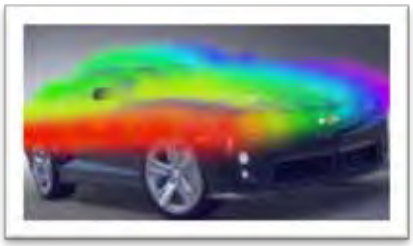
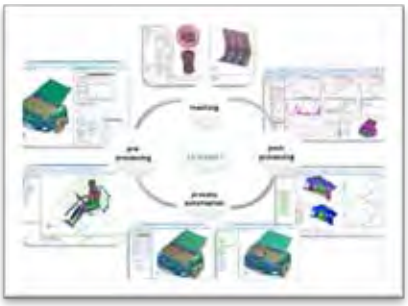
fea INFORMATION
Engineering Solutions

Volume 5, Issue 06, June 2016





FEA Information Inc.

A publishing company founded April 2000 – published monthly since October 2000.

The publication's focus is engineering technical solutions/information.

FEA Information Inc. publishes:

FEA Information Engineering Solutions

FEA Information Engineering Journal

FEA Information China Engineering Solutions

Livermore Software Technology, Corp. (LSTC) Developer of LS-DYNA One Code Methodology.

LS-DYNA provides fully integrated, strongly coupled, solvers for extensive multiphysics capabilities. Integrated, at no additional cost. Optimized for shared and distributed memory for Unix, Linux, & Windows Based platforms.

FEA Information Engineering Solutions – Dedicated To:

Finite Element Analysis * Hardware * Software * Cloud * Consulting * CAD * CAE Distribution* * Implicit * Explicit *Applications * Press Releases * Events * Training

logo courtesy - Lancemore


BETA
CAE Systems SA


CRAY


eta


JSOL


恒士达科技
Hengstar Tech.


Oasys
The Software House of Arup


rescale


DELL

FEA Information News Sections

Announcements

We welcome a new participant for your LS-DYNA needs in Mexico.

Full introduction in July!

Sales – Training – Technical Support

COMPLX (http://www.complx.com.mx)

Contact: Armando Toledo (armando.toledo@complx.com.mx)

Tel: (+52) 229.200.9573

ALE/Eulerian, Fluid/Structure Interaction in LS-DYNA

LTC office: Early discounted registration through June 30th

Aug 15-17 Mon-Wed

ALE/Eulerian, Fluid/Structure Interaction in LS-DYNA CA

Aug 18-19 Thur-Fri

SPH: Smoothed Particle Hydrodynamics in LS-DYNA CA

USA software training in Europe with T. Littlewood

DYNAS+ France:

Contact: Mr. Thomas Beal

t.beal@dynasplus.com

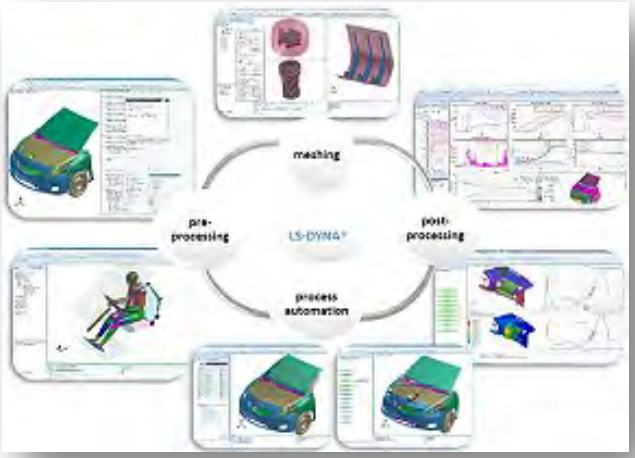
Sincerely,

Marsha Victory Trent Eggleston

Marnie Azadian Suri Bala Dilip Bhalsod Yanhua Zhao

ESI - the Release of its Multi-Domain Platform ESI Visual-Environment 12.0

Andrea Gittens



ESI Visual-Environment 12.0 is the most competitive multi-domain platform solution for multiple solvers. It helps engineers get their job done in the smoothest and fastest possible way by offering an intuitive graphical interface serving their need for comprehensive and integrated solutions for **meshing, pre/post processing, process automation, customization and simulation data & content management**.
Visual-Environment comprises tools and techniques to increase productivity and efficiency for LS-DYNA® workflow.

VISUAL-ENVIRONMENT
Release Highlights for LS-DYNA® users

- **Improvements in File Append/Merge**
  The Append panel was improved for usability and consistency. The interface provides Assembly > Advanced Renumber panel (alone) as a solution to resolve ID clashes.
- **Append Options:**
  - **Merge to active level**: The data in the loaded file is merged with the active include / sub-model. No INCLUDE card is created.
  - **Append as include:** The loaded file is added as an include file to the active include / sub-model. An INCLUDE card is created.
  - **Append as sub-model**: The loaded file is added as sub-model to the active include / sub-model. This means all data is bound between the two comment lines: $@SBMODEL_BEGIN : <loaded file name> and $@SBMODEL_END : <loaded file name>. This option is useful when you want your data in a single file but still want to organize it into various subsystems.
- **Renumbering Options, if ID clash exists:**
  During append operation, if there is a clash in ID between any entity in the current model (master model) and the loaded model (slave model), two options are available to resolve the clash. They are:
  - **Automatic:** On choosing the **Automatic** renumber option, if a clash in ID of any entity is detected, the tool will automatically shift the clashing entity ID of the loaded model to a unique number.
  - **Advanced:** If you want to apply your own renumbering rule, on selecting the **Advanced** option, Advanced Renumber panel is posted on detecting an ID clash with the current model. Here, you can apply the desired rule to eliminate the clash in IDs for any entity.

- During append, you are also provided with the flexibility to create *INCLUDE_TRANSFORM cards by entering the Offset IDs as desired. On selecting **Include Trsfrm** option, the **Automatic** and **Advanced** ID clash resolving options are greyed. The clash has to be resolved in this case by entering the proper offsets in the INCLUDE_TRANSFORM panel.
- **Improvements in File Export**
  The Export panel is improved to increase ease of use.
  - Once a file is exported, the information is remembered by the tool whether an include file is written out or not. Hence, the next time the Export panel is posted to export the same file in the same instance of Visual-Environment, the status of the include toggles are remembered.
  - The **Update Tree button**, which updated the export tree path with the directory name seen in the **Directory**: area, is removed in this release. For increased ease of use, the directory path and the names of the includes, if modified in the panel, are set automatically when the Export panel is activated the next time.
- **Improvements in Barrier Positioning**
  The Barrier Positioning tool is enhanced for protocol updates of IIHS side impact (VII) and IIHS Frontal Small Overlap barrier 25% or 15% (III).
  - **IIHS Side Impact (Updated)**
    Impact Reference Distance (IRD) calculation is updated as per the new regulation, which is:
    - If wheelbase < 250 cm, then IRD = 144.8 cm
    - If 250 cm < wheelbase < 290 cm, then IRD = (wheelbase / 2) + 19.8 cm
    - If wheelbase > 290 cm, then IRD = 164.8 cm
    - IIHS Frontal Small Overlap (New)

    Positioning of the barrier based on the IIHS Small Offset Regulations (25% or 15%) at the left side of the vehicle is now possible.

- **Improvements in VE Data Checker**
  - The VE Data Checker panel is improved to have a more easy-to-use interface.
    The keywords on whose data the data check can be performed are displayed in a tabular format for easy selection.
  - The XML file that can be used to define additional checks can be configured from the VE Data Checker panel itself through Pref... button
  - The specific ‘CheckByName’ value in the XML file is displayed in the ‘Type:’ combo box.
  - Improvements in Joints Checks

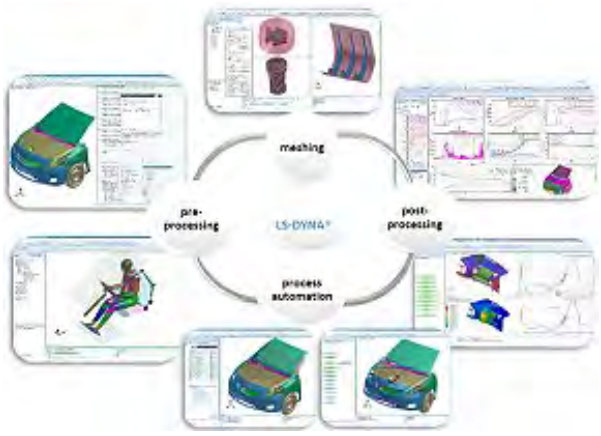
- **Controls and Database Management**
  Controls and Database definitions can be imported from a file into the current model, thereby providing a quick and easy way to compare and decide which controls should be kept. Controls can be imported into the environment.
  Controls or database entities imported from a file can be copied to the main model or to any include file. On reading in the file, the controls or database definitions in the file are compared against the corresponding entities of the current model through the Compare Controls panel that functions like the Model Compare panel.

- **Pedestrian Impact Zone Identifier Process**
  This tool enables you to identify the Headform Grid (HIT) Points for both Child and Adult as per EuroNCAP protocol. The output file's HIT data and part information can be used as input for the Pedestrian Impact Zone Simulation Setup Process.

- **Pedestrian Impact Zone Simulation Setup Process**
  This process guides you to set up an analysis deck for various hit locations inside and on the vehicle, for Interior and Pedestrian head impact analysis, respectively.

- **Visualization of Multi Direction Result**
  Visual-Viewer now supports customization of results with different display settings and their subsequent visualization. Visualization of multiple directions as a single component can be achieved by configuring the combined results with vector settings in Contour Custom Result file. Title attributes like Min/Max value or ID display can also be configured for custom result.

- **Support for Multi Annotation and Table Annotation**
  You can now use 'Value on selected entity' for multiple entities. These values can also be visualized as a table referred to in future as 'Table Annotation'.



ESI - the Release of its Multi-Domain Platform ESI Visual-Environment 12.0

ESI Visual-Environment continuously expands its collection of tools supporting Computer Aided Engineering (CAE) across multiple CAE domains in meshing, pre/post processing, reporting, automating CAE processes, customizing workflows, efficient handling of simulation data and content management as well as graphical support for Modelica based systems modeling. The Visual-Environment enables customers to work with many ESI solvers of different physics as well as solvers like LS-DYNA, MADYMO, RADIOSS and NASTRAN and provides multi-domain simulation facility within one single simulation environment.

General Release Highlights

- Usability updates across the platform for an improved user experience (CATIA Mouse scheme, Visual-Mesh, Visual-Viewer, Visual-Process, VisualDSS, etc.)
- Support for new versions of CAD formats (PARASOLID versions up to 28.0.159, ACIS up to 2016 1.0, AutoCAD (DXF/DWG) up to 2016 (Windows only), Inventor versions up to 2016 (Windows only) and Solid Edge versions up to ST8 (Windows only)
- ERF FEMZIP import, Surface data visualization for 2D and 3D, Measure of Draw-In, support of multi and table annotations among other updates in Visual-Viewer
- Enhanced new Shelling algorithm, improved Surface creation GUIs, among other updates in Visual-Mesh
- And many more …

ESI's customer portal is available for all ESI customers.

For additional product information, please feel free to visit our website, contact any of the local ESI subsidiaries or contact Andrea Gittens, Product Marketing Manager for ESI Visual-Environment.

For more ESI news, visit www.esi-group.com/press

For more ESI news, visit www.esi-group.com/press

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Connect with ESI on

Kaizen-DYNA mobile & web app built to help LS-DYNA Users

Introduced at the LS-DYNA Conference – Now In Demand!

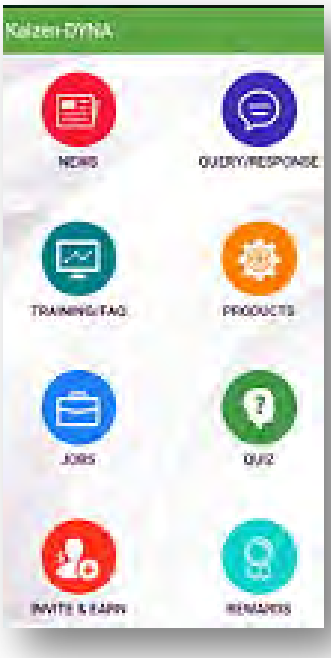
Kaizenat Tech. P. Ltd. (KTPL) participated at the 14th International LS-DYNA conference held June 12-14th 2016 at Detroit, USA along with a paper presentation on "Durability study of Tractor seat & drop test using LS-DYNA"

KTPL had the opportunity to co-sponsor welcome reception of the conference.

A highlight was KTPL joined the exhibitor booth of LSTC & FEA Information showcase our new App, Kaizen-DYNA-the trending platform to exchange technical knowledge.

Ramesh@kaizenat.com For Information

'Kaizenat-DYNA" is a mobile & web application which is built to help LS-DYNA Users to get instant answers for technical query from experts. Instead of support engineers spending couple of hours / days to duplicate the query & trying to find answer, this app aims at leveraging some other's knowledge who had already explored that particular topic. Though, Android version was launched during Nov 2015, IOS & web version was launched during this conference along with many enhancements requests of users.



The following are the salient features of the App which is beneficiary to the App

1. **NEWS** - Technical & General news related to CAE.
2. **QUERY/RESPONSE**- Post query, get instant response and earn coupons
3. **TRAINING /FAQ** - Learn LSTC suite of products easily through training videos and FAQs & Answers.
4. **PRODUCTS** – Check and know the best product that suits your requirements.
5. **JOBS** - Apply and Post jobs specific to LS-DYNA.
6. **QUIZ** – Participate and test your LS-DYNA Knowledge & earn coupons.
7. **INVITE AND EARN** - Invite your friends and earn coupon
8. **REWARDS** – Redeem your Rewards.

CRAY Inc. Launch of the Cray® Urika®-GX system

Sussy Tussy ctussy@cray.com Cray Inc.

§ Increase utilization and agility by dynamically allocating resources and running multiple workloads concurrently including Hadoop, Spark and graph

§ Get blazing-fast results at scale on even your most complex analytics workloads with a supercomputing approach for pervasive speed and performance

§ Easily handle your most demanding analytics with a system tuned for big data, including the integrated Cray Graph Engine with unparalleled pattern matching and relationship discovery

SEATTLE, WA -- (Marketwired) -- 05/24/16 -- Global supercomputer leader Cray Inc. (NASDAQ: CRAY) today announced the launch of the Cray® Urika®-GX system -- the first agile analytics platform that fuses supercomputing technologies with an open, enterprise-ready software framework for big data analytics. The Cray Urika-GX system gives customers unprecedented versatility for running multiple analytics workloads concurrently on a single platform that leverages the speed of a Cray supercomputer.

The size, scope, and complexity of big data analytics is exploding and creating problems for customers who are already struggling with cluster sprawl, a torrent of new applications, and increasing pressure to deliver faster insights. The Cray Urika-GX system is designed to eliminate these challenges of big data analytics. Cray's new agile analytics platform combines the unique scale and throughput capabilities of Cray supercomputers with the convenience of an appliance, the flexibility of industry-standard hardware, and an open software framework that enables customers to innovate as they run existing and emerging analytics workloads. The Cray Urika-GX system gives customers a powerful tool for delivering high-frequency insights.

Optimized for demanding analytics workloads, the Cray Urika-GX system is pre-tested and pre-integrated with the Hortonworks Data Platform providing Hadoop® and Apache Spark®, as well as the Cray Graph Engine, designed for solving the largest and most complex graph analytics problems. The system includes enterprise tools, such as OpenStack for management and Apache Mesos for dynamic configuration -- all designed to protect customers' investments in the rapidly-changing big data software landscape.

"The Urika-GX is a dynamic analytics solution that brings out the best of Cray's decades of expertise in providing our customers with world-class systems for data-intensive computing," said Peter Ungaro, president and CEO of Cray. "Customers have asked us to blend the unique features of our product lines into a single platform for data analytics. We took the Aries system interconnect from our supercomputers, the industry-standard architecture of our clusters, the scalable graph engine from the Urika-GD appliance, and the pre-integrated, open infrastructure of our Urika-XA system and combined them into one agile analytics platform. The Urika-GX gives our customers the tool they need to overcome their most advanced analytics challenges today, and the platform to bridge to tomorrow."

Cray Urika-GX systems are currently being used by multiple Cray customers across the life sciences, healthcare, and cybersecurity industries. The Broad Institute of MIT and Harvard, a non-profit research institute aimed at advancing the understanding and treatment of disease, is currently using the Cray Urika-GX system for analyzing high-throughput genome sequencing data.

"With the Cray Urika-GX, we had quality score recalibration results from our Genome Analysis Toolkit (GATK4) Apache Spark pipeline in nine minutes instead of forty minutes," said Adam Kiezun, GATK4 Project Lead at the Broad Institute. "This highlights the potential to accelerate delivery of genomic insights to researchers who are making breakthroughs in the fight against disease."

An exclusive feature of the Cray Urika-GX system is the Cray Graph Engine for fast, complex iterative discovery. Graph analytics has long been understood to pose some of the most difficult scaling and performance challenges for modern analytics systems. The Cray Graph Engine on the Urika-GX system, originally developed for the Cray Urika-GD Graph Discovery appliance, is typically ten to 100 times faster than current graph solutions for complex analytics operations. The Cray Graph Engine can run at any scale from a single processor to thousands of processors without compromising performance. With the Cray Graph Engine, customers can tackle multi-terabyte datasets comprised of billions of objects. The Cray Graph Engine can run in conjunction with open analytics tools such as Hadoop and Spark, enabling customers to build complete end-to-end analytics workflows and avoid unnecessary data movement.

"Analytics workflows are becoming increasingly sophisticated with businesses looking to integrate analytics such as streaming, graph, and interactive," says James Curtis, Senior Analyst, Data Platforms & Analytics at 451 Research. "An agile analytics platform that can eliminate many of the challenges data scientists face, as well as reduce the time it takes to get an integrated environment up and running has become a requirement for many enterprises."

The Cray Urika-GX system features Intel® Xeon® Broadwell cores, 22 terabytes of memory, 35 terabytes of local SSD storage capacity, and the Aries supercomputing interconnect, which provides the unmatched network performance necessary to solve the most demanding big data problems. Three initial enterprise-accessible configurations featuring 16, 32, or 48 nodes delivered in an industry standard 42U 19-inch rack will be available in Q3 2016, and larger configurations will be available in the second half of 2016.

For more information on the Cray Urika-GX system, please visit the Cray website at www.cray.com.

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.

Safe Harbor Statement: This press release contains forward-looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934 and Section 27A of the Securities Act of 1933, including, but not limited to, statements related to its product development plans, including the timing of availability of Cray Urika-GX systems, the sales prospects of Cray Urika-GX systems and the ability of Cray Urika-GX systems to perform as expected. These statements involve current expectations, forecasts of future events and other statements that are not historical facts. Inaccurate assumptions and known and unknown risks and uncertainties can affect the accuracy of forward-looking statements and cause actual results to differ materially from those anticipated by these forward-looking statements. Factors that could affect actual future events or results include, but are not limited to, the risk that Cray is not able to successfully complete its planned product development efforts related to the Cray Urika-GX within the planned timeframes or at all, the risk that Cray Urika-GX systems do not perform as expected or as required by customers or partners, the risk that Cray will not be able to sell Cray Urika-GX systems as expected and such other risks as identified in the Company's quarterly report on Form 10-Q for the quarter ended March 31, 2016, and from time to time in other reports filed by Cray with the U.S. Securities and Exchange Commission. You should not rely unduly on these forward-looking statements, which apply only as of the date of this release. Cray undertakes no duty to publicly announce or report revisions to these statements as new information becomes available that may change the Company's expectations.

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206/701-2044 - ir@cray.com
Source: Cray Inc
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TOPCRUNCH Benchmarks

Submission Date – June 2nd, 2016

Vendor Submitter: Huawei/HPC-Advisory Council

#Nodes x #Processors per Node x #Cores Per Processor = Total #CPU 8 x 2 x 14 = **224**

Computer/Interconnect	Processor	Time (Sec)	Benchmark Problem
FusionServer E9000, CH121 V3/Mellanox Technologies ConnectX-4 EDR InfiniBand	Intel(R) Xeon(R) CPU E5-2680 v4@ 2.40GHz	51	neon refined revised
FusionServer X6800, XH620 V3/Mellanox Technologies ConnectX-4 EDR InfiniBand	Intel(R) Xeon(R) CPU E5-2680 v4@ 2.40GHz	564	3 vehicle collision

Among The FEA Particpants at the 14th Int'l LS-DYNA Conference

Among The FEA Particpants at the 14th Int'l LS-DYNA Conference

CAE Associates - June News & Insights

: **Christina Capasso Jamerson, Marketing Coordinator**

June 14th, 2016

Christina Capasso Jamerson, Marketing Coordinator

https://caeai.com/news-insights

In this week's post, we wanted to take a break from our usual blog topics to make a special announcement about CAE Associates! As you know, the engineering insights we share via our blog have come from the 35 years experience we have performing engineering analysis. But, you may not know that CAE Associates has also been an ANSYS Channel Partner since 1985.

We are pleased to announce that our ANSYS Software sales and support region has expanded! We now cover: all of Massachusetts, Rhode Island, Connecticut and the Hudson Valley, as well as: New Jersey, NYC, Long Island, Eastern Pennsylvania and Northern Delaware.

CAE Associates represents the entire portfolio of ANSYS products: from FEA and CFD, to the ANSOFT family of Low and High Frequency Electromagnetics, to Full System Solutions. This expansion brings CAE Associates' superior ANSYS services and support to companies in our extended geographies. We look forward to welcoming them into our ANSYS User community!

If you are located within these areas and would like more information about the ANSYS family of products, please contact us!

Hi, I'm Chris Mesibov. I recently joined the CAE Associates' technical team, and am pleased to have the opportunity to work with these consummate professionals! I have over 25 years of electrical engineering experience with a strong concentration in Signal Integrity and analog circuit design. Signal Integrity (SI) is the effort to ensure high speed electrical signals have optimal performance while traversing a transmission line.

Introducing Chris Mesibov! - June 23, 2016 / Chris Mesibov, B.E.E.E., Senior Project Engineer

Oasys v13.1 Now Available to Download - Latest News - June 2016

www.oasys-software.com/dyna/en/software/oasys_13.shtml

Oasys 13.1 is the latest version of our Oasys Software Suite for pre- and post- processing of LS-DYNA models and provides the user with a variety of new tools to help reduce the amount of time spent pre- and post- processing a model.

For a more detailed list of the changes between Oasys 12 and Oasys 13.1 please refer to the Oasys 13.1 Release Notes on the website

Below are a few of the new features:

Oasys PRIMER :

- •Support for LS-DYNA R8.0 keywords
- •Checking of models, and various other core features are now much quicker.
- •Improved BOM feature, including the ability to write images to a BOM.
- •Redesigned connection creation panel to improve work flow.
- •Bespoke, user defined bolted connections that can be easily applied in multiple locations in the model automatically.
- •Ability to compare connection information across models easily.

Oasys D3PLOT:

Multiple Data Components

- •Multiple components can be plotted simultaneously
- •Different plotting modes can be can be set for each entity type
- •Components can be turned on/off for each entity type

Composite Models

- •It is easier to post-process models with *ELEMENT_SHELL_COMPOSITE
- •Data can be plotted on a per ply basis
- •The local axis (as defined by the beta angle) can be visualised
- •Plys and layups can be blanked/unblanked and viewed in the part tree

Oasys REPORTER:

- •Tables are now included in the numbering of generated items on a page
- •Variables can now be marked as 'temporary'.
- All temporary variables can be deleted at any point to 'clean' the template.
- •Images in ImageFile, D3PLOT, T/HIS and PRIMER objects can now be justified
- •The aspect ratio or size of images created in D3PLOT, T/HIS and PRIMER can now be controlled
- •Files or directories can now be dragged into a template to generate a report

BETA CAE Open Meetings 2016 - White Papers – Case Studies

www.beta-cae.com/ourevents.htm

Recent white papers:

- ANSA & µETA for Fatigue analyses
- The µETA ASAM ODS Browser
- Multivariant / Multidiscipline Modeling
- Modeling for Nastran Embedded Fatigue

Case Studies:

- Honda R&D: Exterior Acoustics full vehicle model generation
- Opel: ANSA in Pedestrian Safety Analysis
- Selected cases from the
- Automotive Industry

BETA CAE Open Meeting NA
October 11, 2016
The Inn at St. John's
Plymouth, MI, USA
hosted by BETA CAE Systems USA

BETA CAE Open Meeting Beijing China
November 22, 2016
Beijing, China
hosted by Beijing E&G Software

BETA CAE Open Meeting Japan
November 8, 2016
Nagoya, Japan
hosted by TOP CAE Corp.

BETA CAE Open Meeting Shanghai China
November 25, 2016
Shanghai, China
hosted by Shanghai Turing Info. Tech.

SPONSORED EVENTS: BETA CAE Systems participation

ESB 2016 - July 10-13, Lyon, France: This will be a unique opportunity for the participants to be introduced or updated on the advanced CAE functionality that our software suite offers on the field of biomechanics. www.esbiomech.org

NAFEMS India Conference 2016 - August 29-31, Bangalore, India: Don't miss this opportunity to be updated or introduced by our agent, Xitadel CAE Technologies, to the latest advances of our software products and find out the benefits realized by employing our solutions. www.nafems.org

The 14th International Symposium CMBBE - September 20-22, Tel Aviv, Israel: Use this unique opportunity to be introduced or updated to the latest developments and existing functionality that can propagate our 20 years CAE experience and know how to the biomechanics industry. www.cmbbe2016.com

BETA CAE Open Meetings 2016 - White Papers – Case Studies

www.beta-cae.com/ourevents.htm

SPONSORED EVENTS: BETA CAE Systems participation

FISITA 2016 - September 26-30, Busan, Korea: As a major Automotive Industry supplier, showcases its innovative CAE software solutions for this sector, at the exhibition that runs during FISITA 2016. Don't miss our presentation with title: "Rapid NVH design improvements through a unified environment for handling full FE and reduced models". www.fisita2016.com

German LS-DYNA forum 2016 - October 10-12 2014, Bamberg, Germany:
Meet the experts of LASSO Ingenieurgesellschaft mbh and BETA CAE Systems and discuss the benefits and the updates of our software suite. Our presentation: "Model Set-up analysis tools for Squeak and Rattle in LS-DYNA", will feature at the event's agenda. www.dynamore.de

FFT Acoustic Simulation conference & ACTRAN Users' meeting 2014 October 11-13, Brussels, Belgium

BETA CAE Systems is pleased to participate, as a Gold Sponsor, to the 2016 FFT Acoustic Simulation conference & ACTRAN Users' meeting. Take advantage of this opportunity to discuss with our expert engineers the benefits of employing our suite for exterior acoustic analyses using ACTRAN and NASTRAN.
www.fft.be

SIMVEC - Simulation und Erprobung in der Fahrzeugentwicklung – Nov. 22-23, Baden Baden, Germany

BETA CAE Systems, once again, takes its place in this event, organized by VDI, as a major Automotive Industry supplier, and showcases the latest solutions and applications for this sector.
More information: www.vdi-wissensforum.de

LS-DYNA Recommendations - LS-DYNA Group

Author: James Kennedy, KBS2 jmk@kbs2.com

Please note below is a short excerpt of an internet thread – an excerpt does not reflect the full information, or explanation. Further solutions or corrections may have been posted after this excerpt.

The newer forms of contact which are usually identified with automatic option:

www.dynasupport.com/tutorial/contact-modeling-in-ls-dyna/contact-types
www.dynasupport.com/tutorial/ls-dyna-users-guide/contact-modeling-in-ls-dyna

If an element becomes so distorted that the volume of the element is calculated as negative, the simulation has become numerical unstable and will not yield a reasonable result.

Some notes that should be helpful (you may have already seen these):

- Interior Contact for Foams, Honeycombs and Rubbers to Eliminate Negative Volumes
  http://blog2.d3view.com/?p=375
- Internal Contact for Solids using *SET_SEGMENT_GENERAL
  http://blog2.d3view.com/?p=388
- Contact Surface Generation for Solid Elements
  http://blog2.d3view.com/?p=243
- Negative Volumes in Foams (or other soft materials)
  http://ftp.lstc.com/anonymous/outgoing/jday/faq/negative_volume_in_brick_element.tips
- Negative Volumes in Brick Elements
  www.dynasupport.com/howtos/element/negativ-volumes-in-brick-elements

In order to simulate the physical cracks in concrete an external erosion

algorithm needs to be implemented. An additional material model called *ma t_add_erosion can be used along with *mat_072r3 to include failures in concrete. This erosion model is based on the concept that the concrete element is deleted when the material response in an element reaches certain critical value. The *mat_add_erosion model has various criteria to include erosion and failure in the model and each of these criteria is applied independently and the elements get deleted from the simulation as soon as one of the criteria is satisfied.

There is an interesting erosion study using *mat_072r3 in the following work:

Jaime, M.C., "Numerical Modeling of Rock Cutting and its Associated Fragmen tation Process Using the Finite Element Method", Ph.D. Thesis, Department of Civil and Environmental Engineering, University of Pittsburgh, Pittsburg, Pennsylvania, November, 2011.
http://d-scholarship.pitt.edu/10611/1/Jaime_Maria_PhD_diss_ETD_Nov30_11.pdf

Example: *mat_072r3 & *mat_add_erosion provided in the Appendix of the following thesis:

Vasudevan, A.K., "Finite Element Analysis and Experimental Comparison of Double Reinforced Concrete Slabs Subjected to Blast Loads", Master's Thesis, Department of Civil and Mechanical Engineering, University of Missouri-Kansas City, Kansas City, Missouri, April, 2012.
https://mospace.umsystem.edu/xmlui/bitstream/handle/10355/14606/KadambiVasudevanFinEleAna.pdf

Sincerely, James M. Kennedy KBS2 Inc.

DYNAmore14th German LS-DYNA Forum

Author: Albert Oswald albert.oswald@werbos.de Conference Contact: forum@dynamore.de

Announcement and invitation to present a paper

14th GERMAN LS-DYNA® FORUM 2016

October 10 - 12 2016, Bamberg, Germany

Conference website - www.dynamore.de/forum2016-e

DYNAmore kindly invites you to participate at the 14th German LS-DYNA Forum and encourages you to actively contribute to the conference agenda by submitting a presentation about your experience with the LSTC product range. Participation without a presentation is also worth-while to exchange your knowledge and discuss new solution approaches with other users.

Besides presentations from users, there will be also selected keynote lectures of renowned speakers from industry and universities as well as developer presentations from LSTC and DYNAmore. The popular workshops on various topics will also be continued.

We hope that we have stimulated your interest and are looking forward to receiving your abstract and to seeing you in Bamberg.

Attending

In user presentations from industry and academia you will learn more about the software packages LS-DYNA®, LS-OPT®, LS-TaSC™ und LS-PrePost® as well as their application possibilities for virtual product design.

Presenting

Communicate your work with international colleagues to share knowledge and to stimulate discussions with other users about new solution approaches.

Exhibiting and sponsoring - If you want to contribute, please request additional exhibitor and sponsoring information.

Venue - Welcome Kongresshotel Bamberg Mußstraße 7, 96047 Bamberg, Germany

Conference language - German and English

Participant fees

Industry speaker:	€ 360 -
Academic speaker:	€ 260
Industry:	€ 510 [1] / € 580
Academic:	€ 360 [1] / € 410

[1] Registration before 27 June 2016.
All prices excluding VAT.

Important dates

Presentation submission:	30 May
Author notification:	17 June
Two-page abstract:	5 Sept.
Conference dates:	10-12 Oct.

To Submit A Presentation:

Please send us title, author(s) and short description of approximately 300 words
E-Mail to forum@dynamore.de
or submit it online - www.dynamore.de/forum2016

Contact and registration - DYNAmore GmbH, Industriestr. 2, D-70565 Stuttgart, Germany
E-Mail: forum@dynamore.de

2 Abstracts – Papers will be published in a few weeks on: www.dynalook.com and www.feajournal.com

Presented at the 14th Int'l LS-DYNA Users Meeting & Conference

Modelling Laminate Failure in Composite Materials for Automotive Applications

D. Moncayo1, F. Köster1, P. P. Camanho2, D. Coutellier3, S. Hartmann4
1DAIMLER AG, Sindelfingen, Germany
2 University of Porto, Portugal
3University of Valenciennes, France
4 Dynamore GmbH, Stuttgart, Germany

Abstract: In order to capture the complexity of material failure it is necessary to understand that the performance of FE models depends on a fair use and a fair modeling of composite materials. Based on previous research works, the prognosis capabilities of the current material definitions in LS-DYNA will be discussed. The predictive capability of the simulations will be evaluated by comparing the validity of the models, starting with simple coupon tests and then gradually proceeding to more complex geometries. In this paper two new material models for composite laminates will be discussed and compared to current definitions in LS-DYNA. In conclusion, the achieved correlation between simulation and experimental results will be discussed to present the new technical challenges for the numerical simulation of composite materials in automotive applications.

Approaches for an advanced modeling technique for component design and prediction of the laminate failure in thick multilayered composites

F. Köster1, Prof. Dr. F. Henning2, D. Moncayo1
1 DAIMLER AG, Sindelfingen, Germany
2 Universität Karlsruhe, Germany

Abstract: Currently, most of the methods with a high level of abstraction are used for the calculation of post-critical material behavior in crash simulations of fiber reinforced composites. Hereby, complex and often thick laminate-structures are modeled by a highly homogenized shell model and a set of simplified failure hypotheses. Neglecting the influence of delamination and the out-of-plane stress components lead to an inaccurate prediction of fracture failure and stiffness degradation, especially for thick laminates. With the present publication, a method which depicts the fracture and delamination behavior is presented using a stacked shell modeling approach based on thick shell elements. A more accurate modeling of the laminate properties through the thickness, in combination with a fracture-mode-based contact formulation increases the model complexity. Of course, using a limited number of thick shells with an appropriate sublaminate approach, enables the depiction of inter- and intralaminar failure considering the out-of-plane stress components. However, the material parameters need to be adjusted by coupon- and principle component tests, whereby the various laminates and laminate thicknesses have to be taken into account. For a final validation of the material behavior, a laminate evaluation will be presented by a subcomponent test, depicting the advantage of this approach in an early stage of the part or component development.

AUTOMOTIVE NEWS & EVENTS

Dilip Bhalsod

The purpose of this section is to provide a place, for our automotive readers, to share news and events relative to their company and/or products.

The criteria for submitting information is as follows:

- It has to be public information
- Published on the Internet
- Be automotive informational, or human interest.
- We do not accept financial quarterly information

We would welcome the opportunity to share information about your company with our readership.

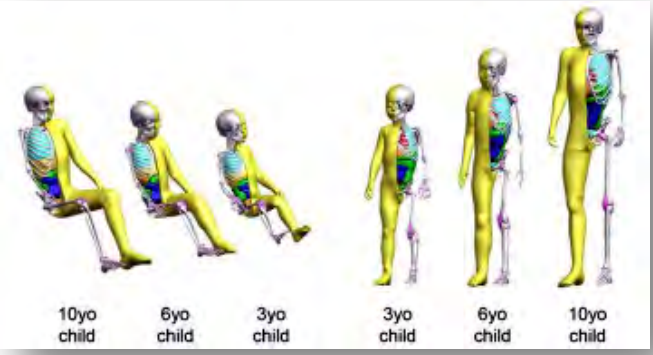
You may send Title to your information and the accompanying URL to agiac99@aol.com - Subject Line please

use " Automotive News"

Submissions should be received by the 15th of each month, of the month you want your article placed

Submission publications is at the sole discretion of FEA Information Inc.

Toyota Adds Child Models to Virtual Crash Dummy Line-up



THUMS Version 4: Child Models

Toyota City, Japan, June 21, 2016—Toyota Motor Corporation has added three new models to represent children aged ten, six, and three to Version 4 of its Total Human Model for Safety (THUMS) virtual crash dummy software. THUMS allows injuries sustained by human bodies during vehicle crashes to be simulated on computer, and sales of the new models will begin from this autumn.

THUMS is able to forecast the extent of injuries sustained throughout the human body, and thus, is utilized in the technological development of passenger protection devices such as airbags, and to contribute to improved vehicle safety performance. THUMS is also increasingly being used in the field of motorsports. For example, it has been used by NASCAR (the U.S.-based National Association for Stock Car Auto Racing) to formulate regulations for seat shapes that are better able to reduce the likelihood of rib fractures sustained in drivers as a result of racing accidents.

The ten-year old (138cm tall), six-year old (118cm tall) and three-year old (94cm tall) additions to THUMS Version 4 represent the average physiques of children at each respective age. As with the large male (189cm tall), average-build adult male (179cm tall), and small female (153cm tall) models that are already being sold, the new models will come in two versions—a passenger version and a pedestrian version—for a total of six new additions to the THUMS line-up. This expanded line-up takes into consideration the influence of age and physique, and allows for a more thorough injury analysis.

Ever since THUMS Version 1 was launched in the year 2000, continued improvements and refinements have been made to the software. For Version 2, which was released in 2003, faces and bone structure were added to the models. Version 3, launched in 2008, added a brain simulation and in 2010, Version 4 was upgraded with detailed modeling of the brain and also the addition of internal organs and their placement and interaction within the body. In 2015, Version 5 added simulated musculature, allowing the models to assume the same bracing positions that a human might just before a crash.

Toyota Adds Child Models to Virtual Crash Dummy Line-up

The newly launched child-spec models were created as a result of collaborative research between Wayne State University, the University of Michigan, and the Collaborative Safety Research Center* located in the Toyota Technical Center in Ann Arbor, Michigan.

THUMS is available for purchase through the Tokyo-based JSOL Corporation and ESI Japan. THUMS is used for a wide variety of purposes by automobile manufacturers, parts manufacturers, and universities both in Japan and overseas. It contributes to research on safety technologies not just at Toyota, but also by organizations all over the world. The ultimate desire of a mobile society is to advance towards the goal of eliminating traffic fatalities and injuries. Going forward, Toyota will utilize THUMS to analyze the injuries sustained by both passengers and pedestrians during collisions with and between vehicles, and to further research and improve safety technologies of all kinds.

Reference: the evolution of THUMS

1997

Toyota begins developing THUMS in cooperation with Toyota Central R&D Labs, Inc.

2000

Version 1 goes on sale

2003

Version 2 launches, adding detailed modeling of faces and bones

2008

Version 3 launches, adding detailed modeling of the brain

2010

Version 4 launches, adding detailed modeling of internal organs

2015

Version 5 launches, adding detailed modeling of muscles

*The Collaborative Safety Research Center was established in 2011. It aims to reduce the number of traffic fatalities and injuries through collaborative research with North American universities, hospitals and research agencies, and by sharing the results of this research with society. Between 2011 and 2021, it is slated to receive 85 million dollars in investment.

AEROSPACE NEWS & EVENTS

Marnie Azadian

The purpose of this section is to provide a place, for our automotive readers, to share news and events relative to their company and/or products.

The criteria for submitting information is as follows:

- It has to be public information
- An internet URL
- Be technical, informational, or human interest.
- We do not accept financial quarterly information

We would welcome the opportunity to share information about your company with our readership.

You may send Title to your information and the accompanying URL to Marnie Azadian at agiac99@aol.com - Subject Line please use "Aerospace News"

Submissions should be received by the 15th of each month, of the month you want your article placed. For example: We would need the title of the news or event by December 15th, 2015 to be featured in the December 2015 FEA newsletter.

Submission publications is at the sole discretion of FEA Information Inc.

First Two PzH2000 Howitzers Procured from the Bundeswehr Are On the Way to Lithuania

(Source: Lithuania Ministry of National Defence; issued June 23, 2016)

Lithuanian artillerymen train to operate the PzH2000 self-propelled 155mm gun/howitzer that Germany has sold for a nominal amount. The first two arrived yesterday by ship at the Lithuanian port of Klaipėda.
(Lithuania MoD photo)

Today, June 23, the first two of the 155 mm self-propelled PzH2000 (Panzerhaubitze 2000) howitzers the Lithuanian Armed Forces have acquired from the Bundeswehr will be brought to Lithuania. Under a contract signed last September the Lithuanian Armed Forces bought from the German Armed Forces 16 155mm self-propelled howitzers for combat purposes, and 5 for training and spare parts.

By the same contract the Lithuanian Armed Forces also acquired 26 M577 V2 armoured command vehicles and 6 BPZ2 recovery tanks -- 53 pieces of materiel in total. The contract also s includes training for the Lithuanian soldiers and support for technical maintenance arrangements.

The rest of the equipment is planned to arrive in Lithuania by 2019.

Lithuanian soldiers will soon start training to master the newly received advanced and particularly capable equipment and the first shots are expected to be fired within several months at Exercise Flaming Thunder.

Efficient fire support is one of the key priorities of the Lithuanian Armed Forces, and it is exactly what the procurement of one of the world's most advanced artillery equipment for maneuver units enables. Acquisition of self-propelled howitzers is a quality leap in fire support in the Lithuanian Armed Forces. The equipment will give a substantial boost to the capability of the Lithuanian Armed Forces and open up new opportunities of operational planning and execution.

First Two PzH2000 Howitzers Procured from the Bundeswehr Are On the Way to Lithuania

(Source: Lithuania Ministry of National Defence; issued June 23, 2016)

The new purchase of the Lithuanian Armed Forces will be used by General Romualdas Giedraitis Artillery Battalion of the Mechanised Infantry Brigade Iron Wolf based in Rukla. The Battalion currently operates 105mm howitzers with effective range of 11 kilometres, while the new PzH2000 self-propelled howitzers will enable it to destroy targets at the range of 40 km.

German representatives have already finished training Lithuanians who will responsible for the maintenance and servicing of the equipment, as well as crews serving the artillery system and the personnel planning operations. After the training in Germany, the Lithuanian troops will transfer the experience of employing the PzH2000 to Lithuanian colleagues.

The two PzH 2000 artillery systems will be brought from Germany via Klaipėda Seaport in the evening of June 23 and will be transported to the permanent base in Rukla by roads during the night.

-ends-

LS-DYNA Resource Links

LS-DYNA Multiphysics YouTube Facundo Del Pin

https://www.youtube.com/user/980LsDyna

FAQ LSTC Jim Day

ftp.lstc.com/outgoing/support/FAQ

LS-DYNA Support Site

www.dynasupport.com

LS-OPT & LS-TaSC

www.lsoptsupport.com

LS-DYNA EXAMPLES

www.dynaexamples.com

LS-DYNA CONFERENCE PUBLICATIONS

www.dynalook.com

ATD –DUMMY MODELS

www.dummymodels.com

LSTC ATD MODELS

www.lstc.com/models www.lstc.com/products/models/mailinglist

AEROSPACE WORKING GROUP

http://awg.lstc.com/tiki/tiki-index.php

Participant's Training Classes

Webinars

Info Days

Class Directory

Participant Class Directory

Arup **(corporate)**	www.oasys-software.com/dyna/en/training
BETA CAE Systems S.A. **(corporate)**	www.beta-cae.com/training.htm
DYNAmore **(corporate)**	www.dynamore.de/en/training/seminars
ESI-Group **(corporate)**	https://myesi.esi-group.com/trainings/schedules
ETA **(corporate)**	www.eta.com/support2/training-calendar
LSTC **(corporate)**	www.lstc.com/training
LS-DYNA OnLine **(Al Tabiei)**	www.LSDYNA-ONLINE.COM

ARUP Visit the website for complete listings/changes/locations

www.oasys-software.com/dyna/en/training

To enrol on any of these courses please email Dyna Support at dyna.support@arup.com.

Date	Training Class
Scheduled on request	Oasys PRIMER - An Introduction
Scheduled on request	Oasys PRIMER - Automatic Assembly of Multiple Crash Cases
Scheduled on request	Oasys PRIMER - Spotwelds and Connections
Scheduled on request	Oasys PRIMER - Seat and Dummy Positioning
Scheduled on request	Oasys PRIMER & D3PLOT - An Introduction to JavaScripting

BETA CAE Visit the website for complete listings/changes/locations

www.beta-cae.com/training.htm

Basic and advanced training courses can be scheduled upon request. A variety of standard or tailored training schedules, per product or per discipline, are being offered to meet customers needs.

A number of recommended training courses offered are described below. The list is not exhaustive and more courses can be designed according to your needs.
Please, contact ansa@beta-cae.gr for further details.

Recommended Training Courses (Complete information on website)

- SPDRM
- ANSA / μETA Basics
- ANSA / μETA for CFD
- ANSA / μETA for Crash & Safety simulation
- ANSA / μETA for Durability simulation
- ANSA / μETA for NVH analyses
- Multi-Body Dynamics
- Laminated Composites
- Morphing and Optimization
- Automation
- Additional special sessions

Submitted: Albert Oswald

DYNAmore Visit the website for complete listings / changes / locations

www.dynamore.de/seminars

Download full seminar brochure (pdf): www.dynamore.de/seminars-2016

We are pleased to offer you a selection of seminars and free-of-charge information & support.

If not otherwise stated, the event location is Stuttgart (S), Germany. Other event locations are:
L = Linköping, Sweden; V = Versailles, France; Z = Zurich, Switzerland; T = Turin, Italy

Overview and registration: www.dynamore.de/seminars

If the offered seminars do not fully suit your needs, we are pleased to meet your individual requirements by arranging tailored on-site training courses on your company premises.

DYNAmore hopes that our offer will meet your needs and would be very pleased to welcome you at one of the events.

https://myesi.esi-group.com/trainings/schedules

Latest Release is ESI Visual-Environment 12.0

Farmington Hills, Detroit, MI

Basic PAM-STAMP
20 Jul 2016 to 21 Jul 2016

Basic PAM-STAMP
17 Aug 2016 to 18 Aug 2016

Introduction to QuikCAST
29 Aug 2016 to 31 Aug 2016

Weld Distortion Engineering - Shrinkage Method
14 Sep 2016 to 16 Sep 2016

Introduction to ProCAST
20 Sep 2016 to 22 Sep 2016

Basic PAM-STAMP
21 Sep 2016 to 22 Sep 2016

High frequency automotive interior acoustics
29 Sep 2016 to 30 Sep 2016

VA One: Coupled FEA/SEA Training
12 Oct 2016 to 13 Oct 2016

Basic PAM-STAMP
19 Oct 2016 to 20 Oct 2016

A One: SEA Training
24 Oct 2016 to 25 Oct 2016

Tabiei	Blast in LS-DYNA	CA	July 12-13
Tabiei	Penetration in LS-DYNA	CA	July 14-15
Tabiei	Adv Impact	CA	July 19-20
Tabiei	Implicit	CA	July 28-29
Yan / Ho	Intro to LS-PrePost	CA	August 1
Tabiei	Intro to LS-DYNA	CA	Aug 2-5
Yan / Ho	Intro to LS-PrePost	MI	August 8
Tabiei *** FULL ***	Intro to LS-DYNA	MI	Aug 9-12
Souli	ALE/Eulerian, Fluid/Structure Interaction in LS-DYNA	CA	Aug 15-17
Souli	SPH: Smoothed Particle Hydrodynamics in LS-DYNA	CA	Aug 18-19
Inaki	ICFD	CA	Aug 22-23
Inaki	Electromagnetism	CA	Aug 24
Basudhar	Optimization, Probabilistic Design Using LS-OPT (3.5 days)	MI	Oct 25-28
Yan / Ho	Intro to LS-PrePost	CA	Oct 31
Tabiei	Intro to LS-DYNA	CA	Nov 1-4
Y Huang	NVH and Frequency Domain Analysis with LS-DYNA	CA	Nov 7-8
Tabiei	Adv Impact	MI	Dec 8-9
Yan / Ho	Intro to LS-PrePost	MI	Dec 12
Tabiei	Intro to LS-DYNA	MI	Dec 13-16

LS-DYNA On Line Visit the website for complete listings/changes/locations

www.LSDYNA-ONLINE.COM

For Information contact: courses@lsdyna-online.com or 513-3319139

Composite Materials In LS-DYNA

This course will allow first time LS-DYNA users to use composite materials. The most important elements to start using all the composite material models in LS-DYNA will be presented in the 8 hours.

Foam & Viscoelastic Materials in LS-DYNA

Objective of the course: Learn about several foam material models in LS-DYNA to solve engineering problems. Detailed descriptions are given of the data required to use such material in analysis. Examples are used to illustrate the points made in the lectures

Plasticity, Plastics, and Viscoplastics Materials in LS-DYNA

Objective of the course: Learn about several plasticity based material models in LS-DYNA to solve engineering problems. Detailed descriptions are given of the data required to use such material in analysis. Examples are used to illustrate the points made in the lectures.

Rubber Materials in LS-DYNA

Objective of the course: Learn about several rubber material models in LS-DYNA to solve engineering problems. Detailed descriptions are given of the data required to use such material in analysis. Examples are used to illustrate the points made in the lectures.

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**

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The Cray® XC™ series delivers on Cray's commitment to an adaptive supercomputing architecture that provides both extreme scalability and sustained performance. The flexibility of the Cray XC platform ensures that users can precisely configure the machines that will meet their specific requirements today, and remain confident they can upgrade and enhance their systems to address the demands of the future.

Cray® XC40™ and XC40-AC™ supercomputers are enabled by a robust Intel® Xeon® processor road map, Aries high performance interconnect and flexible Dragonfly network topology, providing low latency and scalable global bandwidth to satisfy the most challenging multi-petaflops applications.

While the extreme-scaling Cray XC40 supercomputer is a transverse air-flow liquid-cooled architecture, the Cray XC40-AC air-cooled model provides slightly smaller and less dense supercomputing cabinets with no requirement for liquid coolants or extra blower cabinets. A reduced network topology lowers costs, and the system is compatible with the compute technology, OS, ISV and software stack support of high-end XC40 systems.

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Innovations in packaging, power, cooling and density translate to superior energy efficiency and compelling price/performance. Expertly engineered system management software instantly boosts your productivity by simplifying system administration and maintenance.

Maximize your productivity with flexible, high-performing Cray CS series cluster supercomputers.

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CRAY® SONEXION® SCALE-OUT LUSTRE®STORAGE SYSTEM

Brought to you by Cray, the world's leading experts in parallel storage solutions for HPC and technical enterprise, the Cray® Sonexion® 2000 system provides a Lustre®-ready solution for popular x86 Linux® clusters and supercomputers through Cray Cluster Connect™. As a leader in open systems and parallel file systems, Cray builds on open source Lustre to unlock any industry-standard x86 Linux compute cluster using InfiniBand™ or 10/40 GbE utilizing proven Cray storage architectures.

The Cray Sonexion 2000 system provides 50 percent more performance and capacity than the Sonexion 1600 system in the same footprint.

Simplify

- Through its fully-integrated and pre-configured design, Cray Sonexion storage gets customers deployed faster and reduces the total number of components to manage.
- The Sonexion system's compact design reduces the total hardware footprint of petascale systems by 50 percent over component-based solutions.

Scale

- Performance scales from 7.5 GB/s to 1.7 TB/s in a single file system.
- Capacity scales in modular increments; the Sonexion 2000 system stores over two usable petabytes in a single rack. Fewer drives and components reduce capital costs as capacity grows.

Protect

- New software-based GridRAID offers higher levels of data protection and up to 3.5 times faster rebuild times than traditional RAID6 and MD-RAID storage.
- Cray ensures quality, reliability and stability at scale through exhaustive thermal and real-world stress testing, system hardening and availability, and tight hardware and software integration.

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Cray Tiered Adaptive Storage (TAS), powered by Versity, is designed to meet the expansive data preservation and access needs driven by big data, where data needs to migrate fluidly from high performance storage to deep tape archives, while always being accessible to users.

CRAY www.cray.com

With Cray TAS you can:

- Deploy tiered storage and archives faster
- Feel confident preserving and protecting data into the future, using Linux®
- Simplify managing data using familiar tools for years to come

CRAY® URIKA-XA™ EXTREME ANALYTICS PLATFORM

Pre-integrated, open platform for high performance analytics delivers valuable business insights now and into the future

The flexible, multi-use Cray® Urika-XA™ extreme analytics platform addresses perhaps the most critical obstacle in data analytics today — limitation. Analytics problems are getting more varied and complex but the available solution technologies have significant constraints. Traditional analytics appliances lock you into a single approach and building a custom solution in-house is so difficult and time consuming that the business value derived from analytics fails to materialize.

In contrast, the Urika-XA platform is open, high performing and cost effective, serving a wide range of analytics tools with varying computing demands in a single environment. Pre-integrated with the Apache Hadoop® and Apache Spark™ frameworks, the Urika-XA system combines the benefits of a turnkey analytics appliance with a flexible, open platform that you can modify for future analytics workloads. This single-platform consolidation of workloads reduces your analytics footprint and total cost of ownership.

Based on pioneering work combining high-performance analytics and supercomputing technologies, the Urika-XA platform features next-generation capabilities. Optimized for compute-heavy, memory-centric analytics, it incorporates innovative use of memory-storage hierarchies and fast interconnects, which translates to excellent performance at scale on current as well as emerging analytics applications.

Additionally, the enterprise-ready Urika-XA platform eases the system management burden with a single point of support, standards-based software stack and compliance with enterprise standards so you can focus on extracting valuable business insights, not on managing your environment.

CRAY www.cray.com

THE URIKA-GD™ GRAPH DISCOVERY APPLIANCE IS A PURPOSE-BUILT SOLUTION FOR BIG DATA RELATIONSHIP ANALYTICS.

The Urika-GD™ appliance enables enterprises to:

- Discover unknown and hidden relationships and patterns in big data
- Build a relationship warehouse, supporting inferencing/deduction, pattern-based queries and intuitive visualization
- Perform real-time analytics on the largest and most complex graph problems

The Urika-GD system is a high performance graph appliance with a large shared memory and massively multithreaded custom processor designed for graph processing and scalable I/O.

With its industry-standard, open-source software stack enabling reuse of existing skill sets and no lock in, the Urika-GD appliance is easy to adopt.

The Urika-GD appliance complements an existing data warehouse or Hadoop® cluster by offloading graph workloads and interoperating within the existing enterprise analytics workflow.

Realize rapid time to powerful new insights.

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

Latest Release is ESI Visual-Environment 12.0

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

Visual-Environment is an integrative simulation platform for simulation tools operating either concurrently or standalone for various solver. Comprehensive and integrated solutions for meshing, pre/post processing, process automation and simulation data management are available within same environment enabling seamless execution and automation of tedious workflows. This very open and versatile environment simplifies the work of CAE engineers across the enterprise by facilitating collaboration and data sharing leading to increase of productivity.

Visual-Crash DYNA provides advanced preprocessing functionality for LS-DYNA users, e.g. fast iteration and rapid model revision processes, from data input to visualization for crashworthiness simulation and design. It ensures quick model browsing, advanced mesh editing capabilities and rapid graphical assembly of system models. Visual-Crash DYNA allows graphical creation, modification and deletion of LS-DYNA entities. It comprises tools for checking model quality and simulation parameters prior to launching calculations with the solver. These tools help in correcting errors and fine-tuning the model and simulation before submitting it to the solver, thus saving time and resources.
Several high productivity tools such as advanced dummy positioning, seat morphing, belt fitting and airbag folder are provided in **Visual-Safe,** a dedicated application to safety utilities.

Visual-Mesh is a complete meshing tool supporting CAD import, 1D/2D/3D meshing and editing for linear and quadratic meshes. It supports all meshing capabilities, like shell and solid automesh, batch meshing, topo mesh, layer mesh, etc. A convenient Meshing Process guides you to mesh the given CAD component or full vehicle automatically.

Visual-Viewer built on a multi-page/multi-plot environment, enables data grouping into pages and plots. The application allows creation of any number of pages with up to 16 windows on a single page. These windows can be plot, animation, video, model or drawing block windows. Visual-Viewer performs automated tasks and generates customized reports and thereby increasing engineers' productivity.

Latest Release is ESI Visual-Environment 12.0

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

Visual-Process provides a whole suite of generic templates based on LS-DYNA solver (et altera). It enables seamless and interactive process automation through customizable LS-DYNA based templates for automated CAE workflows.

All generic process templates are easily accessible within the unique framework of Visual-Environment and can be customized upon request and based on customer's needs.

Visual*DSS* is a framework for Simulation Data and Process Management which connects with Visual-Environment and supports product engineering teams, irrespective of their geographic location, to make correct and realistic decisions throughout the virtual prototyping phase. Visual*DSS* supports seamless connection with various CAD/PLM systems to extract the data required for building virtual tests as well as building and chaining several virtual tests upstream and downstream to achieve an integrated process. It enables the capture, storage and reuse of enterprise knowledge and best practices, as well as the automation of repetitive and cumbersome tasks in a virtual prototyping process, the propagation of engineering changes or design changes from one domain to another.

Latest Release is ESI Visual-Environment 12.0

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**.**.

Lenovo www.lenovo.com

Lenovo is a USD39 billion personal and enterprise technology company, serving customers in more than 160 countries.

Dedicated to building exceptionally engineered PCs, mobile Internet devices and servers spanning entry through supercomputers, Lenovo has built its business on product innovation, a highly efficient global supply chain and strong strategic execution. The company develops, manufactures and markets reliable, high-quality, secure and easy-to-use technology products and services.

Lenovo acquired IBM's x86 server business in 2014. With this acquisition, Lenovo added award-winning System x enterprise server portfolio along with HPC and CAE expertise.

www.penguincomputing.com

Penguin Computing provides customized build-to-order server solutions for enterprises and institutions with special hardware requirements. We complement our hardware and software solutions with Penguin Computing on Demand (POD)—a public HPC cloud that provides supercomputing capabilities on-demand on a pay-as-you-go basis.

Penguin is a one-stop shop for HPC and enterprise customers, providing solutions for a wide array of computing needs and user profiles:

HPC and cloud solutions optimized for industry-specific uses

High-powered workstations for individual power users

Highly power-efficient server platforms for enterprise computing

Private and public cloud solutions, including hybrid options.

Focus

Penguin Computing is strictly focused on delivering Linux-optimized enterprise solutions. We use a thorough, proven hardware qualification and testing process to ensure that our solutions deliver optimal performance and robustness.

Penguin's in-house development team is dedicated to providing a complete highly interoperable software stack that is tuned for Penguin hardware. As a result our solutions are easy-to-use and "just work." Our integrated approach even extends to our hybrid compute solutions, which combine local and cloud computing resources, taking ease-of-use and cost-effectiveness to the next level. Penguin customers can reduce capital expenditures by right-sizing clusters for average resource utilization and easily and quickly offload excess workload into the cloud.

Penguin also offers a full range of services and support that is backed by a seasoned team of Linux, HPC and application experts.

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 info@esi-group.com

www.esi-group.com

PAM-STAMP

QuikCAST | SYSWELD | PAM-COMPOSITES | CEM One

VA One | CFD-ACE+ | ProCAST

Weld Planner | Visual-Environment | IC.IDO

United States

Engineering Technology Associates – ETA etainfo@eta.com

www.eta.com

INVENTIUM/PreSy | NISA | VPG | LS-DYNA

LS-OPT | DYNAform

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 george.laird@predictiveengineering.com

www.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	
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	

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		

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

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	
Japan	**FUJITSU**			
	http://www.fujitsu.com/jp/solutions/business-technology/tc/sol/			
	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	**APIC**			
	www.apic.com.tw			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

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:

- Instant access to an HPC Cloud Cluster
- High performance InfiniBand bare-metal compute
- Free support from HPC experts
- No charges for network transfers
- Cost-effective, pay-per-use billing model
- 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

Rescale Cloud Simulation Platform

www.rescale.com

Rescale: Cloud Simulation Platform

The Power of Simulation Innovation
We believe in the power of innovation. Engineering and science designs and ideas are limitless. So why should your hardware and software be limited? You shouldn't have to choose between expanding your simulations or saving time and budget.

Using the power of cloud technology combined with LS-DYNA allows you to:
· Accelerate complex simulations and fully explore the design space
· Optimize the analysis process with hourly software and hardware resources
· Leverage agile IT resources to provide flexibility and scalability

True On-Demand, Global Infrastructure
Teams are no longer in one location, country, or even continent. However, company data centers are often in one place, and everyone must connect in, regardless of office. For engineers across different regions, this can cause connection issues, wasted time, and product delays.

Rescale has strategic/technology partnerships with infrastructure and software providers to offer the following:
· Largest global hardware footprint – GPUs, Xeon Phi, InfiniBand
· Customizable configurations to meet every simulation demand
· Worldwide resource access provides industry-leading tools to every team
· Pay-per-use business model means you only pay for the resources you use
· True on-demand resources – no more queues

ScaleX Enterprise: Transform IT, Empower Engineers, Unleash Innovation
The ScaleX Enterprise simulation platform provides scalability and flexibility to companies while offering enterprise IT and management teams the opportunity to expand and empower their organizations.

ScaleX Enterprise allows enterprise companies to stay at the leading edge of computing technology while maximizing product design and accelerating the time to market by providing:

- Collaboration tools
- Administrative control
- API/Scheduler integration
- On-premise HPC integration

Industry-Leading Security

Rescale has built proprietary, industry-leading security solutions into the platform, meeting the needs of customers in the most demanding and competitive industries and markets.

- Manage engineering teams with user authentication and administrative controls
- Data is secure every step of the way with end-to-end data encryption
- Jobs run on isolated, kernel-encrypted, private clusters
- Data centers include biometric entry authentication
- Platforms routinely submit to independent external security audits

Rescale maintains key relationships to provide LS-DYNA on demand on a global scale. If you have a need to accelerate the simulation process and be an innovative leader, contact Rescale or the following partners to begin running LS-DYNA on Rescale's industry-leading cloud simulation platform.

LSTC - DYNAmore GmbH JSOL Corporation

Rescale, Inc. - 1-855-737-2253 (1-855-RESCALE) - info@rescale.com - 944 Market St. #300, San Francisco, CA 94102 USA

ESI Cloud Based Virtual Engineering Solutions

www.esi-group.com/software-solutions/cloud-solutions/esi-cloud

ESI Cloud offers designers and engineers cloud-based computer aided engineering (CAE) solutions across physics and engineering disciplines.

ESI Cloud combines ESI's industry tested virtual engineering solutions integrated onto ESI's Cloud Platform with browser based modeling,

With ESI Cloud users can choose from two basic usage models:

- An end-to-end SaaS model: Where modeling, multi-physics solving, results visualization and collaboration are conducted in the cloud through a web browser.
- A Hybrid model: Where modeling is done on desktop with solve, visualization and collaboration done in the cloud through a web browser.

Virtual Performance Solution:

ESI Cloud offers ESI's flagship Virtual Performance Solution (VPS) for multi-domain performance simulation as a hybrid offering on its cloud platform. With this offering, users can harness the power of Virtual Performance Solution, leading multi-domain CAE solution for virtual engineering of crash, safety, comfort, NVH (noise, vibration and harshness), acoustics, stiffness and durability.

In this hybrid model, users utilize VPS on their desktop for modeling including geometry, meshing and simulation set up. ESI Cloud is then used for high performance computing with an integrated visualization and real time collaboration offering through a web browser.

The benefits of VPS hybrid on ESI Cloud include:

- Running large concurrent simulations on demand
- On demand access to scalable and secured cloud HPC resources
- Three tiered security strategy for your data
- Visualization of large simulation data sets
- Real-time browser based visualization and collaboration
- Time and cost reduction for data transfer between cloud and desktop environments
- Support, consulting and training services with ESI's engineering teams

ESI Cloud Based Virtual Engineering Solutions

www.esi-group.com/software-solutions/cloud-solutions/esi-cloud

VPS On Demand

ESI Cloud features the Virtual Performance Solution (VPS) enabling engineers to analyze and test products, components, parts or material used in different engineering domains including crash and high velocity impact, occupant safety, NVH and interior acoustics, static and dynamic load cases. The solution enables VPS users to overcome hardware limitations and to drastically reduce their simulation time by running on demand very large concurrent simulations that take advantage of the flexible nature of cloud computing.

Key solution capabilities:

- Access to various physics for multi-domain optimization
- Flexible hybrid model from desktop to cloud computing
- On demand provisioning of hardware resources
- Distributed parallel processing using MPI (Message Passing Interface) protocol
- Distributed parallel computing with 10 Gb/s high speed interconnects

Result visualization

ESI Cloud deploys both client-side and server-side rendering technologies. This enables the full interactivity needed during the simulation workflow along with the ability to handle large data generated for 3D result visualization in the browser, removing the need for time consuming data transfers. Additionally ESI Cloud visualization engine enables the comparisons of different results through a multiple window user interface design.

Key result visualization capabilities:

- CPU or GPU based client and server side rendering
- Mobility with desktop like performance through the browser
- 2D/3D VPS contour plots and animations
- Custom multi-window system for 2D plots and 3D contours
- Zooming, panning, rotating, and sectioning of multiple windows

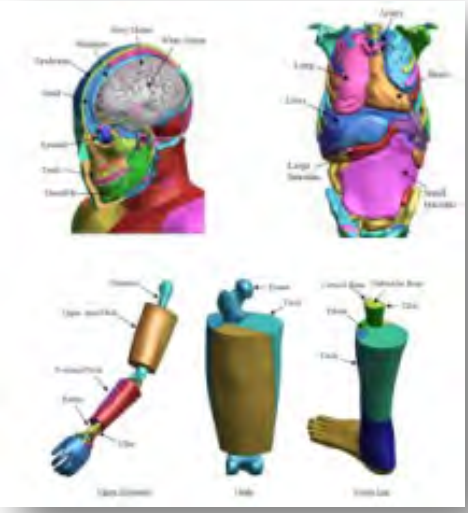
Collaboration

To enable real time multi-user and multi company collaboration, ESI Cloud offers extensive synchronous and asynchronous collaboration capabilities. Several users can view the same project, interact with the same model results, pass control from one to another. Any markups, discussions or annotations can be archived for future reference or be assigned as tasks to other members of the team.

Key collaboration capabilities:

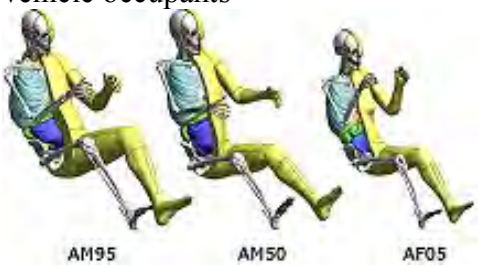
- Data, workflow or project asynchronous collaboration
- Multi-user, browser based collaboration for CAD, geometry, mesh and results models
- Real-time design review with notes, annotations and images archiving and retrieval
- Email invite to non ESI Cloud users for real time collaboration

TOYOTA - Total Human Model for Safety – THUMS

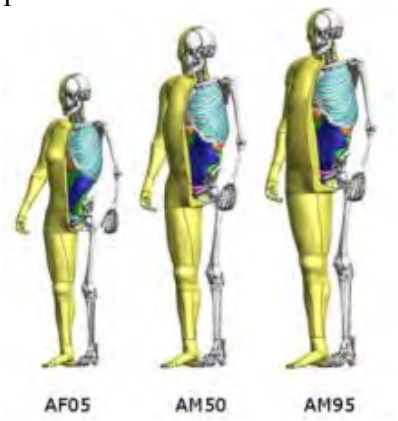


The Total Human Model for Safety, or THUMS®, is a joint development of Toyota Motor Corporation and Toyota Central R&D Labs. Unlike dummy models, which are simplified representation of humans, THUMS represents actual humans in detail, including the outer shape, but also bones, muscles, ligaments, tendons, 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:
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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.

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