INDUSTRIES

CAESES® is used by leading companies all over the world in various engineering sectors.

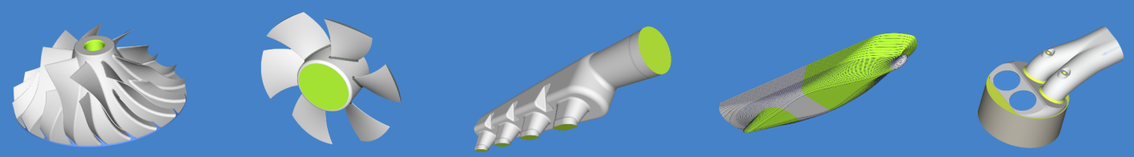
MARINE TURBOMACHINERY AUTOMOTIVE AEROSPACE ENERGY OFFSHORE

APPLICATIONS

Design, optimize and innovate anything that needs to be improved in terms of fluid-dynamic performance (internal/external flows) or structural behavior. CAESES® comes with specialized add-ons for marine ship hull design, turbomachinery blades and advanced optimization capabilities.

Example applications are:

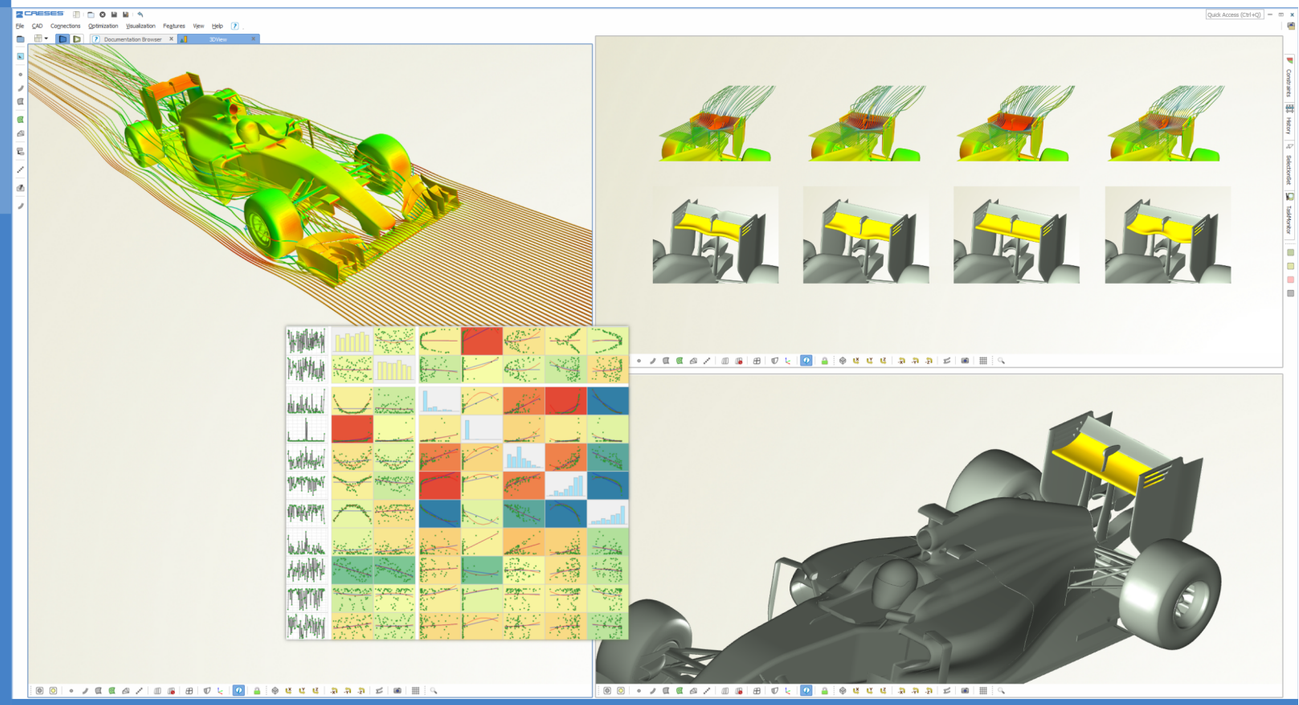
* Ship and boat hull forms for any vessel type
* Propellers, rotors, stators, drone blades
* Turbochargers including impellers, volutes, diffusers, scallops
* All types of pumps, compressors and turbines, including endwall contouring
* Engine components such as intake ports, piston bowls, manifolds, etc.
* Wings, ducts and nozzles for aircrafts, race cars, etc.



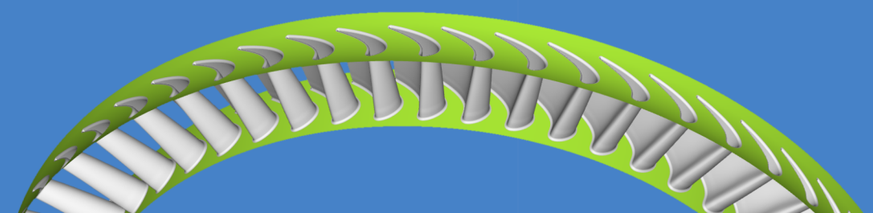
Find all details on: **www.CAESES.com**

CAESES® is a product by FRIENDSHIP SYSTEMS AG | www.friendship-systems.com
Available for Linux and Windows.

CAESES®



ROBUST VARIABLE GEOMETRY FOR SHAPE OPTIMIZATION



CAD FOR OPTIMIZATION

Simulation-driven shape optimization requires specialized modeling approaches that are efficient and robust: Less parameters for quicker optimization and geometry models that never fail to regenerate.

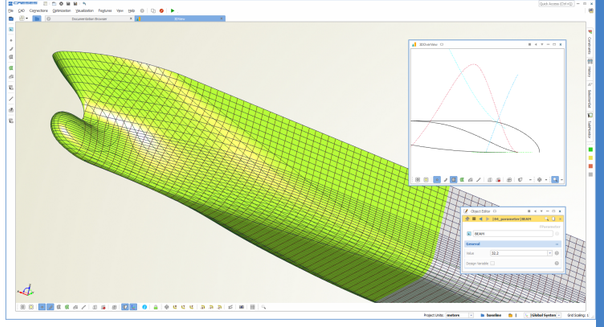
CAESES® is a powerful CAD platform for fast and comprehensive design studies with simulation tools. Integrated capabilities for process automation and shape optimization make it an all-in-one tool for simulation engineers.

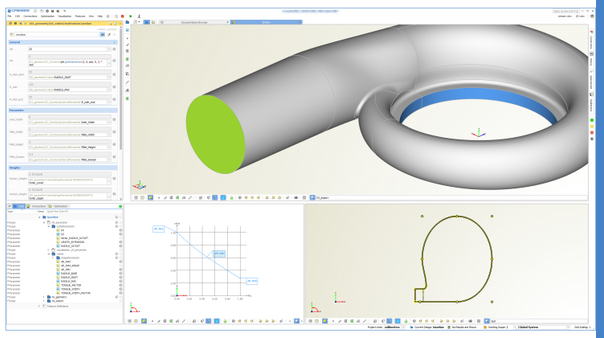
AUTOMATED GEOMETRY VARIATION

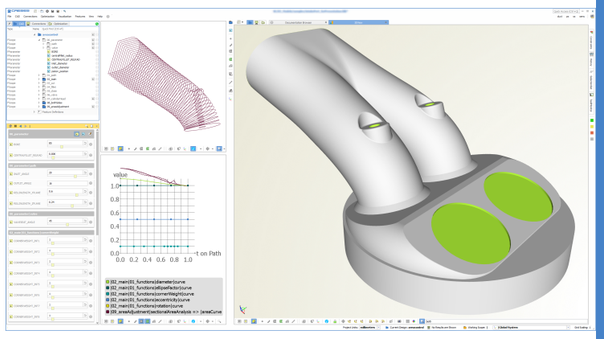
CAESES®' foundation is a flexible fully-parametric 3D modeler. Unlike traditional CAD tools, the main focus of CAESES® is robust automated geometry variation. All generated variants are clean, watertight, and ready for meshing and analysis with no user interaction.

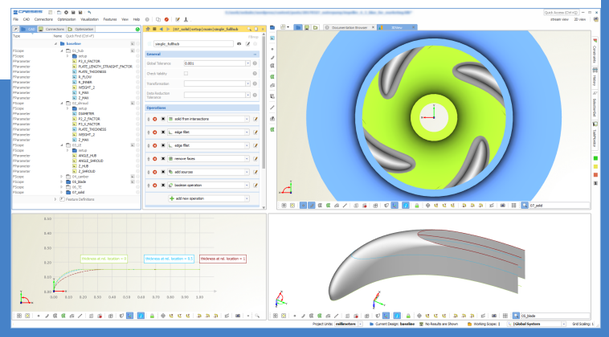
GEOMETRY CONSTRAINTS

CAESES® models automatically fulfill all required geometry constraints, such as manufacturing restrictions, cross-sectional areas, volumes, centroids, packaging, A/R ratios, etc.









KEY FEATURES

* **SMARTER SURFACE MODELING |** Specialized techniques for generating parameter-reduced variable models
* **ROBUST CAD |** Comprehensive robust NURBS modeling and Boolean operations (trimming, intersection, union, etc.)
* **PRE-PROCESSING |** Efficient one-time preprocessing for all variants (assign colors/IDs, create closed bodies, etc.)
* **POST-PROCESSING |** Integrated light-weight post-processing capabilities to quickly compare variants and CFD results
* **MORPHING |** Free-Form Deformation, RBF and various shift transformations for fast studies with imported geometries
* **SCRIPTING |** Feature definitions to script all GUI actions as well as functions, custom workflows, geometry objects, etc.
* **OPTIMIZATION |** Integrated environment for fast design studies and shape optimization incl. charts, tables, reports
* **BATCH MODE |** Non-GUI option to easily integrate CAESES® as a powerful geometry engine into existing workflows

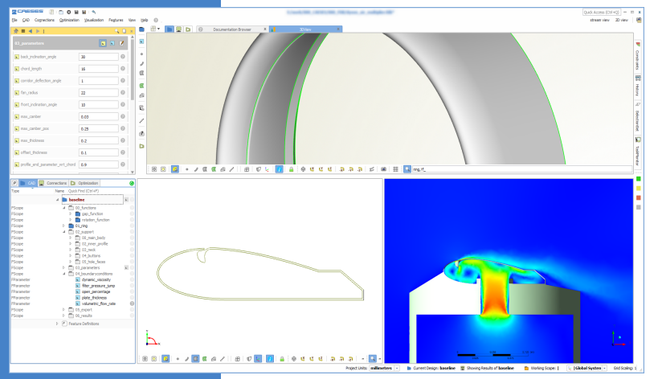
AUTOMATION OF SIMULATION RUNS

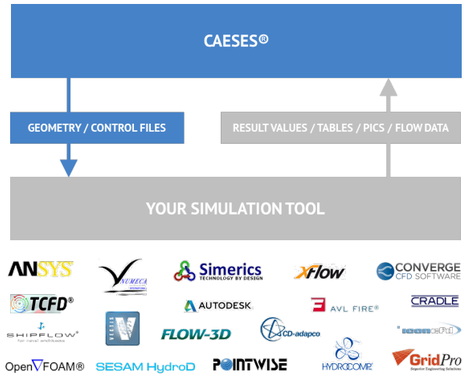
With the software connector of CAESES® you automate the meshing and analysis runs, no matter whether you consider CFD or structural analysis.

As a result, creating and analyzing a new design candidate of your product means just a single click, and makes it ready for fully automated studies.

CONNECT ALL OF YOUR TOOLS

Any external software (commercial/non-commercial/proprietary) that comes with a batch mode can be coupled to CAESES®.





CAESES®

DESIGN STUDIES AND OPTIMIZATION

Using the robust geometry models of CAESES® along with the automated analysis, you can directly run design studies and shape optimizations within the CAESES® user interface.

CAESES® provides a set of sampling methods and optimization strategies for single- and multi-objective optimization tasks. Create and use response surfaces (e.g. kriging, neural networks, polynomials) to find optimal designs much faster, compared to traditional optimization methods.

Finally, CAESES® does all the variant management for you - browse through the designs and pick your optimal candidate!