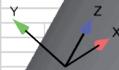


THE SUBVERSIVELY SIMPLE KARALIT CFD WORKFLOW

1. Import your CAD model
2. Enter your parameters in a customized app
3. Let Karalit do the rest



KARALIT. SIMPLICITY WITHOUT COMPROMISE.

FOUR BIG GAME - CHANGERS.

The KARALIT approach, called Direct CFD, is based on four basic concepts:

1. Eliminating the tedious and time-consuming meshing process.
2. Providing simple fill-in-the-blank apps to streamline setup for specific CFD disciplines.
3. A flexible pricing structure that enables users to take full advantage of the latest hardware advances at no extra cost.
4. A personal, one-to-one, responsive technical support, bringing the benefits and experience of complex engineering problem-solving across a broad range of industrial sectors - no call centers!

DISRUPTIVE, BUT PROVEN. KARALIT's technology might be disruptive, but it's been tested and fine-tuned in leading academic and R&D organizations worldwide. Our founders have led innovative research into new CFD methods for more than 20 years. Our team comprises international developers and analysts with a common mission: making CFD a naturally integrated part of the design process.

WE'RE JUST GETTING STARTED.

KARALIT is built for the long run. A company designed to anticipate and respond to customer needs. Built to deliver continuous improvements and product evolution - release after release.



SAVE UP TO 99% OF PRE-PROCESSING TIME - GET SUPERIOR RESULTS - SIMPLIFY AND SAVE \$\$\$

For more information
www.karalit.com - sales@karalit.com

 **KARALIT**
Simplicity without compromise

KARALIT DIRECT CFD 3D

KARALIT has pioneered a breakthrough called **DIRECT CFD**, where CAD models go directly to CFD without time-consuming meshing or tedious manual set-up. The simple process streamlines CAD-to-CFD for experts and non-specialists alike. The KARALIT revolution is based on four innovations:

1. A unique implementation of immersed boundary (IB) technology that enables geometry to be immersed into Cartesian grids, eliminating meshing, maintaining the integrity of cells, and speeding CAD-to-CFD iterations throughout the design cycle.
2. The use of pre-designed apps that automate, simplify and speed set-up for industry-specific simulations.
3. A flexible pricing structure that enables users to take full advantage of the latest hardware advances at no extra cost.
4. A personal, one-to-one, responsive technical support, bringing the benefits and experience of complex engineering problem-solving across a broad range of industrial sectors - no call centers!

KARALIT CFD 2.1 FULL FEATURES LIST TECHNOLOGIES

- Immersed Boundary Technique
- Anisotropic LGR (Local Grid Refinement)
- Implicit: steady state & transient (Dual Time Stepping)
- Explicit: steady state & transient (constant time step)
- Preconditioning
- Massively Parallel MPI (efficient parallel processing on shared memory environment or cluster)
- Thin surfaces (sails, parachutes, fins)

PHYSICAL MODELS

- State equations: compressible, incompressible.
- All range of Reynolds, Mach and Grashof numbers
- Heat Transfer: thermal conduction, forced & natural convection (buoyancy)
- Turbulence models: Spalart-Allmaras, $k-\omega$, $k-g$
- Porous surfaces and volumes
- Volume sources: heat, momentum, pressure gradient
- Diabatic heat transfer model through solid walls
- Single reference frame rotating flows

BOUNDARY CONDITIONS

- Wall models: No slip, free slip, wall roughness, moving & rotating walls
- Atmospheric boundary layer
- Symmetry
- Inlet/Outlet: velocity, pressure, mass flow rate
- Periodic translation & rotation

USER INTERFACE

- Application-driven interface:
- Dedicated Apps: External Aerodynamics, Wind Tunnel, Building flow, Environmental Terrain flow, Internal flow, FreeApp

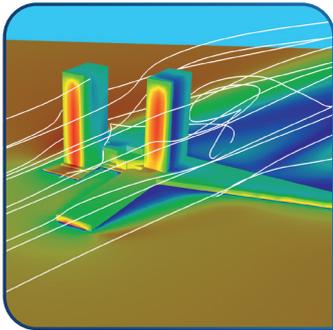
- Surface selection tool
- Internal part selection
- Complex objects composition
- Void volumes (VOID)

PRE PROCESSING

- Import STL and MAP formats
- Geometry STL manipulation: rotation, scaling, translation

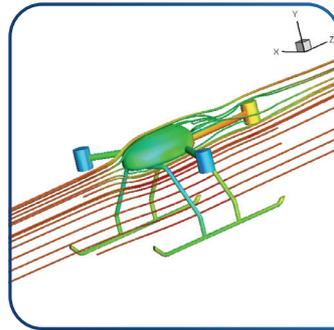
POST PROCESSING

- KARALIT Visualizer
- Export to Paraview, Tecplot 360, Ensight
- App-customized monitor: forces, heat transfer, mass flow rate, pressure



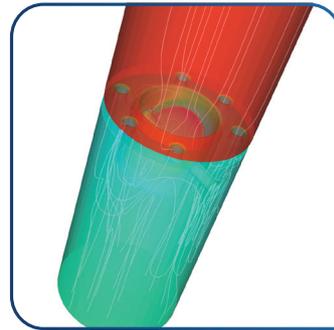
BUILD ENVIRONMENT.

The "Building Flow" app can be used for build environment applications such as pedestrian comfort analysis outside of buildings and on walkways, smoke dispersal and fire safety; it can also be used for energy efficiency inside buildings, analysis of wind forces on building walls, antennas. Another app, named "Environmental Terrain Flow", has been designed to perform a wind site assessment study. The app reads directly the .map file (x,y,x, terrain roughness) to verify the proper wind speed distribution within a specified site. As for all KARALIT apps, the simulation is carried out by simply setting up few parameters.



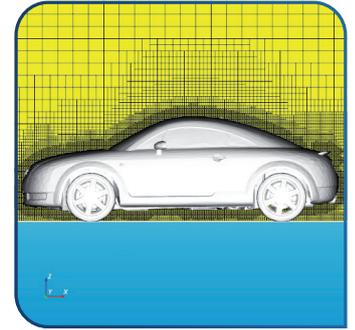
AEROSPACE.

KARALIT provides two apps for aerospace external aerodynamic simulations: an External Flow App and a Wind Tunnel App. Both customized apps walk the user through the necessary inputs to set up boundary conditions, flow regime and other parameters. Within minutes, even CFD novices can begin running high-quality simulations.



INTERNAL FLOW.

The "Internal Flow" App, drastically simplifies the setup of complex geometries from automotive, aerospace, Oil&Gas, medical and other sectors. Users work directly on their CAD geometry and, through the App, enter a few key inputs - such as the boundary conditions, fluid properties and flow regime, going from CAD to simulation in a few minutes.



AUTOMOTIVE.

KARALIT has developed a "Wind Tunnel" app, to help designers and CFD analysts during the aerodynamic study of the car. The app can be used for studies of factors such as airflow around car bodies, pressure distribution, turbulence and drag. Users simply enter the parameters for key factors and the app takes over, setting up the boundary conditions for a highly accurate simulation.

SYSTEM REQUIREMENTS

KARALIT CFD 2.1

- Windows® 7 64-bit or superior
- Fedora™ 15 or superior
- Ubuntu 11.04 or superior
- Red Hat
- SuSe
- Intel® Pentium® 4, Intel Xeon®, Intel Core™, AMD Athlon™ II, AMD Opteron™, AMD Phenom™, AMD FX™
- processor or later (2 GHz CPU speed or higher)*
- 8 GB RAM or higher**
- 10 GB or higher of free disk space (500 MB free disk space for installation)
- 512 MB DRAM or higher OpenGL-capable graphics card
- 24-bit color setting at 1,280 x 1,024 or higher

- screen resolution
- CD-ROM and DVD-ROM drives are not required: installation via electronic download
- Web browser
- Internet connection for web downloads

Notes

* For superior performance, KARALIT recommends

an Intel Xeon®, or AMD Opteron™ processor, and 24 GB RAM or higher.

** KARALIT recommends settings that allow your operating system to manage virtual memory, as needed. There should always be at least as much free hard disk space as system memory (RAM).