

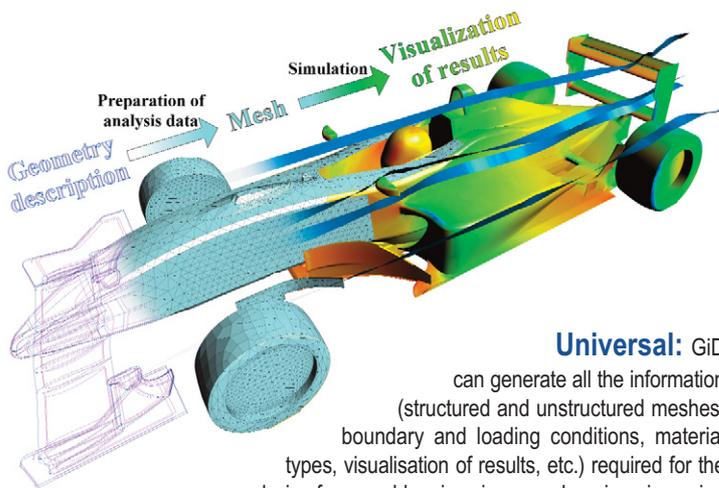
THE PERSONAL PRE / POSTPROCESSOR

What's GiD?

GiD is an universal, adaptative and user friendly pre and postprocessing system for computer analysis in science and engineering, developed by CIMNE, International Center for Numerical Methods in Engineering (www.cimne.com), located in Barcelona (Spain).

GiD has been designed as a universal, adaptive and user-friendly graphical user interface for geometrical modelling, data input and visualisation of results for all types of numerical simulation programs. Typical problems that can be successfully tackled with GiD include most simulations in solid and structural mechanics, fluid dynamics, electromagnetics, heat transfer, geomechanics, etc. using finite element, finite volume, boundary element, finite difference or point based (meshless) numerical procedures.

GiD is ideal to be used in a multi-user environment such as universities, research centers and enterprises for development and applications of different numerical simulation programs.



Universal: GiD can generate all the information (structured and unstructured meshes, boundary and loading conditions, material types, visualisation of results, etc.) required for the analysis of any problem in science and engineering using numerical methods.

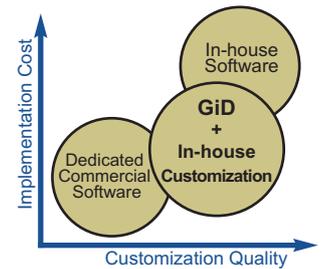
Adaptive: GiD is extremely easy to adapt to any in-house or commercial numerical simulation code. The user can customize GiD's input and output formats. The different menus can be tailored to fit any specific need. A deep integration to any code with GiD is possible. The analysis process can be also be started monitored and stepped from within GiD.

User-friendly: The development of GiD has been focused on the user needs and on the simplicity, speed, effectiveness and accuracy required at input data preparation and results visualization levels.

International: GiD environment is fully translated into English, Spanish, Russian and Japanese, and an application is provided to manage and translate all messages of customization. Manuals are translated into English and Russian.

Customization

Because of the multidisciplinary philosophy present since the beginnings of GiD, its connection with other softwares is extremely easy, allowing the users to customize the product to be the pre and postprocess of their particular applications. Thanks to this capability, GiD can be understood as a perfect platform to integrate several softwares in a single numerical simulation environment, replacing all the pre and postprocessors related to each one of them.



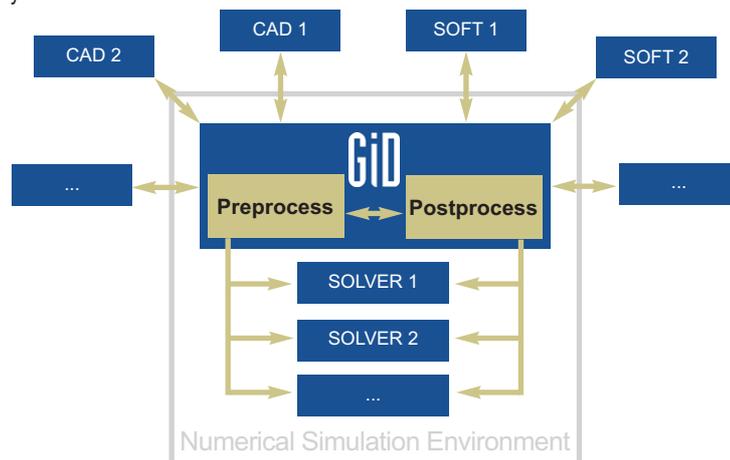
▲ GiD as a solution for simulation environment

The integration possibilities involve either the graphical user interface customization (providing the needed tools to completely modify menus, windows or toolbars) and the communication protocol with all kind of packages related to numerical simulations (not only solver codes but also CAD programs, external meshers, visualization tools, etc.). The final product, after the integration process, will be a single and completely customized package able to pre and postprocess the simulations of one or several solver codes without exiting our program.

Once the customization is performed, the user can take profit of all the GiD geometry creation and reparation, meshing and visualization tools in order to pre and postprocess the numerical simulations (to get more details about this point please visit the GiD official website <http://www.gidhome.com>). The implementation cost is then considerably reduced compared to a fully in-house software development, and with an almost equivalent quality in terms of customization for both products.

GiD has been already linked with a lot of numerical simulations packages thanks to the development of the respective customization modules, either by the GiD development team or by external companies. Some of them are open to the GiD users community (refer to the table below to get more information), including both research and commercial softwares.

In-house / Compass IS customization: All the documentation about the customization is provided together with GiD manuals (no additional purchase is needed). Technical support is available for the module developers, and the different implementation options are presented on the reverse of this brochure.



▲ GiD as a multi-software integration platform

Users can also order the development of a module to one of the CIMNE's spin-off companies, Compass IS (www.compassis.com). They are specialized in the GiD customization, having already developed different modules for a wide variety of applications (Geomechanics, Industrial Glass forming processes or CFD simulations).

GiD as a generator of products: Once a software is connected to GiD, the combined software can be understood as a single product, packaged and commercialized together, always after an agreement with Compass IS (www.compassis.com).

Modules already developed

Commercial integrated software

RAM-SERIES	Structural analysis and design	www.compassis.com
TDYN	Computational fluid dynamics	www.compassis.com
STAMPACK	Sheet stamping	www.quantech.es
VULCAN	Casting process	www.quantech.es
ATILA	Electromagnetics	www.micromechatronicsinc.com
SCIFEA	Super-operator system	www.supcompute.com

Research integrated software

CARPA	Hydraulic simulation	www.flumen.upc.edu
X-FINAS	Structural analysis	www.xfinas.com
CALSEF	Structural analysis	www.cimne.com/calsef
CALTEP	Heat transfer	www.cimne.com/caltep
EMANT	Electromagnetics	www.cimne.com/emant
MAT-fem	Educational fem	www.cimne.com/mat-fem

Interfaces for third party software

LS-DYNA	Transient dynamics	www.gidhome.com/gidplus
PLAXIS	Geomechanics	www.gidhome.com/gidplus
NASTRAN	Structural analysis	www.gidhome.com/gidplus
ABAQUS	Structural analysis	www.gidhome.com/gidplus
FLUENT	Computational fluid dynamics	www.gidhome.com/gidplus

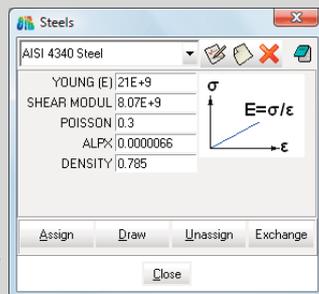
Technical details of customization modules design are presented

Basic Integration

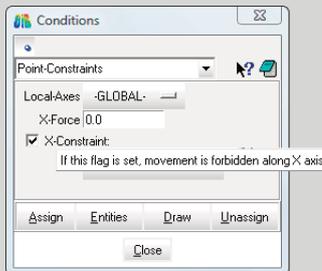
Every GiD user can develop a customized preprocess module within a short time, even without any knowledge in programming languages.

Only a couple of text files should be written describing the user's problem properties (like conditions or materials) using an easy keyword system and GiD will create automatically the corresponding windows, with this keyword system which is described in the GiD documentation, all the information required for a particular problem type can be specified:

- Conditions parameters and dependencies
- Material properties
- General data and interval data
- Symbols to draw conditions nicely
- Definition of used unit system
- Other configuration parameters (version, icons, password)
- Format of the analysis file needed by the simulation executable
- Batch file to launch the calculation and, eventually, previous necessary operating



▲ Example Basic Integration



▲ Example Basic Integration

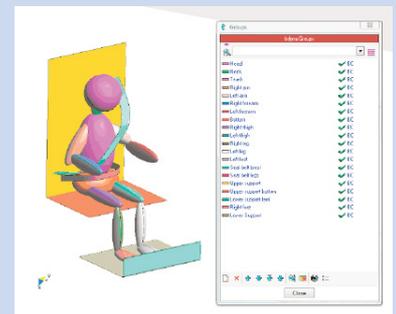
GiD will create automatically windows like the shown ones allowing the end user to manage the data of the problem, assign or modify conditions, draw properties over model, etc. in a really easy way.

After the definition of the problem, GiD will write all the conditions, materials and mesh information using the previously specified format.

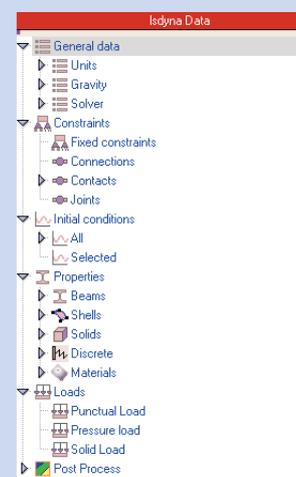
Advanced Integration Toolkit

This toolkit is developed by Compass IS, and offers an alternative to the classical process of simulations integration in GiD.

The description of the properties and data needed by the analysis problem is performed using a XML tree (graphical part) and a Tcl file which access all the nodal and elemental information during the writing process of the analysis file. Due to the complexity of these file, a minimum of knowledge in



▲ Example of the groups edition windows



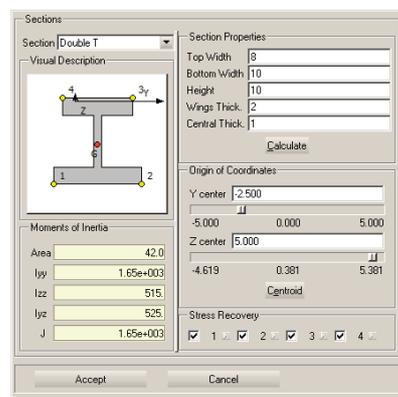
programming languages is required. Tcl is the scripting language used in GiD.

On the other hand, this method offers a lot more possibilities, including an appealing view of the managed data, not only to the developer but also to the final user.

With this toolkit, the problem and group data are always displayed during preprocess, on the left side of the graphical window. This facilitates the management of the analysis properties to the end users.

Groups are defined by their mesh elements or geometry entities, and they can be created and edited in an easy way with help of a groups edition window.

◀ Detail of the preprocessing window



Extensions

New windows and functionalities, such as menus or toolbars, can be added to the program with the help of Tcl/Tk, a scripting language. This extension allows, indeed, the full control of our software, since any GiD's process can be executed from a script.

To facility the development of these scripts, a debugging tool called RamDebugger is included in all GiD distributions.

These advanced customization features, added to the possibility to work with GiD using batch file, make GiD one of the most flexible tool in its field on the market.

◀ Example of a property definition window implemented in Tcl (interface GiD-Nastran)

Postprocessing data

GiD can read simulation result files for post processing written in several formats. Such as Tecplot and FEMAP. If the solver which is being linked to GiD can not write the results in any of the supported formats, a library called GiDpost is provided to help the developers in the adaptations task. This library is able to write the simulation results in GiD format and it is offered to the GiD users' community without any additional cost.

The library implemented taking into account two of the most widely used development languages: C/C++ and FORTRAN.