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FEA INFORMATION RESOURCE MAGAZINE

FEA Information Announcement:

Welcome New Participant:

Intelligent Light is a world leader in the development and delivery of software for computational fluid dynamics (CFD) users. We help the world's best engineering and research organizations maximize the productivity and impact of their CFD capabilities

Visit and View: Intelligent Light - LS-DYNA fluid-structure interaction (FSI) simulation of a liquid filled bottle dropped onto an inclined plate. FSI and CAE post-processing is among the new capabilities of FieldView Version 12.

Updated Resource Page SMP and MPP and MPI Interconnect

IBM Power PC 970

Sincerely,

Art Shapiro   **art@feainformation.com - Editor**

Marsha Victory   mv@feainformation.com - President

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October Featured Paper

Airbag Simulation With LS-DYNA Past-Present-Future

A. Hirth, DaimlerChrysler - Germany
A. Haufe DYNAmore GmbH - Germany
L. Ovovsson, IMPEYUS Afea, AB - Sweden

ABSTRACT

During the last decade the simulation of the airbag deployment process has become a standard application of the explicit finite element codes. At the beginning of the development the focus was to capture the influence and improve the results of dummy impact on fully inflated airbags. Later the deployment kinematics of folded airbags, different folding techniques and vent-hole design became more and more important. With the requirements to comply with FMVSS 208, i.e. Out-of-Position load cases, it became apparently necessary to include the interaction between the internal gas flow and the fabric airbag structure. Hence coupled algorithms that allow for interaction between the discretized gas flow and the airbag structure were the main focus during the past five years.

The present paper aims to sketch the development history of airbag deployment simulations from the very beginning of the late 1980's to the current, highly sophisticated models available in LS-DYNA. Different modelling techniques will be shown and their advantages, drawbacks and the necessary effot to gain uselful result will be discussed.

Keywords:

Airbag deployment simulation, uniform pressure, Fluid-Structure Interaction, Arbitrary-Langrangian-Eulerian method, corpuscular (particle) method

Featured AVI's – FEA Information AVI Library

CASTING
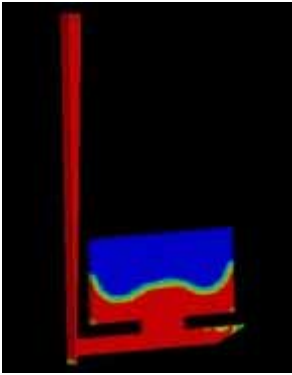
AVI 74 2.2MB

Numerous industrial applications are complicated to model and are only possible with coupled fluid-thermal-mechanical analysis such as Casting. The analysis code must be able to model the hot liquid metal as it fills a mold, its subsequent solidification and shrinkage on cool down, and predict the final dimensions of the cast part. This is important in the manufacturing of automobile engine blocks, cylinder heads, and other engine cast components. This AVI shows the filling of a mold using the LS_DYNA ALE calculational method. The problem is defined in, "BENCHMARK: Review of Computer Simulation and Casting Reality", Modeling of Casting and Advanced Solidification Process VII, ed. M. Cross and J. Campbell, 1995, ISBN 0-87339-297-3.

Participants Benchmarks on TopCrunch
TopCrunch.org   TopCrunch.org for complete vendor benchmarks

Vendor/Submitter IBM/IBM Submitted 09/20/2007

Computer/Interconnect	Processor	#Nodes x #Processors per Node x #Cores Per Processor = Total #CPU	time/sec	Benchmark Problem
HS21XM BladeCenter/InfiniBand	Intel Xeon 5160	8 x 2 x 2 = **32**	497	neon_refined_revised
HS21XM BladeCenter/InfiniBand	Intel Xeon 5160	4 x 2 x 2 = **16**	827	neon_refined_revised
HS21XM BladeCenter/InfiniBand	Intel Xeon 5160	2 x 2 x 2 = **8**	1542	neon_refined_revised
HS21XM BladeCenter/InfiniBand	Intel Xeon 5160	1 x 2 x 2 = **4**	3003	neon_refined_revised

Participants Benchmarks on TopCrunch

TopCrunch.org   TopCrunch.org for complete vendor benchmarks

Submitted by SGI/Applications Engineering – 09/21/2007

Computer/Interconnect	Processor	#Nodes x #Processors per Node x #Cores Per Processor = Total #CPU	time/sec	Benchmark Problem
Altix 4700/NUMAlink	Intel Itanium 2 1600MHz Montecito	1 x 128 x 2 = **256**	174	neon_refined_revised
Altix 4700/NUMAlink	Intel Itanium 2 1600MHz Montecito	1 x 64 x 2 = **128**	217	neon_refined_revised
Altix 1200/Voltaire HCA 410Ex InfiniHost III Lx DDR, OFED v1.2	Intel 5160 Woodcrest DC 3.0GHz	64 x 2 x 2 = **256**	267	neon_refined_revised
Altix 1200/Voltaire HCA 410Ex InfiniHost III Lx DDR, OFED v1.2	Intel 5160 Woodcrest DC 3.0GHz	32 x 2 x 2 = **128**	275	neon_refined_revised
Altix 4700/NUMAlink	Intel Itanium 2 1600MHz Montecito	1 x 32 x 2 = **64**	307	neon_refined_revised
Altix 1200/Voltaire HCA 410Ex InfiniHost III Lx DDR, OFED v1.2	Intel 5160 Woodcrest DC 3.0GHz	16 x 2 x 2 = **64**	349	neon_refined_revised
Altix 4700/NUMAlink	Intel Itanium 2 1600MHz Montecito	1 x 128 x 2 = **256**	1260	3 Vehicle Collision
Altix 1200/Voltaire HCA 410Ex InfiniHost III Lx DDR, OFED v1.2	Intel 5160 Woodcrest DC 3.0GHz	64 x 2 x 2 = **256**	1684	3 Vehicle Collision
Altix 4700/NUMAlink	Intel Itanium 2 1600MHz Montecito	1 x 64 x 2 = **128**	1753	3 Vehicle Collision
Altix 1200/Voltaire HCA 410Ex InfiniHost III Lx DDR, OFED v1.2	Intel 5160 Woodcrest DC 3.0GHz	32 x 2 x 2 = **128**	2105	3 Vehicle Collision
Altix 4700/NUMAlink	Intel Itanium 2 1600MHz Montecito	1 x 32 x 2 = **64**	2794	3 Vehicle Collision

Participants Benchmarks on TopCrunch
TopCrunch.org TopCrunch.org for complete vendor submitted Benchmarks

Submitted by SGI/Applications Engineering – 09/21/2007
Continued from previous page

Computer/Interconnect	Processor	#Nodes x #Processors per Node x #Cores Per Processor = Total #CPU	time/sec	Benchmark Problem
Altix 1200/Voltaire HCA 410Ex InfiniHost III Lx SDR, OFED v1.2	Intel 5160 Woodcrest DC 3.0GHz	16 x 2 x 2 = **64**	3066	3 Vehicle Collision
Altix 1200/Voltaire HCA 410Ex InfiniHost III Lx SDR, OFED v1.2	Intel 5160 Woodcrest DC 3.0GHz	8 x 2 x 2 = **32**	5597	3 Vehicle Collision
Altix 1200/Voltaire HCA 410Ex InfiniHost III Lx SDR, OFED v1.2	Intel 5160 Woodcrest DC 3.0GHz	4 x 2 x 2 = **16**	10460	3 Vehicle Collision
Altix 1200/Voltaire HCA 410Ex InfiniHost III Lx SDR, OFED v1.2	Intel 5160 Woodcrest DC 3.0GHz	1 x 2 x 2 = **4**	39423	3 Vehicle Collision

Press Release

Panasas Sets New Standard for Storage System Reliability with Tiered-Parity™ Architecture

Breakthrough Technology Dramatically Increases Data Reliability and System Availability for Network Storage Users

FREMONT, CA — October 9, 2007 — Panasas, Inc., the leader in parallel clustered storage solutions for the high-performance computing industry announced the Panasas Tiered Parity Architecture, the most significant extension to disk array data reliability since Panasas CTO Garth Gibson's pioneering RAID research at UC-Berkeley in 1988. With the release of the ActiveScale 3.2 operating environment, Panasas will offer an innovative end-to-end Tiered-Parity architecture that addresses the primary causes of storage reliability problems and provides the industry's first end-to-end data integrity checking capability.

Traditional RAID implementations protect against disk failures by calculating and storing parity data along with the original data. In the past 10 years, individual disk drives have become approximately 10 times more reliable and over 250 times denser than those protected by the first generation RAID designs in the late 1980s. Unfortunately, the number of disk media failures expected during each read over the surface of a disk grows proportionately with the massive increase in density and has now become the most common failure mode for RAID. A RAID disk failure can cause loss of all the data in a volume which may be tens of terabytes (TB) or more. Recovery of the lost data from tape (assuming that is all backed up) can take days or even weeks. Other storage system vendors recognize this same issue and apply

RAID 6, often called double parity RAID, to address this problem. Double parity schemes only treat the symptom of the failure, not the cause, and they carry substantial cost and performance penalties, which will only get worse as disk drive densities continue to increase. Panasas Tiered Parity architecture directly addresses the root cause of the problem, not the symptom. Solving the storage reliability problem caused by these new 1TB and larger disks allows Panasas to build larger and more reliable storage that allows users to get more value from their data and are less expensive for IT to support.

"The challenges with storage system reliability today have little to do with overall disk reliability, which is what RAID was designed to address in 1988. The issues that we see today are directly related to disk density and require new approaches. Most secondary disk failures today are the result of media errors, which have become 250 times more likely to occur during a RAID failed-disk rebuild over the last 10 years," said Garth Gibson, CTO of Panasas. "Tiered Parity allows us to tackle media errors with an architecture that can counter the effects of increasing disk density. It also solves data path reliability challenges beyond those addressed by traditional RAID and extends parity checking out to the client or server node. Tiered Parity provides the only end-to-end data integrity checking capability in the industry."

Panasas Tiered-Parity architecture addresses reliability and data integrity in three independent tiers that combine to deliver the most comprehensive reliability architecture available today.

Horizontal Parity uses the current Panasas Object-RAID to provide protection from disk failure across the entire storage array. This unique technology provides scalable RAID recovery, parallel reconstruction, and per-file fault isolation.

Vertical Parity, a new technology from Panasas, detects and fixes media errors on disk before the failure can interfere with RAID recovery. This new technology fixes the leading cause of failed RAID recovery operations.

Network Parity, which provides the industry's first end-to-end data integrity capability, enables a compute node to be absolutely certain of the integrity of data it reads over the network from the Panasas Parallel Storage Cluster.

"Panasas is unique in that they have extensive experience deploying very large storage systems to a broad range of commercial and government customers who have strict requirements on reliability and data integrity. Tiered-Parity builds on Panasas' RAID expertise and further extends their leadership by providing reliability features built to protect peta-scale storage systems," said Mike Karp, senior analyst, Enterprise Management Associates.

Panasas Tiered-Parity architecture, coupled with Panasas' industry-leading RAID implementation, will enable customers to scale storage systems seamlessly and reliably while maintaining the same high level of data protection. The net result is maximum user and IT productivity enabling more intelligent, faster business decisions leading to the competitive advantage that every enterprise seeks.

"We are very excited to see Panasas take such a leadership position and address this critical issue for users throughout the IT industry," said Bill Rickert, Global Computing Resources Manager, Petroleum Geo-Services. "We utilize Panasas parallel storage throughout the world and it is a valued component of our seismic processing system. The Panasas Tiered Parity offerings will help us to ensure reliability in meeting the needs of our oil and gas exploration customers."

About Panasas

Panasas, Inc., the global leader in parallel storage solutions, helps commercial, government and academic organizations accelerate their time to results leading to real world breakthroughs that improve people's lives. Panasas' high-performance storage systems enable customers to maximize the benefits of Linux clusters by eliminating the storage bottleneck created by legacy network storage technologies. The Panasas ActiveStor Parallel Storage Clusters, in conjunction with the ActiveScale® Operating Environment and PanFS™ parallel file system, offer the most comprehensive portfolio of storage solutions for High Performance Computing (HPC) environments. Panasas is headquartered in Fremont, California. For more information, please visit

www.panasas.com.

ActiveScale, DirectFLOW and PanFS are trademarks or registered trademarks of Panasas, Inc. All other trademarks are the property of their respective owners.

Participant Profile: APTEK Software Development
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APTEK, Incorporated is an applied research and development (R&D) company located in Colorado Springs, CO.

The APTEK R&D studies-both analytical and experimental-have primarily been directed at:

- Development of software products and other technologies for a wide variety of applications
- Evaluation of civil and defense structures to explosive blast and fragment loads
- Evaluation of strategic missile systems to intense x-ray loads from nuclear or laser weapons
- Highway safety studies

APTEK has won over 50 awards from the very competitive Small Business Innovation Research program which has led to two hardware technology patents and one software patent.

Software Development

APTEK has continually developed innovative, custom software for both commercial and research & development purposes. Much of the software developed was used to assist the many engineering studies that APTEK has conducted throughout our history. Other software was developed to meet specific customer needs. For approximately 6 years we developed Graphical User Interface (GUI) codes for NASA to assist in optimized packing of items and for inventory management. The NASA work resulted in U.S. Patent #5950190, Dynamic, self-modifying graphical user interface for use with relational databases.

Material models that we developed for use in finite element structural response codes to describe the non-linear behavior of reinforced concrete, wood and soil have been incorporated into the commercially available structural response code LS-DYNA, available from Livermore Software Technology Corporation.

Commercial

Mixed Mode Constitutive Driver (MMCD)

The Mixed Mode Constitutive Driver (MMCD) is a new graphical software package that helps the user to efficiently evaluate the response of material models implemented in the LS-DYNA finite element code, and to fit the material model parameters to test data (parameter identification). APTEK leases copies of the Mixed Mode Constitutive Driver (MMCD) on a commercial basis using this web site.

Thermo-Structural Response Toolkit (TSRTk)

APTEK developed the Thermo-Structural Response Toolkit (TSRTk) for the Defense Threat Reduction Agency. TSRTk is used to predict the response of missile system components subjected to intense x-ray loads. It is available to government approved entities.

Composite Retrofit Program

The Composite Retrofit Program (CRP) is a web-based program for predicting building component vulnerability and retrofit selection. Building components

include reinforced concrete columns and beams, and walls made of concrete masonry units. Vulnerability is reported as level of damage (none, slight, moderate, severe). Threats are terrorist bomb attacks with uncased charges for a variety of explosives (like TNT or C4) and standoffs (5 to 200 feet). Retrofit options include composite materials (carbon/epoxy, Kevlar/epoxy, and fiberglass) for wrapped columns, plated beams, and fabric-backed walls.

This program is available for lease from APTEK.

Research and Development

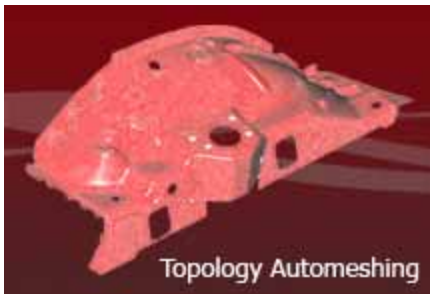Each of the following were developed under government funded Small Business Innovative Research grants.

- NASA Graphical Inventory Management System for Mission Operations.
- Rapid Aero-Shape Generator (RAGE). SBIR Phase 2
- NASA Training Hardware Management System
- NASA Automatic User's Training Operations Facility Utilization Request System
- NASA Space Station Stowage Database

eta/VPG Overview

For Complete Information on eta/VPG visit www.eta.com
Contact Tim Palmer for further information +1 (248) 729-3010 x 239

ETA's Software products, **eta/DYNAFORM** and **eta/VPG**, streamline the virtual product development process--shortening the overall product development cycle and saving companies millions of dollars in physical prototype testing.

eta/VPG provides an efficient and comprehensive environment for development of finite element models. In addition, eta/VPG delivers a unique set of tools which allow engineers to create and visualize advanced simulations for vehicle crashworthiness and dynamic durability.
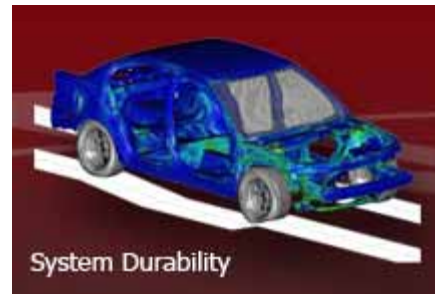
- Shell /Plate Automeshing
- Automated Tetra Meshing
- Automated Welding
- Material Library

Model Assembly Tools
- Complete Results Visualization
- Graphing Capabilities
- PowerPoint Plug-in for Results Visualization

Topology Automeshing

System Durability

VPG/PrePost (FEMB) : Provides a wide range of tools that can be used to efficiently create meshes on CAD data, using an advanced automeshing algorithm, which eliminates most manual mesh manipulation. The results are better quality models in a fraction of the time.

VPG has interfaces to create various MCAE model formats. The unique "zero text editing environment" allows users to create complete simulations from within the graphical user interface. Complete LS-DYNA , RADIOSS and NASTRAN interfaces allow the user to see the data as it will be created in the model file.
- Direct CAD Interface with CATIA, UG, Pro/E, STEP, IGES, VDA and DXF file formats

VPG/Structure: eta/VPG enables users to create unique system level simulations of mechanical systems such as vehicle suspensions and linkages. eta/VPG enables users to include components as flexible bodies, combining the traditional kinematic/dynamic simulation methods with finite element analysis methods. The results are simulations that provide greater insight and opportunities to improve or prove out your design.

VPG/Safety, Drop Test & Blast: With a complete dummy library, barrier library and airbag folding system, eta/VPG enables users to quickly and painlessly set-up complex simulations for standard vehicle impact simulations. The "Process Guidance" approach to process automation delivers the flexibility that is needed by users, with a streamlined

model creation. eta/VPG users can quickly and reliably create simulation models that previously took a great deal of expertise and time to create.

Occupant Safety Processes

Structure & Safety Module Features:

- Suspension Library
- Parametric Tire Modeler
- Road Surface Library
- Fatigue Calculation and Post Processing
- Dummy Library
- Barrier Library
- Airbag Folder
- Drop Test Module for Electronics/Packaging

For Complete Information on eta/VPG visit www.eta.com

HP and Halloween Tips and tricks

Excerpt From How to make your Halloween projects a real treat

www.hp.com/hpinfo/newsroom/feature_stories/2007/07halloween.html

by Susan Twombly, October 2007

Don't get spooked by the thought of throwing a Halloween party for the kids. HP has a witch's brew of projects you can make for frightfully good fun before, during and after your party.

With HP, you get the right print, the first time, every time - so you don't waste ink, paper, time or money. Designed to work together, HP printers and inks can really make your projects pop.

Before the party: Get into the spirit

There's no better way to get your brood in the mood than making Halloween decorations for all around the house. These projects from HP are sure to lift your spirits!

Pumpkin carving templates

From bats and spiders to ghostly grins, the pumpkin carving templates helps you create jack-o-lanterns to light up your windows or walkways

Take a walk on the wild side with World Wildlife Fund templates! See the box for details on a new contest from Snapfish, HP and World Wildlife Fund.

Doorbell Decorations

Create a simply wicked welcome for your guests with this doorbell design. Or, choose a cat or ghost to put more boo in your bell.

Halloween party invitations

Create your own party invitations to gather all the boys and ghouls at your house for a ghostly good time.
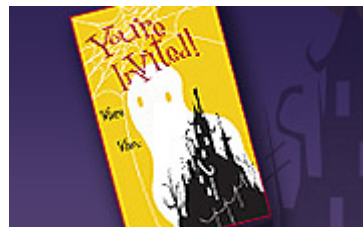
A house full of kids can be a hair-raising experience. But not if you keep them busy posing for pics, making masks and hanging bats.

Halloween Masks

Whether the kids party down with Dracula, freak out with Frankenstein or get goofy with glasses, you'll hide faces, not smiles with these Halloween masks

Hanging Decorations

From fraidy-cats to gruesome ghosts and spindly spiders, the kids can make these decorations at the bat of an eye.

HP compact mobile printer wherever the party is[2], slip in the memory card[3], pick the photos to [frame](), and print them wirelessly[4] as instant mementos for guests as they go.

Haunted Halloween scrapbook

A Halloween [scrapbook]() can capture the spirit of the party for years to come.

Photo Frames

Take hauntingly beautiful photos with your HP digital camera. Then, bring your

For all the other wonderful things to create go to:

/www.hp.com/hpinfo/newsroom/feature_stories/2007/07halloween.html

Microsoft Windows® Compute Cluster Server 2003
Nanyang Polytechnic

www.microsoft.com/casestudies/casestudy.aspx?casestudyid=4000000645

Digital Media School Deploys Render Farm Technology, Cuts Compute Runtime By Days

Nanyang Polytechnic School of Interactive and Digital Media (SIDM) in Singapore offers digital media courses to local and overseas students. Students and researchers are required to render large amounts of animation and computer-generated images. Previously, it could take users up to one full day to render files on their individual machines. Because of the processing power required, students and staff were limited in their ability to complete other work while waiting for render file results. SIDM opted to deploy a Windows® Compute Cluster Server 2003 environment in a render farm. This enables students and school researchers to render large amounts of high definition images and animation within hours, freeing up individual machines for further course work and research—and enhancing the productivity and efficiency of the School.

Nanyang Polytechnic (NYP) was established in Singapore in 1992. It has approximately 15,000 students and 1,500 staff, and offers courses in seven schools. These include engineering, information technology, design, business management, health sciences, chemical and life sciences, and interactive and digital media.

The School of Interactive and Digital Media (SIDM) delivers three diploma courses in digital media design, digital entertainment technology, and motion graphics and broadcast design. The School also offers a specialist diploma in games development. The 3-year diploma courses teach almost 1,000 students each year.

Students enrolled in the diploma courses are required to render high-definition animations and images as part of their course work. File rendering involves generating an image from a 3D model using computer programs. Films traditionally have 24 frames per second (fps), and video 30-60 fps depending on the medium being used, but in both cases every image within a frame needs to be rendered and then added to the previous frames to create the animation.

The School did not have an effective computer cluster to render computer-generated images (a render farm) solution for users who needed to create large volumes of animation and images. Instead of leveraging the calculating power of a multi-computer cluster to render images, students used local individual machines to render their work. This meant that rendering multiple high definition animated images could take days, and often locked up all the processing power of the machine. With tight course deadlines, such time-consuming processes affected students' abilities to produce long-sequence animations on time, and hence limited the creative content that went into their work.

Ng Kian Bee, Deputy Director, Games & Digital Entertainment of NYP's SIDM, explains, "Cost containment was a key consideration for the School, as we are a not-for-profit institution. The School wanted a (render farm) solution that would be able to integrate seamlessly into our existing Windows network and operating system. We also needed a technology platform that could be easily

maintained through available expertise and support, with tools on hand to allow us to upgrade and automate relevant processes."

Solution

As part of its decision making process, SIDM evaluated both a Red Hat Enterprise Linux solution and Windows® Compute Cluster Server 2003. The School chose Windows Compute Cluster Server for its competitive price and available technology support. "We didn't know originally that Microsoft offered a reduced version of Windows Server® 2003 specifically for render farm use. This was exactly the solution we were looking for. It is a cost-effective solution and integrates perfectly with our existing Microsoft environment," says Ng.

With support from Microsoft, the School used a trial version of Windows Compute Cluster Server for one month before selecting the solution. "The month trial gave us enough time to evaluate Windows Compute Cluster Server and decide that the solution met our criteria. We were able to use it immediately without any problems," says Ng.

As a render farm solution, Windows Compute Cluster Server brings together the power of 64-bit x86 computers, the ease of use and security of Active Directory® directory service, and the Windows operating system to provide a security-enhanced and affordable high-performance computing (HPC) solution.

Windows Compute Cluster Server includes a single head node and one or more compute nodes. The head node deploys compute nodes and schedules jobs for the compute cluster. To automatically deploy compute nodes to the cluster, the School simply installs and configures Remote Installation Services (RIS) on the head node. As Ng says, "Windows Compute Cluster is very simple to use. The user interface is Windows-based so little learning was

required by administrators and users. And when needing to make updates, the IT administrator deploys updates remotely via the server machine."

Integration with Active Directory enables role-based security for administration and users, and the use of Microsoft Management Console provides a familiar administrative and scheduling interface. IT administrators can use Active Directory to view the exact files that are being rendered by each student.

"Before we had render farm, every student rendered on his or her own PC, so sharing images and viewing the current status was not easy. Now we can decide how many PCs will render a particular image. On 32 machines it takes just a couple of hours—this is a huge reduction in time," asserts Ng.

Furthermore, students can send images direct to the render farm, enabling them to free up space on their PCs. Ng explains, "File rendering takes up a lot of CPU power. When students rendered files on individual PCs, it meant they couldn't do very much until the rendering was completed. Now they run a client on their PCs which sends files to the render farm remotely, so they don't need to do rendering on their local machines." Instead files are rendered on the file server and if the local machine is networked, students simply retrieve the results from the file server, mapped to their network environment.

Benefits

SIDM uses Windows Compute Cluster Server to support student and research work, and to optimize its computing infrastructure. The School benefits from extensive Microsoft support available, value for money when compared to competitive cluster solutions, and increased speed and efficiency when rendering large amounts of images. Due to its seamless integration into the existing Windows environment, Windows

Compute Cluster Server enables students and researchers to quickly send files to the render farm from their networked PCs, freeing memory for other course work and research activities.

Value for Money

As a not-for-profit organization, SIDM needs to be smart when investing in technology. Ng comments, "Windows Compute Cluster Server was cheaper than the Linux alternative. Coupled with excellent support and the solution meeting our exact needs, we felt that this made it the right technology investment decision. Windows Compute Cluster Server offers great value for money."

Extensive Support

"There is high demand on the render farm and if something goes wrong and support is lacking, then we are in trouble, as we conduct classes every day," says Ng. The support available from Microsoft made the solution a better choice for SIDM, and the integration with existing environments and operating systems also proved to be a bonus in terms of IT admin familiarity.

Increased Efficiency

File rendering could previously take days to complete, and left users without a PC while waiting for rendering to finish. Now students can send images to the file server to be rendered, and get on with other tasks. "Windows Compute Cluster is made specifically for render farm use. Through the increased computing power that it offers us, large volumes of animation and images can be rendered very quickly. This contributes positively to the content quality of student work, as well as the productivity and efficiency of the School," asserts Ng.

Ease of Use

"Windows Compute Cluster Server is integrated into the existing desktop so students and staff do not have to learn additional commands," comments Ng. From an administration perspective, the School finds the server easy to manage, and the solution allows administrators to manage multiple systems at the same time. "Administrators can now reinstall or push upgrades out from a single screen," says Ng.

Seamless Integration

With NYP running a Windows-based environment throughout its seven schools, integration of new software in the existing environment was a key requirement for SIDM. "We are a Windows-based institution, so naturally a solution using Windows is going to integrate far more easily with the rest of our software. Windows Compute Cluster was deployed and ready to go within hours," Ng comments.

For More Information

For more information about Microsoft products and services, call the Microsoft Sales Information Center at (800) 426-9400. In Canada, call the Microsoft Canada Information Centre at (877) 568-2495. Customers who are deaf or hard-of-hearing can reach Microsoft text telephone (TTY/TDD) services at (800) 892-5234 in the United States or (905) 568-9641 in Canada. Outside the 50 United States and Canada, please contact your local Microsoft subsidiary. To access information using the World Wide Web, go to: www.microsoft.com

For more information about School of Interactive and Digital Media, Nanyang Polytechnic products and services, call + 65 6550 5115 or visit the Web site at: www.nyp.edu.sg

Microsoft Server Product Portfolio

For more information about the Microsoft server product portfolio, go to: www.microsoft.com/servers/default.mspx

Product Report NEC Express5800
/www.necam.com/servers/products/model.cfm?model=10

The third-generation NEC Express5800 series servers amplify the capability of the new Dual-Core Intel® Itanium® 2 processor 9000 sequence. Leveraging NEC's supercomputing and mainframe technology, the NEC Express5800/1320Xf and Express5800/1080Rf servers incorporate the new Dual-Core Intel Itanium 2 processor (code-named Montecito). Designed to meet the needs of the high-end server market, NEC Express5800/1000 series offers the performance and reliability that enterprises require for mission critical operations.

Supercomputer Performance

NEC Corporation's experience in technical computing began in early 1980s with the introduction of its SX line of vector supercomputers. In 2002, NEC manufactured the Earth Simulator, which was fastest computer in the Top 500 Supercomputer for more than two years. The low latency and high performance memory and crossbar interface technology of NEC's supercomputers served as a basis for its Express5800/1000 series. NEC recognizes that the demand for Itanium solutions is moving toward the high-end symmetric multiprocessing (SMP) server market, where performance and scalability are vital. With the new Dual-Core Intel Itanium 2-based processors, NEC expects significant market growth as Itanium processing power becomes a mainstream processor for enterprise servers.

Mainframe Reliability

NEC introduced its first mainframe system in 1970s. Its deep heritage in mainframe technology and NEC's expansive research and development efforts in Itanium server technology, NEC has delivered mainframe-class RAS features in its Express5800/1000 series. The server supports modular designs, redundant components, hot plug capabilities, and floating I/O. Illustrating

its mainframe technological capabilities, NEC was the first company in the world to demonstrate the dynamic reconfiguration of CPU and memory resources while running beta 1 of the future Microsoft® Windows® Server operating system, code-named "Longhorn."

Express5800/1320Xf

- Up to 32 Dual-Core Intel Itanium 2 1.6GHz/24MB processors
- Maximum memory capacity of 512GB
- Expansion for up to 64 PCI-X slots
- Up to 8 partitions
- Redundant and Hot-plug components
- Microsoft Windows and Linux®
- Stand-alone cabinet (37U)

Express5800/1080Rf

- Up to 8 Dual-Core Intel Itanium 2 1.6GHz/24MB processors
- Maximum memory capacity of 64GB
- Expansion for up to 16 PCI-X slots
- Up to 2 partitions
- Hot-plug components
- Microsoft Windows and Linux
- 8U Rack-mount chassis

Intelligent Light delivers FieldView Version 12, the industry's most comprehensive CFD and CAE post-processing tool.

"Many LS-DYNA customer organizations are already FieldView users for CFD. LSTC engineers have worked closely with Intelligent Light to support the development of CAE post-processing capabilities for LS-DYNA data within FieldView. We welcome FieldView as a tool to increase productivity and enhance both the interrogation of and presentation of simulation results," said Wayne L. Mindle, Ph.D., technical sales engineer at Livermore Software Technology Corporation (LSTC). "Customers with large simulations will benefit from the rich heritage and capabilities for handling large, transient data that have been a part of FieldView for many years."

Increased performance for large datasets and extensive feature improvements enhance CFD capability, productivity and impact; FieldView post-processing is now available for structural analysis for the first time.

With support for structural analysis (CAE) simulation data and new data readers, the benefits of FieldView are now available to many more engineering analysts. Support for the growing use of arbitrary polyhedral elements, one-click animation of multiple transient datasets, and improved performance will benefit customers in all industries.

The technology, reliability, and ease of use of FieldView are among the reasons that the top automotive company in Japan and the top aerospace company in the world have standardized on FieldView for their CFD post-processing. Leading engineering organizations are growing and improving their capabilities at a tremendous rate often putting distance between them and their competitors.

Introducing FieldView Version 12

New capabilities of FieldView Version 12 include:

- Fluid Structure Interaction (FSI) and crash simulation post-processing
- Substantial additions to 2-D plotting capability for quantitative evaluation

- Large data capabilities are further enhanced with the addition of
  o Performance tuned, native Win64 support with batch mode
  o Faster read-in times for Parallel FV-UNS data reads
  o Improved graphics performance and large data capacity with existing system memory
- Arbitrary Polyhedral Element support
- New data readers help more users bring data directly to FieldView
- One-click animation for multiple surface sweeps, multiple transient cases
- Automation and customization with FVX scripting offers improved control of analysis and output

Performance improvements from advanced memory management are changing the game for many customers. The new Smart LInked Memory, or SLIM, increases the data capacity on all systems. One Formula 1 racing customer can now view entire vehicle models on Windows systems that previously had to be explored in subsystems. For Windows users, the native and optimized Windows 64 server requires no compatibility or emulation tools and delivers outstanding performance.
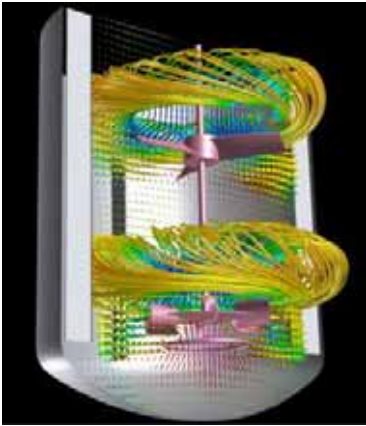
Sparger mixer simulation post-processed and presented using FieldView. The latest release brings FieldView capabilities to new market segments while delivering remarkable new capabilities to the CFD and CAE community. FLUENT simulation data courtesy of Ansys, Inc

"Much more than a performance release, FIELDVIEW Version 12 brings support for best-in-class technologies such as the use of arbitrary polyhedral elements. We've worked closely with our partners at Ansys and CD-adapco to handle these elements in their native form to ensure accuracy and the faithful representation of the data," explains FieldView product manager Matthew Godo, Ph.D.

FieldView now supports post-processing of structural analysis data. With FieldView Version 12, LS-DYNA simulation data can be easily read into and post-processed bringing powerful analysis, animation, and large data capabilities to this community. This is an ideal joint solution for Fluid-Structure Interaction (FSI) simulations. The structural analysis support will expand as additional data readers are made available as plug-ins to the initial release.

Dr. Godo added, "We've added the ability to read FSI and crash simulation data from LS-DYNA and we are proud to deliver the results of our collaboration with LSTC to our customers."

"Many LS-DYNA customer organizations are already FieldView users for CFD. LSTC engineers have worked closely with Intelligent Light to support the development of CAE post-processing capabilities for LS-DYNA data within FieldView. We welcome FieldView as a tool to increase productivity and enhance both the interrogation of and presentation of simulation results," said Wayne L. Mindle, Ph. D., technical sales engineer at Livermore Software Technology Corporation (LSTC). "Customers with large simulations will benefit from the rich heritage and capabilities for handling large, transient data that have been a part of FieldView for many years."

Users in all industries will benefit from the simplicity of the new one-click animation capability. It is now simple to create animations of simulation results with the click of a single button. The linking of surfaces and datasets allows this to be done for multiple transient datasets as required for FSI and other multi-physics applications.

"It is exciting to simultaneously extend the capabilities of FIELDVIEW while bringing its culture, reliability, and well known ease of use to new analyst communities," Dr. Godo concludes. "Our commitment to user productivity is reflected in this release with new automation functions in FieldView FVX and the ability to capture available hardware resources for optimal performance and multitasking."

Many analysts have used FieldView over the years and have moved into other roles where FieldView is not available to them. The tremendous changes to FieldView capabilities are causing analysts and managers to consider FieldView again. When they do, they find the same simple, efficient, reliable

environment they appreciate and are familiar with along with new functionality including the ability to handle their FSI and CAE data, different solvers, arbitrary polyhedral elements, and 2-D plotting needs. FieldView has become the most comprehensive post-processing and visualization tool on the market today.

About Intelligent Light
Intelligent Light, located in Rutherford, New Jersey, was founded in 1984 with a mission to provide the scientific and engineering community with the best possible tools for understanding data and communicating results. The company provides CFD post-processing and big data visualization capability, under the industry leading FieldView brand, to thousands of HPC users in the aerospace, automotive and general manufacturing industries. Their unique development team is composed of CFD leaders, computer scientists, and visualization experts focused on listening to clients and delivering products that meet their needs.

FieldView and FieldView FVX are trademarks of Intelligent Light. All other trademarks are property of their respective owners.

Seminars from carhs.training
Knowledge for the automotive development of tomorrow

[CARHS](#) - 49 6023 96 40 60 - info@carhs.de

Here is a list of the seminars currently offered in English by carhs. Please note that all information presented here is subject to change without further notice.

Advanced Complexity-based Robust Design	TrainingCenter Alzenau	Thu, 08 Nov 2007 9:00 am
Introduction to Passive Safety of Motor Vehicles	TrainingCenter Alzenau	Tue, 04 Dec 2007 9:00 am
Knee Mapping Workshop	TrainingCenter Alzenau	Tue, 29 Jan 2008 9:00 Uhr

Yahoo Group Yammerings

Note: LS-DYNA Yahoo Group is neither owned nor operated by LSTC, and LSTC has no control over the content.

Jim Kennedy	Len Schwer
KBS2 Inc.	Schwer Engineering & Consulting
jmk@kbs2.com	Services
	Len@Schwer.net

The LS-DYNA Yahoo Group archive contains a wealth of information that can be helpful to any LS-DYNA user. We suggest you review the archives when you are seeking help on any topic related to LS-DYNA. *NOTE: Questions and responses may have been edited for clarity & brevity.*

This installment of "Yahoo Yammerings" features several questions and responses from the past month of postings to the LS-DYNA Yahoo Group:
1. *Significance of massless nodes*
2. *When to use *CONTACT_FORCE_TRANSDUCER*
3. *Details about SST and MST for *Contact*
4. *LS-DYNA terminated without a restart file*

Significance of massless nodes?

After starting a calculation, LS-DYNA provides warning messages about massless nodes. What is the reason for these warnings?

Reply by Jim Kennedy

I do not recall there being any specific reason why this warning is provided other than most users like to have "clean" models and like to be advised if the model has such nodes, which then allows checking for possible errors. Massless nodes can be extraneous nodes that are not part of any elements. Massless nodes can be nodes used to create a coordinate system or beam element orientation.

When to use *CONTACT_FORCE_TRANSDUCER

When should one use the option CONTACT_FORCE_TRANSDUCER? The same contact force output can be obtained from the RCFORC file. Can you please tell me situations where using CONTACT_FORCE_TRANSDUCER is compulsory/better than the RCFORC output?

Reply by Jim Kennedy

The following was copied from the following link:
http://www.dynasupport.com/Support/tutorial/contact.modeling/contactoutput

To obtain RCFORC data when single surface contacts are used, one or more force transducers should be added via the *CONTACT_FORCE_TRANSDUCER_PENALTY command. A force transducer does not produce any contact forces and thus does not

affect the results of the simulation. A force transducer simply measures contact forces produced by other contact interfaces defined in the model. One would typically assign a subset of the parts defined in a single surface contact to the slave side of a force transducer. No master side is defined. The RCFORC file would then report the resultant contact forces on that subset of parts. The transducer feature also allows you to identify contact forces in very specific regions.

Details about SST and MST for *Contact?

I would like to know about the SST and MST parameters on the *Contact cards. As any value specified for these parameters over writes the true thickness in *Section card, does this over writing has any effect on physics of the problem? What is the difference between providing the value of SST, MST and SFST, SFMT in this card?

Reply by Ravi Dhulipalla

Shell thickness specified with SST/MST is used for contact purposes only. It will not over write the thickness specified on the *SECTION_SHELL card. SFST/SFMT (Scale Factor for Slave/Master thickness) is also used for the same propose.. Here the original thickness from *Section card is scaled using the value specified in this field.

For example, we have a part with thickness specified as 3mm on the *SECTION card. This part is used as a slave surface in a contact definition. If we specify 1.0 for SST, then the thickness used during contact calculations (ONLY) for this slave surface will be 1.0 mm. As another option if we specify 0.5 for SFST, then the thickness used during contact calculations (ONLY) for this slave surface will be 1.5 mm (=0.5*3mm).

Generally reduced thickness for contact is used to avoid initial penetration. We may have to use a larger thickness value for contact when the contact does not work with the original thickness. Additional information can be found in:

http://www.dynasupport.com/Support/tutorial/contact.modeling/Contact.Parameters
Sections 6.4 Contact Thickness and 6.5 Contact Thickness Scaling

http://www.dynasupport.com/Support/tutorial/users.guide/contact.modeling
Sections 6.6.4 Contact Thickness and 6.6.5 Contact Thickness Scaling

LS-DYNA terminated without a restart file?

A LS-DYNA job terminated unexpectedly without an error message after running for 1 day. I do not have a restart (D3DUMP) file. Do you know if it's possible to create a restart file after such a crash?

Reply by Jim Kennedy

I believe that you are out of luck. For runs of more than one day, I highly recommend you request some sort of running restart dump file to allow a restart if something does cause your job to go bad; see the keyword *Database_RUNRSF.

LS-DYNA Yahoo Groups

There are over 2360 subscribers from all over the world, and this list seems to grow by a hundred new subscribers ever few months; no small testament to the rapidly growing popularity of LS-DYNA. The group currently averages about 260 messages per month, i.e. about 10 messages per day. You can subscribe to the group by sending an email request to LS-DYNA-subscribe@yahoogroups.com or by visiting the Yahoo Groups web site http://groups.yahoo.com

Generally, the quickest/best responses are to those questions posed with the most specifics. General questions such as "How do I use XXX feature?" either go unanswered, or are answered by Jim Kennedy with links to appropriate references in the growing LS-DYNA related literature, e.g. see the archive of LS-DYNA Conference proceedings at www.dynalook.com

Employment Opportunity – Melbourne, Australia
Senior CAE Engineer

FUTURiS www.futurisautomotive.com

Are you hungry to make a difference in a rapidly growing global company with a realistic long-term strategy?

With many programs currently running and more launching into the local and international automotive market, Futuris is looking for a motivated individual to join the CAE team and play a senior role in assessing the performance of our products and driving engineered solutions.

As part of a small dynamic team, the successful individual will provide engineering support and guidance to the product design team through the use of the appropriate CAE tools, present the results of the analysis to internal and external customers, and contribute to the continuous improvement of CAE related techniques and processes.

To be successful in this role it is critical you have
- an undergraduate degree in an engineering and/or manufacturing related discipline;
- strong CAE / FEA skills, preferably safety (LS-Dyna)

- had significant experience at the Senior level working on a number of projects
- automotive industry experience preferred however not essential

In addition to your astute judgement and analytical mind, you will have demonstrated your ability to influence others through use of your effective communication skills.

If this sounds like the perfect opportunity to develop your career with a reputable, friendly, professional organisation, then please send your resume and covering letter to the attention of:

Taneal Roach
Senior HR Advisor
email:
work@futurisautomotive.com

For further information on Futuris Automotive Interiors, please visit:
www.futurisautomotive.com

LS-DYNA® at the 25th CADFEM Users´ Meeting

November 21 – 23, 2007, Dresden, Germany - www.usersmeeting.com

CADFEM has announced the preliminary LS-DYNA program at this year´s CADFEM Users´ Meeting. The CADFEM Users´ Meeting will be held simultaneously to the German ANSYS Conference. In 2007, the ANSYS Conference & 25th CADFEM Users' Meeting will be one of the most comprehensive expert conferences on numerical simulation in product development in Europe.

LS-DYNA at the 25th CADFEM Users´ Meeting – preliminary agenda:

Wednesday, November 21, 2007

Keynote:

Future Technology Outlook

J. Hallquist (Livermore Software Technology Corporation, Livermore, CA, USA)

LS-DYNA Session:

Technical Remarks Part I

J. Hallquist (Livermore Software Technology Corporation, Livermore, CA, USA)

ALE and FSI Capabilities in LS-DYNA - New Corpuscular Method for Airbag Deployment Simulations

L. Olovsson (Livermore Software Technology Corp., Livermore, CA, USA, IMPETUS Afea, Huddinge, Sveden)

Neuigkeiten zu LS-DYNA bei CADFEM

U. Stelzmann (CADFEM GmbH, Chemnitz), M. Hörmann (CADFEM GmbH, Grafing)

SPH - New Developments and Applications

J. Lacome (Livermore Software Technology Corporation, Livermore, CA, USA)

Thursday, November 22, 2007

LS-DYNA Session:

Aktueller Stand und neue Trends aus Anwendersicht

U. Stelzmann (CADFEM GmbH, Chemnitz), M. Hörmann (CADFEM GmbH, Grafing)

Simulation von Klebeverbindungen zwischen Stahlblechen unter Crashbeanspruchung im Automobilbau mit der Methode der Finiten Elemente

M. Brede (Fraunhofer-Institut für Fertigungstechnik und Angewandte Materialforschung, Bremen)

Auslegung eines Crashdeformationselementes einer Sicherheitslenksäule mittels numerischer Simulation

K. Plangger (ThyssenKrupp Presta AG, Eschen, Liechtenstein)

FAT-Richtlinie: Dynamische Werkstoffkennwerte für die Crashsimulation

W. Böhme (Fraunhofer Institut für Werkstoffmechanik, Freiburg)

Parameter Identification for the Simulation of Debonding in Honeycomb Sandwich using LS-DYNA

M. Hörmann (CADFEM GmbH, Grafing)

ANSYS & LS-DYNA Simulation of Electronic Modules Subjected to Free Drop Test

P. Gromala (Qimonda Dresden GmbH & Co. oHG, Dresden)

Johnson-Cook Model Parameter Identification: Some Observations Illustrated with Aluminium 6063-T6

L. Schwer (Schwer Engineering & Consulting Services, Windsor CA, USA)

Technical Remarks Part II

J. Hallquist (Livermore Software Technology Corp., Livermore, CA, USA)

N.N.

T. Dutton (Dutton Simulation Ltd., Warks, United Kingdom)

Übertragung von Umformergebnissen in die Crashsimulation zur Verbesserung der Vorhersagequalität

U. Scholl (Fraunhofer Gesellschaft SCAI, Sankt Augustin)

Simulation eines zellularen Verbundwerkstoffes für Crashanwendung

F. Bartl, R. Dallner (Fachhochschule Ingolstadt)

Test Verification Techniques in LS-DYNA

U. Jankowsi, M. Müller-Bechtel, J. Martinez (TECOSIM GmbH, Rüsselsheim)

LS-OPT based Identification of a User Defined Material Model for Distortional Hardening with Application to Sheet Forming Processes with Complex Strain Path Changes

V. Levkovitch, B. Svendsen (Universität Dortmund)

Robustheitsbewertungen von Crashberechnungen mit LS-DYNA und optiSLang

J. Will (Dynardo GmbH, Weimar), U. Stelzmann (CADFEM GmbH, Chemnitz)

An Overview of the ASME Guide for Verification and Validation in Computational Solid Mechanics

L. Schwer (Schwer Engineering & Consulting Services, Windsor CA, USA)

Simulation des Druckanstiegs in der Tür beim Seitencrash mittels Fluid-Struktur-Interaktion

M. Machens (Wilhelm Karmann GmbH, Osnabrück)

Friday, November 23, 2007

Technical Workshop I

New Features in LS-DYNA 971 & Tips and tricks for contacts and composites

U. Stelzmann (CADFEM GmbH, Cemnitz), M. Hörmann (CADFEM GmbH, Grafing)

Technical Workshop II

Optimization and robustness using LS-OPT & Simulation of bonded joints

W. Lietz (CADFEM GmbH, Dortmund), A. Matzenmiller (Universität Kassel)

The program dedicated to LS-DYNA will be embedded in one of this year´s most comprehensive expert conferences. 800 or even more engineers are expected to attend the event with a special emphasis on structural mechanics, computational fluid mechanics and fluid-structure-interaction. It will be accompanied by a large CAE exhibition with probably more than 40 companies.

So LS-DYNA users benefit twice from attending the conference: They take advantage of an effective and detailed technical content on LS-DYNA, AND additionally, they have access to a broad variety of complementary CAE information!

More information: www.usersmeeting.com

LS-DYNA, LS-OPT, and LS-PrePost are registered trademarks of Livermore Software Technology Corp..

LS-DYNA® Discussion Group
at 78th Shock & Vibration Symposium
November 6th, 2007

An informal LS-DYNA Discussion Group will be held on Tuesday 6 November from 17:30 to 19:00 in conjunction with the 78th Shock & Vibration Symposium. (www.saviac.org)

The Discussion Group will feature a presentation by Tom Littlewood on new and improved under water explosion (UNDEX) capabilities of LS-DYNA.

This meeting is an opportunity for engineers to meet with Livermore Software Technology Corporation (LSTC) personnel, learn of recent developments in LS-DYNA and LS-PrePost, discuss application of LS-DYNA to their problems, share best practices, and make requests for new features.

The meeting is hosted by Livermore Software and Technology Corporation (LSTC) and moderated by Dr. Len Schwer of Schwer Engineering & Consulting Services. You may contact Len (Len@Schwer.net) for more information, comments, or suggestions.

About The annual Shock and Vibration Symposium:

The annual Shock and Vibration Symposium is the leading forum for the structural dynamics and vibration community to present and discuss new developments and on-going research. The Symposium was established in 1947 and includes both classified and unclassified sessions. The classified sessions allow critical technology and classified (up to secret level) research to be presented in closed forums of cleared US Government and government-contractor researchers. Topics covered at the symposium include shock-ship testing, water shock, weapons effects (air blast, ground shock, cratering, penetration) shock physics, earthquake engineering, structural dynamics, and shock and vibration instrumentation and experiment techniques. Over 200 technical papers are typically presented. Panel discussions address topics such as new software developments or accelerometer isolation problems. Tutorials provide up-to-date technology overviews by leading specialists

The 10th International LS-DYNA® Users Conference

June 8-10, 2008

Hosted by

Livermore Software Technology Corp. (LSTC)

Location: The Hyatt Regency Dearborn, Michigan, USA

Abstract Deadline: *Dec. 5, 2007*
Email your abstract to: *papers@lstc.com*
Notification of Acceptance: *01/27/08*
Paper Deadline: *03/07/08*

Conference Papers: The presenter of each accepted paper will receive free admission to the conference, provided that the presenter registers for a room at the Hyatt Regency Dearborn under LSTC Conference.

. **Application Areas Being Accepted for Paper Submission:**

- Aerospace
- Automotive Crashworthiness
- Ballistic and Penetration

- Biomechanics
- Civil Engineering
- Compressible Fluid Dynamics
- Electro Magnetics

- Heat Transfer
- Impact and Drop Testing
- Manufacturing Processes
- Metal Forming
- Modeling Techniques
- Nuclear Applications

- Occupant Safety

- Seismic Engineering
- Ship Building

- Transportation

- Virtual Proving Ground

Abstract Length:	Approximately 300 words, please include figures, if possible
Paper Length:	Maximum of 3000 words, single-spaced, on 8-1/2″ x 11″ paper
Format:	A MS Word template will be provided
Contact:	papers@lstc.com

_____

Livermore Software Technology Corp.
(925) 449-2500
www.lstc.com
www.ls-dynaconferences.com

LSTC California & Michigan Training Classes

A complete list of dates can be found on the <u>LSTC</u> website

<u>Class Registration Form (PDF Format)</u>

November
12-15	CA	Introduction to LS-DYNA
27-30	CA	Introduction to LS-OPT

December
10-11	MI	Contact
12-13	MI	Implicit

For Complete Class Details:

<u>www.lstc.com</u>

2007/2008 Worldwide Events

Nov 05	**12th Korean LS-DYNA Users Conference** **hosted by THEME**
Nov 21 - 23	**CADFEM Users´ Meeting 2007** **Dresden, Germany, hosted by CADFEM**
Dec 5-7	**China International Simulation Industry Exhibition & Conference** **Shanghai, China**
Dec.6-8	**The 3rd Auto Engineers Conference & "Industry Design and R&D Session"**
Events 2008	
April 28-29	**2008 VR&D Users's Conference**
May, 28-30	**The 4th International Conference on Advances in Structural Engineering and Mechanics** **(AWAS'08) in Jeju, Korea**
June 8-10	**The 10th International LS-DYNA® Users Conference** **The Hyatt Regency, Dearborn, MI, USA** **Hosted by LSTC**

FEA Information China Participants

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BOOKS Available at Amazon

The Finite Element Method: Linear Static and Dynamic Finite Element Analysis

Thomas J.R. Hughes (Sept. 2000)

Vibration Simulation Using MATLAB and ANSYS

Michael R. Hatch (Sept. 2000)

Nonlinear Finite Element Analysis for Continua and Structures

Ted Belytschko, et al/Hardcover/Published 2000

Nonlinear Finite Element Analysis for Continua and Structures

Ted Belytschko, et al /Paperback/Published 2000

LS-DYNA Resource Page

FEA Information Inc. Participant's (alphabetical order)

Fully QA'd by Livermore Software Technology Corporation

TABLE 1: SMP	
HP PA-8x00	HP-UX 11.11 and above
HP IA-64	HP-UX 11.22 and above
HP Opteron	Linux CP4000/XC
HP Alpha	True 64
IBM Power 4/5	AIX 5.1, 5.2, 5.3
IBM Power 5	SUSE 9.0
IBM Power PC 970	AIX 5.3
INTEL IA32	Linux, Windows
INTEL IA64	Linux
INTEL Xeon EMT64	Linux
NEC SX6	Super-UX
SGI Mips	IRIX 6.5 X
SGI IA64	SUSE 9 with ProPack 4 Red Hat 3 with ProPack 3
SUN Sparc	5.8 and above
SUN Opteron	5.8 and above

TABLE 2: MPP and MPI Interconnect			
Vendor	O/S	HPC Intereconnect	MPI Software
HP PA8000	HPUX		
HPIA64	HPUX		
HP Alpha	True 64		
IBM Power 4/5	AIX 5.1, 5.2, 5.3		
IBM Power 5	SUSE 9.0		LAM/MPI
IBM Power PC 970	AIX 5.3	MyriCom	MPICH-gm
INTEL IA32	Linux, Windows	InfiniBand (Voltaire), MyriCom	LAM/MPI, MPICH, HP MPI, SCALI
INTEL IA64	Linux		LAM/MPI, MPICH, HP MPI
INTEL Xeon EMT64	Linux	InfiniBand (Topspin, Voltaire), MyriCom, QLogic InfiniPath	LAM/MPI, MPICH, HP MPI, INTEL MPI, SCALI
NEC SX6	Super-UX		
SGI Mips	IRIX 6.5	NUMAlink	MPT
SGI IA64	SUSE 9 w/ProPack 4 RedHat 3 w/ProPack 3	NUMAlink, InfiniBand, (Voltaire)	MPT, Intel MPI, MPICH
SUN Sparc	5.8 and above		LAM/MPI
SUN Opteron	5.8 and above		

LS-DYNA Resource Page - Participant Software

Interfacing or Embedding LS-DYNA - Each software program can interface to all, or a very specific and limited segment of the other software program. The following list are software programs interfacing to or having the LS-DYNA solver embedded within their product.   For complete information on the software products visit the corporate website.

ANSYS - ANSYS/LS-DYNA

ANSYS/LS-DYNA - Built upon the successful ANSYS interface, ANSYS/LS-DYNA is an integrated pre and postprocessor for the worlds most respected explicit dynamics solver, LS-DYNA. The combination makes it possible to solve combined explicit/implicit simulations in a very efficient manner, as well as perform extensive coupled simulations in Robust Design by using mature structural, thermal, electromagnetic and CFD technologies.

AI*Environment: A high end pre and post processor for LS-DYNA, AI*Environment is a powerful tool for advanced modeling of complex structures found in automotive, aerospace, electronic and medical fields. Solid, Shell, Beam, Fluid and Electromagnetic meshing and mesh editing tools are included under a single interface, making AI*Environement highly capable, yet easy to use for advanced modeling needs.

ETA — DYNAFORM

Includes a complete CAD interface capable of importing, modeling and analyzing, any die design. Available for PC, LINUX and UNIX, DYNAFORM couples affordable software with today's high-end, low-cost hardware for a complete and affordable metal forming solution.

ETA — VPG

Streamlined CAE software package provides an event-based simulation solution of nonlinear, dynamic problems.

eta/VPG's single software package overcomes the limitations of existing CAE analysis methods. It is designed to analyze the behavior of mechanical and structural systems as simple as linkages, and as complex as full vehicles

MSC.Software - MSC.Dytran LS-DYNA

Tightly-integrated solution that combines MSC.Dytran's advanced fluid-structure interaction capabilities with LS-DYNA's high-performance structural DMP within a common simulation environment. Innovative explicit nonlinear technology enables extreme, short-duration dynamic events to be simulated for a variety of industrial and commercial applications on UNIX, Linux, and Windows platforms. Joint solution can also be used in conjunction with a full suite of Virtual Product Development tools via a flexible, cost-effective MSC.MasterKey License System.

MSC.Software - MSC.Nastran/SOL 700

The MSC.NastranTM Explicit Nonlinear product module (SOL 700) provides MSC.Nastran users the ability access the explicit nonlinear structural simulation capabilities of the MSC.Dytran LS-DYNA solver using the MSC.Nastran Bulk Data input format. This product module offers unprecedented capabilities to analyze a variety of problems involving short duration, highly dynamic events with severe geometric and material nonlinearities.

MSC.Nastran Explicit Nonlinear will allow users to work within one common modeling environment using the same Bulk Data interface. NVH, linear, and nonlinear models can be used for explicit applications such as crash, crush, and drop test simulations. This reduces the time required to build additional models for another analysis programs, lowers risk due to information transfer or translation issues, and eliminates the need for additional software training.

MSC.Software – Gateway for LS-DYNA

Gateway for LS-DYNA provides you with the ability to access basic LS-DYNA simulation capabilities in a fully integrated and generative way. Accessed via a specific Crash workbench on the GPS workspace, the application enhances CATIA V5 to allow finite element analysis models to be output to LS-DYNA and then results to be displayed back in CATIA. Gateway for LS-DYNA supports explicit nonlinear analysis such as crash, drop test, and rigid wall analysis.

Gateway products provide CATIA V5 users with the ability to directly interface with their existing corporate simulation resources, and exchange and archive associated simulation data.

Oasys software for LS-DYNA

Oasys software is custom-written for 100% compatibility with LS-DYNA. Oasys PRIMER offers model creation, editing and error removal, together with many specialist functions for rapid generation of error-free models. Oasys also offers post-processing software for in-depth analysis of results and automatic report generation.

EASi-CRASH DYNA

EASi-CRASH DYNA is the first fully integrated environment for crashworthiness and occupant safety simulations with LS-DYNA, and covers the complete CAE-process from model building and dataset preparation to result evaluation and design comparisons.

EASi-CRASH DYNA can be used for concept crash, FE crash and coupled rigid body/FE crash simulations in conjunction with MADYMO.

Full capability to handle IGES, CATIA V4, CATIA V5, UG and NASTRAN files

APTEK

The MMCD is a graphics-based and menu-driven program that interfaces with the LS-DYNA library of material models and the LS-OPT optimization code. The core of the MMCD is the driver, which calculates the stress-strain behavior of material models driven by combinations of strain increments and stress boundary conditions, i.e. pure shear stress, and combinations of uniaxial, biaxial, and triaxial compression and tension. MMCD input and output is accessed via pre- and post-processors; graphical user interfaces (GUIs) for easily selecting the material model parameters and load histories, and for plotting the output in both two (stress-strain curves) and three (yield surfaces) dimensions. The pre-processor, driver, and post-processor are combined into a web downloadable software package that operates seamlessly as a single code.

FEA Information Participants –
Company name takes you directly to Website

Oasys, Ltd: Markets engineering software products. Consulting engineers, planners and project managers working in all areas of the built environment.

JRI Solutions Limited: Specializing in Research & Consulting; System Consulting, Frontier Business, System Integration and Science Consulting.

Hewlett Packard: Personal computing, mobile computing, network management, 3-D graphics and information storage.

ANSYS, Inc.:   Develops, markets, supports and delivers collaborative analysis optimization software tools.

SGI: Silicon Graphics, Inc., is a leader in high-performance computing, visualization, and storage.

MSC.Software: Information technology software and services provider.. Products & services used to enhance & automate the product design/manufacturing process.

NEC Corporation A history of more than 100 years of leadership/innovation in the core high-technology sectors of communications, computers/electronic components

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Intel: For more than three decades, Intel Corporation has developed technology enabling the computer and Internet revolution that has changed the world.

Engineering Technology Associates, Inc: Provides engineering & IT services & has created the streamlined simulation software packages DYNAFORM and VPG

IBM: Invention, development & manufacture of advanced information technologies, including computer systems, software, storage systems & microelectronics

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ESI Group: A software editor for the numerical simulation of prototype and manufacturing process engineering in applied mechanics.

Microsoft: For customers solving complex computational problems, Microsoft Windows Compute Cluster Server 2003 accelerates time-to-insight.

BETA CAE Systems S.A., Specialized in the development of state of the art CAE pre- and post-processing software systems.

Sun Microsystems Inc.,provides network computing infrastructure solutions that include computer systems, software, storage, and services.

Detroit Engineered Products: a Michigan based engineering consulting and software products firm specializing in the area of Product Development products and solutions.

APTEK   Among the software developed APTEK develops and licenses an interactive program for driving LS-DYNA material models - the Mixed Mode Constitutive Driver (MMCD).

PANASAS High performing Parallel Storage for scalable Linux clusters. Delivering exceptional scaling in capacity and performance for High Performance Computing (HPC) organizations.

Software Distributors

Alphabetical order by Country

Australia	Leading Engineering Analysis Providers
Canada	Metal Forming Analysis Corporation
China	ANSYS China
China	Arup
China	MSC. Software – China
Germany	CAD-FEM
Germany	DynaMore
India	Oasys, Ltd.
India	Altair Engineering India
India	Cranes Software International Limited (CSIL),
Italy	EnginSoft Spa
Japan	The Japan Research Institute
Japan	ITOCHU Techno-Solutions Corporation
Korea	Korean Simulation Technologies
Korea	Theme Engineering

Software Distributors (cont.)

Alphabetical order by Country

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Russia	State Unitary Enterprise - STRELA
Sweden	Engineering Research AB
Taiwan	Flotrend Corporation
USA	Engineering Technology Associates, Inc.
USA	Dynamax
USA	Livermore Software Technology Corp.
USA	APTEK
UK	ARUP

International Consulting and Engineering Services
(continued on next page)

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USA Consulting and Engineering Services

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USA Troy, MI	Engineering Technology Associates, Inc: (248) 729-3010
USA Corvallis, OR	Predictive Engineering George Laird (1-800) 345-4671 george.laird@predictiveengineering.com
USA Troy, MI	Detroit Engineered Products
ETA Troy, MI	Engineering Technology Associates, Inc. (248) 729-3010 sales@eta.com

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USA	Dr. Taylan Altan	The Ohio State U – ERC/NSM
USA	Dr. Ala Tabiei	University of Cincinnati

Informational Websites

The LSTC LS-DYNA Support site: www.dynasupport.com

[LSTC/DYNAmore LS-DYNA Support Site](#)	[FEA Informationwebsites](#)
[LSTC/DYNAmore LS-DYNA Examples](#) (more than 100 Examples)	[LS-DYNA Conference Site](#)
[TopCrunch](#) – Benchmarks	[LS-DYNA Publications](#) to Download On Line
[LS-DYNA Publications](#)	[LSTC_LS-PrePost Tutorials](#)
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