



## 2008 Analysis Vendor's Directory

**March 2008**

Even a perfect CAD model can still have flaws discovered in the manufacturing phase; catching errors before this stage can save a business crucial time and resources.

In the evolving world of analysis software, users can expect to see a growing trend toward bringing analysis software to the everyday engineer. In one example, direct integration into CAD software allows designers and engineers to analyze their geometry without risking their data to time-consuming—and often problematic—translation tools. Similarly, it is becoming increasingly popular to create analysis tools that are user-friendly and do not require the depth of specialization they may have needed in the past.

Other major trends that have staked a claim in the analysis industry include the growing popularity of multiphysics analysis, a feature designed to allow analysts to combine different kinds of analysis into a single simulation.

Another factor that is heavily influencing the development of modern analysis software is the increasingly powerful hardware available; this allows users to run increasingly complex simulations in shorter periods of time, dramatically improving the efficiency of analysis simulations.

These topics and more are handled in the 2008 ConnectPress Analysis Roundup, featuring our 2008 vendor's directory with more than 25

feature articles and case studies focusing on issues relating to the analysis field.

*SLM White Paper: The Case for Simulation Lifecycle Management* Prepared by SIMULIA, a Dassault Systèmes Brand - The use of engineering and scientific simulation techniques to understand and predict the real-world behavior of physical phenomena is widespread across a number of diverse industries. This is true for simulations involving product performance attributes, manufacturing processes, or fundamental research. The benefits that result from the use of simulation are around us every day, from the vehicles we travel in, to products we use every day in work or play, to medical devices that provide treatments seemingly impossible only a few years ago. These techniques, when used effectively, provide a distinct business advantage to product manufacturers if they replace or augment costly, time-consuming physical prototyping and testing.

*Surface Wrapping for Industrial CAE* by Stephen Ferguson and Joel Davison, CD-adapco, London, UK - Surface preparation and CAD repair are often identified as the most significant bottlenecks in the CAE process. In this paper we describe a fully-automatic surface wrapping process, now in its third generation, which shrink wraps a high quality triangulated surface onto a collection of imported CAD parts, and which is guaranteed to provide a closed manifold surface at every wrap.

?



## Up to your eyeballs in simulation data?

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SIMULIA is the Dassault Systèmes Brand for Realistic Simulation. We provide the Abaqus product suite for Unified Finite Element Analysis, Multiphysics solutions for insight into challenging engineering problems, and SIMULIA SLM for managing simulation data, processes, and intellectual property.

Learn More - Download a Free SLM White Paper at:  
[www.simulia.com/slm-cp](http://www.simulia.com/slm-cp)

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www.3ds.com

*Efficient Wall Thickness Analysis Methods for Optimal Design of Casting Parts* by Bhaskar Sinha, Geometric Limited - Wall thickness is an important parameter for casting design. Thin wall sections cause breakage of parts during manufacturing or during usage of the part. Thick wall sections cause problems in castings and increase weight, needs more material thus increasing the cost. Optimal wall thickness is also important for adequate and sufficient strength of parts.

The current process of wall thickness measurement involves taking sections of the design along standard axis and then measuring those sections using tools available in Computer Aided Design (CAD) Software. Designers use these methods to measure wall thickness. It takes a couple of weeks time to analyze a complete casting for power train parts. Moreover, the

process is not accurate and error prone. Most of these errors may be detected during simulation and analysis phase. This phase is a complex and time consuming process. Also it requires specialized knowledge to use these softwares.

*Electronic Caliper Shows Where to Add Muscle and Cut Fat* by Geometric Limited - Measuring thin and thick wall conditions are tedious and time-consuming, yet crucial manual processes, for ensuring design performance, reducing material costs and improving fuel efficiency as well as performance. After a nod from Chrysler's IT department, the powertrain department at Chrysler began evaluating GeomCaliper®, developed by Geometric Software. In less than an hour, GeomCaliper® measures thin and thick conditions of CATIA V5 models that used to take up to two days.



Accept Zero Tolerance for Error

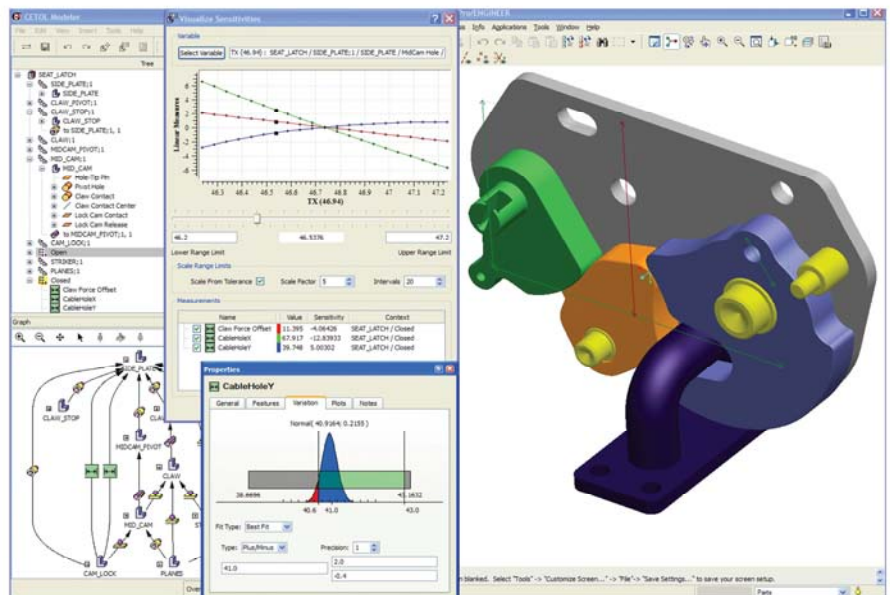
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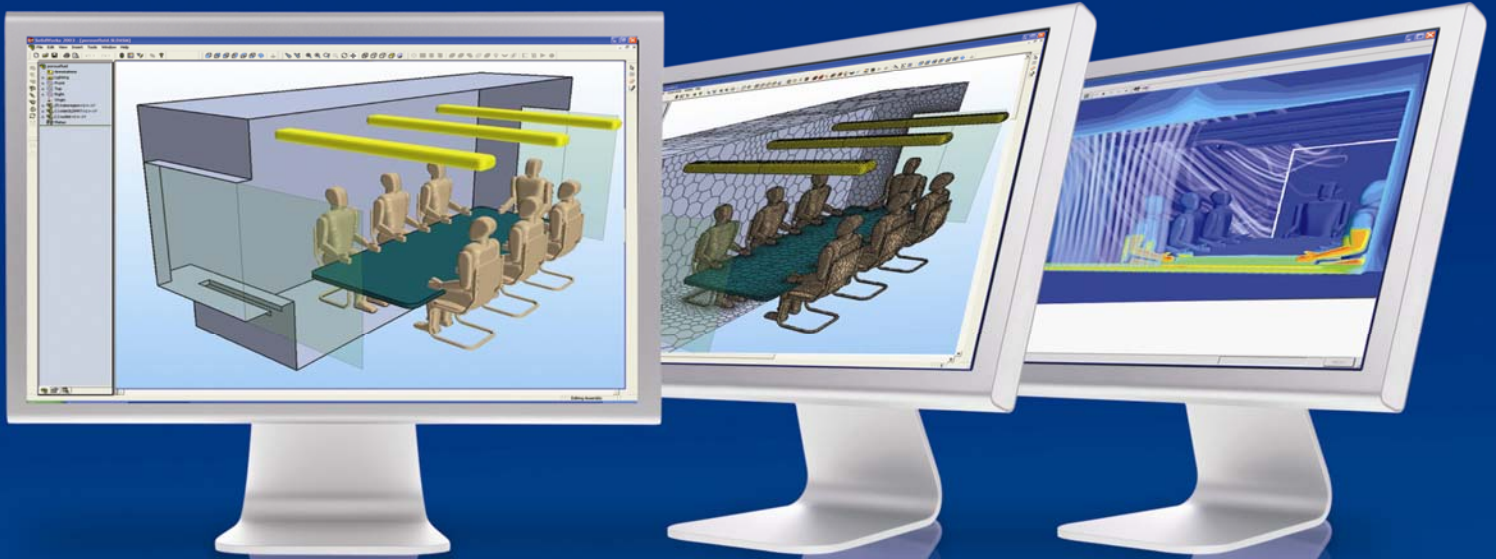
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*You Do the Math: Calculation Tools for Engineers and the CAD Community* by Cynthea Kinnaman of ConnectPress - One of one of the most magnificent military jets ever developed was designed with little more than a slide rule and a notebook. Unofficially nicknamed The Blackbird, the SR-71 was the fastest manned jet-propelled aircraft ever built. Developed as a long-range advanced, strategic reconnaissance aircraft capable of flying at speeds over Mach 3.2 and at 85,000 feet, it was designed in 1962 by Clarence "Kelly" Johnson at the Lockheed Skunkworks in a matter of weeks and without benefit of a calculator. Desktop calculators didn't appear until 1963.

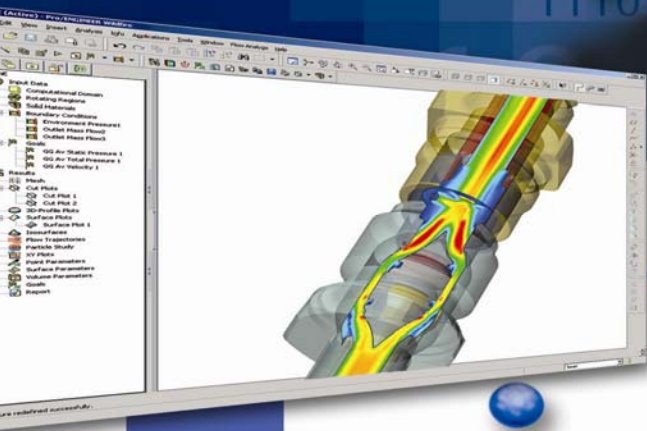
*Electromagnetic and Coupled EMAG Thermal Analysis* by Jennifer Swiderski, ConnectPress - I had the pleasure of meeting with Cranes Software's Ravi Singh - Assistant Vice President of Global Technical Marketing, Dr. Siuchung Wong, Director of Development, and Vipul Kinariwala, Head of Business Development, last week at their new facility on East Maple Road in Troy, MI. Cranes Software International Limited is a company that provides enterprise statistical analytics and engineering simulation software products and solutions across the globe. Business interests span products, productized solutions, services and research and development in future

technologies.

Today, Cranes Software has its presence in 39 countries across the world and has 350,000 global users. Cranes Software Enterprise includes all of the following: FE modeling and stress mesh generation, stress analysis, electromagnetic analysis, laminated composite analysis, vibration analysis, seismic/earthquake analysis, fatigue and fracture analysis as well as optimization. The industries that use Cranes' services are the automotive, aerospace, energy and power, oil and gas, electronic packaging, biomedical and civil engineering industry, to name a few.

*Pacific Design Technologies*, submitted by COSMOSWorks - Pacific Design Technologies, Inc. is a leading contract design and manufacturing company that specializes in the development of advanced fluid cooling and pumping solutions for aerospace, defense, and space exploration applications. Although the company's founders had years of experience working with the Pro/ENGINEER® CAD system, they understood the benefits of moving to a more integrated design environment, according to Eric Turner, manager of marketing and product development.

## EFD - Fluid Flow and Heat Transfer Analysis For Engineers



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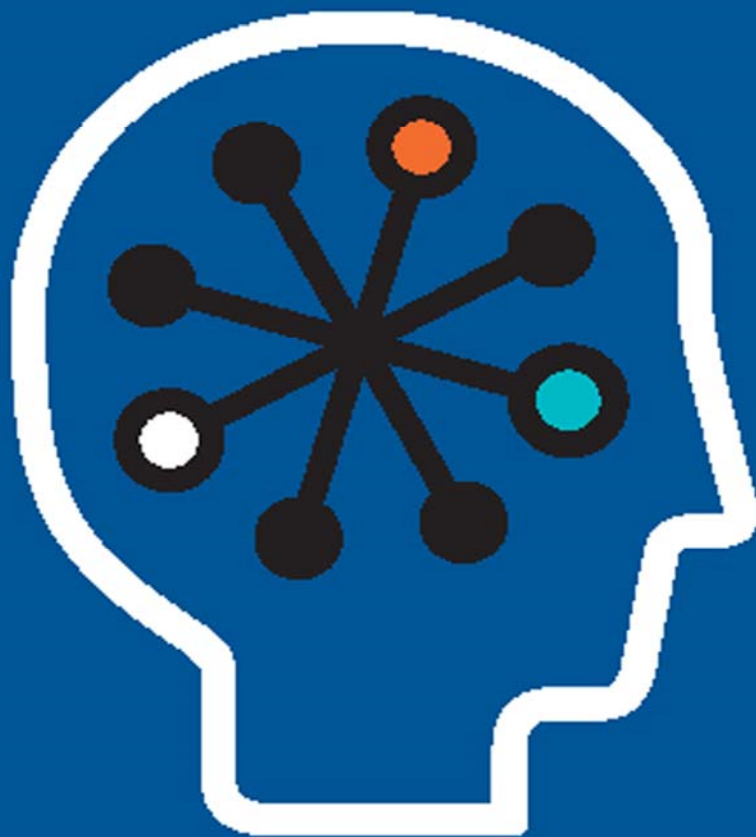
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*Ask the Expert: How to Manage Analysis Data* by Ed Miller - **Question:** How can companies better manage their analysis-related information and work processes?

**Miller:** The use of engineering simulation and analysis has increasingly become an indispensable part of product development. Technologies such as structural analysis, multibody simulation, and computational fluid dynamics let engineers quickly and cost effectively run through what-if scenarios, explore new ideas, evaluate alternatives, and gain deeper insight into product behavior. In this way, simulation and analysis tools are powerful enablers for developing innovative products as well as establishing innovative design processes. But the area of simulation and analysis has long been one that is not well understood by the rest of the organization.

*Sigmatix - Tolerance Analysis* by John Myers of ConnectPress - Tim Bogard, President of Sigmatix has announced CETOL V8 has entered beta testing.

Sigmatix is the maker of CETOL and CETOL Lite, tools for geometric tolerance analysis. "We

deal in the field of how users deal with design variance," says Bogard. "We've been focused for a long time on developing research around the subject of variance modeling. Variance modeling is the creation of a statistical analysis to build a mathematical representation and we've finally come to terms with the technology."

*Field Precision* by John Myers - Stan Humphries created Field Precision to offer finite-element-analysis software and consulting (FEA) for users working with electromagnetic energy. He founded Field Precision shortly after retiring from a professorship at the University of New Mexico.

Currently, the company is a small business ran by Humphries, who designs the software and offers consulting, and his wife who handles marketing.

*Get the Most From Simulation* by John Myers - High performance computing and cluster networking are important for anyone who wants to run detailed simulations, says Barbara Hutchings, Manager of Strategic Partnerships for ANSYS.

## *CAD-Neutral Tolerance Analysis Wizard* **ToleranceCalc 5.0**

ToleranceCalc 5.0 is a graphical wizard that allows CAD users to perform 1D and 2D worst-case as well as Monte Carlo statistical analysis at any stage of the product development process.

With ToleranceCalc 5.0, users can quickly verify tolerance schemes to ensure proper fit, function, and producibility of parts and assemblies committing to the final design and manufacturing resources.

Net results are products that can be manufactured cost-effectively to perform as expected the very first time.

ToleranceCalc 5.0 is a Vista and XP compatible Windows standard application that works in conjunction with all DXF compliant CAD applications.

*Avoid Costly Redesigns!*

## *Software for "What If" Engineering* **GrafiCalc Expert 2008**

GrafiCalc™ Expert 2008 digital prototyping software enables users to simulate and solve a wide range of mechanical design and engineering challenges up-front before committing to expensive design and manufacturing resources.

GrafiCalc Expert 2008 combines the disciplines of sketching, calculations, motion simulation, tolerance analysis, and optimization in a single application that can be used standalone and in conjunction with all popular CAD applications.

GrafiCalc Expert 2008 is especially effective in the conceptual design and manufacturing stages when users have the most questions and minimum information while conflicts are easier to detect and less expensive to fix.

*Next-Generation Digital Prototyping Software*

ANSYS is a software company who works in the field of computer-aided engineering and provides software for engineering simulation. The company's overall goal is to help engineers use their simulation tools to improve the design process. "Our customers are primarily using our products to examine how a particular design idea is going to perform," says Hutchings. "They want to look at a design change and see how it improves the performance and do so in a way that is faster and more productive than traditional engineering prototyping."

*Meet Challenges with Cluster Networks* by John Myers - Joe Cieslak, Industry Manager of High Performance Computing for Platform Computing explains how computer networks can be overburdened by the demands of engineers and how cluster networking can alleviate some of these problems.

Platform Computing has been offering hardware solutions and information technology consulting for the last 15 years. It has offices around the globe, serving more than 2000 customers, including 80 percent of the Fortune 500 List.

*Computational Fluid Dynamics: Past, Present and Future* by John Myers - Computational-fluid-dynamics (CFD) has experienced numerous changes in its 30-year history.

CFD is a branch of fluid dynamics that uses numerical methods and algorithms to solve problems involving fluid flows. In the world of computer-aided design, CFD is an integral element of software tools designed to predict how certain fluids will react.

*Flomerics: CFD for More than Just Analysts* by John Myers - Flomerics was born in the year 1988 as part of a plan to create a truly unique analysis company.

Today, Flomerics provides analysis tools for virtual prototyping and computer-aided-engineering companies. The company provides engineering simulation software and consultancy

services for analysis in the fluid flow, heat transfer and electromagnetic radiation arenas.

*Building Tolerance* by John Myers - The biggest challenge for individuals who specialize in tolerances and tolerance analysis is convincing management there is a need, says Bryan Fisher, President of Advanced Dimensional Management.

He explains that geometric dimensioning and tolerancing and tolerance analysis have existed in one form or another since World War II. They were created to address the numerous problems that arose when several manufacturing companies suddenly found themselves converted to munitions productions for the war effort. In essence geometric dimensioning and tolerancing is a way of describing acceptable variances for parts used in manufacturing.

*CFDesign* by John Myers - In 1992 Blue Ridge Numerics accepted the mission to bring Computational-Fluid-Dynamics (CFD) to the average engineer. In the past, CFD was a process created by highly skilled scientists looking for a way to create accurate numerical analysis for predicting the way fluids behave. "The people who created CFD tools for the marketplace were smart enough to run the calculations and able to spend a month working through them," says Vice President of Marketing for Blue Ridge Numerics, Jim Spann. Blue Ridge Numerics are makers of CFDesign a software tool designed to let CAD users run CFD analysis inside their native software.

*Abaqus Version 6.7* by John Myers - Dassault Systèmes has announced the release of the new version, 6.7, of their Abaqus Finite-element analysis (FEA) software.

Abaqus has recently been re-branded as part of Dassault's SIMULIA line of simulation-based products. No longer an independent product, Abaqus is being marketed as a division of Dassault's SIMULIA line, says Greg Brown Product Manager for Abaqus.

*NX Nastran DMP Job on a Cluster* by Pari Rajaram, HP - NX Nastran application offers better parallel scalability with DMP option. Each MPI process in the DMP job places demanding load on memory and I/O system. Hence we get better performance if we take advantage of all the memory and I/O disks in every

compute node. However, running multiple MPI process on a compute node could degrade performance asymmetrically depending upon the cluster configuration as show below in the chart.

Analysis Toolkit features an advanced post-processing capability for general purpose Nastran analyses. It also includes efficient, state-of-the-art analytical tools for conducting Nastran modal-based response dynamics simulation.

*GrafiCalc Expert Prototyping Platform: If You Can Sketch It, Software Can Solve It* by Kirsten Fox - GrafiCalc Expert 2007, developed by GEOMATE, is the tool of choice when geometry and numerical issues in an engineering challenge are inseparable. GrafiCalc combines the disciplines of constrained sketching, calculations, optimization, mechanism simulation, and tolerance analysis within one application –enabling users to validate critical design parameters prior to committing to expensive product development resources.

GrafiCalc Expert 2007 can be used standalone or in conjunction with Excel and all popular CAD applications, and it is Windows VISTA compatible.

*Finite Element Analysis Today* by John Myers - and evolved over the following decades thanks, primarily, to its use in the space industry. By the end of the 1950's its use had stabilized and NASA began working to develop a software solution to handle the complex mathematics necessary to solve FEA equations.

Historically, FEA has been used in the MCAD arena as a way to test for errors in CAD designs before a product was manufactured. The goal was to give designers a way to detect potentially devastating errors that could cost a manufacturer a fortune in time and resources before they become problematic.

*HPCC: Overview* by John Myers - Several Dell representatives gathered together to explain the basics of high performance compute clusters (HPCC) in a Podcast titled, HPCC Overview.

The team explained that HPCC is a system for tackling an environment with a large amount of computational activity occurring. In the past, these kinds of problems were solved with large, expensive super computers. With a compute cluster users take a building block approach that

allows users to tailor the size and cost of the HPCC closer to their own needs.

*Optical Solutions Manages Calculations with Mathcad* by PTC - Will light streams and tiny fibers deliver the future of home entertainment and Internet? They will if Optical Solutions has its way. Optical Solutions designs and manufactures optical access systems that enable local service providers to offer a wide range of integrated voice, video and high-speed data services to residences, multi-tenant dwellings and small-to-medium-sized businesses.

Headquartered in Minneapolis, Minn., Optical Solutions' 100-plus employees are leading the fiber-to-the-community revolution with the company's patented FiberPath® system for delivery of broadband converged services: voice, high-definition video and high-speed data. With thousands of units in service throughout the United States and Canada, Optical Solutions is the only supplier with field-deployed installations generating revenue and profits for service providers today.

*Alleviate Analysis Fears: A Profile of Analysis Providers* by Kirsten Fox, ConnectPress - Engineering and design is stressful enough, without the added pressure of ensuring your design will perform at its optimum under stressful conditions. Analysis relieves some of the headaches, and now that computing power has increased phenomenally, analysis has become incredibly precise. Whether you need to calculate thermal dynamics, fluid flow or determine design modifications under changing conditions, analysis will, without a doubt, make your job easier. Analysis software and consultants have become ubiquitous—thankfully! Here is a sampling of how some analysis companies can help you succeed.

*Off the Drawing Board: Analysis Today* by Kirsten Fox - A lot has changed in engineering analysis in the last ten years. Once the domain of specialists, now most designers can perform their own analysis using sophisticated software—and vendors have raced to make this software even easier to use. There are a plethora of promises that claim anyone can easily use analysis software to ensure their designs make it to the production floor—and it is evident this belief is growing as sales of analysis packages have skyrocketed.

Speed-to-market is the top priority today for companies, aided by analysis now performed during the design stage by the designer. Upfront analysis is becoming more common in the areas of finite element analysis (FEA), mold flow analysis and computational fluid dynamics (CFD). However, design and analysis are not quite seamless but software developers are working to merge these two processes. Yet, it remains to be seen whether a specialist would provide more accurate analysis results. Now engineers can now easily combine fluid and structural analyses to determine how a product will be affected. Read this report on analysis today.

ConnectPress would like to thank:



For their sponsorship of the 2008 Analysis Roundup

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Data provided on the following pages was compiled using submissions from participating companies. It is not exhaustive and does not include all the products and services available from each company. We have, however, attempted to include the major software solutions and services. ConnectPress, Ltd. cannot guarantee the accuracy of this data. We suggest you contact the participating companies for details, particularly to confirm technical specifications.

## Advanced Dimensional Management LLC

Training, consulting, analysis software and books in Tolerance Analysis, GD&T, Dimensional Management, Design and Drawing Quality.

Bryan R. Fischer is the author of several books, including “The Journeyman’s Guide to GD&T” and “Mechanical Tolerance Stackup and Analysis.”

For more information visit:  
<http://www.advdm.com>

## Algor

ALGOR, Inc. makes computer software and provides services for mechanical and civil engineers in industries such as automotive, aerospace, medical, consumer products, military, electric power, petroleum, large structures, MEMS and more.

ALGOR’s product line is based on the finite element method and includes design, analysis and simulation tools that allow engineers to virtually test and predict real-world behavior of new and existing product designs.

These tests help engineers speed up time to market and make better, safer products at a lower cost. Our wide range of simulation capabilities includes static stress and Mechanical Event Simulation (MES) with linear and nonlinear material models, linear dynamics, fatigue, steady-state and transient heat transfer, steady and unsteady fluid flow, electrostatics, full multiphysics and piping.

These analysis capabilities are all available within FEMPRO<sup>®</sup>, an easy-to-use single user interface that supports all popular CAD solid modelers and includes sketching, modeling and meshing tools.

For more information visit:  
<http://www.ALGOR.com>

## Ansys

ANSYS, Inc. designs, develops, markets and globally supports engineering simulation solutions that are used to evaluate and support the product development process. The Company’s integrated, open portfolio of tools is flexible enough to fit into any customer’s product development process yet powerful enough to drive it. The ANSYS Simulation Driven Product Development vision is to enable customers to optimize designs throughout the product development process, especially in the early stages when changes can be efficiently and cost-effectively implemented. The solutions ANSYS provides in the areas of structural, fluids, chemical, electromagnetic and coupled simulation are adaptable to customer-specific needs. Tools from ANSYS provide customers strategic advantages by:

- Offering time- and cost-saving alternatives to expensive prototype development and experimental efforts
- Providing the opportunity to examine and optimize more design alternatives in the product definition and design stages of development
- Reducing product development time
- Enabling the customer to use simulation in order to optimize and support a product through its entire lifecycle

As one of the fastest growing simulation companies worldwide, ANSYS remains dedicated to offering best-in-class simulation solutions that repeatedly demonstrate success. The most prestigious businesses in the world turn to ANSYS for the company’s history of development and delivery of reliable engineering simulation solutions.

For more information, visit:  
[www.ansys.com](http://www.ansys.com) or email  
[ansysinfo@ansys.com](mailto:ansysinfo@ansys.com)

## Blue Ridge Numerics

CFdesign® is a digital flow bench, thermal test rig, and wind tunnel for the desktop PC. It is the ultimate flow and thermal design tool developed specifically for the multi-tasking design engineer. Featuring a fully associative simulation environment driven by your native MCAD models, CFdesign upfront CFD software provides the total product performance picture early in the design process helping cut project costs and time to market. Full-spectrum flow and thermal simulation functionality reveals crucial engineering information not available from physical tests, allowing engineers to optimize new product designs before building a physical prototype.

Since 1992, CFdesign has helped companies of every size analyze and optimize the design of critical components and systems like hydraulics, pneumatics, valves, blowers, fans, pumps, compressors, heatsinks, heat exchangers, cooling fans, power supplies, manifolds, HVAC components, motors, turbomachinery and entire electronics systems all while on the “digital drawing board.”

For more information visit:

<http://www.cfdesign.com>

## CD-Adapco



CD-adapco is the leading global provider of full-spectrum engineering simulation

(CAE) solutions for fluid flow, heat transfer and stress, with principal offices in New York, London and Yokohama and subsidiaries across the world.

STAR-CD and STAR-CCM+ provide the world's most comprehensive CFD solutions, with the STAR-CAD series as an easy-to-use, CAD-embedded front door to the full

spectrum of CD-adapco solutions, backed by 25 years of extensive experience in CAE consulting.

CD-adapco's solutions are widely used across many industries, including automotive, aerospace, buildings, chemical process, electronics, environmental, marine, offshore structures, pharmaceuticals, power generation, rail, turbomachinery and specialized mechanical engineering applications.

Technology-leading CFD codes STAR-CD and STAR-CCM+ have outstanding capabilities for handling complex fluid flow and heat transfer problems including transient flows, chemical reaction, combustion, rotating systems, multiphase and multiphysics.

CD-adapco offers the STAR-CAD Series: a unique set of solutions embedded within your CAD system so that the CFD solution becomes an integral part of your CAD model. With add-ins for major CAD platforms currently including Pro/ENGINEER, SolidWorks, Unigraphics NX and 18 and CATIA V5, CD-adapco is the first CFD vendor to offer fully associative CAD-embedded CFD.

CD-adapco is consistently a technical leader, offering the world's most comprehensive CAE software and services.

For more information visit: <http://www.cd-adapco.com>

## Cranes Software Inc.

NISA suite of programs are general purpose Finite Element Analysis tools for structure analysis (Static and Dynamic), heat transfer analysis, 3D fluid flow analysis, fatigue and fracture analysis, Electro magnetic analysis, multi-body mechanical system analysis, structural and shape optimization, analysis of printed circuit board and field problems.

NISA supports highly efficient iterative and sparse solvers along with Support for multiple CPU hardware. It is completely interfaced with the geometric and FEA modeling system, DISPLAY III/IV and offers interfaces to major commercially available CAD systems. It consists of the following modules:

NISA II - Linear and nonlinear static analysis, eigen value calculation, buckling analysis, Advanced dynamics - modal and direct (linear and nonlinear) transient dynamics, frequency response, random vibration, shock spectrum analysis and component mode synthesis, Steady state and transient heat transfer analysis.

DISPLAY III/IV - Interactive graphics program for geometry and finite element model building, analysis preparation and post-processing, includes interfaces to majority of commercially available CAD systems. New advanced mesher allows users to create both surface and volume mesh directly on the translated geometries.

NISA/COMPOSITES - FEA program for laminated composite structures (linear and nonlinear)

ENDURE - Fatigue and Fracture analysis program

NISAOPT - Shape & structural optimization of 3D structure and beam optimization

NISA/EMAG - Electric and magnetic field analysis of electromagnetic devices.  
NISA/HEAT is integrated with EMAG to address coupled problems

NISA/3D-FLUID - FE based 2D and 3D fluid flow analysis with conjugate heat transfer (compressible and incompressible). With NISA users can study Fluid-Structure Interaction.

NISA/ACOUSTICS - Acoustics analysis to predict the sound radiation, scatter and transmission in finite and infinite domains

DYMES - Kinematic & dynamic analyses of mechanical systems

For more information visit:  
<http://www.nisasoftware.com>

## Dassault Systemes – SIMULIA



Across many industries and around the globe, companies are using Realistic Simulation

solutions from SIMULIA to accelerate the development and evaluate the performance of reliable, innovative products. From testing crashworthiness for auto safety, to studying blood flow through a heart stent, customers are using SIMULIA technology to improve our world.

SIMULIA is the Dassault Systèmes brand that delivers a scalable portfolio of Realistic Simulation solutions including the Abaqus product suite for Unified Finite Element Analysis, multiphysics solutions for insight into challenging engineering problems, and lifecycle management solutions for managing simulation data, processes, and intellectual property. By building on established technology, respected quality, and superior customer service, SIMULIA makes realistic simulation an integral business practice that improves product performance, reduces physical prototypes, and drives innovation. Headquartered in Providence, R.I., USA, with R&D centers in Providence and in Suresnes, France, SIMULIA provides sales, services, and support through a global network of over 30 regional offices and distributors.

For more information visit:  
<http://www.simulia.com>

## Dynamic Design Solutions

Dynamic Design Solutions ("DDS") is an independent and privately owned developer of CAE software tools for validating simulation models, optimizing engineering designs and integrating and automating simulation processes.

Our flagship FEMtools product is a multi-functional, cross-platform and solver-independent family of CAE software programs providing analysis and scripting solutions for many different applications in the areas of FE pre- and postprocessing, structural dynamics simulation, pretest analysis, test-analysis correlation, finite element model updating, uncertainty analysis, structural design optimization, CAE process integration and simulation data management. The underlying framework architecture with powerful scripting and API function libraries provides unlimited extension and customization. This makes the software an ideal tool for research work and for development of process-based applications like material identification or damage identification.

FEMtools seamlessly integrates with standard analysis codes like MSC.Nastran, NX Nastran, ANSYS, ABAQUS and others. To correlate finite element results against test data, translators for importing static, modal or operational data from the most common test systems are available.

<http://www.femtools.com>

## ElectroMagneticWorks

ElectroMagneticWorks products are based on the Finite Element and packaged into two main products:

**EMS** is a low frequency (DC to 1 GHz) electromechanical simulator that bridges the electrical and mechanical phenomena. This product is particularly useful for the design of electromechanical devices such as motors, generators, actuators, transformers,

circuit breakers, and many other devices that use frequencies up to 1 GHz.

It is the only product of its kind on the market that is fully embedded inside SolidWorks.

**HFWorks** is a high frequency (1 GHz to light) electromagnetic simulator to model electric and electronic components and systems. This product is particularly useful for the design of antennas, waveguides, transmission lines, radar, printed circuit boards, filters, couplers, optical fibers, microwave ovens, and many other devices that use high frequency energy in their operation.

HFWorks is currently being embedded in SolidWorks.

For more information visit:

<http://www.electromagneticworks.com>

## Field Precision LLC

Field Precision LLC has produced advanced finite-element software for research and engineering since 1989. Our 3D solution packages are designed for top speed and resource utilization on personal computers running Windows.

Application areas include high-voltage engineering, magnet design, electron and ion guns, permanent-magnet devices, electrosurgery and other biothermal processes and X-ray sources.

Our 3D automatic mesh generator features a full interactive graphical environment for constructing assemblies and import of complex parts from SolidWorks, ProE and other 3D CAD programs.

For more information visit:

<http://www.fieldp.com>

## Flomerics

Flomerics is a world-leading developer of engineering simulation software and services for analysis of fluid flow and heat transfer. Engineering Fluid Dynamics (EFD) is fully embedded in CAD and enables mechanical engineers to simulate fluid flow and heat transfer using 3D mechanical CAD models directly, with no need for data translations or copies.

EFD is based on the same mathematical foundation as traditional Computational Fluid Dynamics (CFD) software, but several key technologies set EFD apart, making it quicker, easier to use and more accurate. In other words, EFD helps you get on with the business of improving product performance/functionality without requiring you to become a full-time fluid dynamics specialist. EFD is available for a wide range of popular CAD programs.

To watch a free EFD online demo, please visit

<http://www.flomerics.com/products/efd/demo.php>

## GEOMATE – GrafiCalc Expert 2008 & ToleranceCalc 5.0



**GrafiCalc**

**Expert 2008** digital prototyping software enables users to simulate and solve a wide range of mechanical design and engineering challenges up-front before committing to expensive design and manufacturing resources. GrafiCalc Expert 2008 combines the disciplines of sketching, calculations, motion simulation, tolerance analysis, and optimization in a single application that can be used standalone and in conjunction with all popular CAD applications. GrafiCalc Expert 2008 is especially effective in the conceptual design and manufacturing stages when users have the most questions and minimum information while conflicts are easier to detect and less expensive to fix. With GrafiCalc Expert 2008, users can

significantly cut down design time and costs.

For more information visit

[http://www.connectpress.com/geomate/learn\\_more2008.php](http://www.connectpress.com/geomate/learn_more2008.php)



**Tolerance Calc 5.0** is

a graphical wizard that allows CAD users to perform 1D and 2D worst-case as well as Monte Carlo statistical analysis at any stage of the product development process. With ToleranceCalc 5.0, users can quickly verify tolerance schemes to ensure proper fit, function, and producibility of parts and assemblies committing to the final design and manufacturing resources. Net results are products that can be manufactured cost-effectively to perform as expected the very first time. ToleranceCalc 5.0 is a Vista and XP compatible Windows standard application that works in conjunction with all DXF compliant CAD applications.

For more information visit

[http://www.connectpress.com/geomate/tolerance\\_calc.htm](http://www.connectpress.com/geomate/tolerance_calc.htm)

## INTES

INTES is developing and distributing the Finite Element Analysis software PERMAS which provides advanced analysis capabilities in thermo-mechanical analysis (heat transfer analysis, contact analysis in linear and non-linear structures), dynamic and acoustic analysis (in frequency and time domain), and optimization (topology optimization, shape and sizing optimization, reliability analysis and robust design).

Highly efficient solvers are used to solve very large models including parallel processing on multi-processor platforms. High performance algorithms comprise contact analysis, fast calculation of natural vibration modes, and fluid-structure coupled acoustic analysis. Special features available

include substructuring, submodeling, and automated part coupling.

PERMAS is available and supported worldwide, and it is widely used in automotive industry, mechanical engineering, aerospace and ship building industry.

For more information visit:

<http://www.intes.de>

## LISA, Finite Element Tech

Product Name: LISA

Vendor: Sonnenhof Holdings 3757  
Woodruff Cres. Mississauga Ontario L4T 1T8

Analysis Types: Linear static, eigenvalue, steady/transient thermal, dynamic response, fluid, acoustic, electromagnetic, electrical, seepage

Special pricing: formerly selling for Euro 2000, now selling at CAN \$50 to bring affordable FEA software to individuals, not just companies

Free download: Download a free copy of LISA, model sizes limited to 1300 nodes

For more information visit: <http://www.lisa-fet.com>

## Maplesoft

Maplesoft is the leading provider of high-performance software tools for engineering, science, and mathematics. Its product suite reflects the philosophy that given great tools, people can do great things.

Maplesoft has transformed the way engineers, scientists, and mathematicians use math, enabling them to work better, faster, and smarter.

Organizations around the world have applied Maplesoft solutions in nearly every

technical field including engineering design, operations research, scientific research, and financial analysis. Maplesoft's commercial customer base includes Allied Signal, BMW, Boeing, DaimlerChrysler, DreamWorks, Ford, General Electric, Hewlett Packard, Lucent Technologies, Motorola, Raytheon, Robert Bosch, Sun Microsystems, Toyota, and Tyco.

Maplesoft offers powerful and easy-to-use tools that save time and reduce errors.

- **Maple** solves complex mathematical problems and creates rich technical documents
- **Maple Toolbox for MATLAB®** combines the best in symbolic and numeric computation to develop mathematical solutions
- **BlockBuilder™ for Simulink®** is a First Principles physical modeling environment that offers automated export to Simulink
- **BlockImporter for Simulink** is a Maple add-on tool that allows you to import a Simulink model into Maple and convert it to a set of mathematical equations.
- **MapleNet™** allows users to publish live Maple documents on the Web
- The **Professional Toolbox Series** provides domain-specific tools that focus the core Maplesoft products on discipline-specific applications

For more information visit:

<http://www.maplesoft.com>

## Moldflow Corp.

Moldflow Corporation is the world's leading supplier of enterprise-enabled simulation solutions for the plastics injection molding

industry. Moldflow Plastics Insight – Enterprise Edition™ (MPI-e™) is Moldflow's newest product that brings together Moldflow Plastics Advisers® (MPA®), the world's most widely adopted easy-to-use simulation product, Moldflow Plastics Insight® (MPI®), the most in-depth plastics simulation product available, and Moldflow Structural Alliance™ (MSA™), a breakthrough link between flow simulation and leading structural analysis packages to provide engineers with unprecedented results accuracy.

MPI-e is designed to be accessible to everyone involved in the design process, configurable and easy-to-use ensuring high adoption rates, integrated into the development process through CAD and CAE interfaces, communication focused so results can be easily shared with the rest of the design-to-manufacture team, and strategically implemented with training and support so our customers hit the ground running. MPI-e directly benefits anyone involved in the design or manufacture of plastics injection molded parts including industrial designers, mechanical design engineers, CAE analysts, mold designers, mold makers, process engineers and manufacturing engineers.

For more information visit:  
<http://www.moldflow.com>

### **Motovated Design & Analysis**

Motovated Design & Analysis provides world-class mechanical engineering design and analysis services. Our expert engineers are passionate about engineering your vision, working with you to ensure your needs and deadlines are met. Our communication, professionalism and experience will help you minimise the many risks you face, whilst saving you time and money.

Motovated provides a total design service by backing up our designs with all forms of

analysis, from hand calculations through to high-end FEA, including non-linear, dynamic, flow and heat transfer analyses. Motovated's founders and engineers have considerable experience in all forms of analysis, and regularly provide training, seminars and support to FEA end users.

For more information on how Motovated can engineer your vision, visit our website at <http://www.motovated.co.nz>, email [enquiries@motovated.co.nz](mailto:enquiries@motovated.co.nz) or call +64 3 982 5283

### **Noran Engineering**

Noran Engineering, Inc. (NEi) is a world leader in Nastran engineering software for analysis, simulation and virtual testing. The core product NEi Nastran is a powerful, industry proven finite element analysis (FEA) solver that works with a wide portfolio of pre and post processors both in-house, Femap®, NEiFusion™, NEiWorks™, as well as, other major industry brands.

Engineers gain insight with images, contour plots, graphs, and animations of solutions to linear and nonlinear structural, stress, dynamic, vibration, impact, thermal, and heat transfer problems. NEi's software portfolio covers the different needs of product development professionals. From designers looking for affordable, easy-to-use validation, optimization and trade-off study tools to dedicated analysts looking for accurate, real world fidelity.

The website details case studies of high profile projects in aerospace, automotive, maritime, petrochemical, military, medical, electronics, composites, and consumer products, as well as, product demonstration videos, webinars, tutorials, and options for evaluation software.

For more information visit:  
<http://www.NEiNastran.com>

## PDE Solutions

FlexPDE is the original 'scripted finite element model builder' in use in hundreds of corporations and universities around the world. It reads systems of partial differential equations presented by the user, creates a finite element model of the system, solves it and presents graphical output, all in a convenient interactive environment.

The system may have as many equations as required and may be 1D, 2D or 3D in space; steady-state, time-dependent or eigenvalue; linear or nonlinear; from simple Poisson equations to complex nonlinear reactive systems.

FlexPDE knows nothing about specific areas of application; it deals strictly with the mathematics of a PDE system. If you can pose a system of PDE's and initial/boundary values that represent your problem, then it is likely that FlexPDE can solve it.

As a contribution to quality science education, PDE Solutions Inc makes its limited Student Version of FlexPDE freely available. The student version has the full 1D, 2D and 3D capability of the professional version, with limitations only in the size of the finite element mesh and the number of simultaneous equations.

For more information visit:  
<http://www.pdesolutions.com>

## PTC - Mathcad

Today's top engineers use PTC® Mathcad® to perform, document and share calculation and design work. The unique Mathcad visual format and scratchpad interface integrate standard mathematical notation, text and graphs in a single worksheet - making Mathcad ideal for knowledge capture, calculation reuse, and engineering collaboration.

Mathcad is engineering calculation software that drives innovation and offers significant

personal and process productivity advantages for product development and engineering design projects. Unlike proprietary calculating tools and spreadsheets, Mathcad lets engineers design and document engineering calculations simultaneously with comprehensive applied math functionality and dynamic, unit-aware calculations.

The integration between Mathcad and PTC Pro/ENGINEER® is a bi-directional link between the two applications. Users of these solutions can easily associate any Mathcad file with a Pro/ENGINEER part or assembly using the analysis feature in Pro/ENGINEER. The integration offers dynamic updates to calculations and the CAD drawing when parameters are changed. This improves design quality and reduces time wasted by enabling efficient data exchange and optimizing designs later in the process during the iterative, time-consuming analysis and verification stages.

For more information visit  
<http://www.ptc.com>

## Sigmatrrix



Sigmatrrix is a global leader in providing precise, easy-to-use mechanical variation analysis

and tolerance optimization software for mechanical engineers with its CETOL 6 Sigma Technologies™.

CETOL 6 Sigma is the premier tolerance optimization technology in the world. The software accommodates a number of tolerance management needs through its unique dimensional analysis system that is engineered to support robust product development processes from design through manufacture. Unlike any other tool in the

industry, CETOL 6 Sigma is built on 3D Variation Behavior Modeling™ Technology and is fully-integrated with Pro/ENGINEER, CATIA V5, and SolidWorks – allowing for precise sensitivity, statistical and worst case scenario tolerance analysis.

Our clients are experiencing greater confidence in transitioning products from the design to the pre-production phases and prototype build reductions of 50-75%, resulting in fewer costly last minute changes.

For more information visit:  
<http://www.sigmetrix.com>

### **SolidWorks**

Design teams use SolidWorks design validation tools to simulate real-world conditions and test multiple "what if" scenarios, allowing them to improve design quality and reduce costs.

**COSMOSWorks®** is a powerful, easy-to-use design validation and optimization software fully embedded within SolidWorks mechanical CAD software. There are several COSMOSWorks products to choose from.

**COSMOSMotion™** is a complete motion simulation and kinematics package fully embedded within SolidWorks software.

**TolAnalyst** is a tool for automating analysis of tolerance stack-up — the cumulative acceptable variance between the dimensions of multiple machined components of an assembly design.

**COSMOSWorks Designer**, **COSMOSMotion**, and **TolAnalyst** are included with SolidWorks Office Premium.

**COSMOSFloWorks™** redefines fluid flow analysis with robust capabilities normally

found in high-end computational fluid dynamics programs.

**COSMOSDesignSTAR™** enables designers to analyze CAD models created using Autodesk Inventor®, Solid Edge®, and SolidWorks without re-importing the data each time the design is modified.

For more information visit:  
<http://www.solidworks.com>

### **Stress Engineering Services Inc.**

Stress Engineering Services, Inc. is an independent full-service engineering consulting firm committed to technical excellence and customer service. For more than 30 years we have been providing expert analytical services in a wide range of industries including chemical/refinery, medical devices, oil & gas, pipelines, consumer products, power and packaging. We specialize in a number of computer-based process modeling and simulation technologies to predict performance and optimize design including Finite Element Analysis (FEA), Computational Fluid Dynamics (CFD), and Floating Systems analysis. For the gas and oil industry, we bridge the gap between operations and analysis with a full range of capabilities. Our capabilities include failure analysis, risers and moorings, fitness for service and mechanical integrity, vibration analysis, reliability engineering, fracture mechanics, stress analysis and heat transfer analysis, dynamic-transient problems, pressure vessel and piping, and design review. Also, our capabilities include temperature, creep and crack evaluation.

For more information visit:  
<http://www.stress.com>

### **Structure Inc.**

Structure, Incorporated provides research and analysis services to the aerospace,

defense, automotive, and pressure vessel industries.

Services provided include computational and classical analysis of all sorts, but our specialty is the application of NASTRAN and LS-DYNA for finite element analysis.

Types of problems covered include linear and nonlinear statics and dynamics, including random vibration and shock. Design services are also available.

For more information visit:

<http://www.structuretechnology.com>

### **Ternion Corp.**

Ternion Corporation's flagship product is FLAMES®, a powerful simulation framework that addresses all aspects of constructive simulation development and use, including customizable scenario development, execution, post-processing, visualization, and interfaces to constructive,

virtual, and live systems. FLAMES minimizes the amount of software development needed to get a full-featured, working simulation. At the same time, the open, object-oriented architecture of FLAMES gives you the flexibility to modify or enhance your simulation as necessary to meet your specific requirements. FLAMES can be used for a variety of applications including testing, training, analysis, and systems design. Get the simulation you need, when you need it, with FLAMES.

Since 1989, Ternion Corporation has provided quality commercial simulation products and custom software development and support services to government and commercial organizations worldwide.

Ternion is a privately held, employee-owned company located in high-tech Huntsville, Alabama.

For more information visit:

<http://www.ternion.com>

For more analysis tools and services visit:

<http://www.abaqus.com>, <http://www.adina.com>, <http://www.altair.com>,  
<http://www.atir.com>, <http://www.autofea.com>, <http://www.bretech.com>,  
<http://www.comsol.com>, <http://www.caefem.com>, <http://www.3dcs.com>,  
<http://www.ekkin.com>, <http://www.esi-group.com>, <http://www.feastsoftware.com>,  
<http://www.hmssoftware.com>, <http://www.fe-design.de>, <http://www.femengineering.com>,  
<http://www.geometricsoftware.com>, <http://www.interpaper.org>,  
<http://www.transcendata.com>, <http://www.jahm.com>, <http://www.lstc.com>,  
<http://www.lmsintl.com>, <http://www.lusas.com>, <http://www.mscsoftware.com>,  
<http://www.nikafs.com>, <http://www.blastfx.com>, <http://www.numeca.com>,  
<http://www.paulin.com>, <http://www.pointwise.com>, <http://www.st-boulder.com>,  
<http://www.ramint.com>, <http://rsazure.swan.ac.uk>, <http://www.rts-rexnord.com>,  
<http://www.samcef.com>, <http://www.sonic.net>, <http://www.sceconsultants.com>,  
<http://www.SierraVistaTech.com>, <http://www.sai-mtab.com>, <http://www.technalysis.com>,  
<http://thermoanalytics.com>, <http://www.fluidyn.com>, <http://www.vistagy.com>