



## MAKINGITREAL



### 2013 AUSTRALASIAN ENGINEERING SIMULATION CONFERENCE – 30 MAY – SYDNEY

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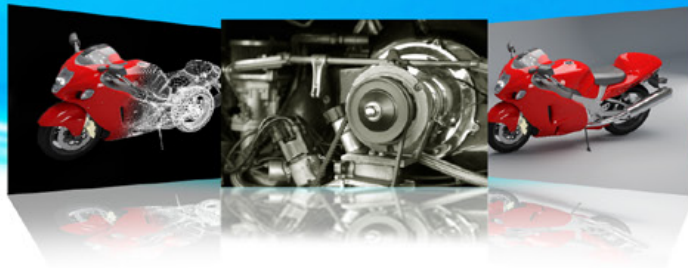
Compumod is proud to announce its sponsorship of the "2013 Australasian Engineering Simulation Conference". This conference will be held at the **Powerhouse Museum** on **Thursday May 30, 2013**.

The conference will consist of key note speakers from industry who will be detailing their Engineering problems and how they have addressed them using Simulation Software. This is not a conference on theory but an opportunity to hear practising engineers talk about real work problems and their solutions to them.

This one day conference is a must attend for anyone in (or interested in) the Engineering Simulation Industry. Along with the presentations, the conference includes networking opportunities with fellow engineers via hosted morning and afternoon teas, lunch and post conference cocktail party.

Mark Thursday 30th of May in your diary and keep an eye on your inbox for more details, alternatively you can register online at [www.compumod.com.au/2013-AES-Conference.php](http://www.compumod.com.au/2013-AES-Conference.php) or contact Compumod on [info@compumod.com.au](mailto:info@compumod.com.au) for more information.





Welcome to Issue 9 of the 'Making it Real' Newsletter for Autumn 2013.

2013 is already shaping up to be a very exciting year and again Compumod is pleased to be sponsoring the Australasian Engineering Simulation Conference to be held in Sydney on May 30.

This conference has been established in an effort to support the local Engineering Simulation Industry and to help foster the awareness and use of high end engineering software tools. The conference will act as a showcase for engineering companies to present and talk about their use of CAE technologies. Last year's event in Melbourne was a great success and it is Compumod's hope that this annual event will continue to grow and act as a focal point to help increase the awareness of CAE tools and capabilities as well as an excellent opportunity for Engineers to network with fellow CAE practitioners. For more details visit

[www.compumod.com.au/2013-AES-Conference.php](http://www.compumod.com.au/2013-AES-Conference.php)

Compumod is also pleased to have partnered with Gexcon, one of the world leaders in the field of safety and risk management and advanced dispersion, explosion and fire modelling, to be delivering Australia's first training course dedicated to explosion modelling and the associated structural response. This two day course, on 19 & 20 June 2013, is a must for anyone undertaking design or simulation in the oil and gas or petrochemical industries. With Australia's growing dependence on these industries it is important that Australian Engineers improve their knowledge of world best practice in order to maintain our competitiveness in this global environment.

It is also of note that in 2013 MSC Software celebrates its 50th anniversary. Just think, in 1963 when MSC was founded Sir Robert Menzies was the Australian Prime Minister, the Beatles were number 1 and it was just the beginning of the NASA space program. 50 years is an amazing milestone for any company – particularly a technology based company and is a testament to the value that MSC Software provides to its customers.

I hope to see you soon at one of our upcoming events and all the best for 2013.

*Warwick Marx*

Warwick Marx  
Managing Director

## COMPUMOD ATTENDS MSC APAC CONFERENCE IN BANGALORE



Compumod was pleased to be invited to be part of the MSC APAC annual conference this year held in Bangalore, India.

At this conference MSC representatives from around the APAC region were updated on the latest plans for MSC's software products. Hosted by Mr Eric Favre, Vice President, Asia Pacific along with Mr Alias Isa Regional Director ASEANz and Mr Eng Jin Lim Channel Director Asia Pacific, it was also an excellent opportunity to network with other MSC resellers in the region to gain a greater understanding of the opportunities and challenges that are present in the current economic climate and how MSC Software is helping our customers maintain a competitive advantage in this environment.

Compumod was also thrilled to be appointed an MSC Software Gold Level Value Added Solution Partner for 2013.



The event was Hosted by Mr Eric Favre,  
Vice President



Warwick with Mr Alias Isa,  
Regional Director ASEAN







## ADAMS 2013 OFFERS DRAMATIC PERFORMANCE GAINS AND AUTOMOTIVE AND MACHINERY FOCUSED SOLUTIONS



### NEW BEARING MODULE FOR MACHINERY DESIGNERS

In the new Adams 2013 release, the Adams/Machinery solution adds a new bearing module to the existing gear, belt, and chain modules introduced in the 2012 release. The new Adams/Machinery Bearing module enables a user to select from a library of more than 24,000 off-the-shelf bearings spanning a range of 14 bearing types. The library supplies characteristic geometry values for bearings from 8 leading manufacturers. The novel modelling technique employed enables service life prediction based on widely-accepted industry standards.

Adams/Machinery is fully incorporated inside the Adams/View environment and makes analyst-level simulation practical and approachable for machinery designers. Engineers now can use multiple modelling productivity modules to create common machinery components more efficiently than with the generic Adams/View environment, while encountering a shorter learning curve.

Building on its ground breaking Adams multibody dynamics technology platform, MSC Software Corporation, announced the new release of Adams 2013. The release includes new modules for machinery dynamics analysis along with extended automotive features for ride test, leaf spring generation, and powertrain modelling.

The Adams 2013 release helps mechanical engineers more accurately model systems, predict performance, and visualize results.

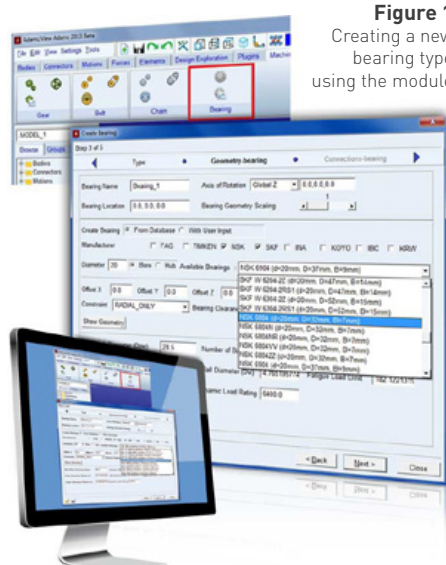
### KEY ENHANCEMENTS INCLUDE:

#### FASTER PERFORMANCE

The HHT integrator was enhanced with a more efficient step size selection which benefits all classes of models with faster speed. Adams 2013 also provides users with the option to implement the "Adaptive Interpolation" in all integrators to improve the solver speed. The "Adaptive interpolation" approach has increased simulation speed by 4 times for a typical Rough Road ride simulation, and by 10 times for a similar Straight Flat Road test.

	GSTIFF	2013 HHT default	HHT Adaptive	HHT Modified	2011 HHT
Integration steps	5318	3867	2777	2785	4832
Function evaluations	11910	16842	13740	9337	20165
Jacobian evaluations	5688	74	79	27	92
CPU time	41.22 s	11.36 s	9.66 s	7.74 s	12.98 s

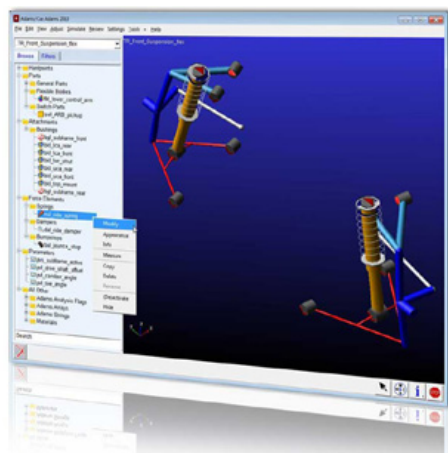
**Figure 1**  
Creating a new bearing type using the module





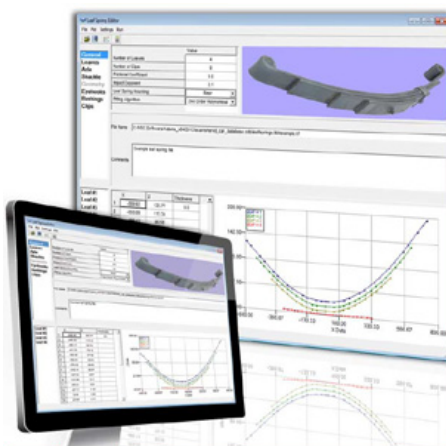
Also included are productivity enhancements for automotive & truck engineers such as:

## USER-CUSTOMIZABLE MODEL BROWSER



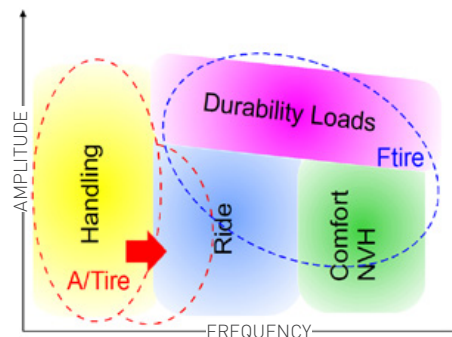
**Figure 2**  
Customisable Model Browser

## NEW LEAF SPRING PREPROCESSOR IN ADAMS/CAR



**Figure 3**  
New Leaf Spring Preprocessor

## ADAMS/TIRE WITH BELT DYNAMICS



**Figure 4**  
Apply Adams /Tire to Ride Analysis

The model browser in Adams/View is now customizable, and is available in both Adams/View and Adams/Car. It exists in both Template Builder and Standard User Interface modes, and has User Defined Element (UDE) support. With the customizable model browser, including dynamic searching and saveable filters, it is now easier to access and modify complex vehicle models.

Taking advantage of previously available and proven leaf spring modelling tools in Adams/Chassis, Adams 2013 implemented this new capability in Adams/Car. Also, a single leaf spring model will be fully supported, thus reducing the need for custom solutions and improving the ease of use. This new feature will benefit the CAE analysts in light and heavy truck industries.

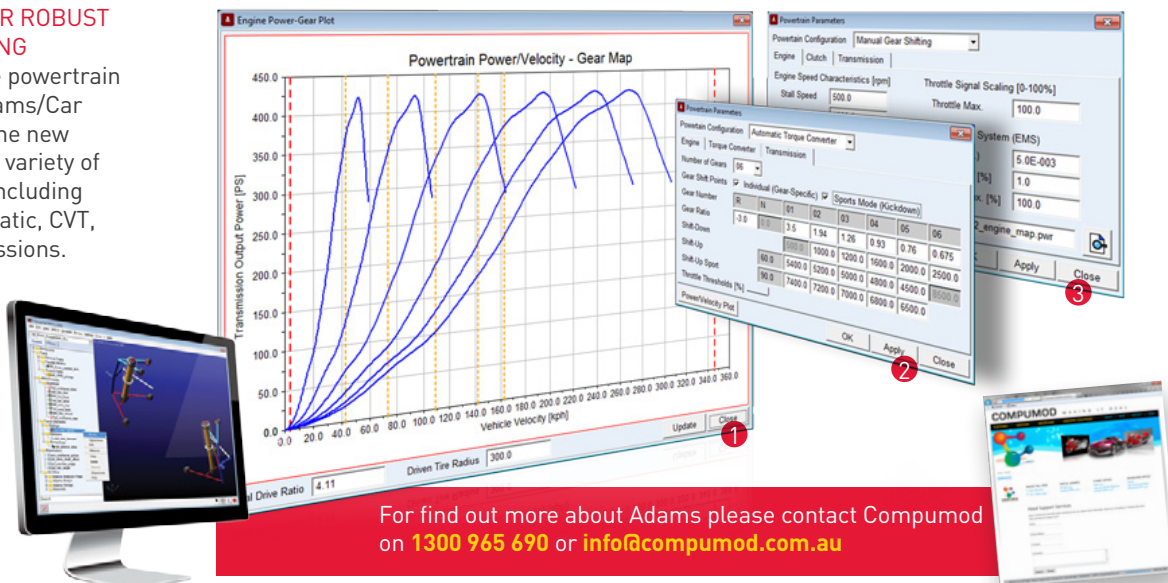
The traditional Adams/Tire focuses on handling tests with frequencies below 15 Hz. In the new Adams 2013 release, the belt dynamics option offers validity up to 70Hz, which enables engineers to apply Adams/Tire to ride analysis with high fidelity and low computational cost.

## EXPANDED OPTIONS FOR ROBUST POWERTRAIN MODELLING

Adams 2013 features the powertrain consolidation in both Adams/Car and Adams/Chassis. In the new release, engineers find a variety of pre-defined templates, including those for manual, automatic, CVT, and dual-clutch transmissions.

**Figure 5**

- 1 Powertrain Power/ Velocity - Gear Map
- 2 Powertrain Parameters - Auto Torque Converter
- 3 Powertrain Parameters - Manual Gear Shifting



For find out more about Adams please contact Compumod on 1300 965 690 or [info@compumod.com.au](mailto:info@compumod.com.au)

ADAMS 2013 OFFERS DRAMATIC PERFORMANCE GAINS



# TWO DAY TRAINING COURSE EXPLOSION & ASSOCIATED STRUCTURAL RESPONSE MODELLING

The Warren Centre in association with Compumod and Gexcon AS is excited to be holding a 2 day training course which will introduce the concepts of both explosion modelling and the modelling of the associated structural responses.

This course is a must for anyone undertaking design or simulation in the oil and gas or petrochemical industries.

This two day course will cover:

- Gas explosion basics
- Release and dispersion of inventory
- Explosion Preventive Measures Mitigation and Control
- Explicit and Implicit solvers
- Numerical Methods of explosion and structural modelling
- Fluid Structure Interaction
- Ballistics
- Blast and Structural Response
- Structural Protection
- Underwater Explosion

**SYDNEY**

JUNE 19 & 20, 2013.

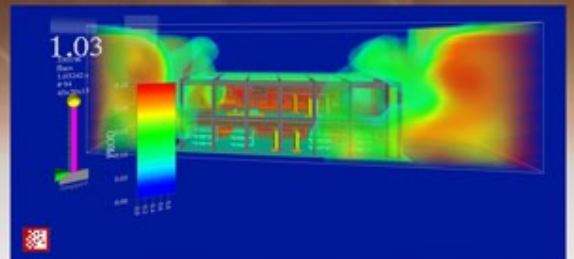
\*SPACES ARE LIMITED SO  
RESERVE YOUR PLACE BY  
CONTACTING COMPUMOD

**cmr** Gexcon

GexCon's is recognised as one of the world leaders in the field of safety and risk management and advanced dispersion, explosion and fire modelling. Gexcon's experience in this area arises from years of extensive research projects, carrying out safety assessments, performing accident investigations and performing physical testing.

 **COMPUMOD**  
MAKING IT REAL

Compumod has for the past 30 years provided a vast range of engineering simulation software and services. Compumod has particular expertise in complex structural simulations and their response to a variety of loading conditions including blast loading.



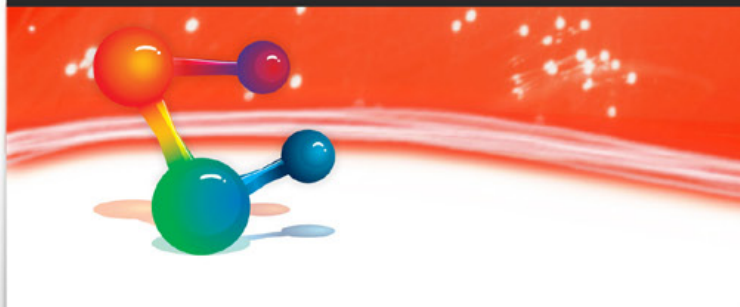
THIS TWO DAY COURSE WILL BE HELD IN SYDNEY ON JUNE 19 & 20, 2013.

SPACES ARE LIMITED SO FOR MORE INFORMATION ABOUT RESERVING YOUR PLACE PLEASE  
CONTACT COMPUMOD ON 1300 965 690 OR EMAIL [INFO@COMPUMOD.COM.AU](mailto:INFO@COMPUMOD.COM.AU)

**cmr** Gexcon

THE **Warren** CENTRE  
FOR ADVANCED ENGINEERING LTD 

 **COMPUMOD**  
MAKING IT REAL



## MSC SOFTWARE UNIVERSITY BUNDLES



The mission of the MSC University Program is to meet the needs of three distinct groups: students, teachers and industry. The primary goal is to help university students obtain desirable jobs with MSC's best-in-class customer-companies who continually seek to hire talented Engineers proficient with MSC's industrial-strength, simulation software.

By enabling teachers to include MSC software in their engineering curricula, our objective is to help them make the principles and theory they teach more understandable, enjoyable, and relevant for their students. Simulation enables

engineers to go beyond static design (CAD) for form and fit – to rapidly develop high-quality, innovative products in the virtual world so they function as intended in the real world.

**MSC Software**  
Simulating Reality, Delivering Certainty™  
**BUSINESS PARTNER**

If your team or university is interested in the MSC University Program, please contact Zigi Barrett on [zigib@compumod.com.au](mailto:zigib@compumod.com.au) or call 1300 965 690



### **A** Adams Multibody Dynamics Simulation Solution

Adams is the most widely used multibody dynamics and motion analysis software in the world. Adams helps engineers to study the dynamics of moving parts, how loads and forces are distributed throughout mechanical systems, and to improve and optimize the performance of their products.

### **N** MSC Nastran Fast & Accurate Multidiscipline Simulations

MSC Nastran is the world's most widely used Finite Element Analysis (FEA) solver. When it comes to simulating stress, dynamics, or vibration of real-world, complex systems, MSC Nastran is still the best and most trusted software in the world – period. Today, manufacturers of everything from parts to complex assemblies are choosing the FEA solver that is reliable and accurate enough to be certified by the FAA and other regulatory agencies.

### **M** Marc Advanced Nonlinear Simulation Solution

Marc combines to deliver a complete solution (pre-processing, solution, and post-processing) for implicit nonlinear FEA. Marc provides the easiest to use and most robust capabilities for contact, large strain, and multiphysics analysis available today to solve static and quasi-static nonlinear problems.

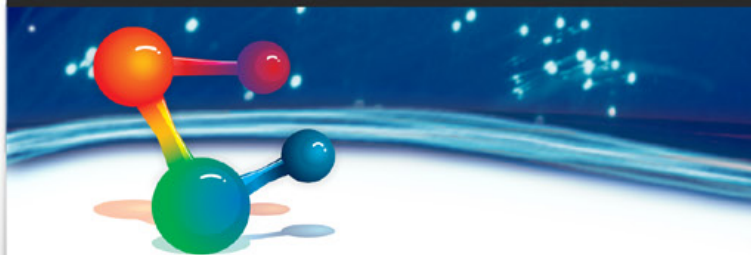
### **P** Patran Complete FEA Modeling Solution

Patran is the world's most widely used pre/post-processing software for Finite Element Analysis (FEA), providing solid modeling, meshing, analysis setup and post-processing for multiple solvers including MSC Nastran, Marc, Abaqus, LS-DYNA, ANSYS, and Pam-Crash.

The following packages are available for universities in bundles for 1, 5, or 50 users.

- ▶ University FEA Bundle includes MSC Nastran, Patran, Marc, Dytran, FlightLoads & Sinda
- ▶ University Motion Bundle includes MSC Adams, MSC Adams/Car + Easy5





## A NEW ERA LAUNCHED FOR FORD PERFORMANCE RACING



Once again in 2013 Compumod is proud to be a sponsor of the Ford Performance Racing team whose 2013 car was unveiled in Melbourne earlier this year.

In 2013, Ford's factory team will benefit from a stable driver and team line-up with Mark Winterbottom and Will Davison entering their third season together.

This season is Winterbottom's eighth with FPR and he is excited by the team's new look, new cars and fresh approach to the season.

Davison is coming off the back of his best ever season and is also a big fan of the team's change in look.

As you may know 2013 heralds the introduction of the Car of the Future (COTF) in V8 Supercars which is a parity formula designed to lower costs, encourage new entrants (such as Nissan and Mercedes in 2013) and make for better racing.

### 2013 FPR SPECS

#### ENGINE

FPR-developed, 5.0-litre Ford V8 with SV0 cylinder iron block and aluminium heads. Category control MoTec engine management system

#### POWER

Estimated 635+ bhp limited to maximum 7500rpm

#### TRANSAXLE

Albins ST6 six-speed sequential

#### CLUTCH

AP Racing triple-plate carbon 7 1/4-inch

#### SUSPENSION

Front: FPR-developed double-wishbone suspension with coil over spring adjustable dampers

Rear: V8 Supercars-designed control Independent Rear Suspension (IRS), coil over adjustable rear dampers

#### BRAKES

Front: Control pedal box, AP six-piston V8 Supercar control brake calliper, AP 395mm V8 Supercar control rotors

Rear: AP four-piston V8 Supercar control brake callipers, AP 355mm V8 Supercar control rotors

#### WHEELS

18x12-inch aluminium control wheel

#### TYRES

Dunlop Sport Maxx control tyre

#### FUEL CAPACITY

115-litre

#### VEHICLE WEIGHT

1400kg (category minimum without driver)

#### TOP SPEED

294+ kph (182+ mph), 0-100kph: 3.8 seconds

#### DATA SYSTEM

MoTec ACL Acquisition System with steering wheel-mounted mini-dash display and gear shift light module. 1Gb memory, up to 100 channels of data at up to 1000 samples per second

#### CAR-TO-PIT

Freewave telemetry system for live data monitoring

#### SEAT

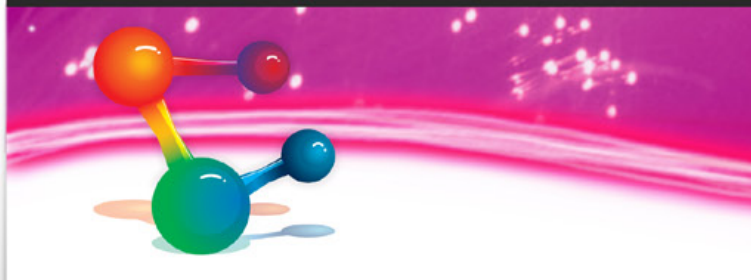
Racetech FIA specification carbon fibre

#### STEERING WHEEL

FPR-developed steering wheel with MoTec mini-dash LCD display, LED gearshift light module and all driver controls

If you would like to follow the progress of the FPR team, find them online at [www.fpr.com.au](http://www.fpr.com.au)





## PULLING LEVERS FOR TECHNOLOGY EDUCATION

**THE Warren CENTRE**  
FOR ADVANCED ENGINEERING LTD



As a strong supporter of **The Warren Centre for Advanced Engineering**, Compumod are pleased to be able to provide a forum for the centre to promote its drive to address the declining number of students studying engineering and other technology based subjects. The Warren centre believes that a new technology curriculum for schools could help revive interest in subjects vital for Australia's future.

The Warren Centre announced its support of the Australian Curriculum Assessment and Reporting Authority's (ACARA) final draft of the Australian Curriculum: Technologies. The new curricula are open for comment until **10 May 2013** and we call on all stakeholders in our nation's future to contribute to this dialogue now.

Dr Nick Cerneaz, Executive Director of the Warren Centre said "we are graduating less than half the engineers we need each year. The current shortfall is partly met through skilled migrant intake. "More significantly, essential infrastructure works are being cancelled or deferred because there aren't enough engineers."

"Next time you're stuck at your local bottleneck of traffic congestion, slow, delayed and cancelled public transport connections or pondering limited airport options or dealing with slow broadband and sub-standard health, education and regional infrastructure, remember that it's engineers and technologists who are critical to fixing these bottlenecks.

Without enough new graduates these bottlenecks will never be adequately addressed."

Participation in Science, Technology, Engineering, & Mathematics (STEM) subjects by students in High School is declining. Within the spectrum of STEM subjects our historic national focus of encouraging only the basic foundation skills of maths and sciences is inadequate and it must be extended to the application of those fundamental skills.

Engineering is about applying those skills to solve society's issues. The teaching profession has made great strides to present the sciences and maths using techniques including action learning and problem based approaches to inspire greater uptake, yet still we fall short.

The new Technologies curricula provides opportunities to significantly extend these improvements and to give teachers some of the resources needed to inspire today's students – and tomorrow's workforce – to solve the problems facing Australia.

The Curriculum includes Digital Technologies, and Design and Technologies which will be mandatory for years F-8 (Foundation/Kindergarten to 8), and optional in Years 9-10. Drafting for subjects for Years 11-12 has now begun.

These subjects teach the fundamentals of design and technology from the start of schooling, with a strong emphasis on engineering principles and the application of maths and science to solving everyday problems.

The Warren Centre encourages all stakeholders in our nation's future to visit the ACARA website ([www.acara.edu.au](http://www.acara.edu.au)) and review the Curriculum.

### Links



Australian Technologies Curriculum Information Sheet  
<http://consultation.australiancurriculum.edu.au/Static/docs/Technologies/Information%20Sheet%20-%20Technologies%20-%20February%202013.pdf>



Draft Australian Technologies Curriculum (complete document):  
<http://consultation.australiancurriculum.edu.au/Static/docs/Technologies/Draft%20Australian%20Curriculum%20Technologies%20-%20February%202013.pdf>



Information about making submissions to the draft curricula:  
<http://consultation.australiancurriculum.edu.au/>

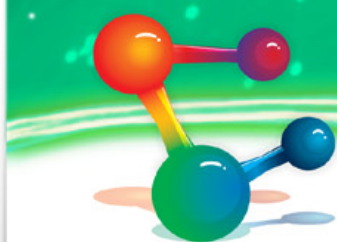
### For more information Contact

Dr Nick Cerneaz  
Executive Director

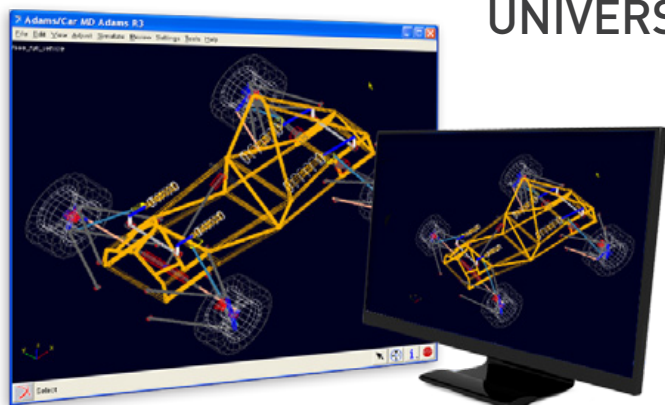
The Warren Centre for Advanced  
Engineering Limited

[nick.cerneaz@twc-network.com](mailto:nick.cerneaz@twc-network.com)





## FREE ANALYSIS SOFTWARE FOR UNIVERSITY FORMULA SAE COMPETITION



Did you know that Compumod and MSC Software are active supporters of the University based Formula SAE competition?

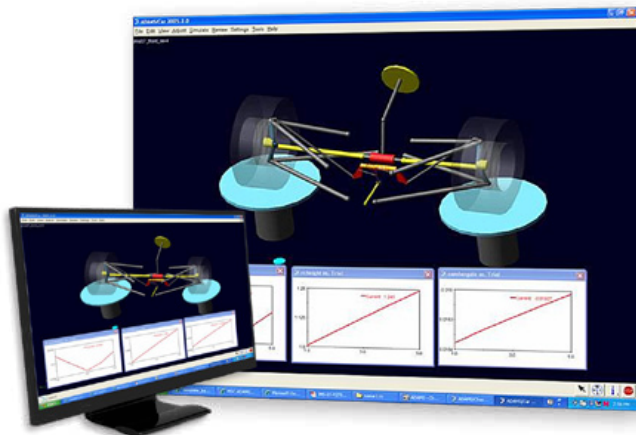
By simply registering with Compumod, approved Universities can obtain five seats of MSC's advanced simulation software for FREE for exclusive use in designing and optimising their FSAE

cars. This means that University Students can now use the same technology as the "big boys" when designing their entries. This program also enables students to leave university "job ready" with commercial engineering software experience. The FSAE software suite includes: Patran, MSC Nastran, Adams, Dytran, Marc and more.

The team can use Adams/Car for suspension or full vehicle dynamic analysis and MSC Nastran for structural analysis. This is a great opportunity for your team to enhance the design capability and obtain a competitive advantage. Many of the winning FSAE teams have been taking advantage of MSC's free software since the competition started in 2000.

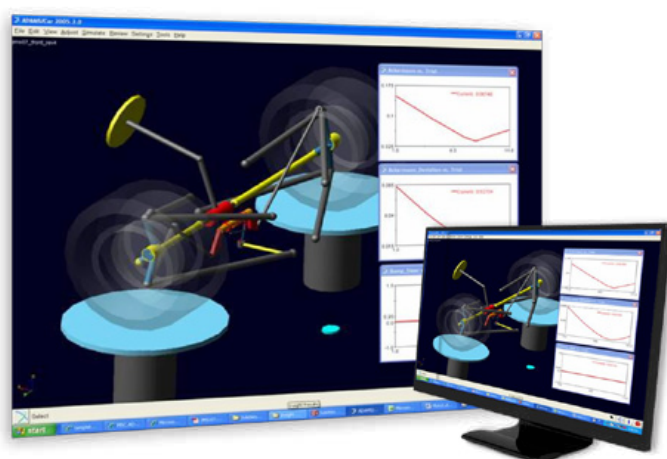
In addition, a special Adams/Car database is now available for you to download that makes it easier to build and simulate Formula SAE vehicles. Some examples of FSAE Adams models are shown below.

DOE results from Adams enabled one team to tune its vehicle's Ackermann by better understanding the impact of various input parameters. A team was able to quickly see the impact of several design ideas on Bump Steer and Camber Gain.



**Figure 2**

A team was able to quickly see the impact of several design ideas on Bump Steer and Camber Gain.



**Figure 3** DOE results from Adams enabled one team to tune its vehicle's Ackermann by better understanding the impact of various input parameters.



For more information on obtaining your FREE Formula SAE software suite please contact Zigi Barrett on [zigi@compumod.com.au](mailto:zigi@compumod.com.au) or call 1300 965 690



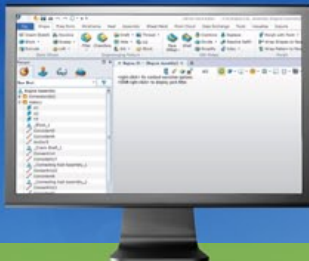


# ACCURATE, EFFICIENT, SIMPLIFIED, ENJOYABLE

All-in-one, affordable CAD/CAM

## ZW3D 2013 Overview:

*ZW3D 2013 is a cost-effective CAD/CAM solution for 3D modelling, mold design, machining and can be implemented in the automotive, mold, consumer product, medical and mechanical design industries.*



STYLISH UI,  
CLEAR WORKFLOW



POWERFUL DATA  
EXCHANGE, ENHANCED  
DESIGN COLLABORATION



PRODUCTIVE MODELLING  
AND ASSEMBLY, ENJOYABLE  
DESIGN EXPERIENCE



EFFICIENT SKETCH &  
DRAFTING, ACCURATE 2D  
DOCUMENTATION



FAST MOLD DESIGN,  
FLEXIBLE PROJECT  
MANAGEMENT



INTELLIGENT 2X-5X CAM,  
RELIABLE MACHINING  
QUALITY



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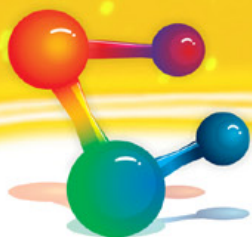
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**ZWSOFT** Design More. Pay Less.



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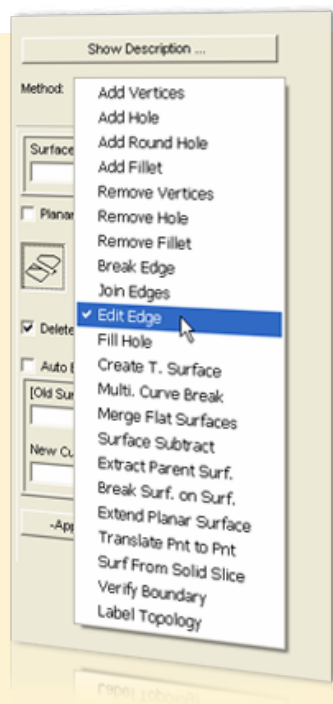


## TIPS AND TRICKS! PATRAN UTILITY: TRIMMED SURFACE EDIT

Most users are aware of the fact that the Patran Utilities Menu offers a lot of powerful functionality that is not always available in core Patran. One of the functions that I use a lot is Utilities – Geometry – Trimmed Surface Edit. This Utility was created by Jim Leedom from MSC Software in his free time!

The Trimmed Surface Edit utility was created to extend the functionality of the standard Patran geometry application in the area of editing surfaces. This article gives a short overview of some of the functions, but for a complete listing I would encourage you to read the help menu underneath the <Show Description> button in the menu.

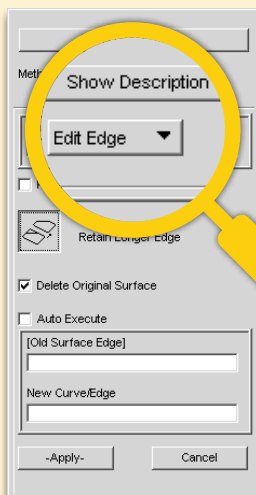
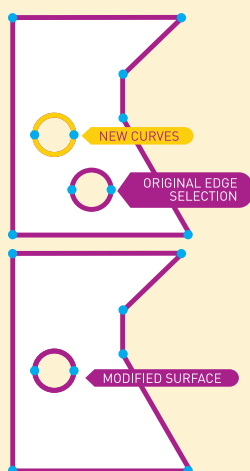
For more information, please contact Peter Brand at [peter@compumod.com.au](mailto:peter@compumod.com.au)



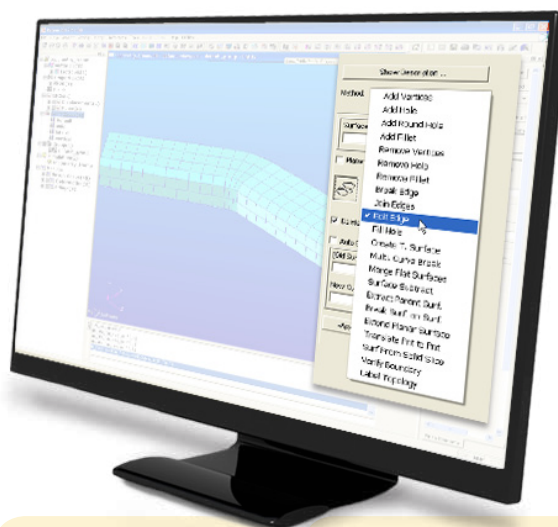
**Figure 1**  
The Trimmed Surface Utility showing the 20 methods available in this version

### EDIT EDGE TOOL

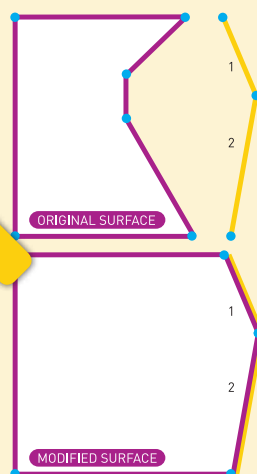
This tool has many uses. Some of them are not obvious. It's main use is to redefine the boundary of a surface by selecting some original edges (Old Surface Edges), and replace them with new curves.



**Figure 2**  
Edit Edge, move the hole

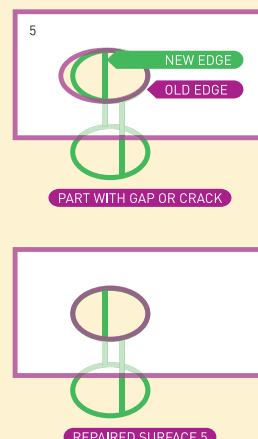


If the old edges are specified, but the new edges do NOT touch the surface, then edges will be extended to the new curve/edges as shown in Figure 3.



**Figure 3**  
Edit Edge, extend the edges

Figure 4 shows a crack in the part between the hole in surface 5 and the cylinder in the hole. Edit edge can easily fix this problem by picking the old old edge on surface 5 and then the new edge from the cylinder surface.



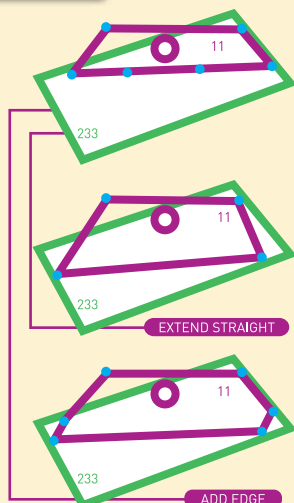
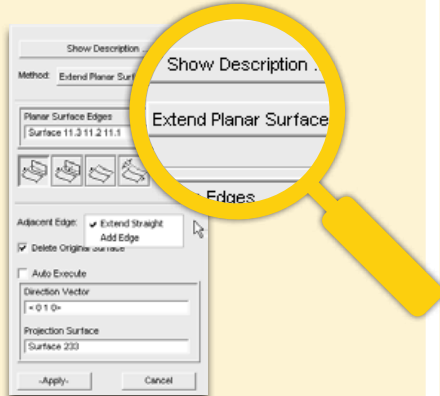
**Figure 4**  
Edit Edge, fill the gap



## TIPS AND TRICKS! [CONTINUED]

### EXTEND PLANAR SURFACE TOOL

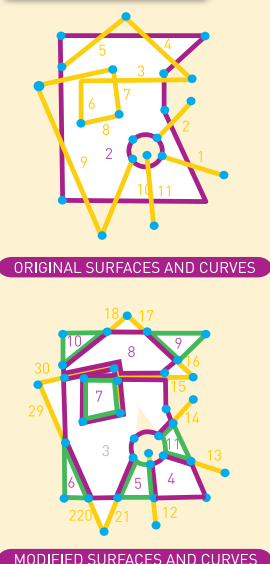
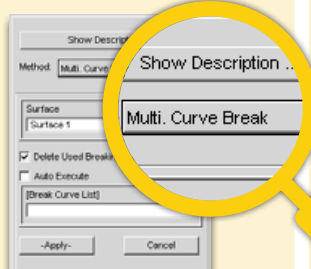
This tool will extend planar surfaces to a surface, plane, curve, or a fixed length. A common use is in mid-surface modeling. This is different from the Patran built in feature Edit/Surface/Extend in that it can extend trimmed surfaces and bi-parametric surfaces. It can also extend multiple edges at once. It is limited though in that it can only extend planar surfaces. Non-planar surfaces can effectively be extended using the **Edit Edge** tool by defining the new extended boundary using curves.



**Figure 5**  
Extend Planar Surface Tool,  
handy for mid surfaces

### MULTI. CURVE BREAK

Multi. Curve Break is a more power tool for breaking surfaces than the Geometry Application Edit/Surface/Break – Curve. More than one break curve can be used at a time. If no break curves are specified, then the tool will try to use all curves that fall on the specified surface. In Figure 6, a single surface was broken on 11 curves at one time. This results in 9 new surfaces and 13 broken curves. Curves are broken on each other and on surface edges.



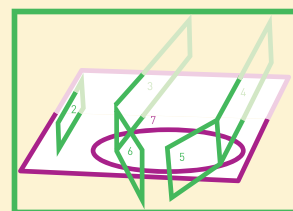
### BREAK SURFACE ON SURFACE

This tool will break multiple surfaces on multiple surfaces. It is more powerful then Patran's built in Edit/Surface/Break – on surface. There is a single list of surfaces and each surface will try to break each other surface. In addition, combinations of surface will be considered in breaking any of the surfaces.

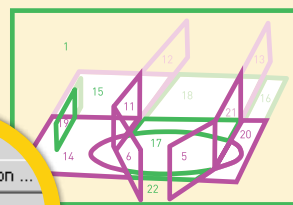
The Toggle, "Associate Unbroken Edges" is used to associate any edges that do not form a valid break, so that congruent meshing can continue.

The "Sew Only" toggle will cause the tool to just perform a sew, similar to Edit/Surface/Sew. The difference is that this sew will handle "Non-Manifold Edges". These are places where MORE than two surfaces come together along a common edge. The built in Sew ignores these places since it was only designed for sewing faces of a solid, which does not have this situation.

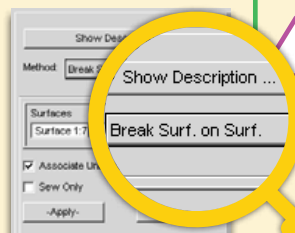
In Figure 7, seven surfaces are given as input, four are broken, creating 13 new surfaces.



ORIGINAL SURFACES



MODIFIED SURFACES



**Figure 6**  
Multi Curve Break: Break  
surface 2 on all curves

**Figure 7**  
Extend Planar Surface Tool,  
handy for mid surfaces





## SURFACE FROM SOLID SLICE

This tool allows the user to create a surface from a cross section of a solid defined by a plane. The solid is not changed. One or more surfaces are created. The cross section can have holes and be made of multiple surfaces.

The plane can be defined by picking a plane entity or by picking 3 points using the select menu.

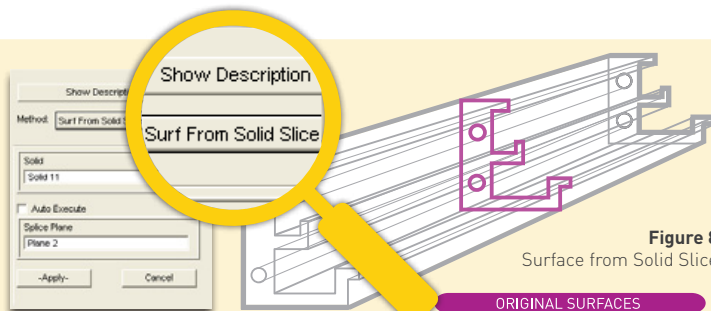


Figure 8

Surface from Solid Slice

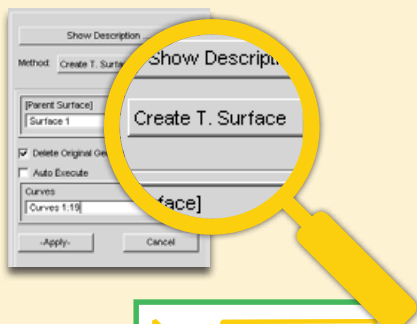
ORIGINAL SURFACES

New surface created at the intersection of the solid and a plane

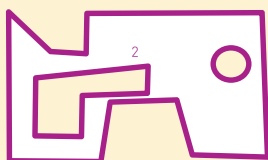
TIPS AND TRICKS! [CONTINUED]

## CREATE T. SURFACE

Create T. (Trimmed) Surface is similar to the core Patran geometry feature Create/Surface/Trimmed. The difference is that there is never a need for creating chains and there is no need to separate inner and outer loops. If no parent surface is specified, it is assumed to be a planar surface. It is assumed that the curves form valid loops, no curve intersections or branches. If a parent surface is specified, it is assumed that the curves fall on the surface.



ORIGINAL SURFACES AND CURVES



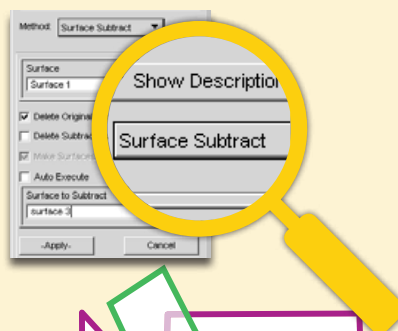
RESULTING T SURFACE

Figure 9

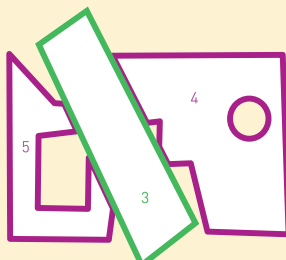
Create T (trimmed) Surface

## SURFACE SUBTRACT

Surface Subtract is similar to the core Patran feature Edit/Surface/Subtract, but the built in tool often does not work in more complicated cases. Use this tool over the core Patran tool for improved reliability. The target surface can be broken into any number of other surfaces.



ORIGINAL SURFACES



RESULTING SUBTRACTED SURFACES

Figure 10

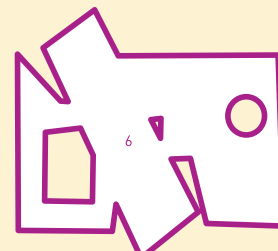
Surface Subtract

## MERGE FLAT SURFACES

Merge Flat Surfaces is a way of merging any FLAT surfaces into a single trimmed surface. The Patran core geometry feature Create/Surface/Composite is more powerful at merging surfaces, but the new surface will be a composite, which cannot directly be edited any further. It is often more desirable to have a trimmed surface.



ORIGINAL SURFACES



MERGED FLAT SURFACE

Figure 11

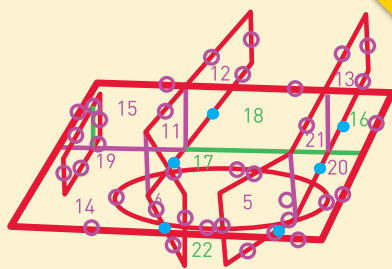
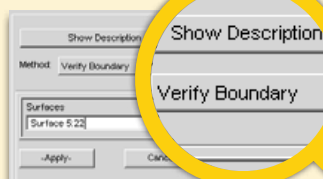
Merge Flat Surfaces

TIPS AND TRICKS! PATRAN UTILITY: TRIMMED SURFACE EDIT

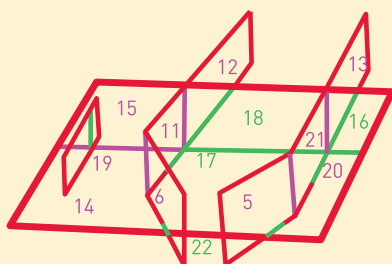


## VERIFY BOUNDARY

This tool is similar to Patran's core application Verify/Surface/Boundary. The core Patran version was designed for verification of surfaces before making a B-rep solid. Because of this, edges that have more than 2 surfaces are marked as a problem (non-manifold edge). This is not an error for other surface models, so this tool was added to address this core Patran limitation. This tool highlights in red all edges that are not shared by at least one other surface in the input list.



VERIFY / SURFACE / BOUNDARY

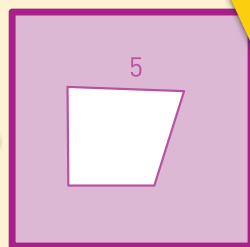


VERIFY BOUNDARY TOOL

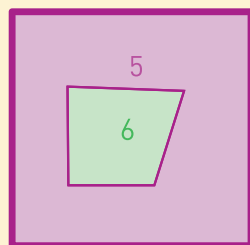
**Figure 12**  
Verify Boundary (left: Patran core tool- right: Patran Utility)

## FILL HOLE

This tool will fill a hole in a trimmed surface with another surface. To use, pick the surface, then one of the hole edges. The new surface will match the curvature of the parent surface and be congruent to the original surface.



SURFACE WITH HOLE

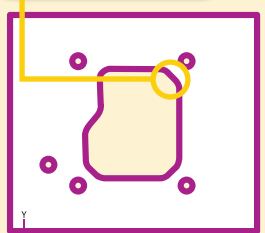
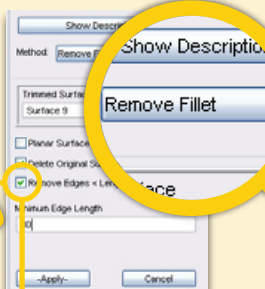


NEW SURFACE

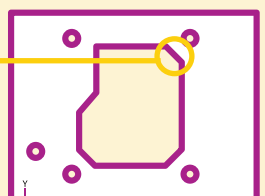
**Figure 13**  
Fill Hole

## REMOVE FILLET

This tool is designed to remove individual small fillets/small edges or many by using a length range. This tool is similar to the Geometry application Edit/Surface/Edge - Remove Edge. To remove large numbers of valid short edges, use the "Remove Edges < Length" toggle and input a value slightly larger than the edge lengths to be removed.



FILLETED SURFACE

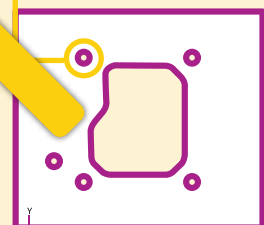
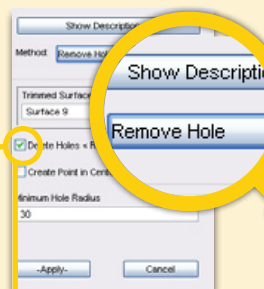


NEW SURFACE

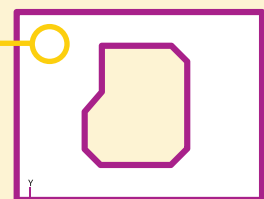
**Figure 14** Remove fillets based on edge length

## REMOVE HOLE

This tool is designed to remove individual holes or many by using a radius range. To remove large numbers of holes, use the "Remove Holes < Radius" toggle and input a value slightly larger than the hole radius to be removed.



SURFACE WITH HOLES



NEW SURFACE

**Figure 15**  
Remove holes based on radius

For more information, please contact Peter Brand at [peter@compumod.com.au](mailto:peter@compumod.com.au)

