



MAKINGITREAL



SimXpert ADVANCED MULTI-DISCIPLINARY MODELLING

SimXpert is MSC's new Multi-Disciplinary simulation pre and post processor. Its interface can seamlessly set up and analyse Finite Element Analysis (FEA), Multi-Body Dynamics (MBD) and also Control System simulations. Integrated with MSC's advanced multidiscipline (MD) solver technologies, SimXpert provides an efficient "end-to-end" solution that takes you from CAD to analysis report in a single easy-to-use application.

SimXpert Key Features Overview

- ▶ Modern Interface
- ▶ End-to-end simulation workspace desktop solution
- ▶ Complete, integrated Multi-Disciplinary simulation
- ▶ Multi-CAD native geometry (bi-directional associativity to Catia, NX and Pro-E)
- ▶ Advanced template automation productivity environment. Contains interactive GUI for drag & drop creation/editing of engineering actions + Python script interface to the API.
Allows you to:
 - ▶ Automate repetitive processes
 - ▶ Encapsulate corporate simulation best practices
 - ▶ Improve productivity
 - ▶ Eliminate process errors

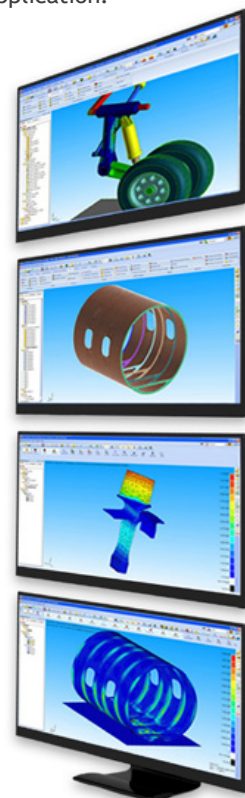


Figure 1 Different Work Spaces in SimXpert, establishing a complete, integrated solution.



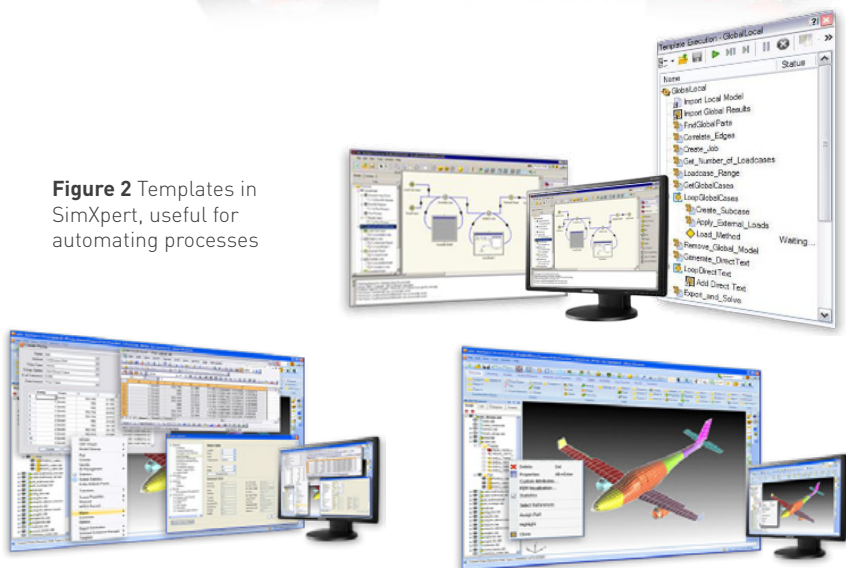
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- ▶ Advanced Meshing and Geometry clean-up tools
- ▶ Advanced tools for creation and visualization of Composites + link to FiberSIM
- ▶ Model Browser
- ▶ Includes advanced nonlinear implicit solver (MD Nastran SOL 400) with 3D contact and thermal-mechanical coupled analysis
- ▶ Includes explicit LS DYNA / Dytran solver in MD Nastran SOL 700, for explicit analysis (crash, droptest, explosions, impact etc)
- ▶ Includes Adams functionality in the Motion Work Space

Figure 2 Templates in SimXpert, useful for automating processes



- ▶ Multi-level Undo/Redo
- ▶ Spreadsheet cut/paste
- ▶ Macro Record/Replay
- ▶ Under the Hood
- ▶ MD Workspaces
- ▶ Tool Bars
- ▶ Tool Ribbon
- ▶ Right-click Context
- ▶ Software organisation

Figure 3 Examples of SimXpert Features

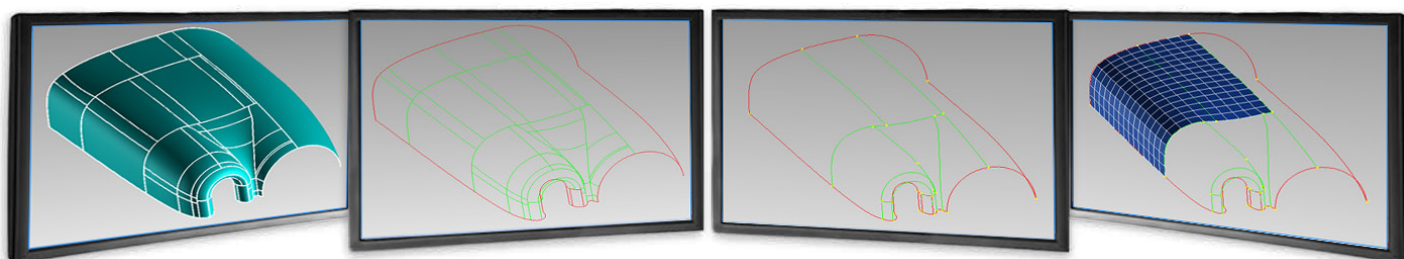


Figure 4 Geometry Clean-up through Virtual Topology:

- ▶ Easily trim and combine surfaces to create areas for a high quality mesh.
- ▶ Suppress and un-suppress surface edges and vertices.

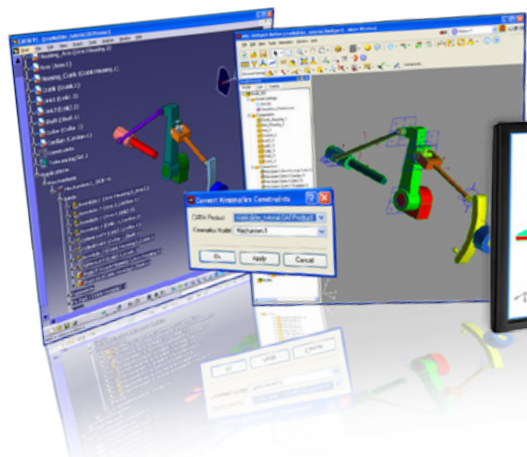


Figure 5 Example in the SimXpert Motion Workspace showing the Bi-Directional Connection from Catia to SimXpert and vice versa

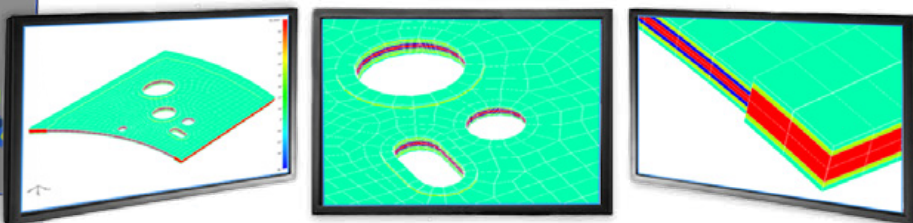
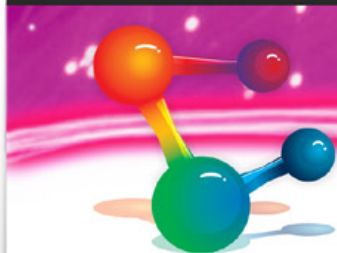


Figure 6 Visualisation of Ply Thickness for Composites

If you would like to know more about SimXpert please contact peter@compumod.com.au



Welcome to Issue 3 of the Compumod - Making it Real Newsletter - again I trust you will find many articles of interest across a wide range of topics.

Compumod is continuing to expand and since our last newsletter we are pleased to announce that we have been appointed reseller for Applied DEM Conveyor and Bulk Material Handling simulation software (see separate article on these products). These products again expand the range of products and services that Compumod can offer to our clients - and with the current boom in mining - and ensuing bottle necks at ports throughout Australia - it is a product set very applicable for our times.

In addition to supporting Applied DEM products - Compumod is also holding Bulk Material Handling Simulation Seminars in both Sydney and Melbourne in late September - see the announcement on page 10 for more details.

Furthermore, we have expanded our association with ZWSOFT and now also market and support ZWCAD - a low cost fully functional CAD system.

We are also pleased to announce the addition of Steve Corrigan to the Compumod team. Based in Sydney, Steve has joined Compumod as a Technical Sales Specialist. Steve has an extensive background in CAE across a large cross section of the Australian engineering industry and is available to assist you with your Engineering Lifecycle questions.

As always, Compumod's goal is to promote and assist the growth of software based Engineering lifecycle tools - and we look forward to discussing with you the application of these tools in your business.

Warwick Marx

Warwick Marx
Managing Director

CONVEYOR BELT, CHUTE AND BULK MATERIAL FLOW SIMULATION

Compumod is pleased to announce that it is now the exclusive distributor of Applied DEM Bulk Flow Analyst™ in Australia and New Zealand.

Bulk Flow Analyst™ is software based upon the Discrete Element Method and developed for the simulation of bulk material flow. With Bulk Flow Analyst™, users can take advantage of the benefits Virtual Prototyping has to offer to particle flow system analysis. Users can evaluate design concepts by creating an assortment of simulations using different material size ranges, chute materials, belt speeds, flow rates, and other factors.



Bulk Flow Analyst™ enables the simulation of sticky particles and structures, the use of moving system components (such as mixer blades, screens, gates, etc.), and the analysis of particle forces placed upon the system.

Benefits of Bulk Flow Analyst include:

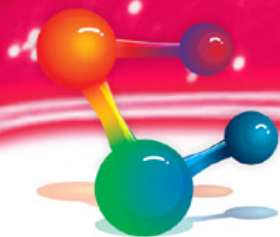
- ▶ Identify common chute flow issues:
 - ▶ plugging
 - ▶ off-center belt loading
 - ▶ material loss
- ▶ Identify regions of severe wear
- ▶ Characterise wider range of materials, including stickiness
- ▶ Analyse performance of systems with moving components such as screw conveyors, gates, or bucket elevators
- ▶ Analyse performance of systems with unique performance requirements such as mixers

Clint Hudson, the Manager of DEM Applications for Applied DEM, stated,

"We [Applied DEM] are excited to have Compumod as the most recent member of the Applied DEM team. Compumod's depth of experience in the engineering simulation and analysis market makes them the ideal choice to sell Bulk Flow Analyst™, and to support and train clients within the Australian and New Zealand territories. Sales revenues in this region have been growing rapidly, so the need for Applied DEM to have a local support and training provider was imperative to our future business there."

For more information on the Applied DEM products visit:
www.compumod.com.au/Partners_AppliedDEM_Inc.php





ZWCAD 180,000 USERS CAN'T BE WRONG

Compumod is pleased to announce that it has recently expanded its ZWSOFT product range and has now been appointed Australian Reseller for ZWCAD along with ZW3D CAD/CAM software.

ZWCAD™ is a cost-effective, DWG file format compatible CAD solution for the AEC and MCAD industries.

ZWCAD provides unparalleled compatibility with AutoCAD, using most of the same file formats including those for drawings (.dwg files), commands, linetypes, hatch patterns, and text styles. You can also use AutoCAD menu files and run Autodesk® AutoLISP® programs. This means users begin working with ZWCAD immediately with little to no training.

ZWCAD incorporates standard features found in other CAD programs, along with features and capabilities you won't find anywhere else. ZWCAD is popular in over 80 countries with more than 180,000 users, and available in 15 different languages.



▶ In-Place Reference Editing ▶ Gradient-Hatch ▶ Design Center & Tool Palettes ▶ Viewports Setup

Figure 1 Efficient Drafting & Advanced Management Features

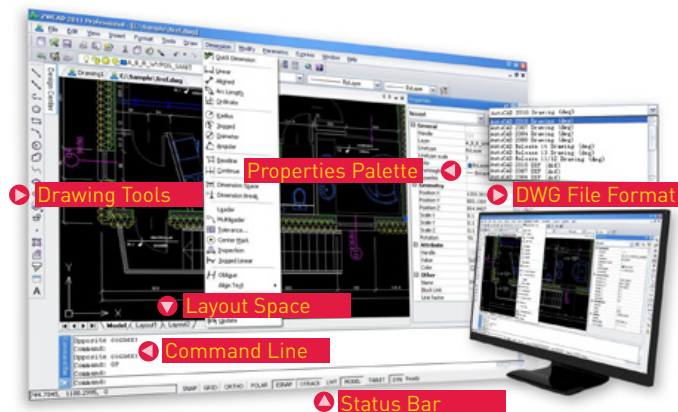


Figure 2 Friendly user interface and unrivaled compatibility.

ZWCAD is designed for anyone who wants a fast and efficient CAD program with all the power and versatility of standard programs such as AutoCAD® by Autodesk®, Inc., or MicroStation® by Bentley Systems, Inc., at an affordable price. Using today's advanced technology, ZWCAD integrates the Microsoft® Windows® interface with a powerful CAD engine.

ZWCAD is more compatible with the AutoCAD program than any other CAD product, delivers additional tools with advanced CAD features, and has a seamless Microsoft® Windows integration. This powerful program provides a superb combination of features for CAD users like architects, engineers, and designers.

“We are extremely excited about our agreement with ZWSOFT as it means Compumod is now able to service a much wider range of clients with our premium software offerings”

said **Warwick Marx** - Managing Director of Compumod. “As ZWCAD is fully featured out of the box and affordably priced, we believe ZWCAD will take the market by storm and are excited to be chosen as a pivotal part of their growth plans.”

ZWCAD is released by ZWSOFT. ZWSOFT (ZWCAD Software Co., Ltd.) is a world renowned CAD/CAM solutions provider, with over 180,000 clients across 80+ countries. Founded in 1998, ZWSOFT has created an international network of highly skilled partners, distributors, and resellers. Headquartered in Guangzhou, China, ZWSOFT and its operating subsidiaries currently employ more than 400 staff worldwide with branch offices in Beijing, Shanghai, Wuhan, and Florida, USA.

For more information on ZW3D contact us at steve@compumod.com.au or visit www.compumod.com.au



BESIDES THE PRICE YOU PICK THE DIFFERENCE BETWEEN THESE TWO CAD SYSTEMS

**SAVE
UP TO 90%
OF YOUR CAD COSTS**



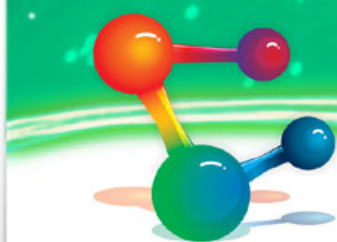
SPEND YOUR MONEY ON DESIGNERS, NOT SOFTWARE

- ✱ Open, Edit & Save any AutoCAD™ dwg file from version 2.5 to 2011
- ✱ Run existing AutoCAD™ Commands, Linetypes, Hatch Patterns & Text styles
- ✱ Use AutoCAD™ Menus, Aliases, Scripts, Lisp & VBA files
- ✱ Use immediately with little to no training
- ✱ Used in over 80 countries with more than 180 000 users
- ✱ Reads and writes DWG files in their native format

Contact Compumod for more details on 1300 965 690
or email info@compumod.com.au

ZWSOFT Design More. Pay Less.





DEAKIN UNIVERSITY SELECTS VI-MOTORCYCLE

Compumod is pleased to announce that the engineering team at Deakin University will be using VI-Motorcycle (from VI-Grade) to assess and optimize the dynamic performance of a revolutionary cross-over vehicle. Characterized by ultra low fuel consumption and emissions, the vehicle is fun to drive, low cost, and brings the small size of a scooter together with the safety, comfort and ease of operation of a car.

“Higher safety risks together with special skill requirements for the driver and much lower comfort compared to normal cars are the main reasons why motorbikes represent only a fraction of all vehicle sales in developed countries” says Frank Will, Senior Lecturer, Deakin University. “Such a product will address customer priorities such as safety, affordability, fun and efficiency (SAFE) and we will use VI Motorcycle to analyze the highest priority issue, which is safety. Thanks to VI-Motorcycle, for example, we could finetune the dynamic behavior of the SafeRide™ fully automatic tilting control system, that enables to build the vehicle with a full enclosure, since the driver does not need to put the feet on the ground to balance the vehicle when he stops.”



- small width for easy parking
- electric or efficient petrol engine
- fuel economy better than the equivalent of 2.5 litres per 100 kilometres
- protective exterior similar to a small standard car offering impact zones and collision protection resulting in a safety performance superior to any small car
- seatbelts, airbags, ABS anti lock brake
- performance better than a standard small car with an acceleration from 0-100kph below 10 seconds and a top speed of over 130 kilometres an hour
- an anticipated price range of \$10,000-\$20,000, depending on the manufacturing location, making it comparable to other micro cars on the market

Warwick Marx, Managing Director of Compumod, says:

“This success proves once again that, through our products and services, we enable our clients to eliminate slow and costly physical testing by creating and testing “virtual prototypes” that can be quickly evaluated for performance to achieve lasting competitive advantage.”

About VI-Motorcycle

With VI-Motorcycle, the specialized simulation environment for motorcycle design and testing, an engineering team can quickly build and simulate a complete parameterized model of a motorcycle in order to select fundamental design options and to explore new functional concepts prior to building physical prototypes. VI-Motorcycle is based on the MSC.ADAMS™ solver and is fully supported by VI-grade developers. It provides common methods throughout corporations and suppliers for modeling and design practices. Due to its scalability and extendibility, it can be customized easily in order to fit into the development process.

If you are interested in finding out more about any of the VI-grade product suite, contact us on 1300 965 690.

The main features of the Tomorrow's Car include:

- the cost effective SafeRide™ tilting control system and three wheels (two at the front, one at the back) to allow the vehicle to drive like a normal motorcycle





TIPS AND TRICKS!

NASTRAN FASTENER

Nastran Connectors

In this newsletter we would like to present a few different techniques to model plate to plate connections in Nastran.

If we confine ourselves to plate structures, the most common techniques to model fasteners or connections are shown in Figure 1. The node to node connection is probably the worst connection as it changes the geometry of the plates when you merge the nodes. The use of 1D CBEAM or CBAR elements requires node to node aligned meshes. The rigid elements also tend to cause stress concentrations. The best (and easiest) technique is the use of the mesh independent CFAST (fastener) or CWELD (spotweld) elements.

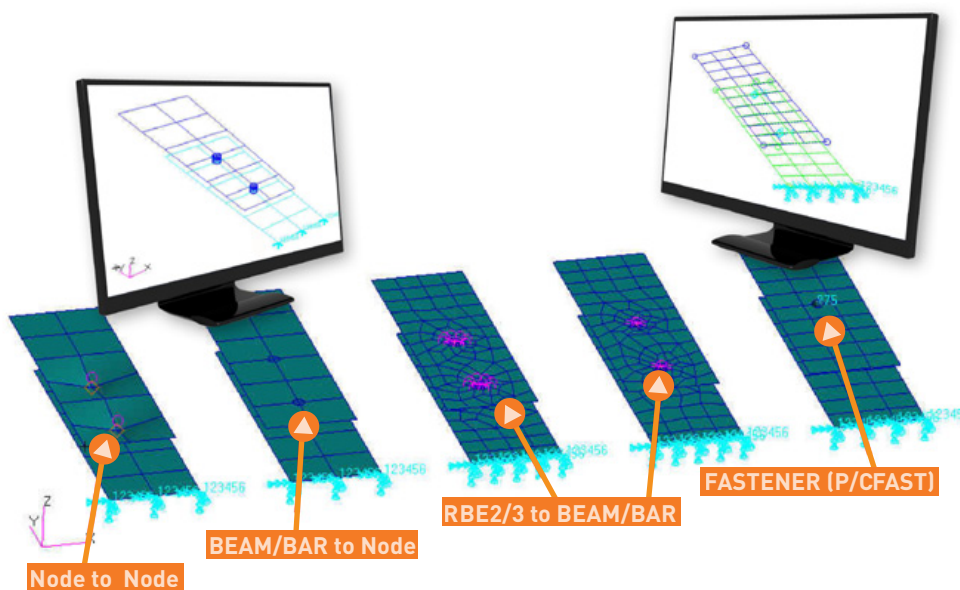


Figure 1 Five different techniques to model fasteners

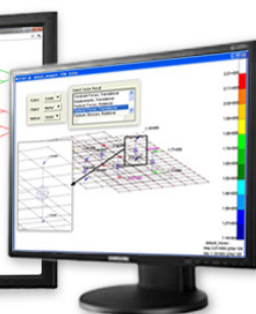
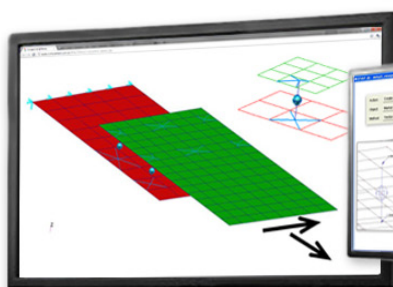
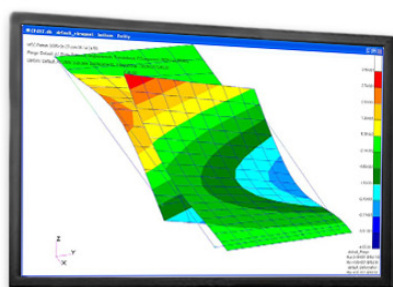


Figure 2 The mesh independent CFAST element for a simple example, showing the model (middle), displacement (left) and fastener forces (right)

The CWELD and CFAST connector elements internally behave in a similar way but the CWELD is defined like a CBEAM element where the user supplies an area and a material etc. The CFAST element is defined like a CBUSH element where the user supplies the translational and rotational stiffness values directly.

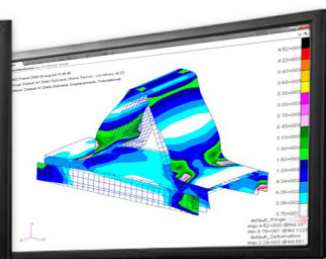
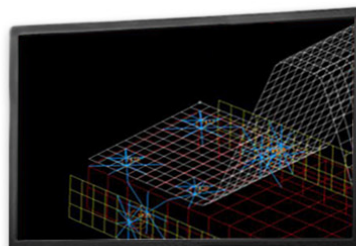
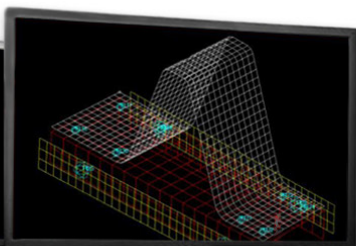
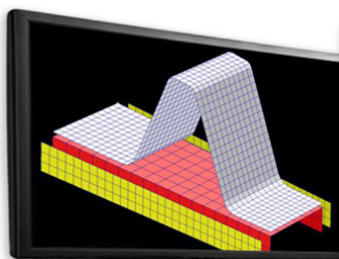


Figure 3 The mesh independent CFAST element for a real structure



The CWELD and CFAST elements are very easy to define (since they are mesh independent). You simply select a few arbitrary locations and then select the two plates (or properties) that you want to connect. Both Patran and SimXpert will automatically set up all the connections between those locations and the two plates, which will save you a lot of time (especially if you have many connections or need to remesh the model!).

Nastran uses an internal algorithm to transfer the forces and moments from the connector to the plates and vice versa. The CFAST/CWELD performance is also superior to traditional methods as they avoid the typical stress concentrations that you get while using rigid elements or bar to plate connections. **Figure 2** shows a small example of two plates connected through CFAST elements at 4 arbitrary locations. **Figure 3** shows a more realistic example for a larger structure.

Simply select the location group and the two parts ▶

Figure 4
Patran menu for CFAST element

Simply select the locations and the two properties ▶

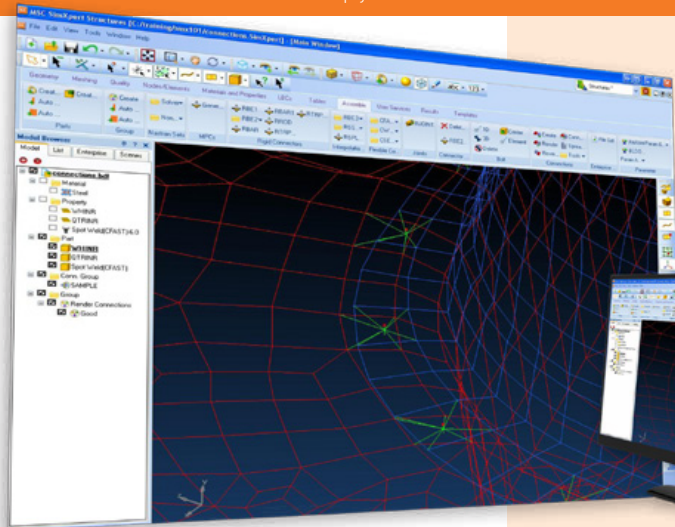
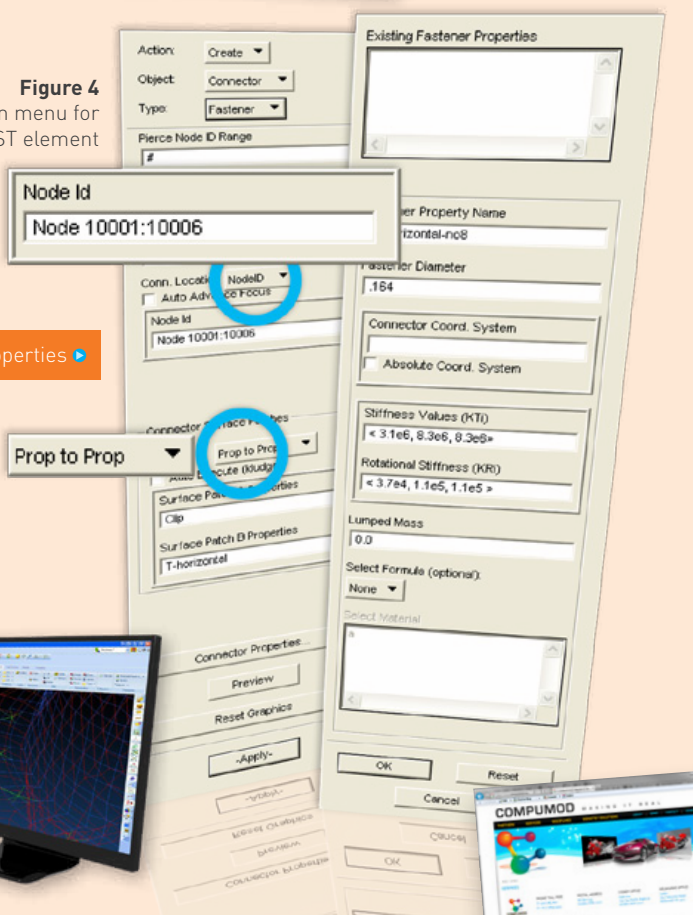


Figure 5
SimXpert Guides and menus to define CFAST element



If you would like to know more about connector elements or techniques, please contact peter@compumod.com.au



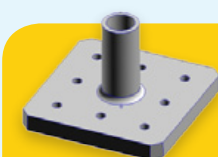
TIPS AND TRICKS!

FEATURE RECOGNITION IN PATRAN SOLID MODELLING

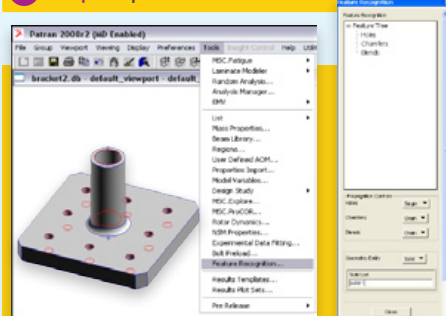
Patran has some robust features to allow you to build and edit geometry. One of these is the Automatic Feature Recognition Tool. This tool has been available with the CAE Solid Modelling option since Patran version 2008r1. It allows editing or removal of holes, chamfers and blends (fillets) in Parasolid geometry and can be accessed from **Patran menu Tools > Feature Recognition**.

Here is an example to show how this tool works. ▶ The below modifications will be done on a model as shown for a preliminary stress analysis.

- ▶ Delete 4 holes;
- ▶ Increase the diameter of another 4 holes;
- ▶ Reduce the pin inner diameter and pin hole depth;
- ▶ Increase the fillet radius.

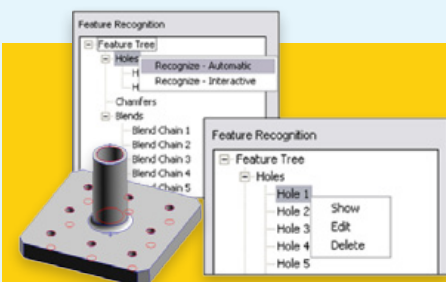


1 Import part



2 Access Feature Recognition

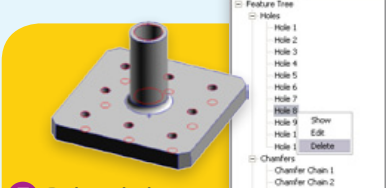
3 Select solid



4 Use Right Mouse Button (RMB) on Holes

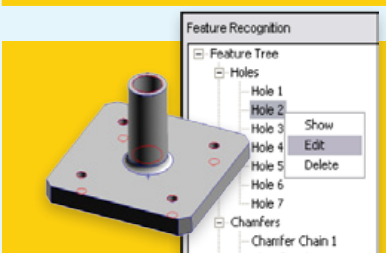
5 Select Recognize - automatic

6 All holes are recognized by Patran and are colored RED



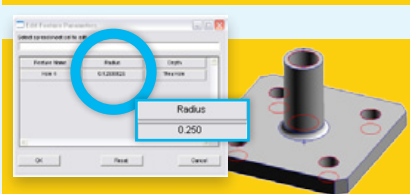
7 Delete holes

- ▶ Pick the hole from the Feature List to delete each hole



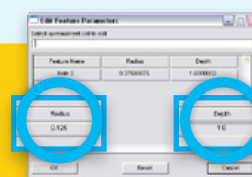
8 To modify holes

- ▶ Pick one hole from Feature List and right click mouse to select Edit



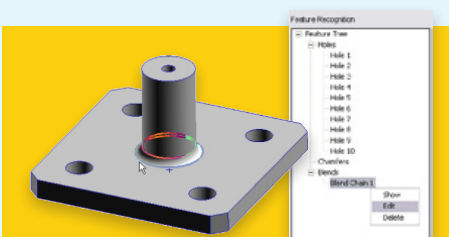
9 Change the hole diameter from 0.125 to 0.25

10 4 holes modified



11 Change the pin inner diameter from 0.375 to 0.125

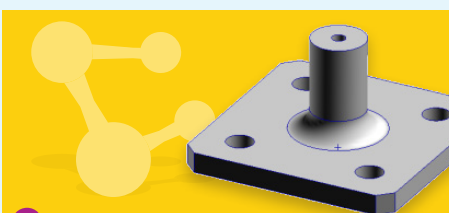
12 Change the hole depth from 1.6 to 1.0



13 Modify the fillet radius



14 Change the radius from 0.125 to 0.375



15 Final Model



CONVEYOR DESIGN & BULK MATERIAL MOVEMENT SIMULATION SEMINAR

Compumod, in association with Overland Conveyor Company and Applied DEM would like to invite you to an informative seminar on Conveyor Design and Bulk Material Movement simulation.

Come and hear what current tools are available and future trends in analysis and simulation for conveyor and chute design for bulk material handling. If you are already a user, now is also your chance to let developers know about your software needs and desires.

VENUE: Brisbane – Novotel Brisbane

DATES: Tuesday September 27, 2011

TOPIC: Belt Analyst

TIME: 5:30pm to 6:30pm

PRESENTER: Mark Alsbaugh
Overland Conveyor Company President

TOPIC: Bulk Flow Analyst

TIME: 6:30pm to 7:30pm

PRESENTER: Clint Hudson
Manager, DEM Applications

Sydney – Vibe Hotel - North Sydney

Thursday September 29, 2011

Belt Analyst

5:30pm to 6:30pm

Mark Alsbaugh
Overland Conveyor Company President

Bulk Flow Analyst

6:30pm to 7:30pm

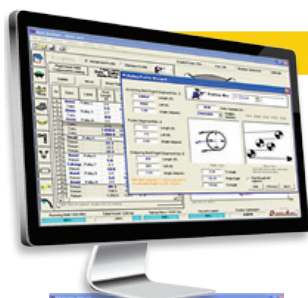
Clint Hudson
Manager, DEM Applications

WHO SHOULD ATTEND

Anyone interested in conveyor design or bulk material movement behaviour.

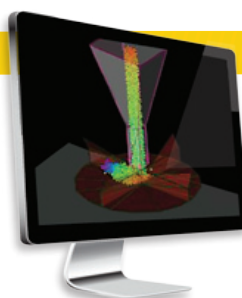
AGENDA

- ▶ Discrete Element Modelling
- ▶ Static System Analysis
- ▶ Dynamic System Analysis
- ▶ Control Algorithms
- ▶ Horizontal/Vertical Curves
- ▶ Pulleys
- ▶ Lagging
- ▶ Belt Feeders



Belt Analyst

Designed by conveyor engineers for conveyor engineers. This is not just software, but a real engineering tool.



Bulk Flow Analyst

With Bulk Flow Analyst™, users can take advantage of the benefits Virtual Prototyping has to offer to particle flow system analysis.

Figure 1 Screen-shots of Belt Analysis functionality and interface.

If you would like to know more about this seminar please contact steve@compumod.com.au





COURSE SCHEDULE

Compumod regularly runs a variety of “standard” public courses in support of its products.

If you have multiple attendees or would prefer a customised course please do not hesitate to contact us to discuss your needs.

Description	Location	Date	Duration
Introduction to Solid Modelling using ZW3D	Sydney	13-Sep-11	3
Introduction to Finite Elements	Sydney	05-Oct-11	3
Introduction to ZWCAD 3D and 3D	Perth	05-Oct-11	3
Introduction to ZWCAD 3D and 3D	Sydney	11-Oct-11	3
Introduction to Patran	Perth	11-Oct-11	3
Nastran Design Sensitivity and Optimisation	Melbourne	11-Oct-11	3
Introduction to Solid Modelling using ZW3D	Brisbane	18-Oct-11	3
Introduction to Patran	Sydney	18-Oct-11	4
Introduction to Solid Modelling using ZW3D	Melbourne	25-Oct-11	3
Introduction to SimXpert	Sydney	25-Oct-11	3
Introduction to Marc and Mentat	Sydney	01-Nov-11	3
Introduction to Dytran	Melbourne	01-Nov-11	3
Introduction to Solid Modelling using ZW3D	Melbourne	08-Nov-11	3
Nastran Implicit Non-Linear	Sydney	08-Nov-11	3
Introduction to Solid Modelling using ZW3D	Sydney	15-Nov-11	3
Introduction to Adams Car	Melbourne	15-Nov-11	3
Introduction to Solid Modelling using ZW3D	Brisbane	22-Nov-11	3
Introduction to FEA - Nastran/Patran	Melbourne	22-Nov-11	4
Durability and Fatigue Life Estimation	Sydney	22-Nov-11	3
Advanced Patran and Meshing	Melbourne	29-Nov-11	3
Introduction to FEA - Nastran/Patran	Sydney	06-Dec-11	4
Nastran Non-Linear Analysis	Sydney	13-Dec-11	3
SimXpert Linear Static Analysis	Melbourne	13-Dec-11	3
Introduction to Solid Modelling using ZW3D	Melbourne	07-Feb-12	3
Introduction to Adams	Sydney	07-Feb-12	4
Introduction to FEA - Nastran/Patran	Perth	14-Feb-12	4
Introduction to ZWCAD 3D and 3D	Sydney	14-Feb-12	3
Introduction to Adams	Melbourne	14-Feb-12	4
Introduction to FEA - Nastran/Patran	Brisbane	14-Feb-12	4
Introduction to Solid Modelling using ZW3D	Brisbane	21-Feb-12	3
Nastran Implicit Non-Linear	Melbourne	21-Feb-12	3
Introduction to Solid Modelling using ZW3D	Sydney	28-Feb-12	3
Introduction to Adams	Brisbane	28-Feb-12	4

Course dates detailed above are indicative only and are subject to change. Compumod also reserves the right to postpone any scheduled courses if required.

If you want to know more about any of the courses on offer, contact us on 1300 965 690.

