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FEA Information Engineering Solutions

Volume 4, Issue 01, January 2015

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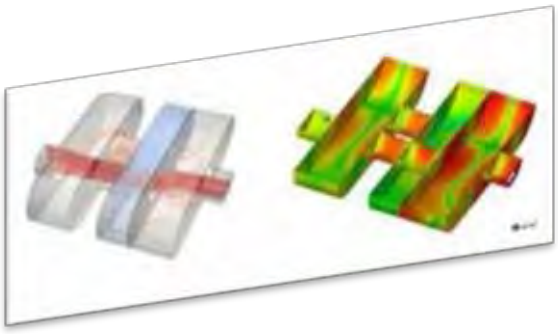
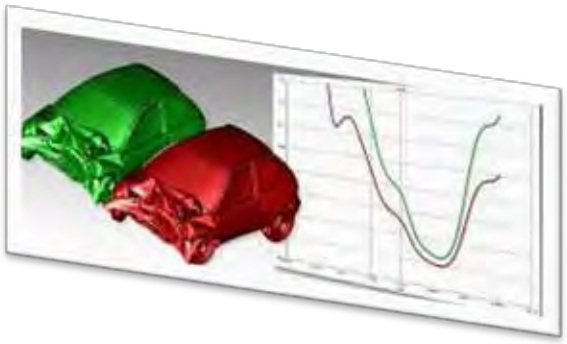


ANSA & µETA v15.2.2



Cray® CS™

GOMPUTE User Meeting 2015

FEA Information Inc. is a publishing company founded April 2000, incorporated in the State of California July 2000, and first published October 2000. The initial publication, FEA Information News continues today as FEA Information Engineering Solutions. The publication's aim and scope is to continue publishing technical solutions and information, for the engineering community.

FEA Information Inc. Publishes:

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FEA Information China Engineering Solutions

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2015 advertisement is open, contact Anthony Giaccana agiac99@aol.com for pricing details

IMPLICIT Part 2 by By Yun Huang, LSTC

(part 1 Presentation, contact huang@lstc.com - Subject line Part 1)

FEB 13th

ABSTRACTS CAN STILL BE SUBMITTED: – DO NOT MISS OUT

10th European LS-DYNA - June 15 – 17 June in Würzburg, Germany

Abstract submission: 13 February

CALL FOR PAPERS pdf

February 10, 2015

2015 BETA CAE Japan Open Meeting - -

Shin Yokohama Prince Hotel - Shin Yokohama, Japan

TopCrunch HPC Performance

Super Micro Computer, Inc./System Performance Team

Book

Second edition - An Introduction to Nonlinear Finite Element Analysis

By Yun Huang – LSTC (part 1 Presentation contact huang@lstc.com subject line Part 1)

Vibration solvers

In LS-DYNA, the following frequency domain vibration solvers have been implemented.

- FRF (keyword: *FREQUENCY_DOMAIN_FRF)
- SSD (keyword: *FREQUENCY_DOMAIN_SSD)
- Random Vibration (keyword: *FREQUENCY_DOMAIN_RANDOM_VIBRATION)
- Response spectrum (keyword: * FREQUENCY_DOMAIN_RESPONSE_SPECTRUM)

These features are provided to meet the needs of customers from various industry areas, such as NVH analysis of automotives and aircrafts, vibration analysis of home appliances, electronic devices, seismic analysis of bridges and dams, where the vibration damage to parts is concerned.

This article provides a brief introduction of these vibration solvers.

FRF

FRF (Frequency Response Function) is the basis for modern vibration analysis and modal testing. Basically it is a transfer function, expressing structural response due to an applied unit load as a function of frequency. FRF is a characteristic of structures or systems. It can be used to analyze energy transfer path for harmonic excitations. Based on FRF, people can also run an inverse analysis to locate the excitations.

For a sample problem we consider a BIW which is subjected to nodal force excitation at an engine attachment point (point A). The nodal force is prescribed for a range of frequency (1-200 Hz). The accelerance (acceleration due to nodal force excitation) at point B is computed. The FRF results are complex variables, and can be expressed as amplitude and phase angle pairs, or real and imaginary parts. Two ASCII files: FRF_AMPLITUDE and FRF_ANGLE are provided as the output of FRF computation. Figure 2 shows the amplitude of the accelerance (given by FRF_AMPLITUDE).

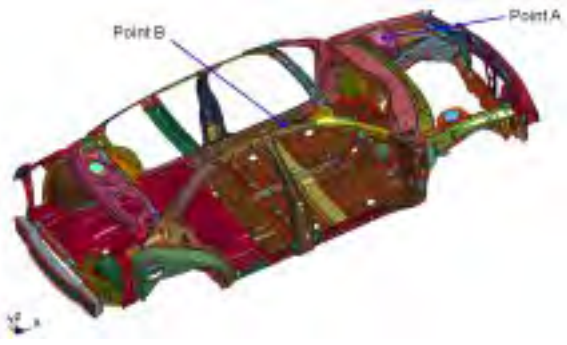

Figure 1. BIW model for FRF analysis

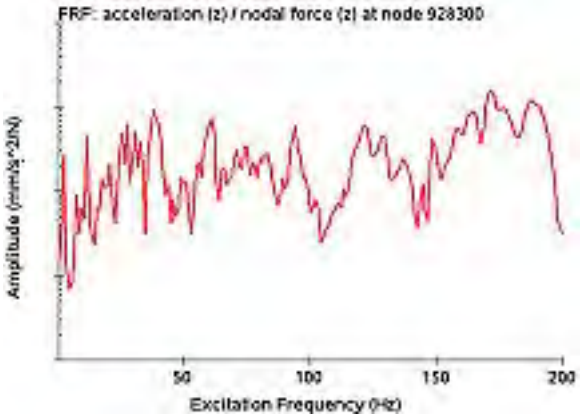

Figure 2. FRF curve

By Yun Huang – LSTC (part 1 Presentation contact huang@lstc.com subject line Part 1)

SSD

SSD (Steady State Dynamics) is also called as steady state vibration. It provides structural mechanical response due to harmonic vibration excitations. The difference between FRF and SSD is that in SSD, user needs to provide not only direction, location and type of excitation, but also the frequency spectrum of the excitation (for example, the magnitude and phase of acceleration vs. frequency curve). Pre-stressed condition can be considered in LS-DYNA SSD computation. The results are given in D3SSD and ELOUT_SSD, NODOUT_SSD. D3SSD is a binary plot database, which is accessible to LS-PrePost; ELOUT_SSD, and NODOUT_SSD are ASCII databases, which shows the elemental and nodal response as a function of frequency in such harmonic vibration environment.

For a simple wheel rim model in a shaker table test, SSD computation is performed. The acceleration excitation (1g) is given in z-direction for the frequency range 10-2000 Hz. The wheel rim is constrained to the shaker table by the inner edge. Figures 3 and 4 show the acceleration and shear stress response at frequency 100 Hz. Response at other frequencies can also be obtained with D3SSD

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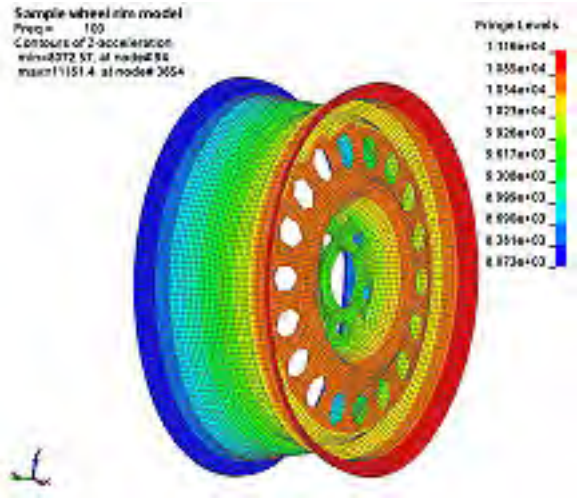


Figure 3. Z-acceleration at frequency 100 Hz (magnitude)

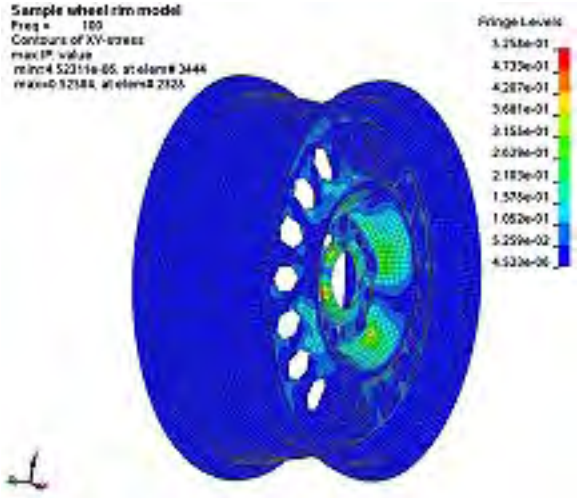


Figure 4. xy shear stress at frequency 100 Hz (magnitude)

By Yun Huang – LSTC (part 1 Presentation contact huang@lstc.com subject line Part 1)

Random Vibration

The random vibration feature provides the structural response due to PSD (Power Spectral Density) acoustic or mechanical loading. Random vibration analysis is useful for the cases where it is difficult (or impossible, sometimes) to get the deterministic time history of loading. Some examples include resultant force on tires running on the road, ocean wave load on offshore structures, wind load on blades of wind turbines. For these cases, the distribution of excitation energy with respect to frequency can usually be described by a PSD curve. Random vibration analysis provides PSD and RMS (Root Mean Square) values of the response, which represent the frequency distribution of energy of response (by PSD), and the overall response level (by RMS). It also provides useful information for fatigue analysis.

The results are given in binary databases D3PSD and D3RMS, which are accessible to LS-PrePost. The corresponding elemental and nodal PSD results are saved in ASCII databases ELOUT_PSD and NODOUT_PSD.

The example considered is an aluminum bracket subjected to shaker table test. Acceleration PSD is applied. The RMS responses of acceleration, and Von Mises stress are shown in Figure 5 and Figure 6.

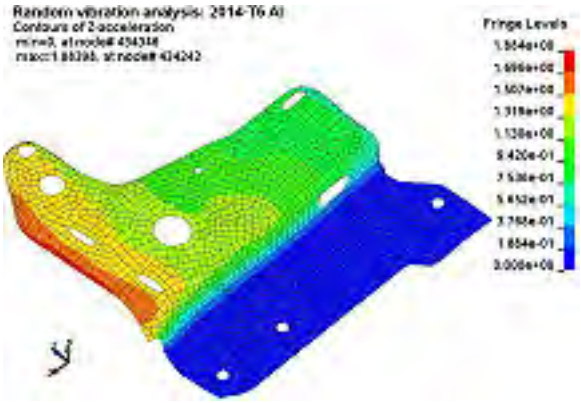


Figure 5. RMS of Z-acceleration

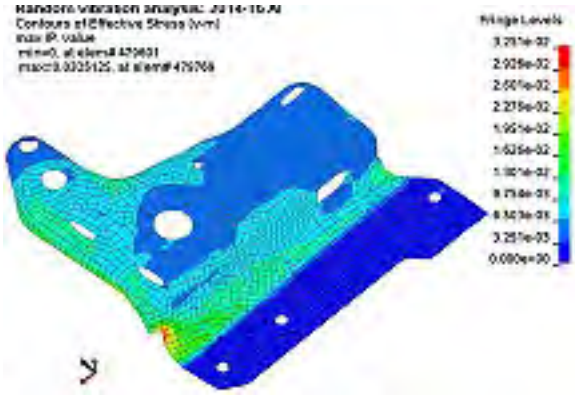


Figure 6. RMS of Von Mises stress

Response Spectrum Analysis

The response spectrum analysis feature evaluates peak response of structures subjected to input excitation spectrum (e.g. earthquake ground acceleration spectrum). It can predict the magnitude and location of the maximum values of responses, like displacement, velocity, acceleration, stresses and strains in structures. Thus it is very useful to civil and hydraulic engineers. It is also useful to other industries where the earthquake risk has to be considered in the designing of buildings (such as nuclear power plants).

By Yun Huang – LSTC (part 1 Presentation contact huang@lstc.com subject line Part 1)

The results are given in binary database D3SPCM, which is accessible to LS-PrePost.

The example considered is a multi-story building, subjected to input ground acceleration spectrum (see Figure 7) from both x and y directions. SRSS mode combination method is used in this example. Figure 8 shows strain results plot, obtained from D3SPCM.

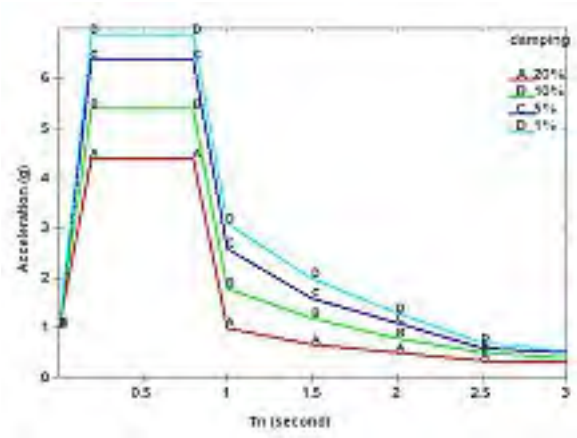


Figure 7. Input spectra for different damping

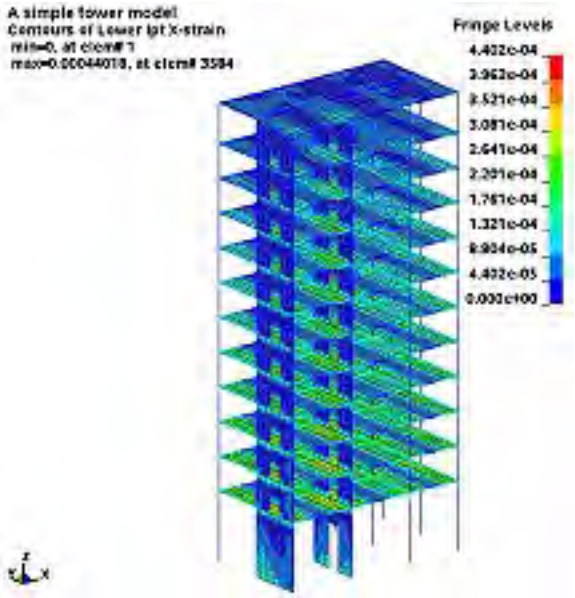


Figure 8. Strain response

Conclusion

To address the vibration problems which are very common in industries, LS-DYNA have provided a series of frequency domain solvers including FRF, SSD, Random vibration and Response spectrum analysis. They evaluate the dynamic response of finite element models from different viewpoints, and can be useful tools to users who need to perform safety and durability analysis of structures, buildings or parts.

For more details about these solvers, please refer to LS-DYNA Keyword User's Manual

.

The Numerical Simulation Conference
33rd CADFEM Users' Meeting
June 24th and 26th, 2015.

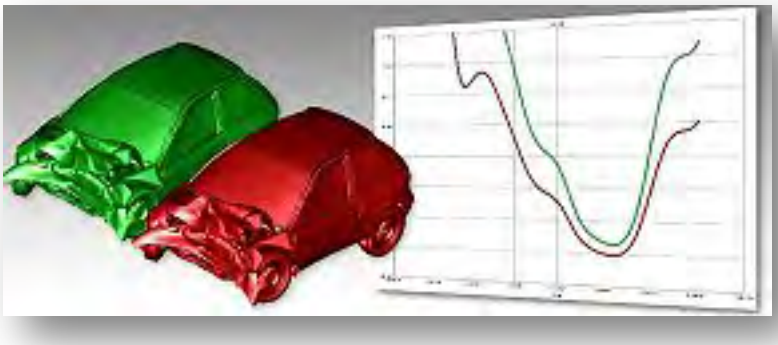
When it comes to numerical simulation in product development, the place to be is the city of Bremen, Germany.

CADFEM GmbH & ANSYS Germany GmbH would like to invite you to the Numerical Simulation Conference between June 24th and 26th, 2015. As a simulation expert, beginner or simply an interested party, you can experience the complete range of simulation technology as a tool for quality, innovation and time-saving in product developments of today and the future.

You can expect a packed and varied agenda at our ANSYS Conference & 33rd CADFEM Users' Meeting – from ANSYS, from CADFEM and from the world of simulation: Technology updates, contributions from users from various sectors and fields of simulation, as well as compact seminars on topical subjects. You can also look forward to the big CAE exhibition, the intensive exchange and dialog with like-minded people and as always an attractive supporting program. Let the conference inspire you to new ideas. Or why not inspire others by making your own contribution to one of the biggest conferences on numerical simulation in Europe. We would like to invite you to send us your papers on the named topics for Thursday, June 25th. If you register before February 2nd, 2015, you will profit from an early-bird discount of 10% either as a speaker or participant. We are looking forward to some great papers, curious trade visitors and exhibitors with some interesting special offers.

Find out everything you need to know about the event at www.usersmeeting.com/en

www.beta-cae.gr/news/20150109_announcement_ansa_meta_v15.2.2.htm



ANSA & µETA v15.2.2
release announcement
January 9th, 2015

Understanding the Software Release Schedule

The plan

We are committed in delivering improved and enhanced software releases, the soonest possible, in order to meet the requirement of our customers for the continuous improvement of their experience and work. Therefore, we are working in releasing new software versions with code corrections, new software features and enhancements, in regular, frequent intervals.

- A major software version is released every year.

- First point releases, such as v15.1.0, v15.2.0 and so on, with code corrections but also with additional software features and enhancements are released every three months.

- Second point releases, such as v15.2.1, v15.2.2, v15.2.3 mainly with code corrections only upon their parent first point release, are scheduled on a monthly basis.

Each software release is accompanied by a detailed description of the introduced corrections and/or additions so that our customers can decide whether it is critical to implement this release in their environment.

This release

This release of v15.2.2 implements enhancements and code corrections on v15.2.0 and v15.2.1.

Note:

ANSA / µETA v15.2.1 has been revoked.

Enhancements and known issues resolved in ANSA

Enhancements in ANSA

Scripting

A new script function has been added in CFD_TRANSL named ScaleBMValues. This function will scale all the length related fields of selected Batch Mesh Sessions.

Known issues resolved in ANSA

DATA Management:

Deleting Include files from the DM Browser might lead to unexpected termination.

Applying a new representation on many parts was not possible when they were physically connected.

TOPO

The performance of Plane Cut has been significantly improved.

DECKs: File Manager: Files that were de-selected were also imported along with the selected ones.

Contact>Assistant: The Master/Slave set ids were inserted in the Contact card as Slave/Master.

For more details about the new software features, enhancements and corrections please, refer to the Release Notes document.

Enhancements and known issues resolved in µETA

Enhancements in µETA

Parametric Point Paths: Commands for stress linearization on axisymmetric elements have been changed.

Supported interfaces

Nastran: Discrete optimization results produced using the parameter DISBEG=0 are now supported as extra cycles when reading 3D Results from the PCH file.

Project Files: Top and Bottom Nodal Results have been supported (reading and writing) since v15.2.0, but not documented.

www.beta-cae.gr/news/20150109_announcement_ansa_meta_v15.2.2.htm

Known issues resolved in µETA

General: The F12: Set Visible Entities window's close button issue has been resolved. This incident was resolved in v15.1.1, but not documented.

Supported interfaces: Opening a FEMZIP file in v15.2.1 generated multiple small files in µETA launch folder.

Fringebar: Vector Fringebar: Major Principal Vectors would not be drawn on solid elements.

Managing Curve Data: Load Curves: When read manually from multiple binout files, node id would unnecessarily be written numerous times in command xyplot read lsdyna etc. .

Automation: Script: Scrolling was not applicable in windows created by script. This incident has been resolved since v15.0.0, but not documented.

For more details about the new software features, enhancements and corrections please, refer to the Release Notes document.

Compatibility and Supported Platforms

- ANSA files saved by all the first and second point releases of a major version are compatible to each other. New major versions can read files saved by previous ones but not vice versa.
- The .metadb files saved with µETA version 15.2.2 are compatible and can be opened by earlier versions of µETA.
- Support for 32-bit platform has been discontinued for all operating systems.

Download

Where to download from:

- Customers who are served directly by BETA CAE Systems S.A. may download the new software, examples and documentation from their account on our server. They can access their account through the "user login" link at our web site http://www.beta-cae.gr
- Contact us if you miss your account details. The [Public] link will give you access to the public downloads area.
- Customers who are served by a local business agent should contact the local support channel for software distribution details.

www.beta-cae.gr/news/20150109_announcement_ansa_meta_v15.2.2.htm

What to download

- All files required for the installation of this version reside in the folder named "BETA_CAE_Systems_v15.2.2" and are dated as of January 9th, 2015. These files should replace any pre-releases or other files downloaded prior to that date.
- The distribution of this version of our pre- and post-processing suite is packaged in one, single, unified installation file, that invokes the respective installer and guides the procedure for the installation of the required components.
- For the installation of the software on each platform type, the.sh installer file residing in the folder with respective platform name, for Linux and MacOS or the respective .msi installer file for Windows, 64bit, have to be downloaded.
- In addition to the above, optionally, the µETA Viewer is available to be downloaded for each supported platform.
- The tutorials and the example files reside in the folder named "TUTORIALS". This folder includes the complete package of the tutorials and example files, and a package with only the updated ones.
- The Abaqus libraries required for the post-processing of Abaqus .odb files are included in the installation package and can be optionally unpacked.
- Earlier software releases are also available in the sub-directory called "old" or in a folder named after the product and version number.

Documentation

Videos

A new folder with videos has been made available on our server for download. The videos are also available on our Youtube channel.

New material for Optimizations by employing the TOSCA-ANSA Environment

A new package has been uploaded on our server including:

- Guides on Optimization in ANSA-TOSCA Environment (TAE) and on hot to define TOSCA keywords.
- A video demonstration of the TOSCA-ANSA environment.
- A white paper on a “Topology and Shape optimization within the TAE” case.
- Tutorials and the files for Bead, Shape, and Topo optimization.

www.beta-cae.gr/news/20141210_2015_japan_om_announcement.htm

2015 BETA CAE Japan Open Meeting
Shin Yokohama Prince Hotel - Shin Yokohama, Japan

February 10, 2015

Invitation

BETA CAE Systems S.A., a leading contemporary industry supplier of CAE software, and its business partner in Japan, TOP CAE Corporation, have the pleasure to invite you to the 2015 Open Meetings in Shin Yokohama.

During this event you will have the opportunity to participate in sessions on the latest developments and real case applications, on various CAE disciplines and industries, of ANSA, μETA, and our new product SPDRM (Simulation Process Data and Resources Manager).

A number of very interesting presentations from guest speakers will feature the event's agenda, showing impressive applications of our software in different sectors. BETA CAE Systems and TOP CAE Corporation would like to extend their appreciation to our customers who accepted our invitation to contribute to the success of this event with their presentations.

During the event, the technical discussions and demonstrations will offer you the opportunity to discuss with our engineers the software features, their application, and the future developments. A team of CAE experts from BETA CAE Systems and TOP CAE Corporation will be pleased to meet you in person and exchange knowledge, experience and visions.

There is no participation fee for the event.
Please, register by email no later than Friday January 30th, 2015 to info@top-cae.co.jp.

The attire will be business casual.

All presentations are in Japanese, unless marked as: [E]* for English with translation to Japanese or [E] for English only.

The event and reception are organized and hosted by TOP CAE Corporation.

Agenda subject to change without notice.

Among the many presentations will be:

Opening Speech
AkiraTakagi, President, TOP CAE Corporation

BETA CAE Systems products suite in the Automotive industry [E]*

Dimitris Angelis, President, BETA CAE Systems

Keynote Speech:
Toyota Motor Corporation's 30years history in Crash Analysis

Tsuyoshi Yasuki, Vehicle CAE Group, Toyota Motor Corporation

Invited Speech:

Efforts of Nissan Techno Group to improve QCT of making CAE model

Trinh An Phong, Vehicle CAE Center, Nissan Techno Vietnam CO.,LTD

Invited Speech:

Efforts to promote efficiency of CAE analysis result processing by using μETA in auto transmission

Takuya Hosoe, CAE developing technology group, AW Engineering CO., LTD

Venue in Shin Yokohama

Shin Yokohama Prince Hotel
3-4 Shin Yokohama
Kohoku-ku, Yokohama
Kanagawa, 222-8533 Japan
Tel: +81-(0)45-471-1111
URL: www.princehotels.com

Information & Registration

Tel: +81-(0)45-478-3840
Email: info@top-cae.co.jp

Important dates

Registration until: Friday January 30, 2015
Event: Tuesday February 10, 2015

http://investors.cray.com/phoenix.zhtml?c=98390&p=irol-newsArticle&ID=2001390

The University of Hawaii Puts Cray CS Cluster Supercomputer Into Production

SEATTLE, WA -- (Marketwired) -- 12/22/14 -- Global supercomputer leader Cray Inc. (NASDAQ: CRAY) today announced that the University of Hawaii (UH) has put a Cray® CS™ cluster supercomputer into production. The new Cray system is the University's first centralized high performance computing system, and will be located on the UH Manoa Campus in a new state-of-the-art 8,000 square foot, Silver LEED Certified data center.

"The Cray high performance computing system will empower innovative research by enabling cost-effective access to big data capabilities for researchers at UH Manoa and across the State of Hawaii," said David Lassner, UH President.

The Cray CS cluster supercomputer will serve as the primary high performance computing (HPC) system for researchers throughout the UH network of campuses, and will also be used to support data intensive research across all research domains in the UH system. The University of Hawaii is recognized as an international leader in astronomy, oceanography, climate, atmospheric, space and energy research in addition to being a home for vibrant research efforts in tropical medicine, cancer research, microbial oceanography, disaster preparedness, coastal and marine research.

"The University of Hawaii system includes three universities, seven community colleges and a wide array of community-based learning centers, geographically dispersed across the Hawaiian Islands," said Barry Bolding, vice president, marketing and business development at Cray. "Users across this large network are conducting data intensive research spanning a number of critical fields, from life sciences to astronomy and we are thrilled they selected a Cray CS system for their scientific computing platform."

The Cray CS series of cluster supercomputers are scalable, flexible systems that consist of optimized, industry-standard building block server platforms into a unified, fully-integrated system. Available with air or liquid-cooled architectures, Cray CS systems provide superior price/performance, energy efficiency and configuration flexibility. The systems are integrated with Cray's HPC software stack and include software tools compatible with most open source and commercial compilers, schedulers, and libraries. The Cray CS systems feature the Cray Advanced Cluster Engine, which is an essential management software suite designed to provide network, server, cluster and storage management capabilities that are necessary to run large, complex technical applications, as well as the Cray Programming Environment to improve the performance and ease of programming of clusters

.

For more information on the Cray CS cluster supercomputers, please visit www.cray.com.

About the University of Hawaii System

The University of Hawaii System (UH) includes 10 campuses and dozens of educational, training, and research centers across the Hawaiian Islands. As the public system of higher education in Hawaii, UH offers opportunities that reflect the diversity of its island home. The unique geographic and cultural advantages of the University of Hawaii System foster expertise in a wide range of fields, spanning the arts, humanities, sciences, and professions. From accounting to zoology and from professional development to vocational training, UH's individualized programs empower all students to achieve their educational goals. For more information, see http://www.hawaii.edu/.

About Cray Inc.

Global supercomputing leader Cray Inc. (NASDAQ: CRAY) provides innovative systems and solutions enabling scientists and engineers in industry, academia and government to meet existing and future simulation and analytics challenges.
.

Leveraging more than 40 years of experience in developing and servicing the world's most advanced supercomputers, Cray offers a comprehensive portfolio of supercomputers and big data storage and analytics solutions delivering unrivaled performance, efficiency and scalability. Cray's Adaptive Supercomputing vision is focused on delivering innovative next-generation products that integrate diverse processing technologies into a unified architecture, allowing customers to meet the market's continued demand for realized performance. Go to www.cray.com for more information.

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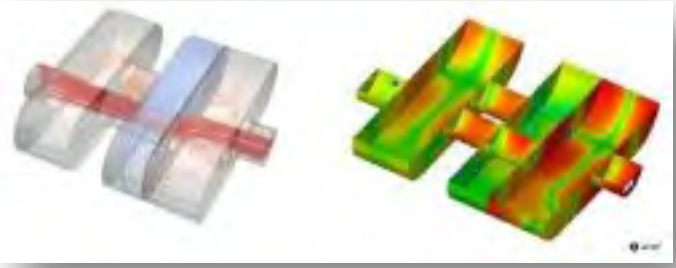
www.esi-group.com/company/press/news-releases/esi-releases-latest-version-va-one



Simulation of an automotive muffler: CFD streamlines (left) and acoustic response (right)

The most complete vibro-acoustic simulation tool on the market

ESI Group, leading solution provider in Virtual Prototyping software and services for manufacturing industries, launches its latest version of VA One. The only solution on the market providing a complete simulation environment for vibro-acoustic analysis and design, VA One covers the full frequency range. The software seamlessly combines key vibro-acoustic modeling methods, Finite Elements (FEM), Boundary Elements (BEM), and Statistical Energy Analysis (SEA), in a single model. This latest release focuses on providing increased flexibility for daily use, seamless coupling with open source Computational Fluid Dynamics (CFD) software OpenFOAM® and supporting advanced aeronautic materials.

Vibro-acoustic engineers need the right model at the right time, and there are as many model requirements as there are milestones in a project – sometimes engineers require fast overnight computation, sometimes what they desire is extreme precision. The new VA One provides this flexibility along with a new automatic model checking function, which ensures that computations will not fail overnight because of some missing parameter.

The new DMP (Distributed Memory Processing) BEM solver now delivers superior performance on High Performance Computing architectures, reducing computational times by a factor of 10 for large cases. It enables faster calculations, which is especially beneficial when faced with tough challenges such as the assessment of vehicle pass-by noise that will be required of automotive OEMs by upcoming regulation UN/ECE R51.03.

The new VA One also provides automated user assistance when setting up a large number of load cases (e.g. for powertrain run-up simulations), reducing import time from several hours to only a few seconds. The objective is to minimize time-consuming jobs by automating them, so engineers can focus on high value-predictions added tasks.

Automatic coupling with the open source CFD software OpenFOAM® is added in this latest version of the software, enabling vibro-acoustic engineers to make quick of the performance of their designs in the presence of stationary flow components. The new utility generates standard OpenFOAM® meshing automatically and updates the vibro-acoustic models with local fluid dynamics properties (e.g. Mach vectors) for easy integration into VA projects involving propagation in ducts, mufflers, and other similar cases. The full automation of CFD model set-up, meshing and post-processing from within VA One makes CFD calculations easily accessible to non CFD-specialists.

Steven G. Mattson, President of Great Lakes Sound & Vibration (GLSV), based in Michigan, USA, has used VA One for a number of years and more specifically for recent projects to develop silencers for exhaust systems. Mattson comments:

The introduction of flow effects into FEA acoustics models enables GLSV to evaluate the installed performance of engine silencing systems more accurately and with a higher level of confidence. Because the CFD is integrated into the workflow, it allows us to perform multiple design iterations, including flow effects, in a short time frame. VA One 2014.5 provides a significant capability increase with the added functionality of flow effects."

The latest version of VA One also contains significant advances in SEA modeling of complex plates. ESI's research teams have worked on a set of new formulations to accurately and quickly calculate the vibro-acoustic response of structures fabricated with the newer materials that are increasingly used in the aerospace industry, including sandwich panels with composite skins, composite panels and laminated visco-elastic panels. Thanks to these new developments, VA engineers can now assess the impact of turbulent boundary layers excitations on every possible type of panel, whatever their thickness and structure type.

An important evolution in the new VA One has been made in the arena of Cloud Computing to satisfy the needs of small companies requiring high performance computing facilities on an ad-hoc basis, and larger ones requiring a temporary increase in their computing capacity. ESI has partnered with Cloud Computing provider Rescale to offer Computing-on-Demand facilities for VA One. Through the built-in functionality added in VA One, users can now securely submit a BEM calculation from their desktop to the cloud. This enables them to reduce turnaround time and automatically recover results locally for post-processing and analysis. For more information about this new offer, please visit www.rescale.com

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ESI Group – Media Relations
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Celine.Gallerne@esi-group.com

About ESI: ESI is a world-leading provider of Virtual Prototyping software and services with a strong foundation in the physics of materials and Virtual Manufacturing.

Founded over 40 years ago, ESI has developed a unique proficiency in helping industrial manufacturers replace physical prototypes by virtually replicating the fabrication, assembly and testing of products in different environments. Virtual Prototyping enables ESI's clients to evaluate the performance of their product and the consequences of its manufacturing history, under normal or accidental conditions. By benefiting from this information early in the process, enterprises know whether a product can be built, and whether it will meet its performance and certification objectives, before any physical prototype is built. To enable customer innovation, ESI's solutions integrate the latest technologies in high performance computing and immersive Virtual Reality, allowing companies to bring products to life before they even exist.

Today, ESI's customer base spans nearly every industry sector. The company employs about 1000 high-level specialists worldwide to address the needs of customers in more than 40 countries

www.gompute.com/events/gum2014

Gompute User Meeting is an event that gathers all aspects related to Simulation and Technical Computing.

Gompute User Meeting 2015

- Discover the latest simulation and HPC software developments.
- Learn about how the Gompute software delivers comprehensive HPC and where it is used.
- Meet experienced analysts.
- Learn about the state of the art on commercially available computing services.
- Meet colleagues active in the field of technical computing and simulation.
- Attend workshops on latest techniques in HPC and simulation tools.

At the 2015 Gompute User Meeting, Engineers, Scientific Users, Designers, contractors, Analysts, Academics, Managers and Executives will meet up to share best practices and tips from their simulation experience.

This convention of Comprehensive Technical Computing is free of charge for attendes, and here you can meet engineers and experts of several related fields in order to improve your engineering and simulation skills.

Topics:

- Simulation Tools,
- Simulation techniques,
- Computing hardware,
- Linux for High Performance Computing,
- HPC Cloud,
- Remote Visulization

Venue:

Elite Park Avenue Hotel
Kungsportsavenyen 36-38
Gothenburg, Sweden

www.topcrunch.org/

The TopCrunch project was initiated to track the aggregate performance trends of high performance computer systems and engineering software

Instead of using a synthetic benchmark, actual engineering software applications are used with real data and are run on high performance computer systems. The data are available for download in the form of data files for our current software suite. The results of the benchmarks are available as submitted, and may be searched by data, code name, and year

Vendor/Submitter: Super Micro Computer, Inc./System Performance Team
Computer Interconnect: SBI-7228R-T2F/B10DRT/Mellanox QDR IB
Processor: Intel Xeon E5-2690 V3 @2.60GHz

#Nodes x #Processors per Node x #Cores Per Processor = Total #CPU	Time (sec)	Benchmark Problem
16 x 2 x 12 = **384**	51	neon_refined_revised
8 x 2 x 12 = **192**	61	neon_refined_revised
4 x 2 x 12 = **96**	91	neon_refined_revised
2 x 2 x 12 = **48**	155	neon_refined_revised
1 x 2 x 12 = **24**	247	neon_refined_revised
16 x 2 x 12 = **384**	416	3 Vehicle Collision
8 x 2 x 12 = **192**	629	3 Vehicle Collision
4 x 2 x 12 = **96**	991	3 Vehicle Collision
2 x 2 x 12 = **48**	1727	3 Vehicle Collision
16 x 2 x 12 = **384**	2807	car2car
1 x 2 x 12 = **24**	3314	3 Vehicle Collision
8 x 2 x 12 = **192**	4589	car2car
4 x 2 x 12 = **96**	9196	car2car
2 x 2 x 12 = **48**	16132	car2car
1 x 2 x 12 = **24**	30744	car2car

/www.dynamore.ch/de

DYNAmore Swiss

Bernd Hochholdinger

DYNAmore Swiss in Zurich is founded by Dynamore (Germany) together with Bernd Hochholdinger.

It is a spin-off company of ETH Zurich. DYNAmore Swiss GmbH.

DYNAmore Swiss has now moved into its permanenet premises at TECHNOPARK® in Zurich and is a direct distributor of Livermore Software Technology Corporation.

DYNamore Swiss serves the Swiss market with technical support and sales of LS-DYNA, including at no additional fees; LS-PrePost, LS-TaSC and the LSTC ATD and Barrier Models..

In addition to the main stream applications of LS-DYNA in crash and metal forming, DYNamore Swiss is working with the high tech industries in Switzerland like the watch and clock industry, the medical industry and with railway and energy companies.

DYNAmore Swiss is also proud to assist renown Swiss Universities and research organizations to solve problems with LS-DYNA.

Please feel free to contact DYNAmore Swiss!

E-Mail: bh@dynamore.ch

Telephone: +41- 445157890

DYNAmore Swiss GmbH
Dr. Bernd Hochholdinger
Technoparkstrasse 1
CH-8005 Zürich

10th European LS-DYNA Conference

June 15 - 17 2015, Würzburg, Germany

We kindly invite all users of LS-DYNA, LS-OPT, LS-PrePost and LS-TaSC to take advantage of this fantastic opportunity to showcase their work. The Conference is your chance to talk with industry experts, catch up with colleagues and enjoy time exploring new ideas. In addition, attendees can meet with exhibitors to learn about the latest hardware and software trends, as well as additional services relating to the finite element solver LS-DYNA, the optimization codes LS-OPT and LS-TaSC, and the pre- and postprocessor LS-PrePost. Make sure that you will be part of the conference by submitting your abstract soon!

Conference website:
www.dynamore.de/ls-dyna2015-e
Abstract online submission:
www.dynamore.de/eu-ls-dyna-abstract-e
Flyer (pdf):
www.dynamore.de/c4p-ls-dyna2015-e

Abstract submission
Please submit an abstract (300 words) by E-Mail to forum@dynamore.de or online at http://www.dynamore.de/ls-dyna2015

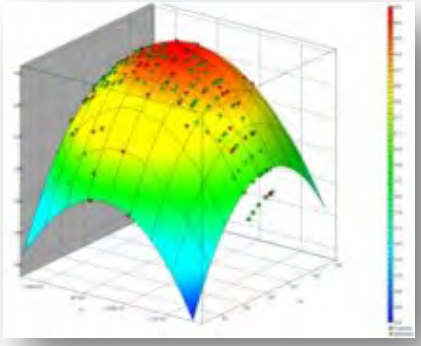
Important dates

Abstract submission:	13 February 2015
Author notification:	6 March 2015
Final paper deadline:	20 April 2015

Contact and registration
DYNAmore GmbH
Industriestr. 2, D-70565 Stuttgart, Germany
Tel. +49 (0) 7 11 - 45 96 00 – 0
Fax. +49 (0) 7 11 - 45 96 00 – 29
E-Mail: forum@dynamore.de
http://www.dynamore.de/ls-dyna2015

Venue:
Würzburg is a beautiful historical city and a UNESCO World Cultural Heritage site, which is easily accessible from Frankfurt International Airport by train or by car. The Congress Centrum at the Maritim Hotel Würzburg is centrally located directly on the banks of the river Main, offering a splendid view of the Marienberg fortress. Visitors can comfortably explore the baroque inner city with its numerous sights by foot.

www.lsoptsupport.com/documents/tutorials/ls-opt/tutorials



metamodel

Tutorial examples for LS-OPT 5.1 now available,

including an example for multi-level optimization

New tutorial examples available

Tutorial examples for LS-OPT 5.1 are now available, including an example for multi-level optimization:

LS-OPT Training Class Tutorial Problems

This tutorial problem set allows LS-OPT users to exercise aspects of mathematical optimization, design optimization and robust design. LS-OPTui is used to create or modify the input.

A first part of the problem set attempts to simulate the design process for examples that are typical for the LS-DYNA® user. Detours have been introduced to investigate features related to a particular design step in more detail. The examples are

- Crashworthiness optimization of a vehicle
- Mode tracking
- Multidisciplinary Design Optimization
- Material parameter identification

Another example has an explicit algebraic formulation. The purpose is to introduce the user to the mathematical aspects of approximations, accuracy and convergence. The example is
..Nonlinear explicit problem

The final part of the problem set teaches the user how to assess reliability of a design, investigate the sources of variability on the FE model and incorporate the effect of uncertainties during design. The categories are:

- Reliability
- Outlier Analysis
- Reliability-based design optimization
- Robust design

The run times for the examples vary between a few seconds (simple explicit problems) and ~10 min. (3GHz) (Iterative optimization using LS-DYNA for crash optimization). The longest DYNA simulation time is about 15s.

Available on the site

- LS-OPT Training Examples
- LS-OPT Tutorial

Kaizenat is glad to announce 2015 schedule of LS-DYNA classes presented in Bangalore and Pune.

The details about the trainings offered are given below

LS-DYNA Training Schedule	
Topic	**Date**
LS-DYNA Software Training	Feb 11-13
Contact Modelling Advanced Training	Feb 19-20
LS-DYNA Software Training	Mar 11-13
Material Modelling Advanced Training	Mar 19-20
LS-DYNA Software Training	Apr 15-17
Advanced Crash Analysis	Apr 23-24
LS-DYNA Software Training	May 13-15
Airbag Deployment Application	May 21-22
LS-DYNA Software Training	Jun 10-12
Advanced Material Forming Analysis	Jun 18-19

Information & Agenda:

Classes generally start at 9:30 a.m. and end at 5:00 p.m. Access to computer for workshop exercises and lunch each day are included with the registration. For details on agenda please Click Here and to register for the training please Click Here. For any queries/clarification please contact us @ support@kaizenat.com

http://blog.d3view.com/

Simlyzer® helps in intelligent unaRended simulation data extraction, analysis & storage

d3VIEW is a web based platform that reduces over 80% of post-simulation time and effort by providing out-of-the box data extraction, transformation and powerful interactive visualizations to design better products.

Benefits: As vast amount of data is generated from simulations, Engineers and Scientists spend a lot of time in non-engineering tasks before arriving at a design decision based on simulation results to improve the product.
d3VIEW provides a single platform that enables users to go from Data to Decision in a significantly reduced time while providing deeper insights using powerful coordinated visualizations of the data.

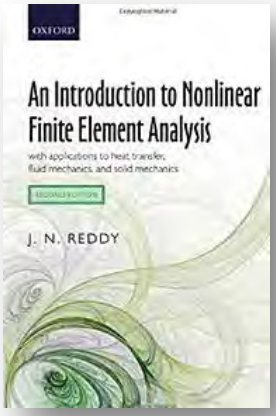
Features

- HPC Job Lifecycle Monitoring and Interactive Results Visualizer.
- Interactive HPC Resource Data Visualizer.
- Intelligent Unsupervised Simulation Data Extractor and Analyzer.
- Workspaces (Projects) to manage Teams, Documents and Tasks.
- Library of Industry specific Smart Templates.
- Plugin-Free 3D Data Renderer.
- Generic Datasets to Study, Analyze Big Data.› Export Data to PPT, PDF, Word and Excel.

SIMLYZER™ - Simulation Data Extraction and Analysis Technology. As a core technology, d3VIEW's Simlyzer® helps in intelligent unaRended simulation data extraction, analysis and storage using existing hardware to provide deep insights into every single simulation.
Our patent pending technology is based on years of research and development and has been honed over several years of in-house and real-world testing.
Simlyzer® has proven to work on any product and can be extended to non-simulation data such as physical test data and material data.

SIMLYTIKS™ - Hybrid data aggregator with powerful interactive visualization.
Aggregate data from simulations and tests and use rich interactive visualizations to understand key measure so you can make decisions quickly and smartly. You can tie the data Machine Learning software like LS-OPT in newer release of d3VIEW to further enrich your understanding of data.

Book Second edition - An Introduction to Nonlinear Finite Element Analysis



An Introduction to Nonlinear Finite Element Analysis: with applications to heat transfer, fluid mechanics, and solid mechanics

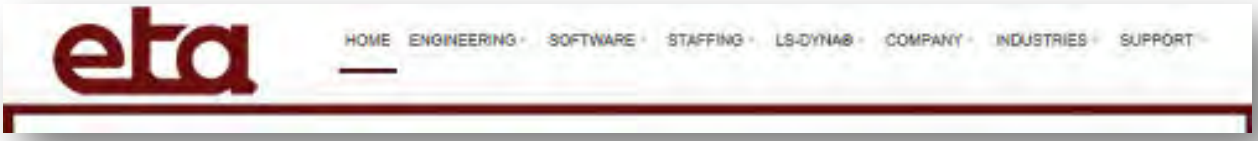
Hardcover – January 6, 2015

The second edition of An Introduction to Nonlinear Finite Element Analysis has the same objective as the first edition, namely, to facilitate an easy and thorough understanding of the details that are involved in the theoretical formulation, finite element model development, and solutions of nonlinear problems. The book offers an easy-to-understand treatment of the subject of nonlinear finite element analysis, which includes element development from mathematical models and numerical evaluation of the underlying physics.

The new edition is extensively reorganized and contains substantial amounts of new material. Chapter 1 in the second edition contains a section on applied functional analysis. Chapter 2 on nonlinear continuum mechanics is entirely new. Chapters 3 through 8 in the new edition correspond to Chapter 2 through 8 of the first edition, but with additional explanations, examples, and exercise problems. Material on time dependent problems from Chapter 8 of the first edition is absorbed into Chapters 4 through 8 of the new edition. Chapter 9 is extensively revised and it contains up to date developments in the large deformation analysis of isotropic, composite and functionally graded shells. Chapter 10 of the first edition on material nonlinearity and coupled problems is reorganized in the second edition by moving the material on solid mechanics to Chapter 12 in the new edition and material on coupled problems to the new chapter, Chapter 10, on weak-form Galerkin finite element models of viscous incompressible fluids. Finally, Chapter 11 in the second edition is entirely new and devoted to least-squares finite element models of viscous incompressible fluids. Chapter 12 of the second edition is enlarged to contain finite element models of viscoelastic beams. In general, all of the chapters of the second edition contain additional explanations, detailed example problems, and additional exercise problems. Although all of the programming segments are in Fortran, the logic used in these Fortran programs is transparent and can be used in Matlab or C++ versions of the same. Thus the new edition more than replaces the first edition, and it is hoped that it is acquired by the library of every institution of higher learning as well as serious finite element analysts.

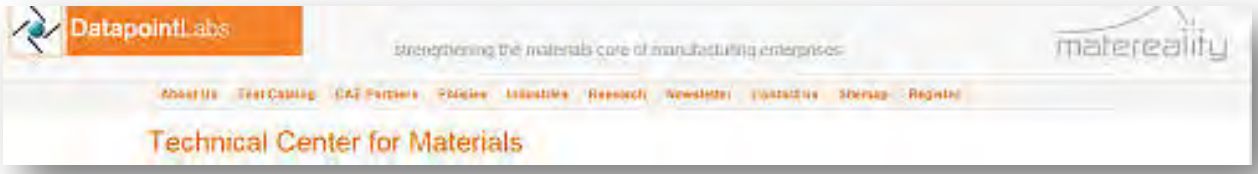
The book may be used as a textbook for an advanced course (after a first course) on the finite element method or the first course on nonlinear finite element analysis. A solutions manual is available on request from the publisher to instructors who adopt the book as a textbook for a course.

www.dynasupport.com/ **LS-DYNA Support**	Answers to basic and advanced questions that might occur while using LS-DYNA. New releases/ongoing developments.
www.dynalook.com/ **Papers**	Papers from LS-DYNA User Conferences with search option.
www.lsoptsupport.com/ **LS-OPT**	LS-OPT, developed by LSTC to interface with LS-DYNA
www.dummymodels.com/ **Dummy Models**	Detailed information on dummy models for LS-DYNA
www.topcrunch.org/ **Benchmarks**	Track the aggregate performance trends of high performance computer systems, with real data
www.dynaexamples.com/keyword-search **LS-DYNA Examples**	Examples for specific LS-DYNA keywords, with search option



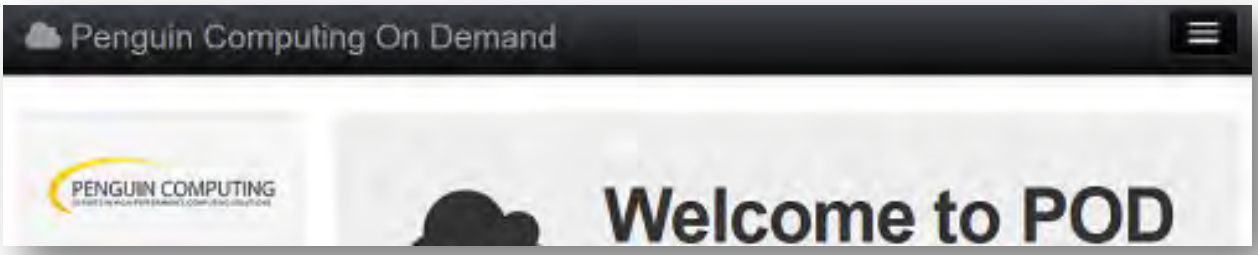
Engineering Services, Simulation Software & Staffing **www.eta.com**

ETA provides engineering & development services from Concept to Product. The company offers a variety of services including product design, complete product development solutions, on-site engineering support, computer aided engineering (CAE) analysis, finite element analysis (FEA) analysis, engineering staffing and IT services.



DatapointLabs **www.datapointlabs.com/**

DatapointLabs is a US-based center of excellence for the measurement of physical properties of materials required for product development, CAE and R&D. Established in 1995, the company's ISO17025 accredited test laboratory provides 5-business-day turnaround on standard testing of virtually any materials used in the products of today and tomorrow.



Penguin's On-Demand HPC Cloud **www.penguincomputing.com/**

Penguin's On-Demand HPC Cloud gives you true HPC computing power and true value: pay for just what you use. Our compute enviroment includes a non-virtualized compute cluster, GPUs, low-latency interconnects, high-performance storage, and a complete HPC software stack.

BETA CAE Systems S.A. **www.beta-cae.gr**

BETA CAE Systems S.A.– ANSA

An advanced multidisciplinary CAE pre-processing tool that provides all the necessary functionality for full-model build up, from CAD data to ready-to-run solver input file, in a single integrated environment. ANSA is a full product modeler for LS-DYNA, with integrated Data Management and Process Automation. ANSA can also be directly coupled with LS-OPT of LSTC to provide an integrated solution in the field of optimization.

BETA CAE Systems S.A.– μETA

Is a multi-purpose post-processor meeting diverging needs from various CAE disciplines. It owes its success to its impressive performance, innovative features and capabilities of interaction between animations, plots, videos, reports and other objects. It offers extensive support and handling of LS-DYNA 2D and 3D results, including those compressed with SCAI's FEMZIP software

Solutions for:

Process Automation - Data Management – Meshing – Durability - Crash & Safety NVH - CFD - Thermal analysis - Optimization - Powertrain Products made of composite materials - Analysis Tools -

Maritime and Offshore Design - Aerospace engineering - Biomechanics

CRAY **www.cray.com**

Cray CS300-AC Cluster Supercomputer

The Cray CS300-AC cluster supercomputer features an air-cooled architecture based on blade server or rackmount server building block platforms. The system is built for capacity and data-intensive workloads. It delivers turnkey high performance computing with a broad range of flexible system configuration options.

The CS300-AC system features two new preconfigured ready-to-go solutions, the CS300 shared memory parallel and the CS300 large memory systems.

Cray CS300-LC Cluster Supercomputer

The Cray CS300-LC cluster solution features a direct liquid-cooled architecture using warm water heat exchangers instead of chillers. It delivers a turnkey, energy-efficient solution that reduces datacenter power and cooling operation costs for faster ROI while addressing capacity and data-intensive workloads.

Cray XC30 Supercomputer Series

The Cray XC30 family delivers on Cray's commitment to an adaptive supercomputing architecture that provides both extreme scalability and sustained performance. The flexibility of the Cray XC30 platform ensures that users can configure the exact machine to meet their specific requirements today, and also remain confident they can upgrade and enhance their system to address the demands of the future.

Cray Sonexion Scale-out Lustre Storage System

Brought to you by Cray, the world's leading experts in parallel storage solutions for HPC and the technical enterprise, the Cray Sonexion is a fully integrated, modular and compact scale-out storage system for Lustre.

DatapointLabs **www.datapointlabs.com**

Testing over 1000 materials per year for a wide range of physical properties, DatapointLabs is a center of excellence providing global support to industries engaged in new product development and R&D.

The compary meets the material property needs of CAE/FEA analysts, with a specialized product line, TestPaks®, which allow CAE analysts to easily order material testing for the calibration of over 100 different material models.

DatapointLabs maintains a world-class testing facility with expertise in physical properties of plastics, rubber, food, ceramics, and metals.

Core competencies include mechanical, thermal and flow properties of materials with a focus on precision properties for use in product development and R&D.

Engineering Design Data including material model calibrations for CAE Research Support Services, your personal expert testing laboratory Lab Facilities gives you a glimpse of our extensive test facilities Test Catalog gets you instant quotes for over 200 physical properties.

ETA – Engineering Technology Associates **www.eta.com**

etainfo@eta.com

Inventium Suite™

Inventium Suite™ is an enterprise-level CAE software solution, enabling concept to product. Inventium's first set of tools will be released soon, in the form of an advanced Pre & Post processor, called PreSys.

Inventium's unified and streamlined product architecture will provide users access to all of the suite's software tools. By design, its products will offer a high performance modeling and post-processing system, while providing a robust path for the integration of new tools and third party applications.

PreSys

Inventium's core FE modeling toolset. It is the successor to ETA's VPG/PrePost and FEMB products. PreSys offers an easy to use interface, with drop-down menus and toolbars, increased graphics speed and detailed graphics capabilities. These types of capabilities are combined with powerful, robust and accurate modeling functions.

VPG

Advanced systems analysis package. VPG delivers a unique set of tools which allow engineers to create and visualize, through its modules--structure, safety, drop test, and blast analyses.

DYNAFORM

Complete Die System Simulation Solution. The most accurate die analysis solution available today. Its formability simulation creates a "virtual tryout", predicting forming problems such as cracking, wrinkling, thinning and spring-back before any physical tooling is produced

ESI Group **www.esi-group.com**

Visual-Environment: An integrated suite of solutions which operate either concurrently or standalone within a common environment. It aims at delivering an open collaborative engineering framework. As such, it is constantly evolving to address various disciplines and available solvers.

Visual-Crash is a dedicated environment for crash simulation: It helps engineers get their job done in the smoothest and fastest possible way by offering an intuitive windows-based graphical interface with customizable toolbars and complete session support.

For LS-DYNA users, Visual-Crash DYNA allows to focus and rely on high quality digital models, from start to finish as it addresses the coupling with competitive finite element or rigid body based software. This very open and versatile environment simplifies the work of CAE engineers across the enterprise by facilitating collaboration and data sharing.

Further tools are integrated in Visual-Environment enhancing CAE engineers work tasks most efficiently.

Visual-Mesh generates 1D, 2D and 3D elements for any kind of simulation. Visual-Mesh provides automatic and guided surfaces clean up, application specific mesh generation and intuitive post mesh editing features..

Visual-Viewer is a complete, productive and innovative post-processing environment for CAE applications.

Visual-Viewer delivers a dedicated plotting and animation control solution. It offers a multi page, multi plot environment, allowing to group data into pages and plots. It is designed with a Windows GUI based on an intuitive and sleek user interface.

Visual-Process Executive is an advanced CAE environment for process customization and automation.

VisualDSS is an End-to-End Decision Support System for CAE. Manufacturers widely resort to Simulation-Based Design to gain a competitive edge in product development.

Gompute on demand®/ Gridcore AB Sweden

www.gompute.com **www.gridcore.se**

Gompute is owned, developed and operated by Gridcore AB in Sweden. Founded in 2002, Gridcore is active in three areas: Systems Integration, Research & Development and HPC as a service.

Gridcore has wide experience of different industries and applications, developed a stable product portfolio to simplify an engineer/scientist's use of computers, and has established a large network of partners and collaborations, where we together solve the most demanding computing tasks for our customers. Gridcore has offices in Gothenburg (Sweden), Stuttgart (Germany), Durham NC (USA) and sales operations in The Netherlands and Norway.

The Gridcore developed E-Gompute software for internal HPC resources gives end users (the engineers) an easy-to-use and complete environment when using HPC resources in their daily work, and enables collaboration, advanced application integrations, remote pre/post, accounting/billing of multiple teams, license tracking, and more, accelerating our customers usage of virtual prototyping

.

JSOL Corporation **www.jsol.co.jp/english/cae/**

HYCRASH

Easy-to-use one step solver, for Stamping-Crash Coupled Analysis. HYCRASH only requires the panels' geometry to calculate manufacturing process effect, geometry of die are not necessary. Additionally, as this is target to usage of crash/strength analysis, even forming analysis data is not needed. If only crash/strength analysis data exists and panel ids is defined. HYCRASH extract panels to calculate it's strain, thickness, and map them to the original data.

JSTAMP/NV

As an integrated press forming simulation system for virtual tool shop the JSTAMP/NV meets the various industrial needs from the areas of automobile, electronics, iron and steel, etc. The JSTAMP/NV gives satisfaction to engineers, reliability to products, and robustness to tool shop via the advanced technology of the JSOL Corporation.

JMAG

JMAG uses the latest techniques to accurately model complex geometries, material properties, and thermal and structural phenomena associated with electromagnetic fields. With its excellent analysis capabilities, JMAG assists your manufacturing process

Livermore Software Technology Corp. **www.lstc.com**

LS-DYNA

A general-purpose finite element program capable of simulating complex real world problems. It is used by the automobile, aerospace, construction, military, manufacturing, and bioengineering industries. LS-DYNA is optimized for shared and distributed memory Unix, Linux, and Windows based, platforms, and it is fully QA'd by LSTC. The code's origins lie in highly nonlinear, transient dynamic finite element analysis using explicit time integration.

LS-PrePost: An advanced pre and post-processor that is delivered free with LS-DYNA. The user interface is designed to be both efficient and intuitive. LS-PrePost runs on Windows, Linux, and Macs utilizing OpenGL graphics to achieve fast rendering and XY plotting.

LS-OPT: LS-OPT is a standalone Design Optimization and Probabilistic Analysis package with an interface to LS-DYNA. The graphical preprocessor LS-OPTui facilitates definition of the design input and the creation of a command file while the postprocessor provides output such as approximation accuracy, optimization convergence, tradeoff curves, anthill plots and the relative importance of design variables.

LS-TaSC: A Topology and Shape Computation tool. Developed for engineering analysts who need to optimize structures, LS-TaSC works with both the implicit and explicit solvers of LS-DYNA. LS-TaSC handles topology optimization of large non-linear problems, involving dynamic loads and contact conditions.

LSTC Dummy Models:

Anthropomorphic Test Devices (ATDs), as known as "crash test dummies", are life-size mannequins equipped with sensors that measure forces, moments, displacements, and accelerations.

LSTC Barrier Models: LSTC offers several Offset Deformable Barrier (ODB) and Movable Deformable Barrier (MDB) model.

Oasys Ltd. LS-DYNA Environment **www.oasys-software.com/dyna**

The Oasys Suite of software is exclusively written for LS-DYNA® and is used worldwide by many of the largest LS-DYNA® customers. The suite comprises of:

Oasys PRIMER

Key benefits:

- Pre-Processor created specifically for LS-DYNA®
- Compatible with the latest version of LS-DYNA®
- Maintains the integrity of data
- Over 6000 checks and warnings – many auto-fixable
- Specialist tools for occupant positioning, seatbelt fitting and seat squashing (including setting up pre-simulations)
- Many features for model modification, such as part replace
- Ability to position and depenetrate impactors at multiple locations and produce many input decks automatically (e.g. pedestrian impact, interior head impact)
- Contact penetration checking and fixing
- Connection feature for creation and management of connection entities.
- Support for Volume III keywords and large format/long labels
- Powerful scripting capabilities allowing the user to create custom features and processes

www.oasys-software.com/dyna

Oasys D3PLOT

Key benefits:

- Powerful 3D visualization post-processor created specifically for LS-DYNA®
- Fast, high quality graphics
- Easy, in-depth access to LS-DYNA® results
- Scripting capabilities allowing the user to speed up post-processing, as well as creating user defined data components

Oasys T/HIS

Key benefits:

- Graphical post-processor created specifically for LS-DYNA®
- Automatically reads all LS-DYNA® results
- Wide range of functions and injury criteria
- Easy handling of data from multiple models
- Scripting capabilities for fast post-processing

Oasys REPORTER

Key benefits:

- Automatic report generation tool created specifically for LS-DYNA®
- Automatically post-process and summarize multiple analyses
- Built-in report templates for easy automatic post-processing of many standard impact tests

Shanghai Hengstar

www.hengstar.com

Center of Excellence: Hengstar Technology is the first LS-DYNA training center of excellence in China. As part of its expanding commitment to helping CAE engineers in China, Hengstar Technology will continue to organize high level training courses, seminars, workshops, forums etc., and will also continue to support CAE events such as: China CAE Annual Conference; China Conference of Automotive Safety Technology; International Forum of Automotive Traffic Safety in China; LS-DYNA China users conference etc.

On Site Training: Hengstar Technology also provides customer customized training programs on-site at the company facility. Training is tailored for customer needs using LS-DYNA such as material test and input keyword preparing; CAE process automation with customized script program; Simulation result correlation with the test result; Special topics with new LS-DYNA features etc..

Distribution & Support: Hengstar distributes and supports LS-DYNA, LS-OPT, LS-Prepost, LS-TaSC, LSTC FEA Models; Hongsheng Lu, previously was directly employed by LSTC before opening his distributorship in China for LSTC software. Hongsheng visits LSTC often to keep update on the latest software features.

Hengstar also distributes and supports d3View; Genesis, Visual DOC, ELSDYNA; Visual-Crash Dyna, Visual-Process, Visual-Environment; EnkiBonnet; and DynaX & MadyX etc.

Consulting

As a consulting company, Hengstar focus on LS-DYNA applications such as crash and safety, durability, bird strike, stamping, forging, concrete structures, drop analysis, blast response, penetration etc with using LS-DYNA's advanced methods: FEA, ALE, SPH, EFG, DEM, ICFD, EM, CSEC**.**.

Distribution/Consulting	US/Canada	Distribution/Consulting

Canada	**Metal Forming Analysis Corp MFAC**		galb@mfac.com	
	www.mfac.com			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	
	eta/DYNAFORM	INVENTIUM/PreSys		
United States	**CAE Associates Inc.**		info@caeai.com	
	www.caeai.com			
	ANSYS Products	CivilFem	Consulting ANSYS	
			Consulting LS-DYNA	
United States	**DYNAMAX**		sales@dynamax-inc.com	
	www.dynamax-inc.com			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models		LSTC Barrier Models	

United States	**ESI-Group N.A** www.esi-group.com			
	QuikCAST	SYSWELD	PAM-RTM	PAM-CEM
	VA One	CFD-ACE+	ProCAST	Visual-Process
	VisualDSS	Weld Planner	Visual-Environment	IC.IDO
United States	**Engineering Technology Associates – ETA** www.eta.com		etainfo@eta.com	
	INVENTIUM/PreSy	NISA	VPG	LS-DYNA
	LS-OPT	DYNAform		
United States	**Gompute** www.gompute.com		info@gompute.com	
	LS-DYNA Cloud Service		Additional software	
	Additional Services			
United States	**Comet Solutions**		steve.brown@cometsolutions.com	
	Comet Software			

United States	**Livermore Software Technology Corp**		sales@lstc.com	
	LSTC www.lstc.com			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	TOYOTA THUMS	

United States	**Predictive Engineering** www.predictiveengineering.com		george.laird@predictiveengineering.com	
	FEMAP	NX Nastran	LS-DYNA	LS-OPT
	LS-PrePost	LS-TaSC	LSTC Dummy Models	
			LSTC Barrier Models	

France	**DynaS+**		v.lapoujade@dynasplus.com	
	www.dynasplus.com		Oasys Suite	
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	DYNAFORM	VPG	MEDINA	
	LSTC Dummy Models		LSTC Barrier Models	

Germany	**CADFEM GmbH**		lsdyna@cadfem.de
	www.cadfem.de		
	ANSYS	LS-DYNA	optiSLang
	ESAComp	AnyBody	
	ANSYS/LS-DYNA		

Germany	**DYNAmore GmbH**		uli.franz@dynamore.de	
	www.dynamore.de			
	PRIMER	LS-DYNA	FTSS	VisualDoc
	LS-OPT	LS-PrePost	LS-TaSC	DYNAFORM
	Primer	FEMZIP	GENESIS	Oasys Suite
	TOYOTA THUMS		LSTC Dummy & Barrier Models	

The Netherlands	**Infinite Simulation Systems B.V**		j.mathijssen@infinite.nl	
	www.infinite.nl			
	ANSYS Products	CivilFem	CFX	Fluent
	LS-DYNA	LS-PrePost	LS-OPT	LS-TaSC

Italy	**EnginSoft SpA**		info@enginsoft.it	
	www.enginsoft.it			
	ANSYS	MAGMA	Flowmaster	FORGE
	CADfix	LS-DYNA	Dynaform	Sculptor
	ESAComp	AnyBody	FTI Software	
	AdvantEdge	Straus7	LMS Virtual.Lab	ModeFRONTIER
Russia	**STRELA**		info@dynarussia.com	
	LS-DYNA	LS-TaSC	LS-OPT	LS-PrePost
	LSTC Dummy Models		LSTC Barrier Models	
Sweden	**DYNAmore Nordic**		marcus.redhe@dynamore.se	
	www.dynamore.se		Oasys Suite	
	ANSA	µETA	LS-DYNA	LS-OPT
	LS-PrePost	LS-TaSC	FastFORM	DYNAform
	FormingSuite		LSTC Dummy Models	
			LSTC Barrier Models	
Sweden	**GOMPUTE**		info@gridcore.com	
	www.gridcore.se		www.gompute.com	
	LS-DYNA Cloud Service		Additional software	

Switzerland	**DYNAmoreSwiss GmbH**		info@dynamore.ch	
	www.dynamore.ch			
	LS-DYNA		LS-OPT	LS-PrePost
	LS-TaSC		LSTC Dummy Models	
			LSTC Barrier Models	

UK	**Ove Arup & Partners**		dyna.sales@arup.com	
	www.oasys-software.com/dyna		TOYOTA THUMS	
	LS-DYNA		LS-OPT	LS-PrePost
	LS-TaSC	PRIMER	D3PLOT	T/HIS
	REPORTER	SHELL	FEMZIP	HYCRASH
	DIGIMAT	Simpleware	LSTC Dummy Models	
			LSTC Barrier Models	

Australia	**LEAP**			
	www.leapaust.com.au			
	ANSYS Mechanical	ANSYS CFD	ANSYS EKM	Recurdyn
	ANSYS DesignXplorer	ANSYS HPC	FlowMaster	Ensigh
	LS DYNA	DYNAform	Moldex 3D	FE-Safe
China	**ETA – China**		lma@eta.com.cn	
	www.eta.com/cn			
	Inventium	VPG	DYNAFORM	NISA
	LS-DYNA	LS-OPT	LSTC Dummy Models	LS-PrePost
			LSTC Barrier Models	LS-TaSC
China	**Oasys Ltd. China**		Stephen.zhao@arup.com	
	www.oasys-software.com/dyna			
	PRIMER D3PLOT	HYCRASH	T/HIS REPORTER	SHELL
	LS-DYNA	LS-OPT	LSTC Dummy Models	LS-PrePost
	DIGIMAT	FEMZIP	LSTC Barrier Models	LS-TaSC
China	**Shanghai Hengstar Technology**		info@hengstar.com	
	www.hengstar.com			
	LS-DYNA	LS-TaSC	LSTC Barrier Models	D3VIEW
	LS-PrePOST	LS-OPT	LSTC Dummy Models	
	Genesis	VisualDoc		ELSDYNA
	Visual-Crahs DYNA	Visual-Proeces		DynaX & MadyX
	Enki Bonnet	Visual Environement		

Distribution/Consultin	Europe	Distribution/Consulting

India	**Oasys Ltd. India**		lavendra.singh@arup.com	
	www.oasys-software.com/dyna			
	PRIMER	D3PLOT	T/HIS	
			LS-OPT	LSTC Dummy Models	LS-PrePost
			LS-DYNA	LSTC Barrier Models	LS-TaSC

India	**CADFEM Eng. Svce**		info@cadfem.in	
	www.cadfem.in			
	ANSYS	VPS	ESAComp	optiSLang
	LS-DYNA	LS-OPT	LS-PrePost	

India	**Kaizenat Technologies Pvt. Ltd**		support@kaizenat.com	
	http://kaizenat.com /			
	LS-DYNA	LS-OPT	LSTC Dummy Models	LS-PrePost
	Complete LS-DYNA suite of products		LSTC Barrier Models	LS-TaSC

Distribution/Consulting	Asia Pacific	Distribution/Consulting

Japan	**CTC**	LS-dyna@ctc-g.co.jp		
	www.engineering-eye.com			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	CmWAVE	
Japan	**JSOL**			
	www.jsol.co.jp/english/cae		Oasys Suite	
	JSTAMP	HYCRASH	JMAG	
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	TOYOTA THUMS	
	FUJITSU			
	http://jp.fujitsu.com/solutions/hpc/app/lsdyna			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	CLOUD Services	
Japan	**LANCEMORE**	info@lancemore.jp		
	www.lancemore.jp/index_en.html			
	Consulting			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models		
Japan	**Terrabyte**	**English:**		
	www.terrabyte.co.jp	www.terrabyte.co.jp/english/index.htm		
	Consulting			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	AnyBody	

Korea	**THEME**	wschung@kornet.com		
	www.lsdyna.co.kr		Oasys Suite	
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	Planets
	eta/DYNAFORM	FormingSuite	Simblow	TrueGRID
	JSTAMP/NV	Scan IP	Scan FE	Scan CAD
	FEMZIP			

Korea	**KOSTECH**	young@kostech.co.kr		
	www.kostech.co.kr			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM
	eta/DYNAFORM	DIGIMAT	Simuform	Simpack
	AxStream	TrueGrid	FEMZIP	

Taiwan	**Flotrend**	gary@flotrend.tw		
	www.flotrend.com.tw			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

Taiwan	**APIC**			
	www.apic.com.tw			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

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POD (Penguin Computing on Demand) offers software including LSTC's LS-DYNA
www.penguincomputing.com/services/hpc-cloud

Penguin HPC clusters are optimized for engineering workloads and offer:

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- Free support from HPC experts
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- Secure environment for private data
- Detailed billing reports for user groups and projects

Self Registration Portal – featuring rich--documentation, wiki, FAQ, pricing and more.
https://pod.penguincomputing.com/

POD Software Applications and Libraries (visit site for complete listing)
FEA, CFD and FDTD Modeling

- **LS-DYNA** / LS-PrePost LS-DYNA is an advanced general-purpose multiphysics simulation software package. Its core-competency lie in highly nonlinear transient dynamic finite element analysis (FEA) using explicit time integration. LS-PrePost is an advanced pre and post-processor that is delivered free with LS-DYNA.
- **OpenFoam:** OpenFOAM (Open source Field Operation And Manipulation) is a C++ toolbox for the development of customized numerical solvers, and pre-/post-processing utilities for the solution of continuum mechanics problems, including computational fluid dynamics (CFD).

- **ANSYS HFSS:** ANSYS HFSS software is the industry standard for simulating 3-D full-wave electromagnetic fields. Its gold-standard accuracy, advanced solver and compute technology have made it an essential tool for engineers designing high-frequency and high-speed electronic components.
- **ANSYS Fluent** ANSYS Fluent software contains the broad physical modeling capabilities needed to model flow, turbulence, heat transfer, and reactions for industrial applications.
- **Star-CD** and **Star-CCM+:** STAR-CCM+ is CD-adapco´s newest CFD software product. It uses the well established CFD solver technologies available in STAR-CD, and it employs a new client-server architecture and object oriented user interface to provide a highly integrated and powerful CFD analysis environment to users.
- **Convergent:** CONVERGE is a Computational Fluid Dynamics (CFD) code that completely eliminates the user time needed to generate a mesh through an innovative run-time mesh generation technique.
- **Lumerical:** Simulation tools that implement FDTD algorithms.

Cloud computing services
for
JSOL Corporation LS-DYNA users in Japan

JSOL Corporation is cooperating with chosen cloud computing services

JSOL Corporation, a Japanese LS-DYNA distributor for Japanese LS-DYNA customers.

LS-DYNA customers in industries / academia / consultancies are facing to the increase use of LS-DYNA more and more in recent years.

In calculations of optimization, robustness, statistical analysis, larger amount of LS-DYNA license in short term are required.

JSOL Corporation is cooperating with some cloud computing services for JSOL's LS-DYNA users and willing to provide large in short term license.

This service is offered to the customers by the additional price to existence on-premises license, which is relatively inexpensive than purchasing yearly license.

The following services are available

(only in Japanese).

HPC OnLine

NEC Solution Innovators, Ltd.
http://jpn.nec.com/manufacture/machinery/hpc_online/

Focus
Foundation for Computational Science
http://www.j-focus.or.jp

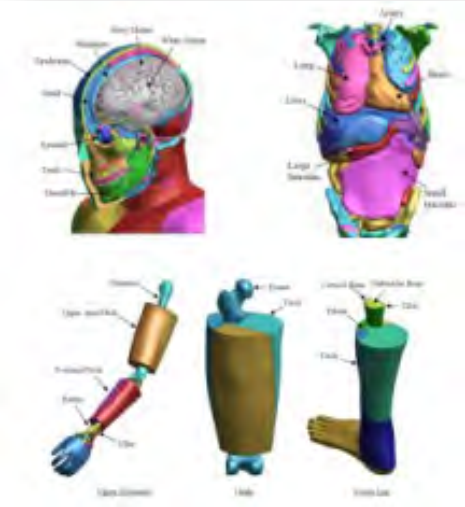
Platform Computation Cloud
CreDist.Inc.
http://www.credist.co.jp /

PLEXUS CAE
Information Services International-Dentsu, Ltd. (ISID) https://portal.plexusplm.com/plexus-cae/

SCSK Corporation
http://www.scsk.jp/product/keyword/keyword07.html

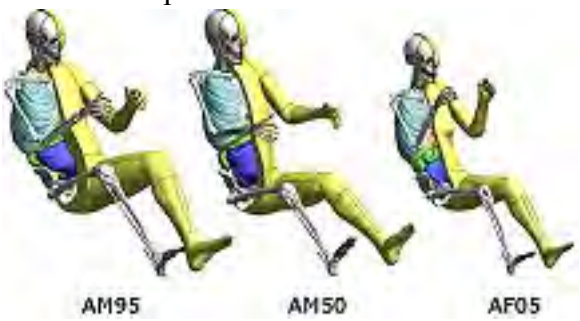
Contact; JSOL Corporation Engineering Technology Division cae-info@sci.jsol.co.jp

TOYOTA - Total Human Model for Safety – THUMS

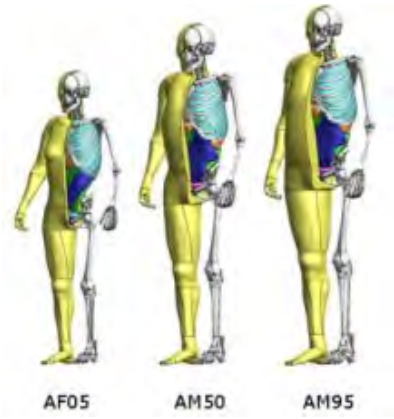


The Total Human Model for Safety, or THUMS®, is a joint development of Toyota Motor Corporation and Toyota Central R&D Labs. Unlike dummy models, which are simplified representation of humans, THUMS represents actual humans in detail, including the outer shape, but also bones, muscles, ligaments, tendons, and internal organs. Therefore, THUMS can be used in automotive crash simulations to identify safety problems and find their solutions.

Each of the different sized models is available as sitting model to represent vehicle occupants



and as standing model to represent pedestrians.



The internal organs were modeled based on high resolution CT-scans.

THUMS is limited to civilian use and may under no circumstances be used in military applications.

LSTC is the US distributor for THUMS. Commercial and academic licenses are available.

For information please contact:
THUMS@lstc.com

THUMS®, is a registered trademark of Toyota Central R&D Labs.

LSTC – Dummy Models

LSTC Crash Test Dummies (ATD)

Meeting the need of their LS-DYNA users for an affordable crash test dummy (ATD), LSTC offers the LSTC developed dummies at no cost to LS-DYNA users.

LSTC continues development on the LSTC Dummy models with the help and support of their customers. Some of the models are joint developments with their partners.

e-mail to: atds@lstc.com

Models completed and available (in at least an alpha version)

- Hybrid III Rigid-FE Adults
- Hybrid III 50th percentile FAST
- Hybrid III 5th percentile detailed
- Hybrid III 50th percentile detailed
- Hybrid III 50th percentile standing
- EuroSID 2
- EuroSID 2re
- SID-IIs Revision D
- USSID
- Free Motion Headform
- Pedestrian Legform Impactors

Models In Development

- Hybrid III 95th percentile detailed
- Hybrid III 3-year-old
- Hybrid II
- WorldSID 50th percentile
- THOR NT FAST
- Ejection Mitigation Headform

Planned Models

- FAA Hybrid III
- FAST version of THOR NT
- FAST version of EuroSID 2
- FAST version of EuroSID 2re
- Pedestrian Headforms
- Q-Series Child Dummies
- FLEX-PLI

LSTC – Barrier Models

Meeting the need of their LS-DYNA users for affordable barrier models, LSTC offers the LSTC developed barrier models at no cost to LS-DYNA users.

LSTC offers several Offset Deformable Barrier (ODB) and Movable Deformable Barrier (MDB) models:

- ODB modeled with shell elements
- ODB modeled with solid elements
- ODB modeled with a combination of shell and solid elements

- MDB according to FMVSS 214 modeled with shell elements
- MDB according to FMVSS 214 modeled with solid elements
- MDB according to ECE R-95 modeled with shell elements
- AE-MDB modeled with shell elements

- IIHS MDB modeled with shell elements
- IIHS MDB modeled with solid elements
- RCAR bumper barrier

- RMDB modeled with shell and solid elements

e-mail to: atds@lstc.com.

Elemance - the sole distributor of the Global Human Body Models

Who We Are:

Elemance is the sole distributor of the Global Human Body Models Consortium family of virtual models of the human body.

Currently Available:

The human model currently available for use is the 50th percentile male occupant (M50-O). The models are intended for human injury prediction in a variety of scenarios including sports, military, and automotive applications. The models were meticulously created to best represent the anatomy necessary to predict Crash Induced Injuries - but their application extends well beyond this area. The model's development was funded by the Global Human Body Models Consortium (GHBMC).

GHBMC M50-O

- 50th percentile male occupant
- Height 175 cm, Weight 76.8 kg
- 2.2 million elements
- Operates in LS-Dyna
- 400+ anatomical components
- Evaluated for 40+ crash induced injuries
- 60+ validation cases conducted at regional and full body levels
- 30+ peer-reviewed articles on its development GHBMC M50-O

Licensing Options:

- Commercial
- Academic

Information/Pricing/Contact:

sales@elemance.com

Web:

www.elemance.com

 **FACEBOOK**

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 **NEWS FEEDS** ETA:

YOUTUBE

YOUTUBE Channel	WebSite URL
BETA CAE SYSTEMS SA	www.beta-cae.gr
CADFEM	www.cadfem.de
Cray Inc.	www.cray.com
ESI Group	www.esi-group.com
ETA	www.eta.com
Lancemore	www.lancemore.jp/index_en.html

For information contact lsdynacourses@aol.com

www.lsdyna-online.com/

contact lsdynacourses@aol.com

February 12-13
Fluid Structure Interaction In LS-DYNA

February 19-20
Material Models In LS-DYNA

February 26-27
Introduction to LS-DYNA

March 3-4
Composites In LS-DYNA

March 5-6
Contact In LS-DYNA

March 12-13
Advance Impact Using LS-DYNA

March 19-20
Fracture, Damage, & Failure In LS-DYNA

Feb 2-4 California
ALE/Eulerian & Fluid/Structure Interaction in LS-DYNA

Training Classes

Feb 5-6 California **Space Available**
SPH: Smoothed Particle Hydrodynamics in LS-DYNA

classes@lstc.com

March 3 Michigan
ICFD_Day 1 : Introduction to CFD and CFD Applications

March 4 Michigan
ICFD_Day 2 : Focus on FSI and Heat Transfer

March 5 Michigan
Electromagnetism

March 23 Michigan
Intro to LS-PrePost

March 24-27 Michigan
Intro to LS-DYNA

March 30-31 Michigan
NVH & Frequency Domain Analysis in LS-DYNA

Germany	**CADFEM GmbH**	www.cadfem.de
Germany	**DYNAmore**	www.dynamore.de/en
US	**LSTC**	www.lstc.com
US	**ETA**	www.eta.com
US	**Cae Associates**	www.caeai.com
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France	**DynAS+**	www.dynasplus.com
Thailand	**DFE-Tech**	www.dfe-tech.com/training.html
UK	**ARUP**	www.oasys-software.com/dyna/en/training