

May 15, 2008

Bridging the Gap Between CAD and CAE

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In this global market, Multi-CAD (Computer Aided Design) environments are becoming a standard. Companies are looking for interoperability that goes beyond the need for CAD translations in a Boundary Representation (B-Rep) of 3D models.

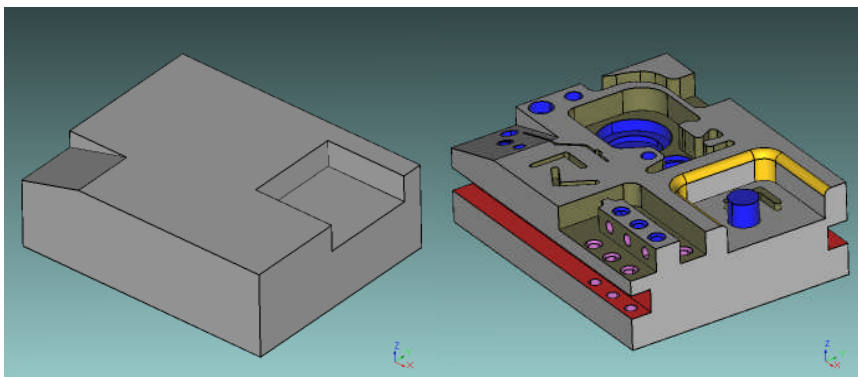
Communication in 3D is the driving force of 3D_Evolution's© FEM modules, developed by Core Technologies. These modules empower companies to bridge the communication gap between CAD and Computer Aided Engineering (CAE) departments across the globe. Now 3D models can be provided to the CAE department with a click of a button. This article will provide insight to the following modules of 3D_Evolution: de-featuring, geometry simplification, meta-face and mid-face creation of the models. Core Technologies' development team has even gone one-step further to allow its users of 3D_Evolution the ability to modify the B-Rep data with its 'direct modeling' module on any CAD model without the use of the CAD system.

Prior to going further, I would like to contribute our success to our 360 customers who have added valuable insight to our technologic growth, as well as the dedication of the development team located in Lyon, France. The marketing and sales team is excited to show off the most powerful FEM modules on the market today.

The API Integration (Libraries)

CAE software developers in Finite Element Analysis (FEA), Computational Fluid Dynamics (CFD), and Noise Vibration Harshness (NVH), are taking advantage of Core Technologies API integration. Our API is based on the programming language C++ and on the compiler Visual Studio.NET. The software CT Convert_EXE is complete with documentation and programming examples for easy integration. CT Convert_EXE is based on the reliable 3D_Evolution interfaces for the import of all current CAD formats. The script language provides further options such as automatic data corrections, filtering and specific assembly functions. Available for Windows 2000, XP and Linux operating systems.

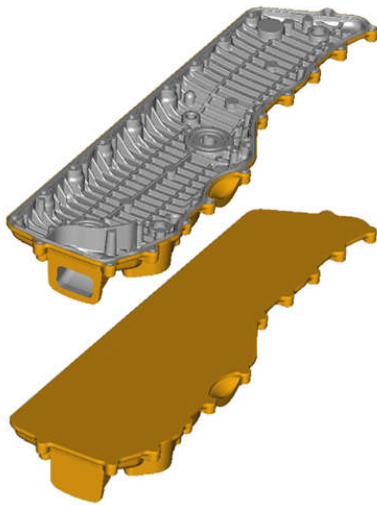
De-Featuring



Automatic FEA generation of CAD-generated data has been a goal of FEA meshing codes for years. However, the lack of accuracy and the amount of detail in the data

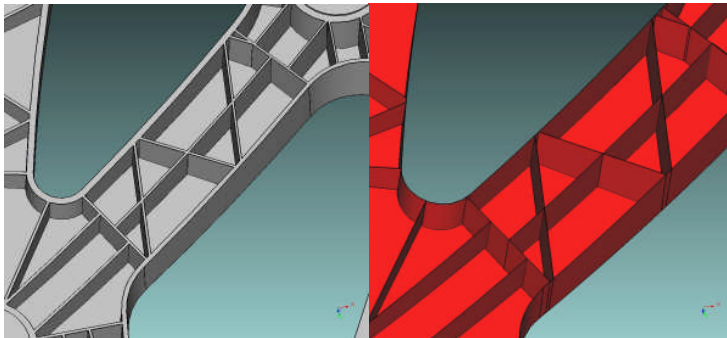
has made this a daunting task. The bottom line is that the CAD data needs to be de-featured to overcome accuracy deficiencies and to remove excessive detail such as: removing fillets, holes, bosses and chamfers. 3D_Evolution's de-featuring module has dramatically decreased the time it takes to prepare CAD models for FEA or CFD analysis as well as other analyses such as durability and NVH. Recently a Tier 1 supplier benchmarked the technology and said, "What took hours can now be completed in minutes." Further, for every eight hours spent preparing a model, it was completed using 3D_Evolution in less than one hour. Through intelligent semi-automatic "de-featuring" functions for geometry simplification, features such as holes, rounds, chamfers or other irrelevant details can be eliminated from the models within seconds, without any specific CAD know-how.

Geometry Simplification



Companies need to protect their intellectual capital/property. At the push of a button, the simplifier module is able to generate a bounding geometry of individual parts or assemblies. This tool is used in mock-ups and digital factories. The simplification process can be executed interactively or fully automated in batch mode. OEM and its suppliers are looking for ways to reduce costs for manufacturing. Understanding another's intellectual property may provide the chance for competitive displacements. It is further becoming a requirement in the industry to simplify a model or remove the intellectual capital before it leaves the four walls of a company.

Mid-Face Creation

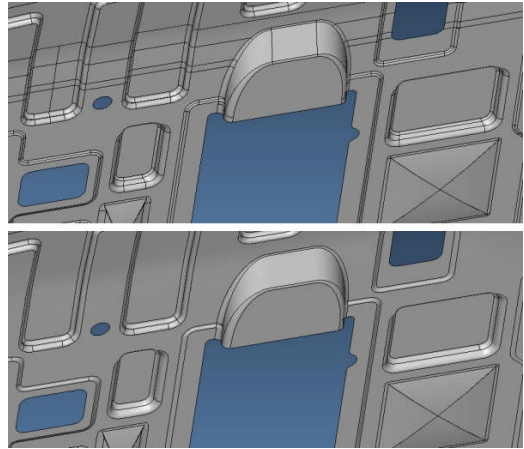


With a click of a button, the automatic creation of an exact middle surface (known as mid-face creation) between two surfaces can be realized. Even complex sweeps and corners can be calculated within seconds using 3D_Evolution. Incorporating the advanced healing kernel within 3D_Evolution's Mid Face Creation tool

will automatically extend faces that end at a T with an adjacent face. This will ensure no gaps in the model and will result in a higher quality model when it is time to mesh. This function can be incorporated in a batch process or in the interactive mode of 3D_Evolution.

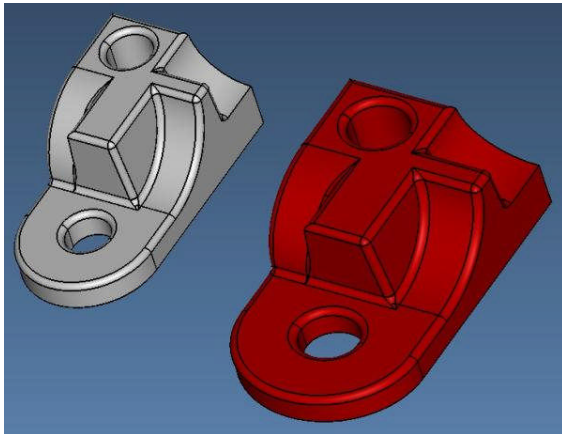
Meta-Face

Mini patches and their basic surfaces can be merged through the meta-face function within user-defined tolerances. Furthermore, the meta-facing process can be run fully automated or interactively. The elimination of problematic mini patches and long thin faces brings a face reduction of 70% with a standard deviation of ten (10). The resulting geometry comprises fewer elements and can be meshed and handled much easier.



The number of faces dropped from 815 to 216!

Direct Modeling



The challenge of altering a B-Rep CAD model is almost impossible. Going back to the original data and making changes is even more difficult. If a CAE designer could run a Design of Experiment (DOE) and make changes to that B-Rep data, hours would be saved during the design process. Core Technologies and its' product, 3D_Evolution, is proud to announce its direct modeling module. Now a change can be easily made in minutes and imported into the required CAD system.

Feature Recognition

We recently visited a client that was interested in a large migration and asked Core Technologies to the table along with the usual suspects. After reviewing the SOW (Statement of Work) and requirements document we came to realize that only a portion of the files were required to be fully feature. Thus, if a feature that was required did not come across during the migration a manual re-mastering would be required. At the end of the day, the rest of the data was useless. Today, this company migrates all its data as a B-REP and, when a change needs to take place, has its engineers use our feature recognition tool. Our alternative saved this company over half a million dollars versus our competitor's suggested migration path.

As Core Technologies Vice President, I challenge you to put 3D_Evolution© to the test. For further information, please contact David Selliman 810-923-6481.