

Multi-objective ship hull form optimization using a free surface RANSE solver

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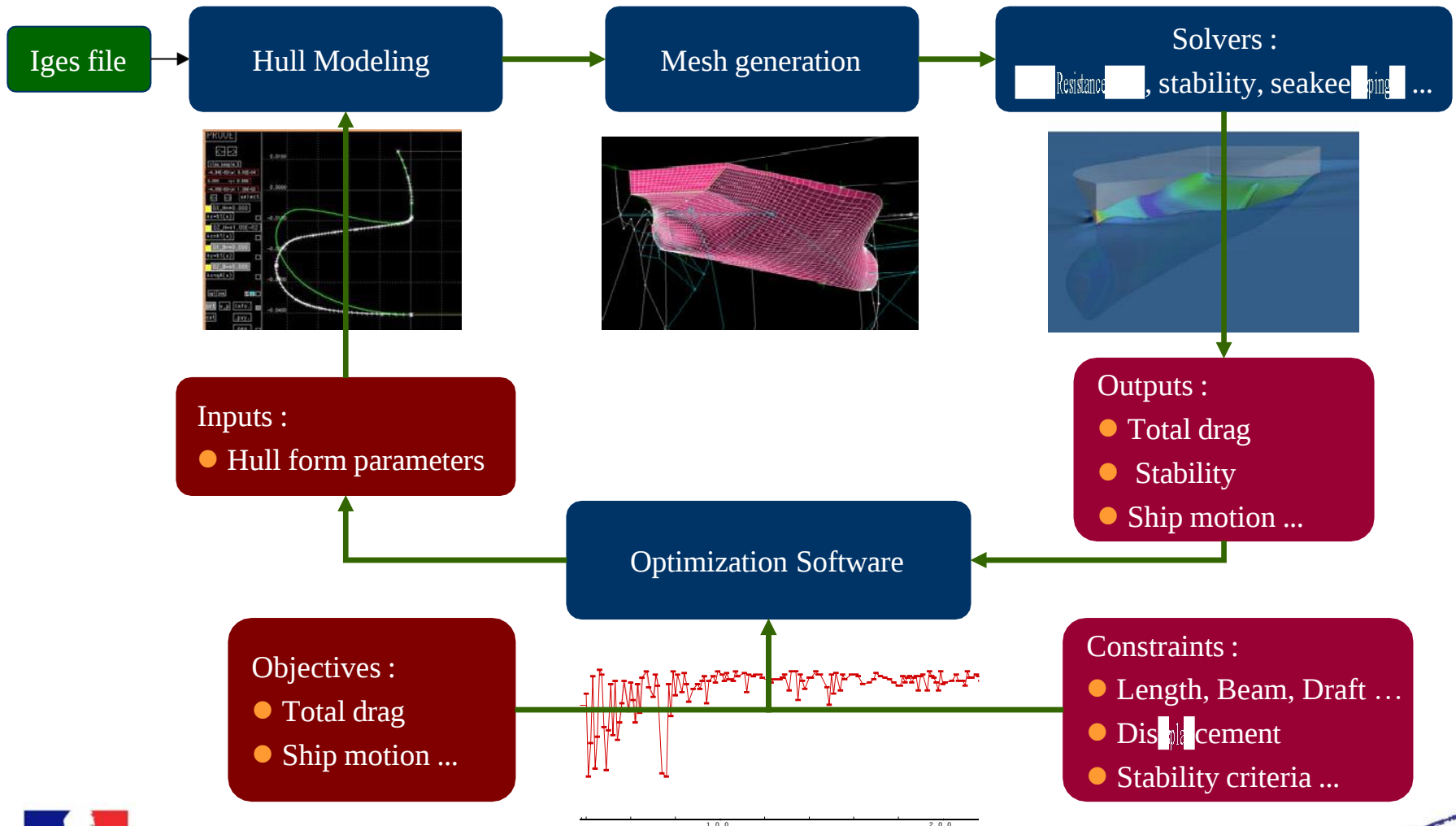
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Motivation

- Development of a practical tool to help the designer choose the best hull form, from the hydrodynamic point of view
- Development of hull form optimization procedures started in 1995
- Process under constant improvement :
 - Panel code → RANSE with free surface solver
 - Mesh deformation → Hull form modeling software
 - Parametric studies → Optimization studies
 - Single-objective → Multi-objectives and constraints

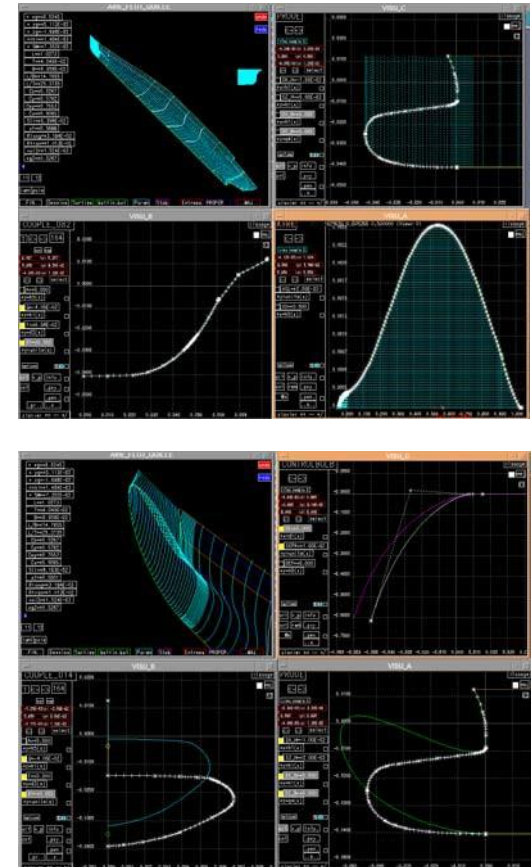
Optimization Process



Hull modeling software

Requirement for hull modeling software :

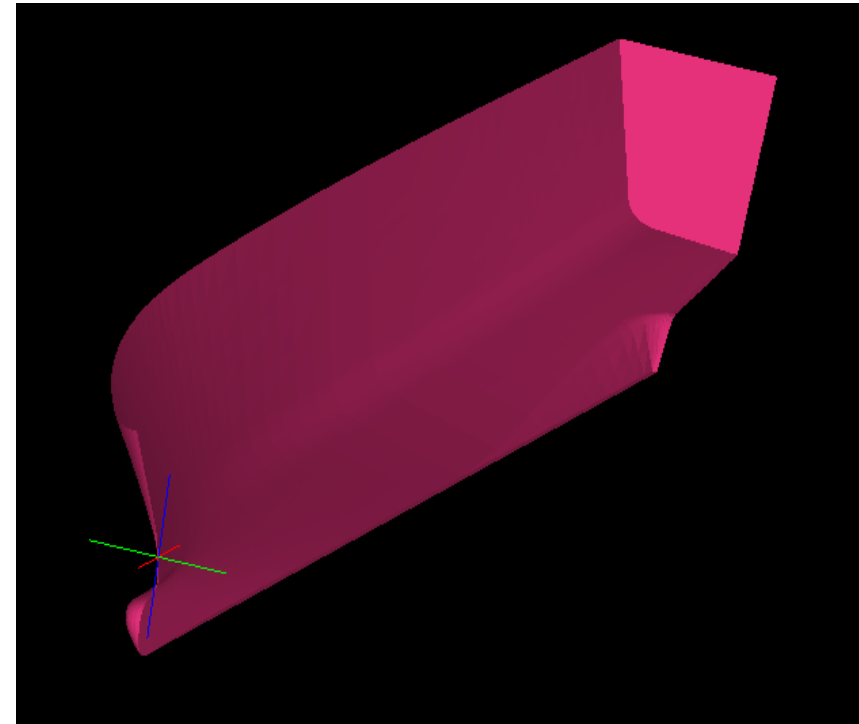
- Import an initial hull (iges file)
- Flexible and practical parametric definition of the hull
- Modify the shape with a limited set of parameters :
 - Sectional area curve: A_x , LCB, C_p ...
 - Waterline, keel, deck or transom line shapes
- Modify the shape locally
- Export the hull shape in CAD compatible format



Development of in house software : **BATAOS**

Principle of BATAOS modeler

- ⌘ The hull shape is completely defined analytically based on Bezier curves : frames, waterline, keel line
- ⌘ Bezier curves are then parameterized
- ⌘ Deformation functions chosen from a set of mathematical functions or user defined, respecting geometrical or stability constraints
- ⌘ Surface shape reconstruction in CAD format



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