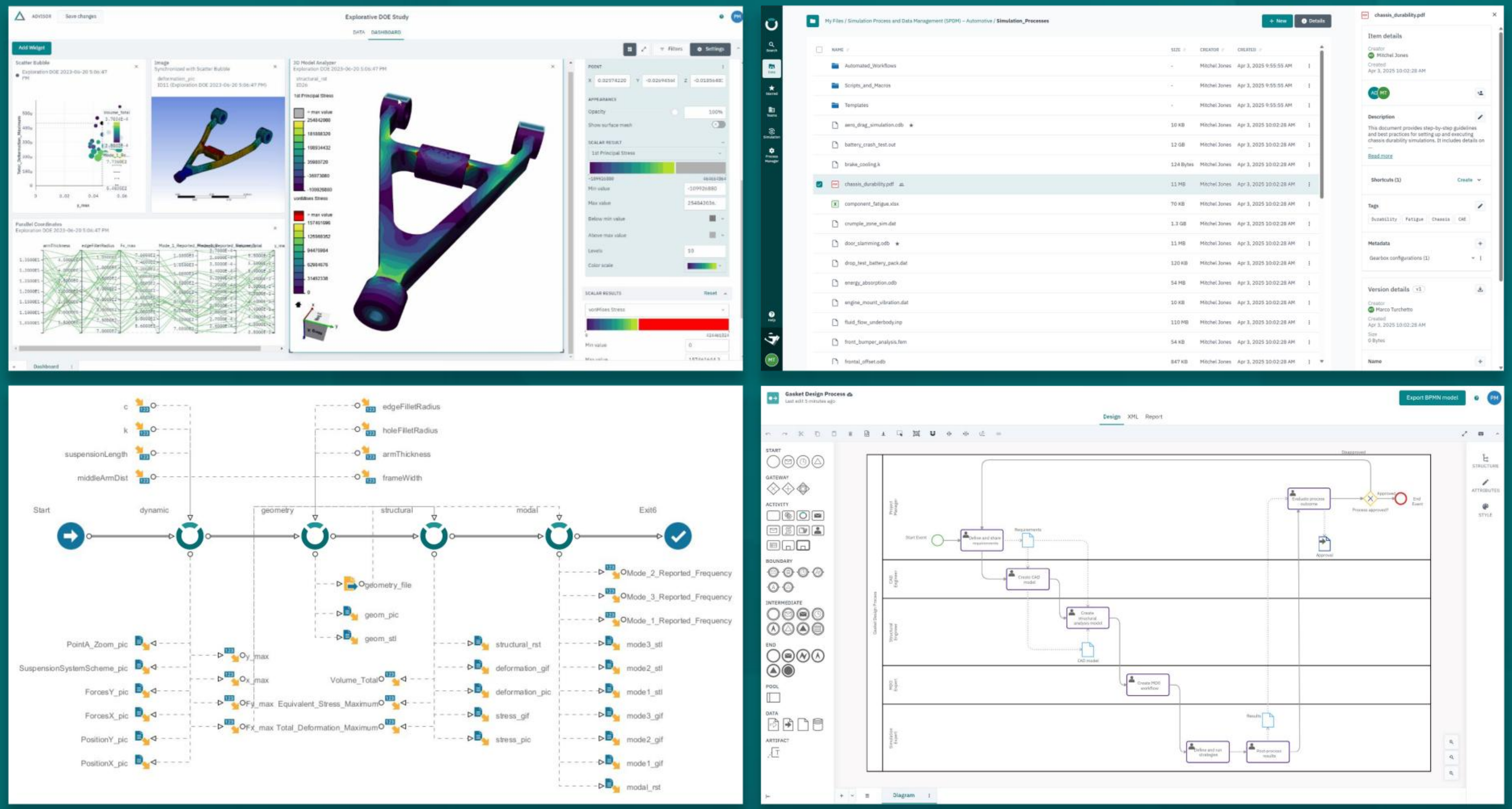


Automatically explore the design space with AI-enabled methods and accelerate product development.

© ESTECO SpA

VOLTA

The digital engineering platform for SPDM and design optimization.



Take full control over the engineering design process, from simulation workflows to high-level business decisions.

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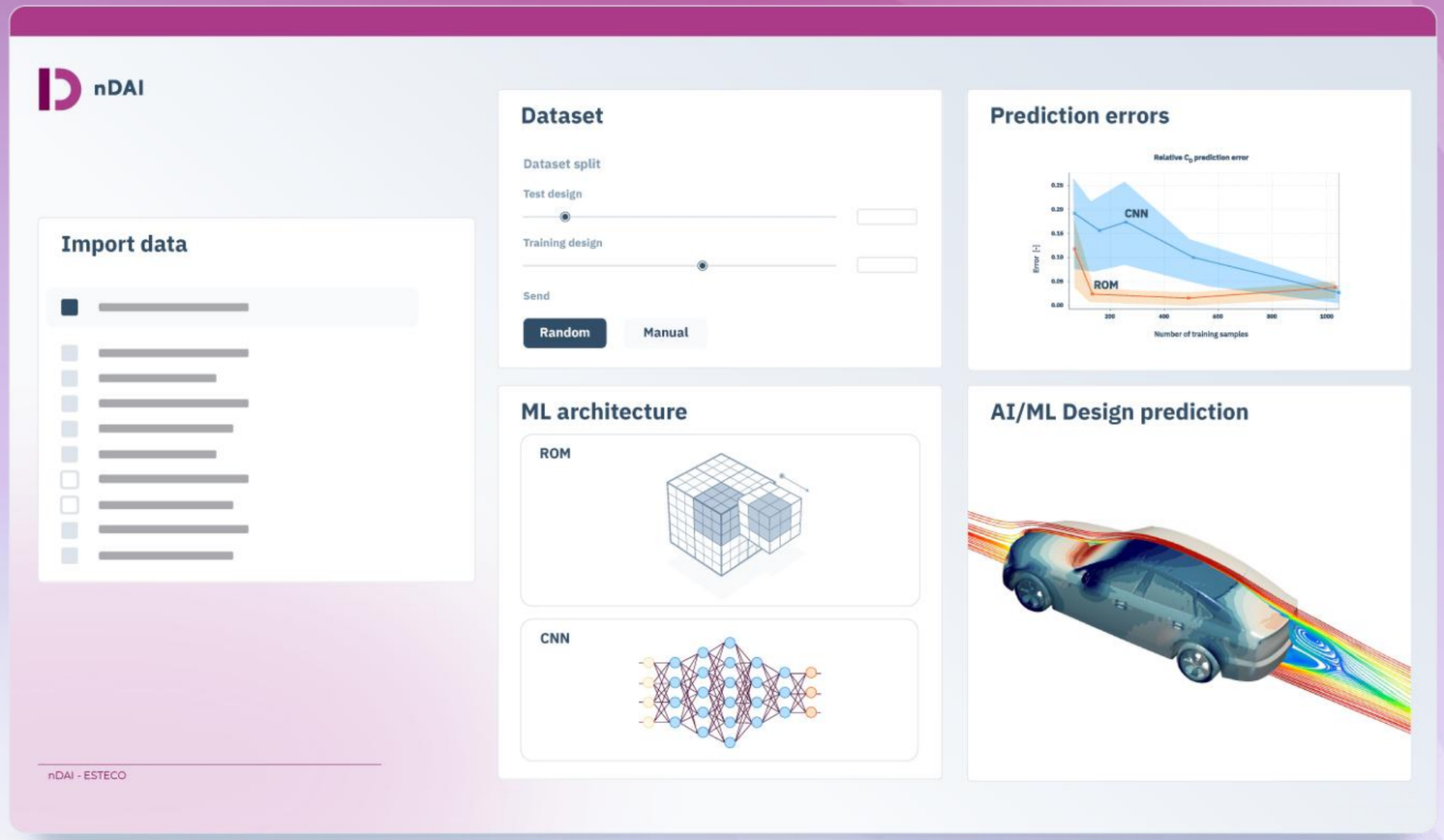
nDAI

The AI engineering platform for instant design predictions, sustainable AI/ML training and data governance.



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We facilitate engineering work, regardless of the level of expertise within one team, and our independent position ensures fast responses to customer demands.

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We’re making another big step in Raytheon’s digital transformation journey by selecting ESTECO’s digital engineering framework, called VOLTA, for our data sharing across the product life cycle.

RAYTHEON

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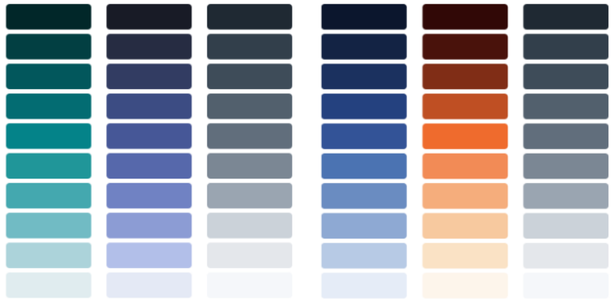
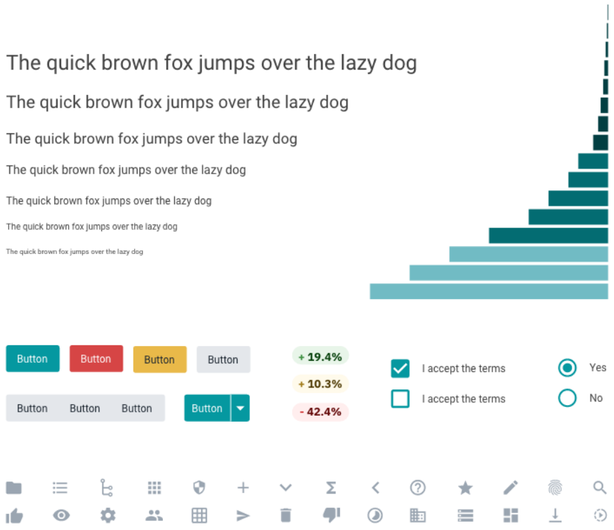
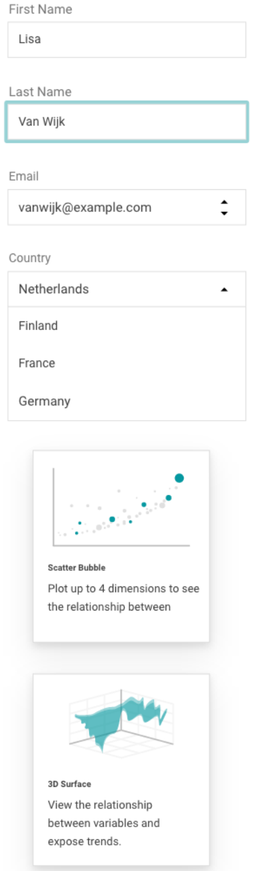
Our unique User Experience

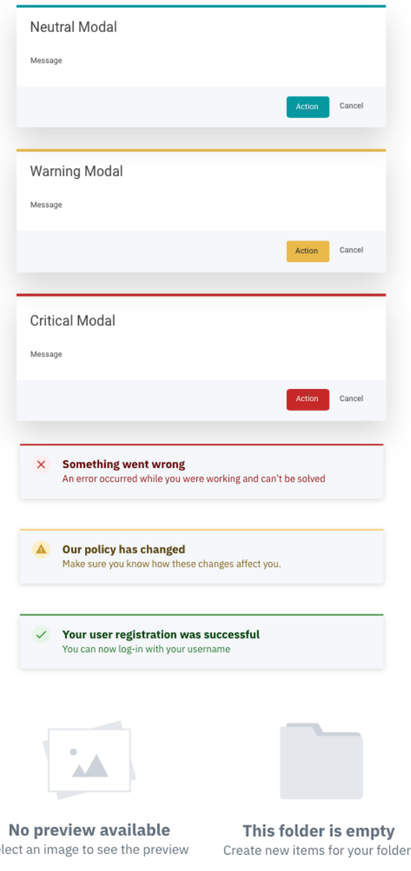
SOUL

soul.esteco.com









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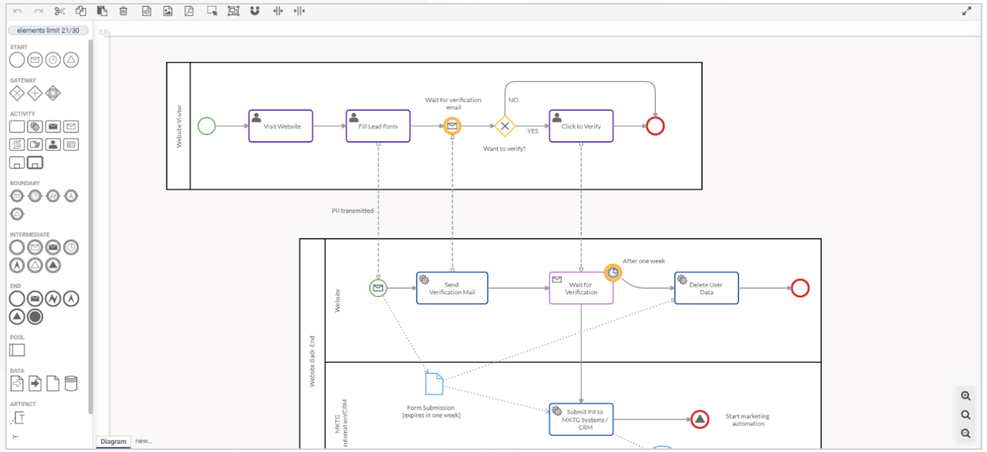
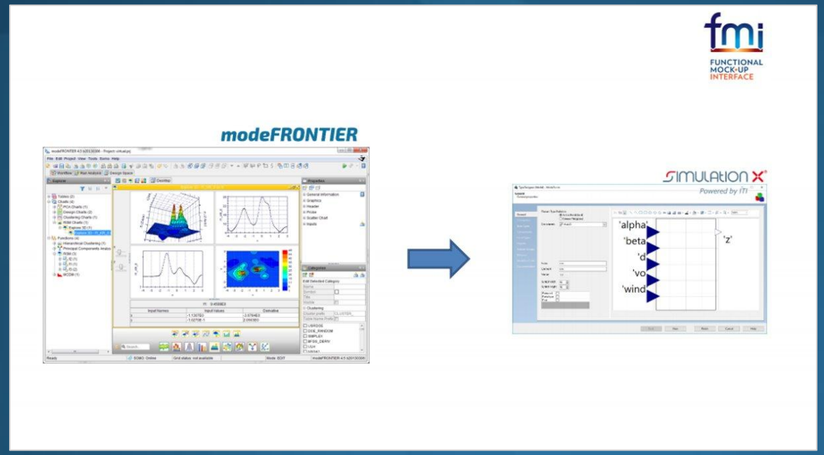
Our standards

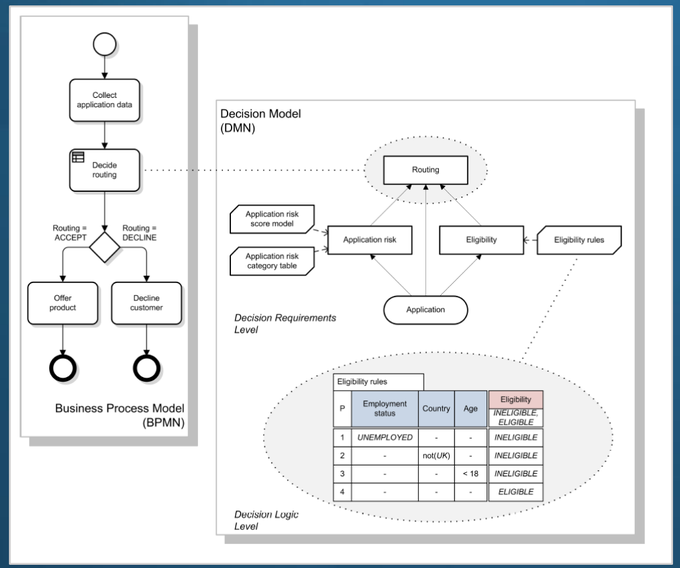
Business Process Model and Notation



Functional Mock-up Interface



Decision Model and Notation



OBJECT MANAGEMENT GROUP®

© ESTECO SpA

The capacity to integrate seamlessly with every system and our secure collaborative environment guarantee data integrity while keeping fast responses.

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Our technology partners

creating value for our customers

Ansys
PREFERRED SOLUTION PARTNER

MSC Software

eXstream ENGINEERING
MSC Software Company

GT Gamma Technologies

BETA
SIMULATION SOLUTIONS

DASSAULT SYSTEMES

SOLIDWORKS

SIEMENS

AVL

ptc

SIMULIA

LOGE

Building coherent solutions with best in class third party software.

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Seamless integration with any engineering application

Our solutions are fully integrated with the most commonly used engineering tools.


Abaqus FEA


Adams/Car


Adams/View


Ansa


ANSYS Workbench


ASMI


AVL AST


CATIA


COMSOL


CREO Elements/Pro


CST Microwave


Dymola

ESI


Excel


FMI


Grasshopper


GT-Suite


Hypermesh


JMAG designer


Keysight ADS


Keysight empro


LightTools


Madymo


Maplesim


Mathcad Prime


MATLAB


Metapost


MSC Nastran


Python


Romax Designer


ROMbox ESTECO


SFE Concept


Simcenter 3D


Simcenter Amesim


Simcenter Flowmaster


Simcenter StarCCM+


SimulationX


SolidWorks


SolidWorks flowsimulation


SpaceClaim


Wave


VOLTA ESTECO

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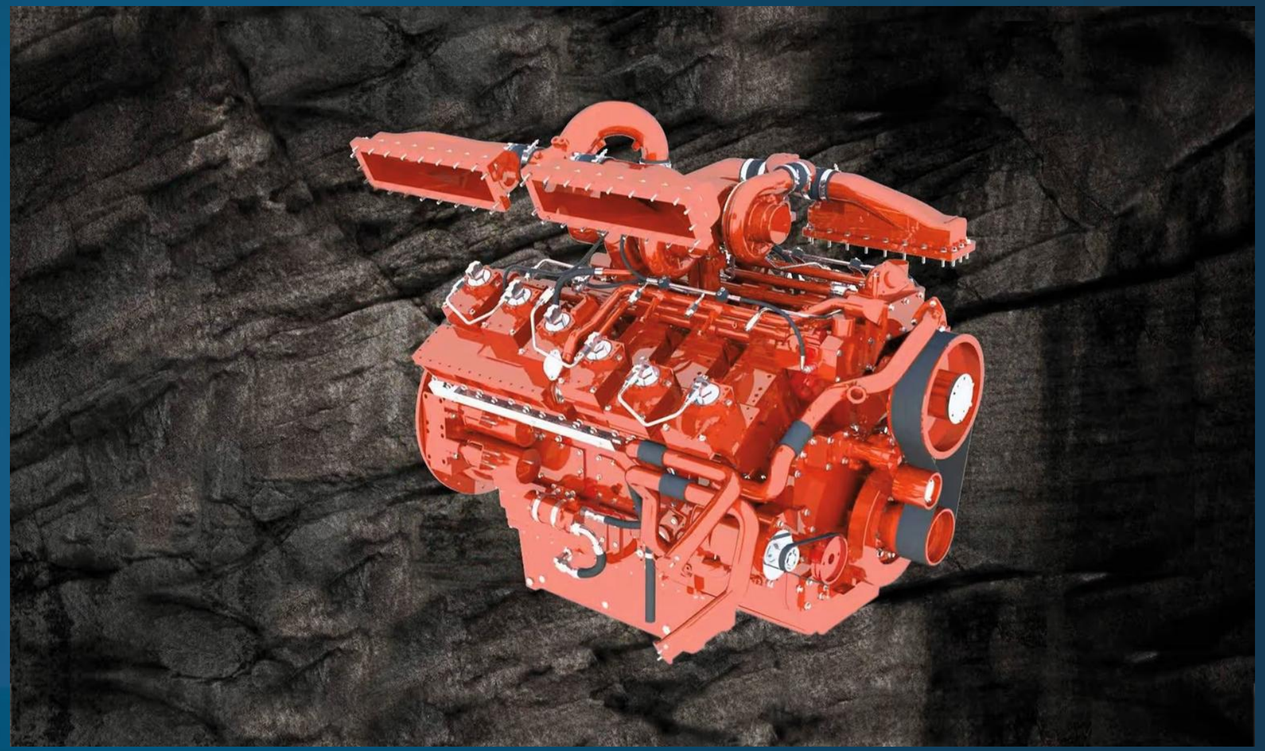
modeFRONTIER proved highly reliable for reducing design cycle time and improving the performance of the valve train. From the outset, it helped drastically reduce the time taken for calibrating GT models.



Ambikapathy Naganathan| Structural and Dynamics Analysis Engineer
Cummins

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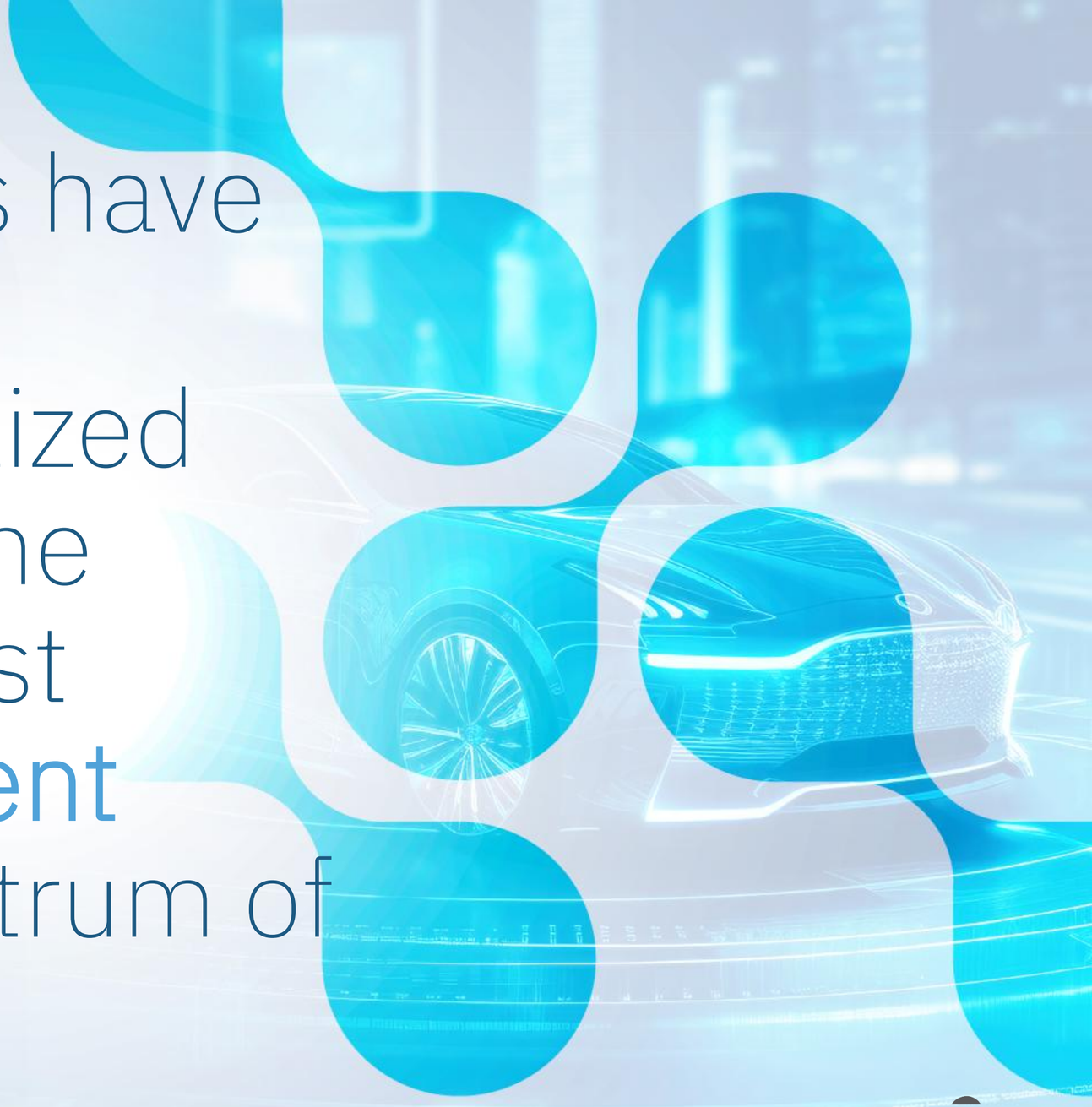
300+ organizations have chosen ESTECO to consolidate specialized expertise, streamline teamwork and boost product development across a wide spectrum of industrial sectors.



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VOLTA automates time-consuming CAE processes. From DOE and surrogate models creation to exploration of pareto front, post-process and visualization of simulation results. This enables a wider audience of our engineers to perform vehicle performance trade-off studies more easily.

TOYOTA

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Main customers (A-Z) and industries

ABB
BASF
Bouygues Construction
Canon
Cummins
Denso
Eaton
Embraer
Ferrari
Fincantieri
Ford Motor Company
General Atomics
Hitachi Energy
Honda
Hyundai
Leonardo
Mahindra
Modine
Nokia
Porsche
Raytheon
Rolls Royce
SLB
Stellantis
Takenaka Corporation
Tata Motors
Toyota
Volvo Car Corporation

© ESTECO SpA

Bombardier reduces aerodynamic drag by 20% and saves about the 10% of energy consumption with modeFRONTIER.

ALEXANDER ORELLANO| Head of Aerodynamics
Bombardier

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Our scientific foundation

Spin-off
of an EU Funded Project in the late ‘90s.

200+
universities using our technologies.

20+
funded research projects.

1000+
scientific papers written about research work performed with our technology.

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ESTECO Academy

We equip educators to teach students how to approach multidisciplinary engineering problems using modeFRONTIER software.

Teaching

Research

University projects

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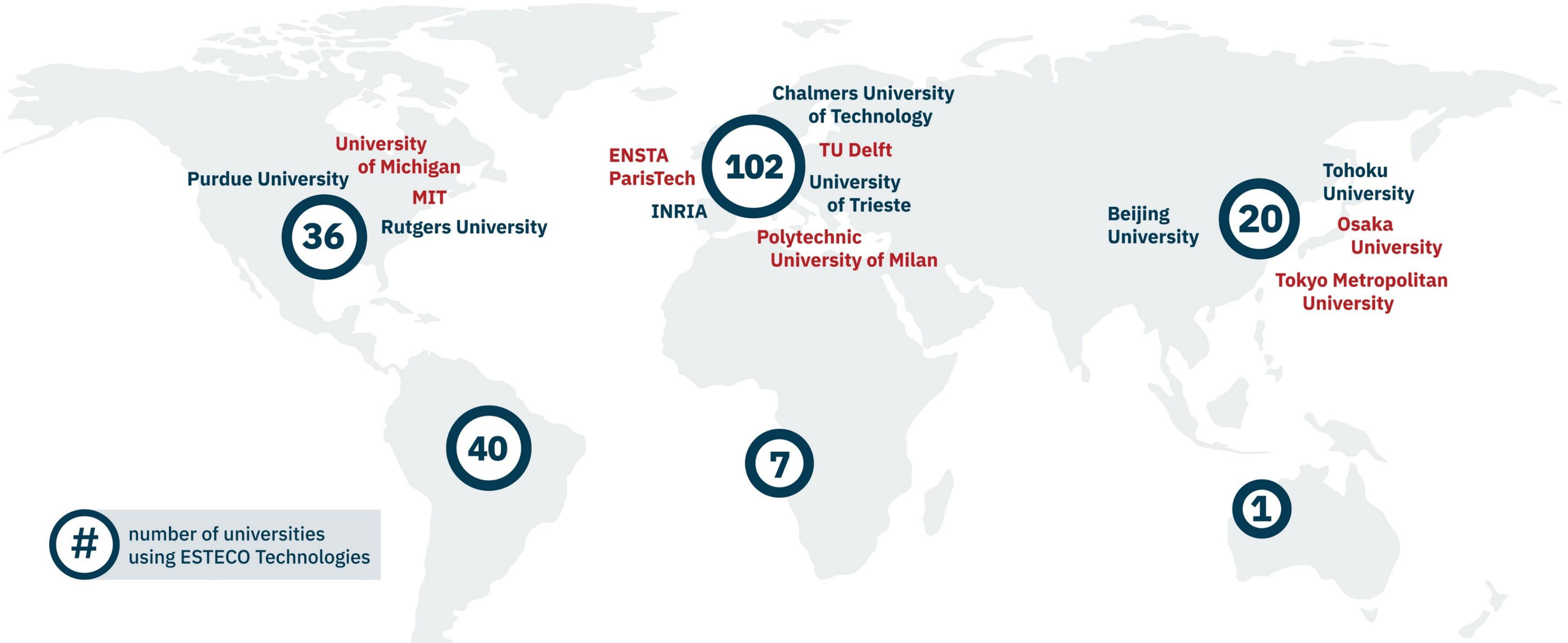
Our community



We bring students closer to the real world by providing cutting-edge software technology and hands-on experience on the different stages of design optimization process.

© ESTECO SpA

BEN–GURION University of the Negev

“You can introduce modeFRONTIER to students who didn’t have any kind of knowledge of optimization whatsoever and they can grasp it in a matter of hours.”

PROF. OHAD GUR
Faculty of Engineering Sciences,
Ben-Gurion University of the Negev

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Our offices

© ESTECO SpA

Our sales network

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Our research projects

musicode

Open Innovation Platform for Materials

ARIA
Accurate ROMs for Industrial Applications

Accurate ROMs for Industrial Applications

EXSCALATE 4COV

Exascale Smart Platform Against Pathogens

COMPOSELECTOR
Polymer Composites
Business Decision Support System
European Commission
Horizon 2020 European Union funding for Research & Innovation

Business Decision Support System

UNCERTAINTY MANAGEMENT FOR ROBUST INDUSTRIAL DESIGN IN AERONAUTICS
UMRIDA

Uncertainty Management and Quantification and Robust Design

GASVESSEL

Natural gas (CNG) transportation system

© ESTECO SpA

Our SaaS application

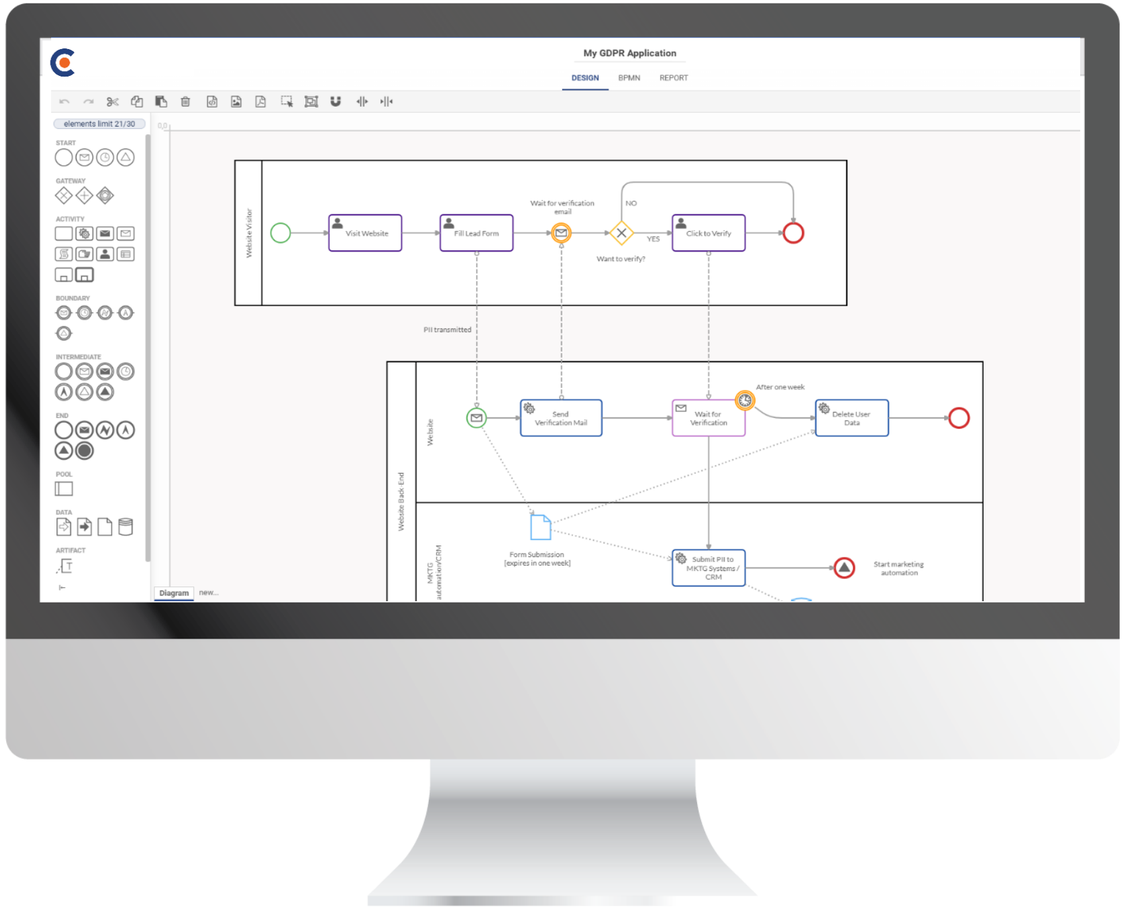
Born as a research project, Cardanit is the next generation collaborative tool for designing business processes.

Cardanit

© ESTECO SpA

Cardanit

Based on the Business Process Model and Notation standard, Cardanit offers businesses and BPM specialists a new flawless approach to process models.



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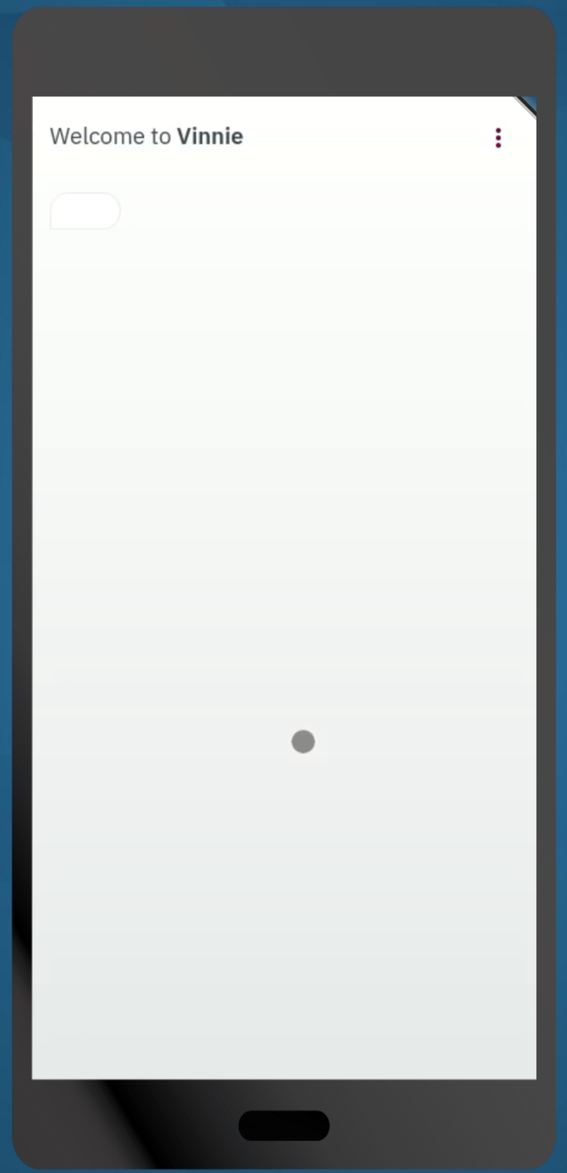
Our adventures

- Machine Learning
- Social login
- Progressive web apps
- Cloud



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Meet us

connect with peers and customers

Users’ Meetings

meet optimization enthusiasts

Technology days

sharing innovative optimization techniques on specific topics

ESTECO Trainings

workshops and learning sessions

um 2026 ESTECO INTERNATIONAL USERS' MEETING

Step into our world.
Meet **VOLTA** and
modeFRONTIER users.

Conference, **June 16/17**
Marina Monfalcone, Italy

Workshops, **June 18**
ESTECO Headquarters, Trieste, Italy

Register now

um26.esteco.com

Job opportunities

we are continuously looking for

Software developers
for our product development teams

Mechanics, naval, aerospace engineers
for customer support and special projects

jobs.esteco.com

Theses and internships

Engineering and services

Integration with applications related to fluid dynamics, structural analysis, electromagnetics.

Research and development

Software architecture, Web and mobile applications, Business Intelligence and Data Analysis.

Numerical methods

Optimization algorithms, Response Surface Models, Artificial Intelligence.

© ESTECO SpA

We support engineers in designing the products of the future, today.

© ESTECO SpA

modeFRONTIER ticks all of the boxes: a flexible optimization tool that provides us with a wide range of state-of-the-art optimization algorithms, easy to use, allowing our engineers to be productive almost immediately. And, it’s a proven software product with a long record of successful usage.

MARTIN JACOBY | CFD Specialist
Luna Rossa Prada Pirelli

© ESTECO SpA

modeFRONTIER helped increase cruise speed and reduce cavitation in marine propellers.

FRANCESCO SERRA | R&D Office
Azimut Benetti Group

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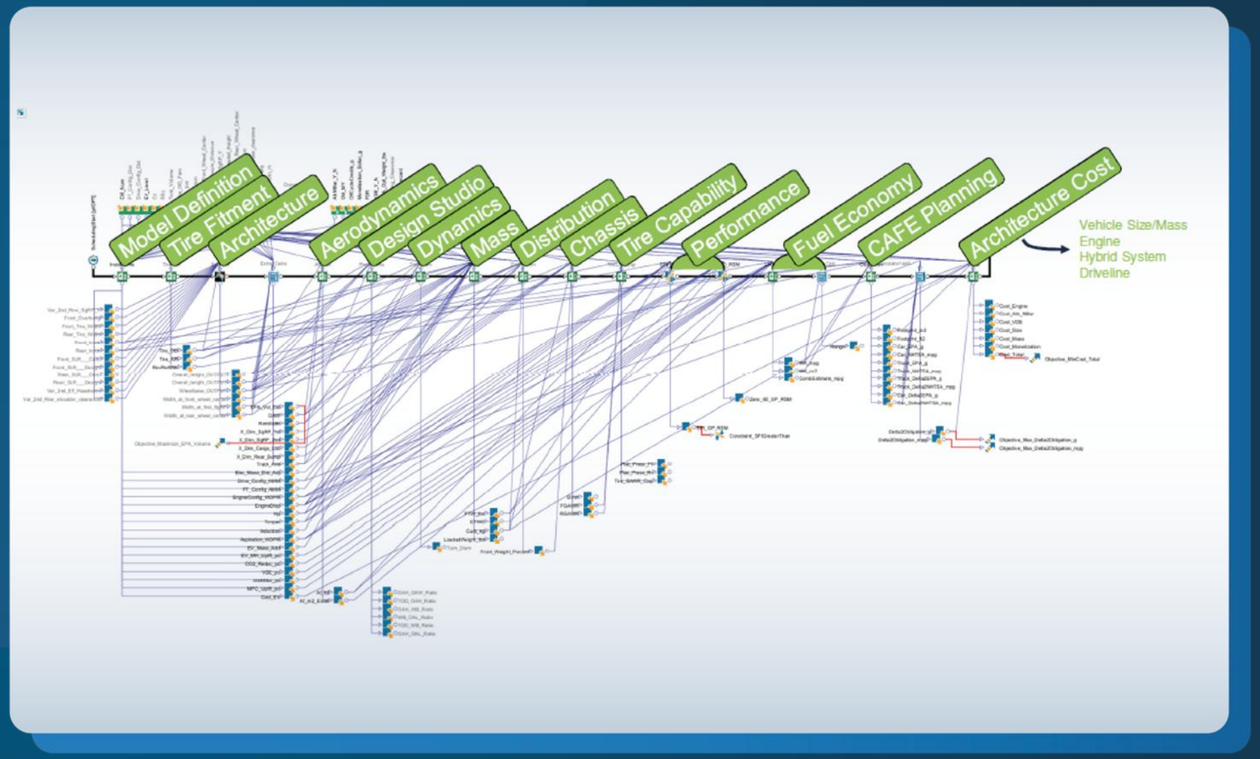
Vehicle architecture brings together many competing attributes like appearance, performance, range and vehicle dynamics.

modeFRONTIER enable us to take the tools from the experts in vehicle dynamics, range or performance, and integrate them into the simulation workflow.



BILL DOWLING | Technical Expert Vehicle Architecture & Attribute Synthesis
Ford Motor Company

© ESTECO SpA

We realized that modeFRONTIER software is the ideal solution for vehicle trade-off analysis and optimization.

We look forward to applying the same methodology for our next EV architecture development projects, by also considering ESTECO VOLTA digital engineering platform to foster collaboration across departments.

JAMES (KR) YOON | Senior Research Engineer |
Virtual MBSE & HPC AI Research
Hyundai Motor Company

© ESTECO SpA

We took advantage of modeFRONTIER to automatically execute a huge number of simulations and evaluate thousands suspension system designs within a few weeks.

The optimization process led us to achieve up to 10% reduction in cab vibration compared to the baseline.

ANDREA MORELLO | Performance Engineer and CAE Senior Analyst
IVECO – CNH Industrial

© ESTECO SpA

modeFRONTIER has proven to be an effective tool for the design team, identifying feasible solutions and achieving a 2.5% enhancement of aerodynamic performance and a 4% wing weight reduction.

ENRICA MARENTINO | CFD Specialist
Leonardo

© ESTECO SpA

We trust the results we get with modeFRONTIER so much that we don’t expect we’ll require a prototype. We go straight into production.

DAVID ERZEN | Aerodynamics Engineer
Pipistrel

© ESTECO SpA

Our simulation toolchain combined with modeFRONTIER optimization capabilities led to evaluate 500 catalyst system designs within two weeks.

Manufacturing and testing few prototypes would have taken us months and significant resources due to the expensive precious metals incorporated and additional operational costs.

STEFAN KAH | Application Engineering Modeling
BASF Catalysts Germany GmbH

© ESTECO SpA

With modeFRONTIER, we run and evaluate 3000 designs in just one day instead of losing weeks doing it manually.

Moreover, the easy-to-use interface and data analysis & visualization tools enabled our designers to process the results faster and select their favorite designs for further studies.

TAKUMA KAWAKAMI | Structural Engineer and Computational Architect
Takenaka Corporation

© ESTECO SpA

The partnership and training provided by the ESTECO team was a key for one of our research centers where we deployed and heavily used modeFRONTIER and VOLTA to develop one product line of tools which are now manufactured and commercialized.

SLB

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Use case | Aerospace Aerodynamics

Environmentally friendly aircraft

Challenge:

Enhance the overall environmental performance of a Green Regional Aircraft (GRA). Minimize aircraft drag, wing weight, and environmental impact at take-off and landing.

Solution:

MOGA-II algorithm was combined with correlation analysis to reduce global computational effort during wing shape optimization. The MCDM tool supported the design team in determining the best outcome by ranking the Pareto frontier results.

Benefits:

- 2.5% enhancement of aerodynamic performance
- 4% wing weight reduction

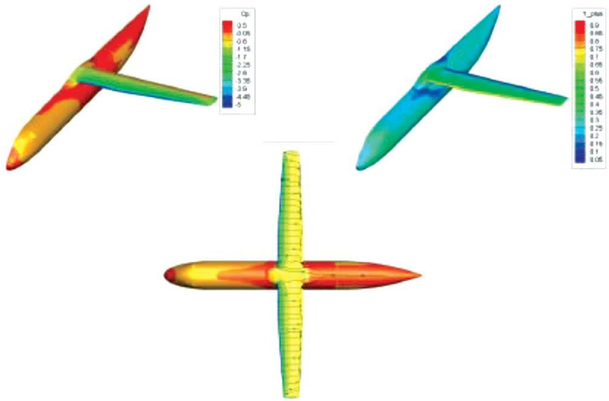

Image courtesy of Leonardo Aircraft

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Use case | Automotive Engine

Air intake manifold design

Challenge:

Optimize the performance of an intake manifold for a multi-cylinder internal combustion engine. Maximize torque and power values while minimizing pressure drop.

Solution:

A multi-fidelity automatic optimization workflow was implemented in modeFRONTIER, combining 1D (GT-Power) and 3D (ANSYS CFX) CFD manifold simulations.

Benefits:

- Global computational effort reduced by multi-fidelity approach
- Contrasting criteria satisfied

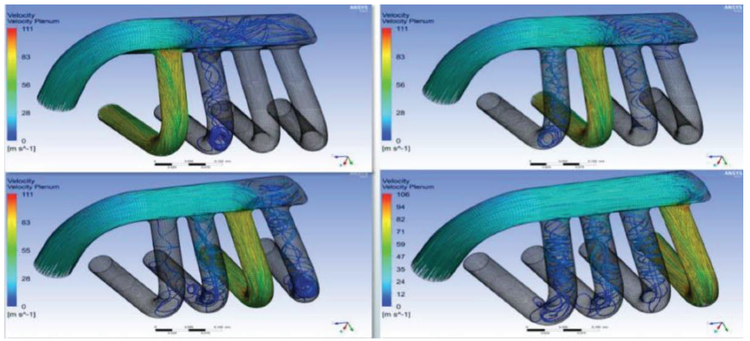

Image courtesy of Magneti Marelli

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Use case | Automotive Materials

Optimization of a Formula 1 car front wing

Challenge:

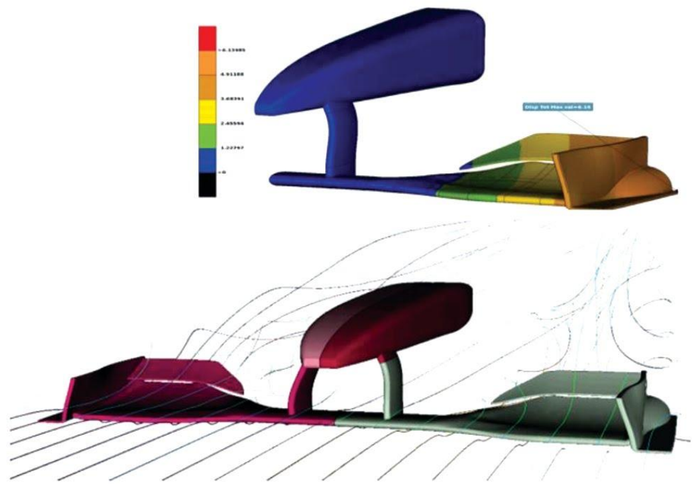
Find the optimum composite design of the Formula 1 car front wing. Reduce weight and drag at high speed, while respecting stress and displacement constraints.

Solution:

ANSA, Nastran and mETA software were integrated into a modeFRONTIER workflow to identify optimal fiber orientation and composite layer thickness.

Benefits:

- Wing weight reduced by 27.4%
- Angle of attack reduced by 2.5% (significant reduction of drag)



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Use case | Automotive Safety

Optimizing vehicle passenger safety

Challenge:

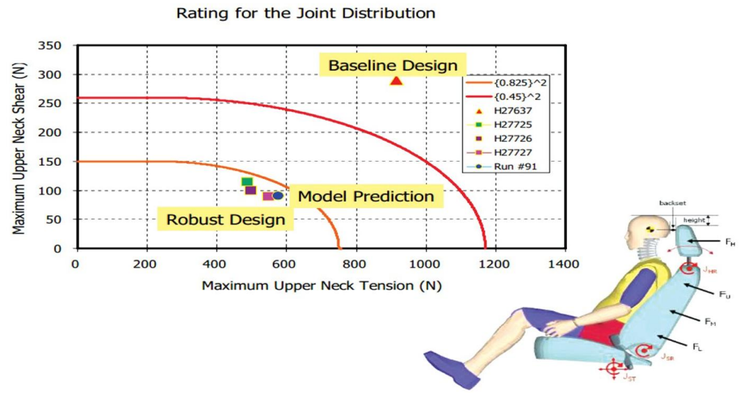
Improve dummy kinematics in rear impact crash tests to improve the overall safety rating of a head restraint system from “acceptable” to “good”.

Solution:

Multiobjective robust design optimization (MORDO) was used to account for uncertainties in the definition of seat geometry. The desired rating objectives were expressed in percentiles.

Benefits:

- ‘Good’ rear impact rating achieved
- Turnaround time reduced by 90%.



Images courtesy of FORD

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Use case | Automotive Heat Rejection

Underhood thermal management

Challenge:

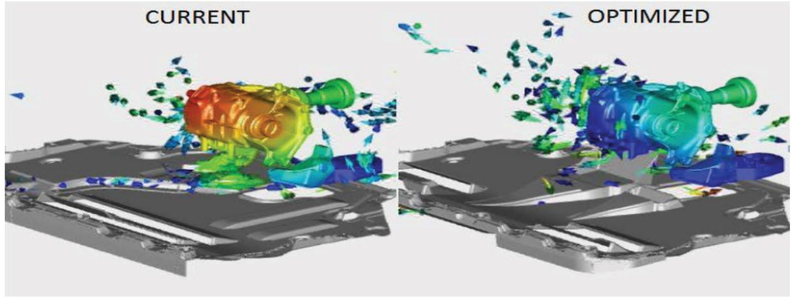
Develop a cost-efficient PTU (Power Take-off Unit) cooling system, suitable for multiple powertrains and different operating conditions without deteriorating the vehicle aerodynamic performance.

Solution:

An automated workflow based on DOE and RSM was implemented in modeFRONTIER, combining a morphing CAE model with full conjugate heat transfer simulations to maximize air flow and minimize the PTU fluid temperature.

Benefits:

- Parallel and distributed simulations speeded up the entire design process.
- Optimized cooling duct design eliminates the need for an expensive water-based cooling system.



Images courtesy of FORD

© ESTECO SpA

Use case | Civil Engineering

Zero Energy Buildings

Challenge:

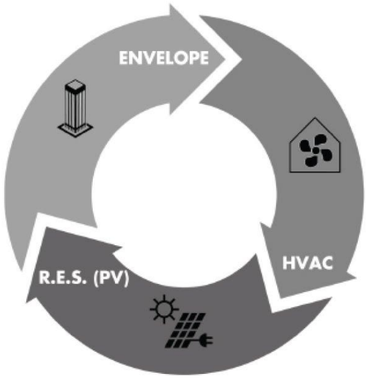
Improve the Nearly Zero Energy Building (nZEB) design to meet the EU's 2020 targets within the Energy Performance of Buildings Directive (EPBD). Minimize the use of energy while maximizing adaptive thermal comfort.

Solution:

EnergyPlus, Rhino and Grasshopper were run through a modeFRONTIER workflow to perform cooling, daylight and heating energy loads simulations for a high-rise office building in Athens. Window to wall ratio, wall and glazing thermal coefficients, façade orientation were considered.

Benefits:

- Building's energy use reduced by 33% (from 109.12 kWh/m2 to 73.13kWh/m2)
- Trade-off solutions identified for increasing energy performance and thermal comfort levels.



Source Google Maps, 2017

Image courtesy of Giouris Civil Engineering Consultants

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Use case | Electronics

Mobile antenna reception performance

Challenge:

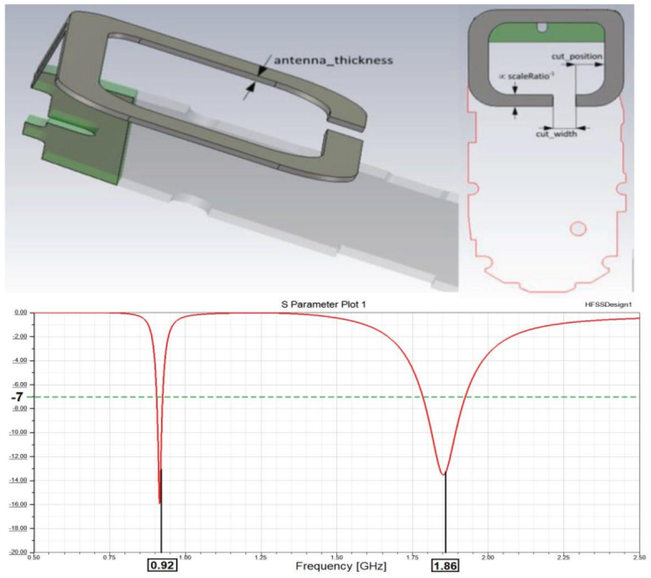
Optimize a GSM dual band mobile phone antenna to guarantee effective transmission and reception at specific frequencies (920 and 1860 Mhz), while reducing the loss of signal power.

Solution:

Catia V5 and CST models were integrated with modeFRONTIER to perform accurate analysis of high frequency range changing the antenna geometry.

Benefits:

- Autonomous Pilopt algorithm required just few hours of simulation to perfectly tune the antenna.
- This methodology may be extended to any component of an electronic system.



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Use case | Marine and Offshore

CNG transportation vessel

Challenge:

Prove the techno-economic feasibility of a Compressed Natural Gas (CNG) transport concept enabled by a newly patented Pressure Vessel manufacturing in the framework of the EU-funded project GASVESSEL.

Solution:

modeFRONTIER was used to optimize the delivery of gas from the identified source locations to the identified markets, and to design the pressure cylinders reinforced by composite fibers.

Benefits:

- Gas transport costs per unit volume minimized for each geographical scenario.
- Partners can easily share data and results through the web-based enterprise solution, VOLTA.

Image courtesy of GASVESSEL

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