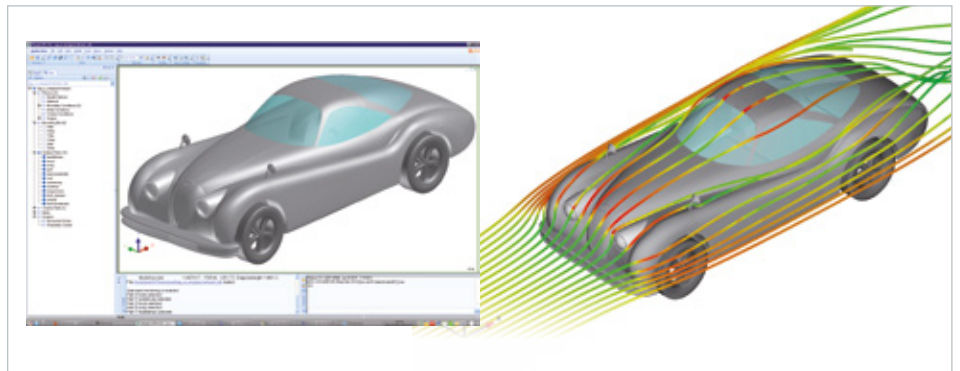# Visual-CFD, AN INTELLIGENT INTERFACE FOR CFD APPLICATIONS

KEY BENEFITS

· One step set up for meshing, simulation and post processing before meshing even starts

· Automatic selection of the solution parameters based on the quality of the mesh

· Flexible solutions by adjusting controls while the simulation is running, based on varying needs

· Great usability for engineers of all levels to set up CFD simulations

· Access to a wide range of monitoring and post processing tools

· Fast and efficient meshing with snappyHex and/or ESI proprietary mesher: Visual-Mesh and VisCART

· Python based scripting and personalized templates allowing customization for future use

· Includes simulation of the best practices for industrial applications to help engineers make better decisions

Visual-CFD FOR OpenFOAM AND GENERAL CFD

Visual-CFD is a part of ESI's multi-domain simulation platform, Visual-Environment. This is an intelligent workflow process manager which consists of the simulation "Best Practices", coming from several years of industry experience. All of the steps involved in a CFD process are managed using one single application connected or integrated with a number of engineering tools. Currently, Visual-CFD supports OpenFOAM and general CFD applications. In the future, it will support complex physics as well as multiphysics applications.

Aerodynamics model in Visual-CFD

Visual-CFD: ENABLING HEAT TRANSFER

With Visual-CFD, one can perform complex heat transfer simulations, such as the one under the hood. The heat exchangers, including radiator, condenser, intercoolers, and fans, can be accurately modeled with the inbuilt features. Due to excellent graphical performance of Visual-Environment on GPU enabled graphics card, visualization of such complex geometries is quite easy.
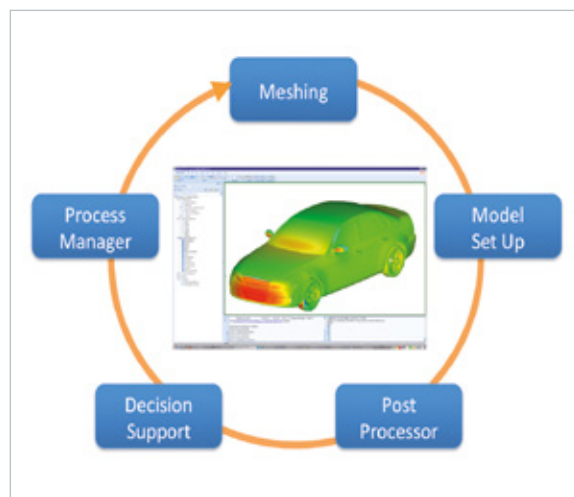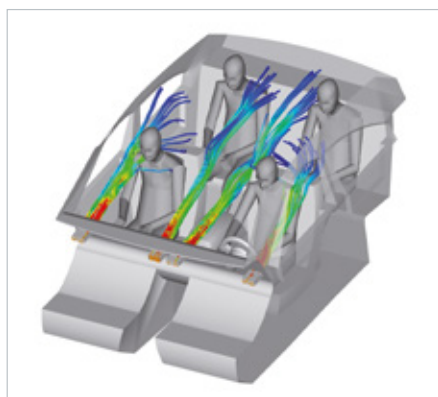

Under hood thermal simulation

TYPICAL CFD PROCESS IN Visual-Environment WITH Visual-CFD

Visual-CFD is a workflow manager that serves CFD simulation with high maturity specifically for OpenFOAM.

· Meshing: Supports CAD Import, 2D/3D meshing, and editing for linear and quadratic meshes. snappyHex as well as Visual-Mesh and VisCART are available.

· Model Set Up: Supports the set up of model conditions like boundary conditions, volume conditions, and solver parameters.

· Post Processor: Helps with data grouping into pages and plots, including animations, videos, model and drawing blocks (available with winter release).

· Decision Support: Manages simulation models for multi-domain usage, automates project workflow, and manages simulation content and data.

· Process Manager: Enables seamless and interactive process automation through customizable solver-based templates for automated CAE workflows.

Typical Visual-CFD Process in Visual-Environment

Comfort inside the vehicle

FLEXIBILITY AND ADAPTABILITY WITH Visual-CFD AND OpenFOAM

· Practically all CAD & CAE file formats can be imported into Visual-CFD.

· Mesh can be easily imported from almost all commercial CFD tools available in the market.

· The CAD Cleanup capability is extensive and includes state-of-the art wrapping technology.

· The user can choose from various tools available for meshing including snappyHex, Visual-Mesh or VisCART.

· Visual-CFD supports simulation done using the open source and free solvers of OpenFOAM.

· To view results and analyze findings, multiple options are available like ParaVIEW or Visual-Viewer (available with winter release).

ABOUT ESI GROUP

ESI is a pioneer and world-leading provider in Virtual Prototyping that takes into account the physics of materials. ESI boasts a unique know-how in Virtual Product Engineering, based on an integrated suite of coherent, industry-oriented applications. Addressing manufacturing industries, Virtual Product Engineering aims to replace physical prototypes by realistically simulating a product's behavior during testing, to fine-tune fabrication and assembly processes in accordance with desired product performance, and to evaluate the impact on product use under normal or accidental conditions. ESI's solutions fit into a single collaborative and open environment for End-to-End Virtual Prototyping. These solutions are delivered using the latest technologies, including immersive Virtual Reality, to bring products to life in 3D; helping customers make the right decisions throughout product development. The company employs about 1000 high-level specialists worldwide covering more than 40 countries. ESI Group is a French company listed in compartment C of NYSE Euronext Paris.

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