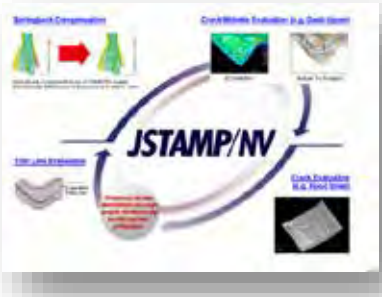
Volume 6, Issue 12, December 2017

www.feainformation.com www.lstc.com www.feaiej.com www.feapublications.com

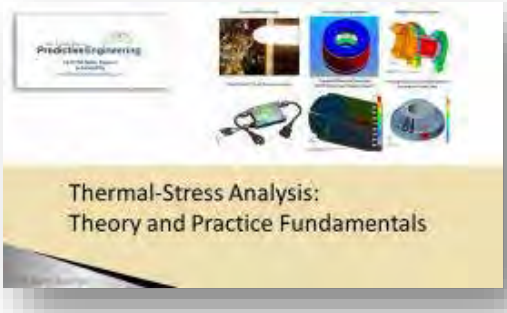
BETA web interface.

LSTC Occupant Modeling Workshops

JSOL - JSTAMP



Predictive Engineering - Overviews



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

FEA Engineering Solutions

www.feapublications.com

Contact: Marsha - mv@feainformation.com

FEA Information China Engineering Solutions

Simplified and Traditional Chinese

Contact: Yanhua - yanhua@feainformation.com

Platinum Particpants

Platinum Particpants

BETA SIMULATION SOLUTIONS

MSC Materials Sciences Corporation

eta

esi get it right

JSOL

恒士达科技 Hengstar Tech.

Oasys The Software House of Arup

rescale

Finite Element Analysis Predictive Engineering

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Announcements

My New personal weekly news/blog page. **FEA Not To Miss** **www.feantm.com** **Start your Monday off with a cup of coffee/tea/protein drink and what you may have missed.** **by Marsha Victory**	**Announcement by Aleta, LSTC** **Seats still available for class in MI, USA** · **Intro to LS-PrePost Jan 22 Monday** · **Intro to LS-DYNA Jan 23-26 Tues-Fri** **Contact: classes@lstc.com to attend**

Not To Miss In This Issue

- **BETA CAE Systems: web Interface**
- **ESI Group: Software release of ESI Visual Environment 13.5 available**

If you have any questions, suggestions or recommended changes, please let us know.

Contact: Marsha mv@feainformation.com

Developing CAE software systems for all simulation disciplines. Products: ANSA pre-processor/ EPILYSIS solver and META post-processor suite, and SPDRM, the simulation-process-data-and-resources manager, for a range of industries, incl. the automotive, railway vehicles, aerospace, motorsports, chemical processes engineering, energy, electronics…

Video: the new BETA web interface.

This video presents the new BETA web interface. This new tool enables engineers to broadcast their ANSA or META screen through a web browser and share their work with partners and colleagues.

BETA CAE Systems
Open Meeting in Germany
February 8, 2018
Leinfelden-Echterdingen, Germany
hosted by LASSO Engineering

BETA CAE Systems
Open Meeting in France
February 15, 2018
Etablissement SAFRAN PARIS-SACLAY
hosted by SAFRAN Engineering Services

BETA CAE Systems India
Open Meeting in Chennai
February 27, 2018
Hilton Chennai

BETA CAE Systems India
Open Meeting in Bangalore
March 1, 2018
Sheraton Grand Bangalore

BETA CAE Systems India
Open Meeting in Pune
March 6, 2018
The Westin Pun

BETA CAE Systems Nordic
Open Meeting
March 20, 2018
Lindholmen Conf. Center & Science Park

Previously: DON'T MISS THE VIDEO:
Comprehensive Safety CAE For The All-New VOLVO S90/V90/V90CC

d3VIEW is a data to decision platform that provides out-of-the box data extraction, transformation and interactive visualizations. Using d3VIEW, you can visualize, mine and analyze the data quickly to enable faster and better decisions.

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Using d3VIEW, you can visualize, mine and analyze the data quickly to enable faster and better decisions.

Overview - d3View can integrate with any High Performance Computing (HPC) systems to submit and track jobs, perform complex data transformations using a rich library of templates that can help turn data to information, help visualize thousands of data using rich powerful visualizations, export to reports to share and collaborate.

HPC Interactions - Using the HPC application, you can submit and track simulation or non-simulation jobs that require compute resources…

Visualize your Data - View your data using extensive library of visualizations to understand your information and to help you make decisions quickly….

Introducing Peacock beta - View your 3D data using our native Multi-threaded GPU-Powered Visualizer….

Track Key Performance Targets and Indexes Define and track key performance targets across simulations and tests to help you identify your design performance…

Design of Experiments (DOE) Data Visualizer - Viewing data from your DOE runs can be challenging when running simulations on the cloud or on-premise HPC system..

Experimental Data - d3VIEW's data to decision framework supports storing, organizing and visualization of experimental data…

DYNAmore is dedicated to supporting engineers solving non-linear mechanical problems numerically. Our tools to model and solve the problems are the FE software LS-DYNA as solver and LS-OPT for optimization. With 100 engineers in Europe we sell, teach, support, and co-develop the software and provide engineering services.

DYNAmore Corporation founded

New tutorials and presentations online

DYNAmore Corporation in Dublin, Ohio, USA

With the foundation of DYNAmore Corporation in September 2017, DYNAmore can also be reached in the US. At our new office in Dublin, Ohio, we supply our customers with high-end engineering solutions as well as general support and consultancy for the FE solver LS-DYNA.

As of today, two senior engineers are installed in the Dublin location and provide excellent engineering support on site at Honda R&D as well as their SIMCenter at Ohio State University.

“The foundation of the new company has been a milestone in the history of DYNAmore. With this step across the Atlantic we strengthen our ties with our international customers and can further improve and expand the excellent support that our customers value so much”, says Nils Karajan, Managing Engineer of DYNAmore Corporation.

It is also planned to offer selected classes from our extensive seminar program. As usual, content and topics of the classes can be adapted to the needs of our customers.

If you have any questions about our services, please do not hesitate to contact us.

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Dublin, Ohio, 43017, US
Phone: +1 614 696 3303
e-Mail: info@dynamore.com

Tutorial "Introduction LS-DYNA/LS-PrePost for explicit and implicit analysis" online

At www.dynasupport.com we published a suite of tutorials with the aim to get new users up and running with using primarily LS-DYNA® and LS-PrePost for explicit and implicit analysis. A tutorial for LS-OPT is also included. If you teach at a university and would like to use the tutorials in your classes, you are welcome to do so.

Presentations of the information day "Welding and Heat Treatment with LS-DYNA" available for download

With more than 50 participants the information day "Welding and Heat Treatment with LS-DYNA" in Aachen was a big success.

Now all presentations of the speakers are available for download at :

www.dynamore.de/welding2017-e

Webinar "Multiphysics" – Presentation slides online

The presentation slides of the webinar "Multiphysics" on November 29, 2017 are now available for download at

www.dynamore.de/multiphysics2017-e

Seasons greetings:

DYNAmore would like to thank all partners, customers, speakers and friends for the positive cooperation in 2017. We wish a merry Christmas and a healthy and successful New Year.

A leading innovator in Virtual Prototyping software and services. Specialist in material physics, ESI has developed a unique proficiency in helping industrial manufacturers replace physical prototypes by virtual prototypes, allowing them to virtually manufacture, assemble, test and pre-certify their future products.

New Software Release of ESI Visual-Environment 13.5 available

ESI Visual-Environment is an open Computer-Aided Engineering (CAE) platform that addresses the simulation needs of multiple domains across major industries. It includes a comprehensive modeling tool to generate quality meshes on complex geometries for various engineering problems from Virtual Manufacturing to Virtual Performance: Heat Treatment, Welding, Casting, Flow, Crash, Safety, NVH (Noise, Vibration & Harshness), Electromagnetics, Fluid Dynamics (CFD), and more. An interactive post-processing module caters to the requirements of the CAE community through its multi-page / multi-plot environment.

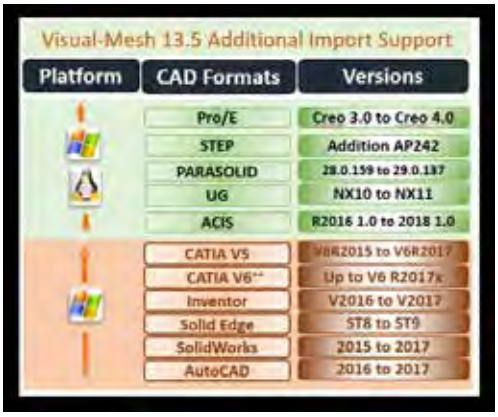
Furthermore, a software development toolkit integrated inside Visual-Environment allows user to customize and extend this open architecture through process templates and macros. Visual-Environment incorporates the finest engineering knowledge & best practices with a process-oriented approach suited to the needs of a shop-floor user or a savvy software user alike.

VISUAL-ENVIRONMENT

Release Highlights across the platform

- Evolution of the platform in line with updates in various solvers supported by Visual-Environment
- Visual-Composer provides an automatic identification mechanism to associate mesh to CAD based on Centre of Gravity (COG)
- Introduction of Die Spray modeling in Visual-Cast
- Support for Aero-Vibro-Acoustics simulations in Visual-CFD
- Improvements in Windfarm workflow and Parametric analyses feature in Visual-CEM
- Seat Positioner for Safety
- Access to LS-DYNA reference manual, facilitating easy definition of solver input in Visual-Crash DYNA
- RCC-M/ASME manager for regulatory analyses in Visual-SYSTUS
- Machining based on material removal is introduced in Visual-Weld
- Enhancements in Visual-Viewer support handling of ERF files and post-processing updates for various CAE domains, e.g. CFD, Crash/Safe, Electromagnetics, Sheet Metal Forming, etc.
- Visual-Systems provides Co-Simulation simplification as well as direct import of FMU exported from SimulationX

Meshing (module: Visual-Mesh)
CAD Import



Seeding Modification

Mesh Seeding: Minimum count of four allowed at holes for better mesh flow.

Simplify Geometry: Retain Edges Option

Retain Edges option is provided to lock edges of features while deleting edges during surface simplification. Automatic identification of feature edges to lock is provided, which can be edited.

Node Create on Curve: An option to set a desired number of seeds on holes, made up of multiple edges, is supported. Curve/Edge selection is provided to simply select all edges of desired holes. The holes are automatically detected and given count is applied on them.

Extract Curve from 1D Element: Curve extraction from 1D elements is supported to enable viewing 1D models in CAD systems. An Element type Bar/Beam will the displayed based on solver used and an option is provided to create Smooth or Linear curve.

2D Mesh Blend GUI: An option is provided to snap resulting mesh onto displayed CAD to guarantee that the mesh stays on CAD during extensive manual operations.

Topo Mesh / Auto Mesh / Mesh Utility: Option to display the resulting size of mesh on surface edges is provided.

Remesh GUI: Provides improved hole shape handling for remesh to better mesh flow and quality. Dropping nodes on nearest surface to retain initial geometry.

Tetra Mesh: Quality of tetra meshing is improved in Gradual method.

Transform & Copy: New option "+" is provided in Part text field for copy operation, to create a new part for each copy of the source part. This helps in easier identification of parts when many number of copies are made.

Element Quality: Jacobian computation for higher order tria and tetra elements is supported. For basic tria and tetra elements, Jacobean values it shows as 1.

Remesh Features in Post-Wrap: Coarsening or refining of an existing mesh by remeshing the entire component with higher or lower element size.

Localized coarsening or refining is also possible by selecting few elements for remeshing.

Improving the mesh quality of input mesh. Areas where mesh quality needs to be improved can be remeshed to get better quality. The output is good quality triangular mesh. If the input has varied mesh sizes, remeshing with varied sizes can be achieved by way of Relative remeshing technique. Feature Angle and Geometrical Error fields are provided to get desired mesh quality capturing curvatures well.

Crash/Safe/Impact (module: Visual-Crash DYNA)

Info: In addition to providing a crash module dedicated to ESI Virtual Performance Solution, Visual-Environment also supports LS-DYNA, MADYMO and RADIOSS users.

Text Editor Support: Text editor is a simplified interface provided to work with card data. Card Image panel works with 3D window for selection of attributes, whereas Text Editor is like any other standard editor wherein the attributes can be manually edited or even pasted from elsewhere.

Solver Manual Help Posting Support

Solver Manual help can be posted for any keyword, which opens the pdf page for the Keyword in default browser with pdf plugins.

Improvements in Part Manager for Part Composite Layers Handling

Layer Tab functionalities**:** The Part Manager facilitates management and visualization of Layers for Part Composite.

Visualize Results:

Support for Importing/Displaying a CONTOUR on Pre-File

To visualise all contour results (d3plot) on Pre-File:

Click Contour button in Visualize Results dialog to post Contour dialog with all the results mapped to Pre-Model. All options of Animation tab like animation of results will be displayed over the Pre-Model.

Tools > Copy Coordinates/Results is enhanced to visualize the contour of Pre-simulation results.

Visualization of Initial Stress Shell and Thickness of dynain Results

Shell Section Thickness: This shows the model's 2D elements' thickness defined in *ELEMENT_SHELL_THICKNESS card or *SECTION_SHELL_OPTION card as contour.

Filter and Replace

Find, filter and replace utility, which is part of the "Properties" GUI, is replaced by the new Filter Replace GUI, an improved version that is more intuitive with advanced features.

***COMMENT Support in Entity Creation GUI**

Commented Solver Cards

Prefixing *COMMENT to any supported keyword or *COMMENT followed by subsequent line of input text till the start of another keyword, treats it as Commented Solver Card.

Post-Processing (module: Visual-Viewer)

ERF Curve Data Only: Loading of ERF or ERF-FEMZIP files with only curve data.

SURFACE Entity Support: ERF Reader is enhanced to support SURFACE Entity. Contour and curve plotting is also supported.

Support for Creation/Display of Points for Curve with Single Point: A single point curve creation is supported.

Local Frame for View Operations

View the active model with reference to local frame also along with global frame.

Create a local frame and use the same for view operations.

Process Automation:

Visual-Process Executive refers to CAE Process Automation. Automate repetitive and cumbersome CAE tasks in virtual product development. Engineers can capitalize, share and deploy their organization's best practices within their extended ecosystem, thanks to this versatile module. It is commonly used for regulatory test simulation such as FMVSS, IIHS, EURO NCAP, etc… Simulation setups are captured and automated in Visual-Environment and can be coupled with Simulation Data Management.

There are several process templates delivered by standard Visual-Environment distribution which help to achieve high productivity for standard regulation. Visual-Environment provides also a software development environment (Visual-SDK) which enables user to integrate their best practices.

Software Development Toolkit:

Visual-SDK is the software development toolkit available on demand. This module provides a complete tool set required for authoring, debugging and execution of process templates. Visual-SDK toolbox give user a comprehensive tool to design graphical user interface, integrate Python scripting and access to Visual API's online documentation.

Simulation Lifecyle Management:

Visual-Composer refers to the Multi-Domain Compute Model Management and is a Simulation Lifecycle Management tool that aims at providing end-to-end decision-making support for simulations. Engineers can smartly build and maintain the two-directional link between CAD data stored in PLM systems and simulation domains. Visual-Composer allows propagation of design and engineering changes across the virtual tests, while maintaining traceability of data throughout the virtual product development process.

It further provides a local data management, called "Simulation Content Manager (SCM)", in which it manages a single core model for multiple domains as well as CAE representations for each component.

CAD and CAE representation are in sync. With Visual-Composer, versions and revisions, projects and studies plus corresponding content are manageable and supported. Visual-Composer enables concurrent engineering and realistic simulation, supports project and workflow management connecting simulation content, project schedules, applications, teams, suppliers and associated documents together.

System Modeling (module: Visual-Systems)

FMU Import: Visual-Systems provides direct import of FMU exported from SimulationX. On import, Modelica model is generated to wrap FMU, a Modelica component.

Co-Simulation Simplification: CoSimVPS packages are enhanced to enable selection of load curves and CoG nodes for sensors and actuators. New enhancements allow selection of load curves directly from property pages. Based on load curve direction and keyword, subset of load curves is proposed. Choosing load curve highlights the loads.

Computational Fluid Dynamics (CFD) (module: Visual-CFD)

Steady to Transient Simulation: Option to initialize transient result with previously performed steady state simulation on the same mesh. This helps user to combine the result faster and get more accurate results.

Previous Result – Turn ON "Initialize Previous Result" Projected Area Calculation

This information is required if user want to calculate coefficient of drag or lift during aero simulation.

Multi-Domain Meshing using Domain Marker: This is one of the biggest advantages of 1612+ version. User no longer have to make separate stl files for each domain. It can be handled by putting domain markers within the enclosed volume.

Improved Mesh Setting: Mesh setting has been further improved to get better prism layers and user have option to define relax quality parameters, which can be used during snapping or prism generation.

All Snapping, Prism and Quality related parameters are now open to user in case user want to modify them to get a mesh as per user's choice.

Support for Aero-Vibroacoustics Simulations: Heat transfer has been supported for all available LES & DES models. This was required for better prediction of pressure distribution over parts, which could be used later for Aero-Vibroacoustic Simulation.

Data Dumping at Surface Parts: User can dump various available variable data in different formats such as Ensight, VTK or RAW at surface parts, which can be used later for post-processing or supplied to other solvers.

DES Simulation Schemes: Recommended numerical schemes for DES simulations are:

- DES Hybrid
- Lust
- filteredLinear2V supported

Additional Lib Support for Custom BC: This is useful for those who have written and compiled their own boundary conditions. For such cases, user need to include libs (.so file) in the controlDict.

Frozen Flow Support: Support for frozen flow, where initial simulation has been done without turning on Energy. Once flow field is stabilized, only energy has been turned ON. This makes simulation much faster. It is mainly supported for CHT problems.

VDB File Size: There is significant improvement in VDB file size reduction. It is roughly gone to the one third of file size as compared to the previous versions.

Residual Plot Enhancement: For time dependent problems, now user can see time instead of Iteration at X axis, as it makes more sense for transient simulations.

Further Improvement: Heat Exchanger modeling has become more robust. The Fan/Pressure Jump condition has now more refined and much improved. The Mesh Menu has been moved upward, as current workflow of Visual-CFD follows top to bottom approach, which gives user ease of use.

ESI is continuously expanding the capabilities of Visual-Environment to support new physics in CAE, enabling customers to work with different physics in a single simulation environment, with the ability to virtually build and test a full Virtual Prototype, all around a single core model, delivering tremendous gains in productivity and accuracy.

ESI's customer portal myESI is available for all ESI customers to access updated product information, tips & tricks, training information, and selected software downloads.

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 information: www.esi-group.com/press

ESI Group – Media Relations
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ETA has impacted the design and development of numerous products - autos, trains, aircraft, household appliances, and consumer electronics. By enabling engineers to simulate the behavior of these products during manufacture or during their use, ETA has been involved in making these products safer, more durable, lighter weight, and less expensive to develop.

ETA & AlphaSTAR Announce New Partnership

LONG BEACH, CA and TROY, MI (November, 2017) – AlphaSTAR Corporation announced today that it has signed a value added reseller agreement with ETA. The agreement enables ETA to resell AlphaSTAR's advanced composite simulation tools, GENOA and MCQ.

Through its work with a variety of large automotive product development organizations, ETA has frequently seen its clients need to reduce cost and mass, while improving quality and performance. Composite materials and multi-materials are fundamental in addressing the light-weighting challenge that ETA's clients face. The future of component design in the automotive industry is moving towards advanced materials and manufacturing processes where accurate simulation tools are paramount.

GENOA is a durability & damage tolerance software that provides engineers with predictive computational technology to conduct multi-scale progressive failure analysis of composite materials and structures. MCQ is a material modeling tool that allows engineers to characterize composites materials, optimize material layouts and evaluate the effect of manufacturing defects. With its easy-to-use graphical interface, it helps to facilitate material qualification, modeling, and design analysis of continuous & discontinuous fiber polymer matrix composites, ceramic matrix composites and metal matrix composites.

"AlphaSTAR is looking forward to a mutually rewarding partnership with ETA as we expand our reach into key regions and leading industries" said Kay Matin, President of AlphaSTAR. "Through this reseller agreement, we will work closely with ETA to present our solutions and assist customers and partners in adopting the technology. ETA's expertise in light-weighting within the automotive industry coupled with AlphaSTAR's excellence in the field of composites make us ready to dive into a market that has an ever growing need for advanced material analysis."

"ETA is very pleased to extend our relationship with AlphaSTAR through this reseller agreement," said ETA's President and CEO, Abraham Keisoglou. "We have a strong commitment to being an innovation leader in the development and implementation of cutting-edge product development tools and techniques. Therefore, we are eager to provide OEMs and suppliers in the auto industry an accurate software solution for designs with composite materials and structures. We expect that our customers will be able to reap the benefits of what AlphaSTAR has to offer."

For more information, please visit - www.eta.com .

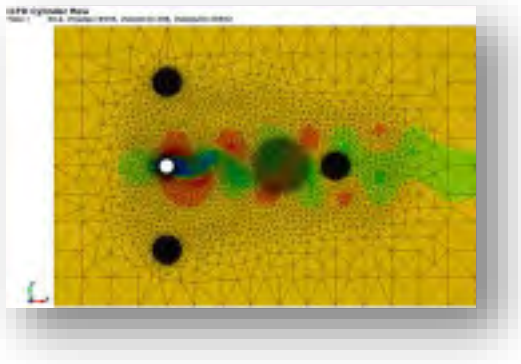
FEA Information is dedicated to focusing on technical information for the engineering community with a number of websites and the FEA Information Engineering Solutions.

I am doing my personal engineering weekly blog/news on Monday www.feantm.com

Please visit FEA Participants 15th International LS-DYNA Conference booth(s)

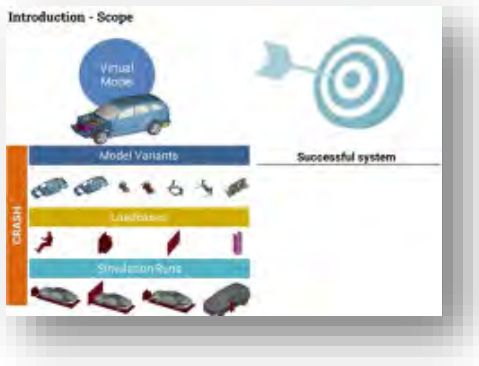
100	ETA	www.eta.com
101	Oasys	www.oasys-software.com/dyna/en /
103	DatapontLabs	www.datapointlabs.com/
107	JSOL	www.jsol.co.jp/english/cae
201	BETA Simulation Solutions	www.beta-cae.com /
301	Predictive Engineering	www.predictiveengineering.com
303	Shanghai Hengstar Technology	www.hengstar.com
400	LSTC	www.lstc.com
401	FEA Information	www.feainformation.com

YouTube December not to miss: AND my new blog www.feantm.com FEA Not To Miss
Join me every Monday morning for two new videos and my pet picture of the week!
You must come and visit for morning coffee on the internet at my Blog



LS-DYNA CFD: Mesh size shape keyword example
Published on Nov 21, 2017

This example shows a combination of adaptive remeshing and various zones of specific mesh sizes defined by the user using the keyword MESH_SIZE_SHAPE.



BETA CAE Systems Solutions for Crash and Safety
Published on Dec 6, 2017

This video demonstrates the new concept of the Model Browser in ANSA from the aspect of a Crash & Safety analysis, as well as a solutions overview and the latest developements of the BETA CAE Systems software suite for Crash & Safety.

Shanghai Hengstar Technology sells and supports LSTC's suite of products and other software solutions. These provide the Chinese automotive industry a simulation environment designed and ready multidisciplinary engineering needs. Sales, Consulting, Training & Support.

Hongsheng Lu welcomes you to Shanghai Hengstar Technology

Distributor in China, for FEA and CAE needs for engineers, professors, students, consultants.

Contact us for our LS-DYNA training courses, such as

- Crashworthiness Simulation with LS-DYNA
- Restraint System Design with Using LS-DYNA
- LS-DYNA MPP
- Airbag Simulation with CPM
- LS-OPT with LS-DYNA

Our classes are given by experts from LSTC USA, domestic OEMs, Germany, Japan, etc. These courses help CAE engineers to effectively use CAE tools such as LS-DYNA to improve car safety and quality, and therefore to enhance the capability of product design and innovation.

Sales & Consulting - Besides solver specific software sales, distribution and support activities, Shanghai Hengstar offers associated training and consulting services to the Chinese automotive market since April 1st, 2013

Solutions - Our software solutions provide the Chinese automotive industry, educational institutions, and other companies a mature suite of tools - powerful and expandable simulation environment designed and ready for future multidisciplinary CAE engineering needs.

Shanghai Hengstar provides engineering services, consulting and training that combine analysis and simulation using Finite Element Methods such as LS-DYNA.

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Shanghai Enhu Informatio
n Technology Co., Ltd
http://www.enhu.com

JSOL supports industries with the simulation technology of state-of-the-art. Supporting customers with providing a variety of solutions from software development to technical support, consulting, in CAE (Computer Aided Engineering) field. Sales, Support, Training.

Convenient, Accurate, and Robust

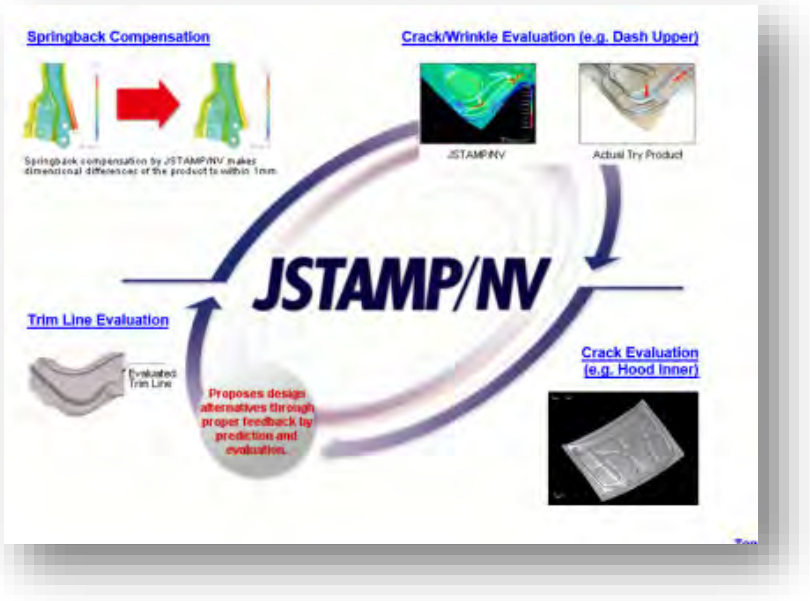
JSTAMP/NV is an integrated forming simulation system for virtual tool shop based on IT environment.

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.

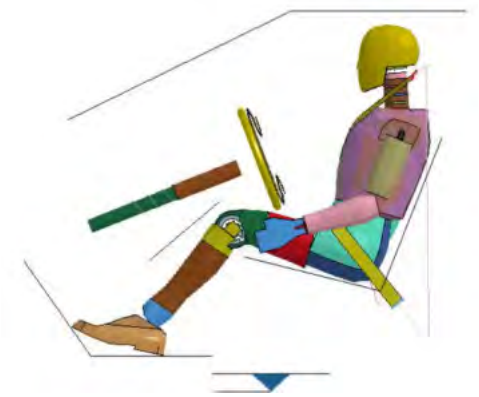
JSTAMP/NV includes various robust solvers, LS-DYNA, JOH/NIKE, and HYSTAMP, which are being renewed progressively.

JSTAMP/NV is widely used in many companies, mainly automobile companies and their suppliers, electronics, and steel/iron companies in Japan. The JSTAMP/NV will be the long-term solution of forming simulation software to companies who want to get reliability and efficiency through CAE technology as in Japan.

JSTAMP/NV gives special features with free of charge like solid blank forming or hot stamping simulation.



A team of engineers, mathematicians, & computer scientists develop LS-DYNA, LS-PrePost, LS-OPT, LS-TaSC, and LSTC's Dummy & Barrier models, for



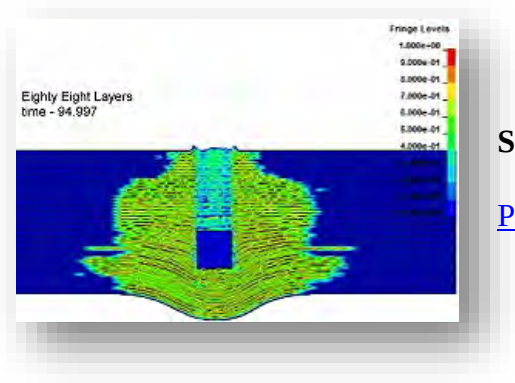
Occupant Modeling Workshops Free Series

- **Dummy Positioning -**
- **Sled Modeling**
- **Belt Routing -**
- **Post Processing**

Workshop 1 Video	About :Video 1 updates/explains corrections
Workshop 2 Video	About :Video 2 updates/explains corrections
Workshop 3 Video	
Workshop 4 Video	
Workshop 5 Video	About : Video 5 updates/explains corrections
Workshop 6 Video	
Sled Environment	About : Sled Environment/explains corrections
Workshop 7 Video	
Seat Belt Model	About: Seat Belt/explains corrections

Providing engineering services to the composites industry since 1970. During this time, we have participated in numerous programs that demonstrate our ability to: perform advanced composite design, analysis and testing; provide overall program management; work in a team environment; and transition new product development to the military and commercial sectors.

MAT162 is a material model for use in LS-DYNA that may be used to simulate the onset and progression of damage in unidirectional and orthotropic fabric composite continua due to 3D stress fields. This failure model can be used to effectively simulate fiber dominated failures, matrix damage, and includes a stress-based delamination failure criterion. This approach to predicting interlaminar failure is advantageous in cases when locations of delamination sites (i.e., interlaminar crack initiation surfaces) cannot be anticipated.

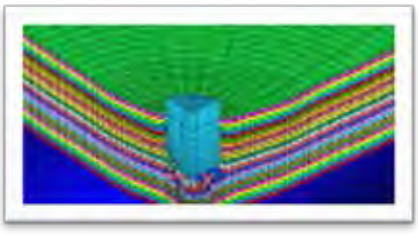


Simulation Movie

Penetration and Perforation of Moderately Thick Composites

Examples are located at www.ccm.udel.edu/software/mat162/examples /

Example 1:
Sphere Impact on a Composite Laminate
Example 2:
Sphere Impact on a Perfectly Clamped Composite Plate
Example 3:
Sphere Impact on Elliptical Carbon/Epoxy Tube



High Velocity Impact of Square Plate using MAT161/162

www.youtube.com/watch?v=NgjncjfLKGw

Oasys Ltd is the software house of Arup and distributor of the LS-DYNA software in the UK, India and China. We develop the Oasys Suite of pre- and post-processing software for use with LS-DYNA.

Oasys LS-DYNA Environment - YouTube

Oasys PRIMER: Model Build/Databases

Gavin Newlands, Arup Associate and developer of the Oasys PRIMER software presents this free webinar, which describes and demonstrates the process of building multiple models within Oasys PRIMER, using a PRIMER model database and positioning impactors at multiple locations.

The Oasys PRIMER pre-processor is designed to make preparation and modification of LS-DYNA models as fast and as simple as possible, improving user productivity and efficiency and reducing the time spent manipulating and developing models suitable for LS-DYNA.

Our priority with Oasys PRIMER is to provide complete support for every LS-DYNA keyword. The user can be assured that every model read in and written out will lose no data.

Main features:

- Full support for LS-DYNA version R9.0
- Connections function for defining various connections (e.g. spotwelds, bolts) including a Autoweld function that does not require an input file
- Quick-pick menu for on-screen manipulation of entity display characteristics
- Quick-pick menu for on-screen editing of LS-DYNA keywords
- Easy access to part data through the Part Tree navigation menu, and Part Table
- Cross reference viewer menu for tracking how different entities refer to each other
- Airbag Folding including mesh-independent airbag folding
- Seatbelt fitting including automatic seatbelt re-fitting after dummy re-positioning
- Mechanisms
- Keyboard shortcut keys for most of the common functions
- Simple meshing capability.
- Full support for LS-DYNA parameters
- Background image and image/model alignment function

Complete Information Oasys PRIMER

Predictive Engineering provides finite element analysis consulting services, software, training and support to a broad range of engineering companies across North America. We strive to exceed client expectations for accuracy, timeliness and knowledge transfer. Our process is both cost-effective and collaborative, ensuring all clients are reference clients.

Project Overviews:

Thermal-Stress Analysis: Theory and Thermal-Stress and Thermal-Deflection

www.predictiveengineering.com/content/project-overview

Thermal-Stress Analysis: Theory and Thermal-Stress and Thermal-Deflection analyses are an important subset of general finite element analysis (FEA) modeling. Such analyses are common in the development of rocket motors, ASME pressure vessels, electronics (PCB), electronic systems (automotive lamp systems), composite curing mandrels, generators, satellites and etc.

This technical white paper is part of a technical seminar that was presented in 2015 for our sister company AppliedCAx. This white paper presents the basic principles of linear, thermal-stress and thermal-deflection analysis. We say "linear" since it is starting point if one endeavors to move forward with more complex type of analyses. For this seminar we will use thermal-stress to cover any type of mechanical behavior, stress or deflection introduced by a fixed temperature rise (delta) or an induced temperature gradient. The resulting strain from this temperature load is based on the material's coefficient of thermal expansion (CTE). The development of stress or deflection within the structure due to this fixed strain and/or variable strain is dependent upon many factors that will be discussed with easy-to-follow basic examples.

With this background, the creation of temperature loads is covered using simple boundary conditions or running a steady-state conduction analysis to map out an imposed temperature gradient. These thermal results will then be converted to a temperature load for the thermal-stress or –deflection analyses.

Offering industry-leading software platforms and hardware infrastructure for companies to perform scientific and engineering simulations. Providing simulation platforms that empower engineers, scientists, developers, and CIO and IT professionals to design innovative products, develop robust applications, and transform IT into unified, agile environments.

ScaleX™ - Products

- **ScaleX™ Pro**
- **ScaleX™ Developer**
- **ScaleX™ Enterprise**

www.rescale.com/products

ScaleX™ Pro is the professional version of Rescale's award-winning cloud simulation and HPC platform and can be deployed within minutes to any organization. The ScaleX Pro platform is designed for independent professionals and SMBs to perform their complex engineering and scientific simulations with speed, performance, and confidence.

ScaleX™ Developer is designed for external application developers and independent software vendors (ISVs) to build, test, and deploy software directly to Rescale's platforms and perform native software integration with Rescale's powerful backend.

ScaleX™ Enterprise is the enterprise deployment of Rescale's industry leading cloud simulation and HPC platform. ScaleX Enterprise features a unified enterprise simulation platform and a powerful administrative portal, along with direct integrations and management of on-premise HPC resources, schedulers, and software licenses.

CAE software sale & customer support , initial launch-up support, periodic on-site support. Engineering Services. Timely solutions, rapid problem set up, expert analysis . material property test Tension test, compression test, high-speed tension test and viscoelasticitiy test for plastic, rubber or foam materials. We verify the material property by LS-DYNA calculations before delivery.

For the entire list of products, within each category, please visit Terrabyte Website

FE analysis

- LS-DYNA is a general-purpose FE program capable of simulating complex real world problems. It is used by the automobile, aerospace, construction, military, manufacturing and bioengineering industries.
- ACS SASSI is a state-of-the-art highly specialized finite element computer code for performing 3D nonlinear soil-structure interaction analyses for shallow, embedded, deeply embedded and buried structures under coherent and incoherent earthquake ground motions.

CFD analysis

- AMI CFD software calculates aerodynamics, hydrodynamics, propulsion and aero elasticity which covers from concept design stage of aerocraft to detailed design, test flight and accident analysis.

EM analysis

- JMAG is a comprehensive software suite for electromechanical equipment design and development. Powerful simulation and analysis technologies provide a new standard in performance and quality for product design.

Plastic Mold

- FormView focuses on thermoforming process (sheet reheat, forming and solidification). It helps to optimize blow moulding process to reduce defects, cycle time and manufacturing cost.

Metal sheet

- JSTAMP is an integrated forming simulation system for virtual tool shop based on IT environment. JSTAMP is widely used in many companies, mainly automobile companies and suppliers, electronics, and steel/iron companies in Japan.

Pre/ Post

- **PreSys** is an engineering simulation solution for FE model development. It offers an intuitive user interface with many streamlined functions, allowing fewer operation steps with a minimum amount of data entry.
- **JVISION** - Multipurpose pre/post-processor for FE solver. It has tight interface with LS-DYNA. Users can obtain both load reduction for analysis work and model quality improvements.

Biomechanics

- **The AnyBody Modeling System**™ is a software system for simulating the mechanics of the live human body working in concert with its environment.

Gaurav Nilakantan gaurav.nilakantan@teledyne.com

Realistic Stochastic Virtual Microstructure Generation for Woven Fabrics and Textile Composites: The Thermal Growth Approach

Gaurav Nilakantan, PhD
Research Scientist

Teledyne Scientific & Imaging
Thousand Oaks, CA, USA

gaurav.nilakantan@teledyne.com

Generating realistic 3D tow-level finite element (FE) models of textile weaves and impregnated textile composites poses a challenge because of the complexity of the 3D architecture and the need for achieving high quality finite elements and non-intersecting tow volumes. A common approach is to sweep a constant tow cross-sectional shape along a smooth and continuous centerline that repeats over a unit cell length. This approach breaks down with tight and complex weave architectures. Moreover, actual microstructures of dry fabrics and textile composites are often aperiodic and non-deterministic.

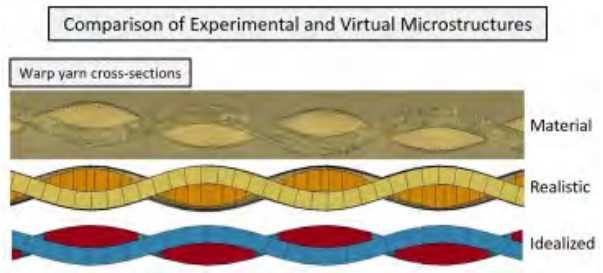
In this work, we present a novel method to generate realistic virtual microstructures of woven fabrics and textile composites using a "thermal growth" approach. This involves a series of orthotropic volumetric expansions and shrinkages of the tow cross-sections and centerlines that are artificially induced by prescribed thermal loads, along with mechanics-driven tow deformations in order to "grow" or "form" the tows into their final realistic configurations within the weave. Contact-pairs are defined between interlacing tow surfaces to prevent tow inter-penetrations. The final virtual microstructures are generated through a series of simulations executed using LS-DYNA.

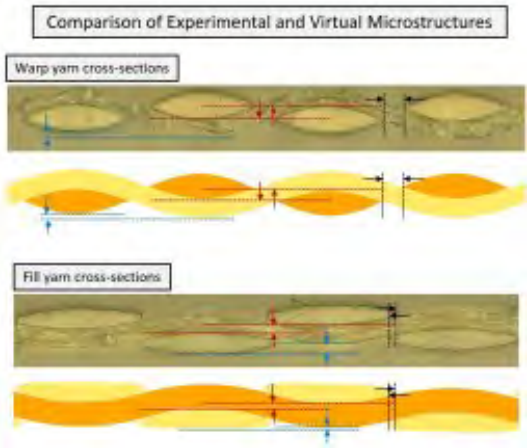
In the example below, we present the microstructure generation of a plain-weave Kevlar fabric (Style 706) used in body armor.

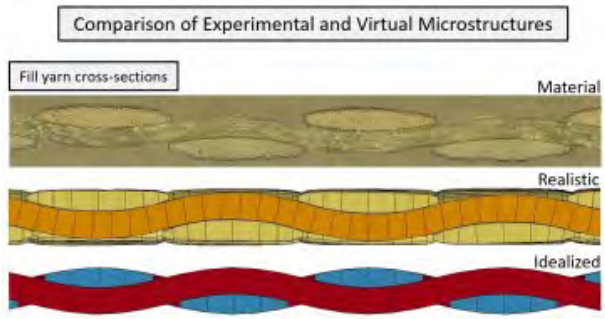
The virtual microstructures are characterized using ImageJ-based image analysis and then validated against experimental microstructures obtained from SEM, optical, and microCT characterization. Relatively fine microstructural features are accurately reproduced.

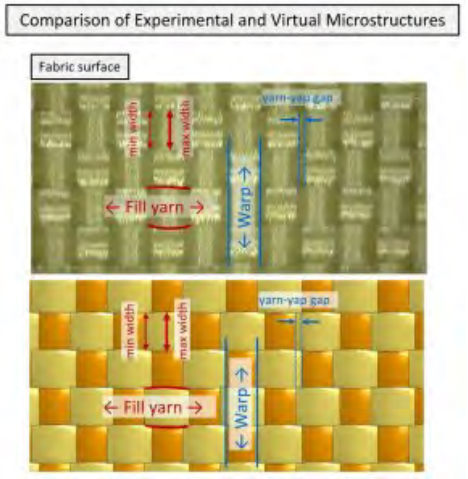
To view a movie of the thermal growth process applied to the Kevlar S706 plain-weave fabric, go to (YouTube Channel): https://youtu.be/FEZfOlU-_wQ

This novel thermal growth approach to generate 3D tow-level meshes of weave architectures can be applied towards any 2D, 2.5D, and 3D woven, as well as braided and knit architectures. It can also be applied towards generating 3D fibers with stochastic centerlines within a single yarn. Additional case studies will be presented at the 2018 LS-DYNA Users' Conference in Michigan. More information about Dr. Nilakantan can be obtained from his research website: http://www.drgaurav.org









Guest - Thierry Marchal

Find me on Twitter @tmmarchal

Bringing Engineering Simulation to Healthcare., Sports, Consumer Product and Construction Industries ANSYS Universite Catholique de Louvain (UCL)

For the complete article please contact Thierry Marchal - thierry.marchal@ansys.com

I'm helping innovative biomedical, pharmaceutical, construction and consumer product companies and engineers to adopt and deploy engineering simulation for accelerating their product development process.

I'm partnering with thought leaders around the world with a strong motivation to ensure that the 'in silico' evolution experienced by the healthcare industry will soon improve the life of every one of us.

By assisting the Construction and Consumer Product industries to democratize their use of simulation, I'm contributing to make our world more environment friendly without compromising with our day to day comfort.

I'm discussing and teaching general best practices followed by leading companies as a way to maximize their return on simulation investment (ROI) and accelerate their pace of innovation.

The current “one size fits all” approach to healthcare fails to recognize the significant differences between the bodies and behaviors of different patients. This creates inefficiencies and cost overruns — but it also affects the quality of care provided. By personalizing the specific treatment to each patient, healthcare will become more affordable for patients and more profitable for providers due to increased efficiency. Implanted medical devices and wearables are becoming more commonplace, saving millions of lives each year. Yet personalized healthcare still requires a significant paradigm shift, as well as a new technology toolkit for collecting data via devices and wearables. Engineering simulation provides a cost-effective, rapid and straightforward solution for modeling patients’ bodies and designing devices that interact optimally with the body. This allows healthcare providers to devise truly personalized treatment plans, as well as to predict health problems before they occur, enabling early intervention. While this “medical digital twin” concept might seem like science fiction, advanced technology is poised to improve quality of life for people around the world.

Custom-Tailored Healthcare: Short- and Long-Term Benefits

Whether you call it precision medicine, individualized medicine or customized medicine, all these terms refer to the same idea: Someday, all of us will be under permanent intensive care. All our vital and non-vital signs — body temperature, blood pressure, glucose level, cardiac rhythm, breathing pace, number of platelets or cells, etc. — will be continuously monitored. Warnings or alarms will be recorded and sent to us, and possibly to medical staff or close family members, whenever a key reading deviates too much from its standard. [1]

In the future, this level of participatory medicine will be the norm, and most of us will be sharing medical data and contributing to a pool of big data necessary for statistical analysis. The combination of available data and advanced methods to predict the outcome of a given treatment for a given patient will naturally lead to predictive medicine — and the opportunity to pay for treatment based on the expected outcome, rather than on an a priori imposed price. Our society will have all the components needed to ensure effective preventive medicine, where pathologies are cured before they break out or evolve. P4 medicine — personalized, participatory, predictive and preventive — a concept imagined a few years ago, will progressively become a reality.

For the complete article please contact Thierry Marchal - thierry.marchal@ansys.com

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www.eta.com

www.flotrend.com.tw

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BETA
SIMULATION SOLUTIONS

BETA CAE Systems. **www.beta-cae.com**

BETA CAE Systems - 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 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

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

get it right®

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.

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.

JSOL

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.

Material Sciences Corporation www.materials-sciences.com

Materials Sciences Corporation has provided engineering services to the composites industry since 1970. During this time, we have participated in numerous programs that demonstrate our ability to: perform advanced composite design, analysis and testing; provide overall program management; work in a team environment; and transition new product development to the military and commercial sectors. MSC's corporate mission has expanded beyond basic research and development now to include transitioning its proprietary technologies from the research lab into innovative new products. This commitment is demonstrated through increased staffing and a more than 3-fold expansion of facilities to allow in-house manufacturing and testing of advanced composite materials and structures

Materials Sciences Corporation (MSC) MAT161/162 - enhanced features have been added to the Dynamic Composite Simulator module of LS-DYNA.

This enhancement to LS-DYNA, known as MAT161/162, enables the most effective and accurate dynamic progressive failure modeling of composite structures to enable the most effective and accurate dynamic progressive failure modeling of composite structures currently available.

MSC/LS-DYNA Composite Software and Database -

Fact Sheet: http://www.materials-sciences.com/dyna-factsheet.pdf

- MSC and LSTC have joined forces in developing this powerful composite dynamic analysis code.
- For the first time, users will have the enhanced ability to simulate explicit dynamic engineering problems for composite structures.
- The integration of this module, known as 'MAT 161', into LS-DYNA allows users to account for progressive damage of various fiber, matrix and interply delamination failure modes.
- Implementing this code will result in the ability to optimize the design of composite structures, with significantly improved survivability under various blast and ballistic threats.

MSC's LS-DYNA module can be used to characterize a variety of composite structures in numerous applications—such as this composite hull under blast

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

www.predictiveengineering.com

Predictive Engineering provides finite element analysis consulting services, software, training and support to a broad range of engineering companies across North America. We strive to exceed client expectations for accuracy, timeliness and knowledge transfer. Our process is both cost-effective and collaborative, ensuring all clients are reference clients.

Our mission is to be honest brokers of information in our consulting services and the software we represent.

Our History

Since 1995, Predictive Engineering has continually expanded its client base. Our clients include many large organizations and industry leaders such as SpaceX, Nike, General Electric, Navistar, FLIR Systems, Sierra Nevada Corp, Georgia-Pacific, Intel, Messier-Dowty and more. Over the years, Predictive Engineering has successfully completed more than 800 projects, and has set itself apart on its strong FEA, CFD and LS-DYNA consulting services.

恒士达科技
Hengstar Tech.

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 focuses 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.

Cloud - HPC Services - Subscription

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

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 increased needs for additional LS-DYNA cores

In calculations of optimization, robustness, statistical analysis, we find that an increase in cores of LS-DYNA are needed, for short term extra projects or cores.

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

This service is offered to customers using Cloud License fee schedule, the additional fee is less epensive 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.

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

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

Cloud - HPC Services - Subscription

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.

Cloud - HPC Services - Subscription

Rescale Cloud Simulation Platform www.rescale.com

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

Cloud - HPC Services - Subscription

ESI Cloud Based Virtual Engineering Solutions

www.esi-group.com

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

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

Distribution, Consulting, Training

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		
Mexico	**COMPLX** **www.complx.com.mx /**		Armando Toledo armando.toledo@complx.com.mx	
	LS-DYNA LS-OPT		LS-PrePost LS-TAsc Barrier/Dummy Models	
United States	**DYNAMAX** www.dynamax-inc.com		sales@dynamax-inc.com	
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models		LSTC Barrier Models	
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	

Distribution, Consulting, Training

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	**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	

Distribution, Consulting, Training

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	

France	**DYNAmore France SAS**		sales@dynamore.eu	
	www.dynamore.eu			
	LS-DYNA, LS-PrePost	LS-OPT	Primer	DYNAFORM
	DSDM Products		LSTC Dummy Models	FEMZIP
	LSTC Barrier Models		DIGIMAT	

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

Distribution, Consulting, Training

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

Russia	**Limited Liability DynaRu**		office@lsdyna.ru	
	LS-DYNA	LS-TaSC	LS-OPT	LS-PrePost
	LSTC Dummy Models		LSTC Barrier Models	

Spain	**DYNAmore France SAS**		sales@dynamore.eu		
	www.dynamore.eu				
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	DSDM Products		LSTC Dummy Models	FEMZIP	
	LSTC Barrier Models		DIGIMAT		
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 &	Barrier Models	
UK	**ARUP**	dyna.sales@arup.com			
	www.oasys-software.com/dyna		TOYOTA THUMS		
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	LS-TaSC		PRIMER	D3PLOT	T/HIS
	REPORTER	SHELL	FEMZIP	HYCRASH	
	DIGIMAT	Simpleware	LSTC Dummy Models		
			LSTC Barrier Models		

Distribution, Consulting, Training

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**		de-long.ge@arup.com	
	www.oasys-software.com/dyna			
	PRIMER D3PLOT	HYCRASH	T/HIS REPORTER	SHELL
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	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 India**		info@cadfem.in	
	www.cadfem.in			
	ANSYS		VPS	optiSLang
	LS-DYNA		LS-OPT	LS-PrePost

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

Distribution, Consulting, Training

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	
	Inventium PreSys	ETA/DYNAFORM	Digimat	
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	

Distribution, Consulting, Training

Korea	**THEME**	wschung7@gmail.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 **AgileSim Technology Corp.**

www.agilesim.com.tw

LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

Taiwan **Flotrend**

www.flotrend.com.tw

LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

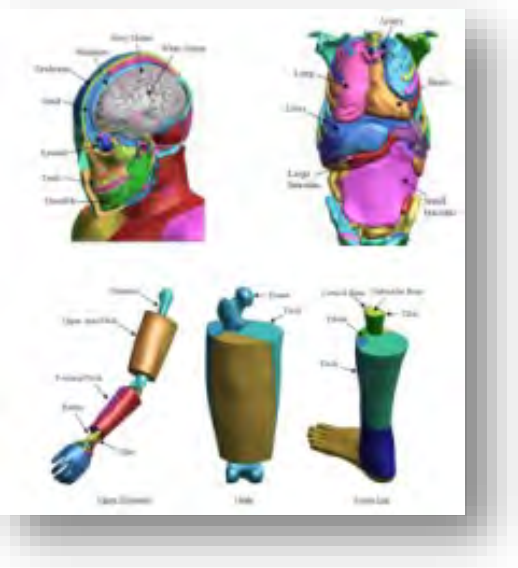
Taiwan **SiMWARE Inc..**

www.simware.com.tw

LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

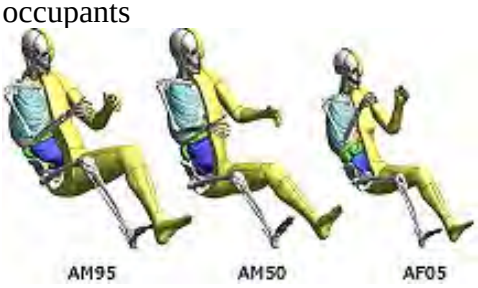
ATD - Human Models - Barrier

TOYOTA - Total Human Model for Safety – THUMS

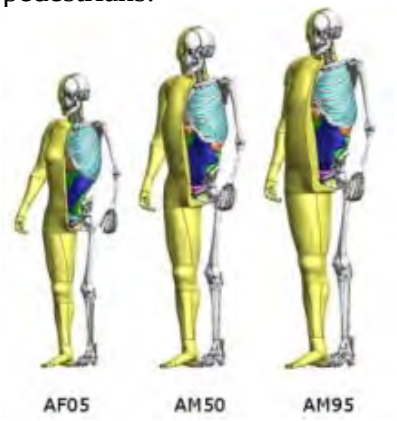


The Total Human Model for Safety, or THUMS®, is a joint development of Toyota Motor Corporation and Toyota Central R&D Labs. Unlike dummy models, which are simplified representation of humans, THUMS represents actual humans in detail, including the outer shape, but also bones, muscles, ligaments, tendons,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

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



and as standing model to represent pedestrians.



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

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

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

For information please contact: THUMS@lstc.com

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

LSTC – Dummy Models

LSTC Crash Test Dummies (ATD)

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

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

e-mail to: atds@lstc.com

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

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

Models In Development

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

Planned Models

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

LSTC – Barrier Models

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

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

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

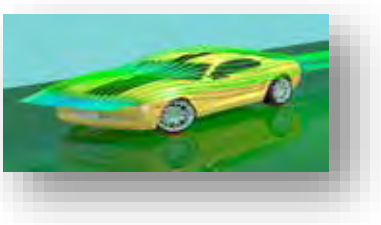
- MDB according to FMVSS 214 modeled with shell elements
- MDB according to FMVSS 214 modeled with solid elements
- MDB according to ECE R-95 modeled with shell elements
- AE-MDB modeled with shell elements

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

- RMDB modeled with shell and solid elements

e-mail to: atds@lstc.com.

15th International LS-DYNA® Users Conference & Users Meeting



June 10-12, 2018

Edward Hotel & Convention Center
Dearborn, MI, USA

For Booth & Sponsorship information contact Dilip@lstc.com

The conference will host a forum for engineers, professors, students, consultants, industry leaders, and interested parties to exchange their ideas, and listen to the latest in industry and academic presentations..

The presenter (1) One Presenter of the accepted paper will receive a complimentary (no fee) conference registration, when they register using the "LSTC Conference" group registration code at the Edward Hotel.

Conference Dates:

Sunday	06/10/2018	Registration	Exhibition Area	Reception
Monday	06/11/2018	Registration	Exhibition Area	Banquet
Tuesday	06/12/2018	Registration	Exhibition Area	Closing
Wednesday/Thursday	06/13-14/2018	Training Classes		

Information:

Abstracts & papers papers@lstc.com
Participation, Registration conference@lstc.com

Abstract Deadline - November 30th, 2017

Paper Submission: Deadline: February 14, 2018 FIRM

Notification and templates will be provided by DYNAmore
For any questions please write papers@lstc.com

Registration/Classes: www.ls-dynaconferences.com

Training - Webinars - Events - Conferences

Participant's Training Classes

Webinars

Info Days

Class Directory

Directory

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

Training - Dynamore

Author: Christian Frech christian.frech@dynamore.de

DYNAmore Visit the website for complete overview and registration

www.dynamore.de/seminars

Seminar dates offered by DYNAmore – January/February

Download full seminar brochure (pdf): www.dynamore.de/seminars2018

Selection of trainings for January and February

Introduction	
Introduction to LS-DYNA	30 Jan-01 Feb (V)/20-22. February
Introduction to LS-PrePost	19 February
Basic/Theory	
User Interfaces in LS-DYNA	5 February
Element Types and Nonlinear Aspects	23 February
Crash/Short-Term-Dynamics	
Failure of Fiber Reinforced Polymer Components	15 February
Passive Safety	
LS-DYNA Dummy and Pedestrian Impactor Modeling	6 February
Metal Forming	
Hot Forming with LS-DYNA	23-24 January
Applied Forming Simulation with eta/DYNAFORM	25-26 January

Information days (free of charge)

Optimization with ANSA, LS-OPT and META	5 February
Dummy Models – Overview and New Developments	23 February
Cloud Solutions for LS-DYNA	26 February
Process Automation and SDM	26 February

Support/Webinar series (free of charge) – Registration via www.dynamore.de

Support day	19 January/16 February

If not otherwise stated, the event location is Stuttgart, Germany. Other event locations are:
G = Gothenburg, Sweden; L = Linköping, Sweden V = Versailles, France; T = Turin, Italy,
Tr = Traboch, Austria

We hope that our offer will meet your needs and are looking forward to welcoming you at one of the events.

www.lstc.com

January

22	Mon	MI	Intro to LS-PrePost	1	P. Ho / Q. Yan
23-26	Tue-Fri	MI	Intro to LS-DYNA	3.5	A. Nair
29-30	Mon-Tues	MI	Airbag Folding	2	R. Chivukula
31- Feb 1	Wed-Thurs	MI	Airbag Modeling in LS-DYNA	2	A. Nair

February

9	Fri	CA	Material Characterization	1	S. Bala
26-28	Mon-Wed	CA	ALE	3	M. Souli
26	Mon	MI	Intro to LS-PrePost	1	P. Ho / Q. Yan
27- Mar 2	Tues-Fri	MI	Intro to LS-DYNA	3.5	A. Nair

March

1-2	Thurs-Fri	CA	SPH	2	M. Souli
5-6	Mon-Wed	MI	LS-DYNA Advanced	2	S. Bala
19	Mon	CA	Intro to LS-PrePost	1	P. Ho / Q. Yan
20-23	Tues-Fri	CA	Intro to LS-DYNA	3.5	A. Tabiei

April

25-27	Wed-Fri	CA	Advanced ALE & S-ALE Applications	3	I. Do
23	Mon	MI	Intro to LS-PrePost	1	P. Ho / Q. Yan
24-27	Tues-Fri	MI	Intro to LS-DYNA	3.5	A. Nair

Social Media

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BETA CAE Systems

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ESI Group

Lenovo

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BETA CAE Systems

ESI Group

ETA

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YOUTUBE Channel	WebSite URL
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CADFEM	www.cadfem.de
ESI Group	www.esi-group.com
ETA	www.eta.com
Lancemore	www.lancemore.jp/index_en.html
Lenovo	

GOOGLE+

BETA CAE Systems	

Editor: Yanhua Zhao - yanhua@feainformation.com

December

Discussion on acoustic databases in LS-DYNA

, Zhe Cui, Yun Huang
Livermore Software Technology Corporation

Abstract: A bunch of acoustic solvers have been provided by LS-DYNA. They include the ones based on boundary element methods (keyword *FREQUENCY_DOMAIN_ACOUSTIC_BEM, including the approximate methods: Rayleigh method, Kirchhoff method), finite element methods (keyword *FREQUENCY_DOMAIN_ACOUSTIC_FEM, and vibration solvers (ERP, equivalent radiated power, based on Steady State Dynamics, keyword *FREQUENCY_DOMAIN_SSD_ERP).

The acoustic solvers have been widely used in NVH, vibro-acoustic analysis and many other areas where noise level or sound quality is a concern. To perform the post-processing of the acoustic analysis with LS-DYNA, a bunch of databases have been implemented.

For fringe plot of the results, the following binary databases have been provided: D3ACS, D3ACP, D3ACC, D3ATV, D3ERP and D3EIGV_AC;

For xyplot of the results, the following ASCII databases have been provided: Press_Pa, Press_dB, Press_Pa_real, Press_Pa_imag, Press_Pa_t, Press_dB_t, Press_Power, Press_radef, Press_dB(A), Press_dB(B), Press_dB(C), Press_dB(D) and panel_contribution_NID.

These databases have different purposes and should be used under different circumstances.

1. Introduction

Since ls971 R6 version, a series of frequency domain features of acoustic simulation have been implemented to LS-DYNA. They include the ones based on boundary element methods (keyword *FREQUENCY_DOMAIN_ACOUSTIC_BEM, including the approximate methods: Rayleigh method, Kirchhoff method), finite element methods (keyword *FREQUENCY_DOMAIN_ACOUSTIC_FEM) and vibration solvers (ERP, equivalent radiated power, based on Steady State Dynamics, keyword *FREQUENCY_DOMAIN_SSD_ERP). They were developed to meet requirements from users of different industries, especially those from auto NVH analysis.

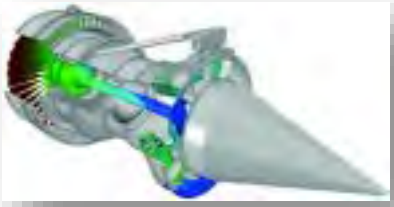
A bunch of databases have been provided for the post-processing of the acoustic analysis with LS-DYNA. All these database files can be accessed by LS-PrePost. This paper gives a brief review of these databases.

The above excerpt is from the complete paper on www.lstc.com/new_features

Editor: Yanhua Zhao - yanhua@feainformation.com

Among the Previous Months Postings on New Features

- Thick Shell Element Form 5 in LS-DYNA
- A Customized Job Manager for Metal Forming Simulations with LS-DYNA
- Improvement of Mesh Fusion in LS-DYNA
- A 3D bond-based peridynamics model for dynamic brittle failure analysis in LS-DYNA®
- Conversion between FLD and Stress Triaxial Limit Curve
- A non-orthogonal material model of woven composites in the preforming process
- Best Fit GUI for Metal Forming in LS-PrePost® 4.5
- Modeling and Numerical Simulation of Afterburning of Thermobaric Explosives In a Closed Chamber
- Improvement of Sandwich Structure Part Adaptivity in LS-DYNA
- New Inflator Models in LS-DYNA®
- Improvement of Mesh Fusion in LS-DYNA
- Representative Volume Element (RVE) analysis using LS-DYNA
- New features of 3D adaptivity in LS-DYNA
- New Feature: Defining Hardening Curve in LS-DYNA®
- Improvements to One-Step Simulation in LS-DYNA
- LS-DYNA Smooth Particle Galerkin (SPG) Method



Jet Engine

LS-DYNA® provides a comprehensive set of analysis tools for engineering applications. Implicit and explicit solutions use the same elements and materials enabling users to have one model for static and dynamic analyses.

Seamless switching between implicit and explicit solutions during a simulation increases the level of applicability. Implicit linear and nonlinear solutions can be either static or dynamic. Dynamic solutions can be performed in either the time or frequency domains. Furthermore, there are powerful tools for examining frequency content for model verification and validation, a capability that can be used stand-alone or incorporated in an implicit or explicit transient simulation to include the effect of prestress. Resulting modes can be used to build reduced linearized models for use in design studies by modal analysis or employed by the frequency domain analysis tools.

Applications:

Implicit analysis can be used on a wide variety of application areas, including but not limited to;

Automotive

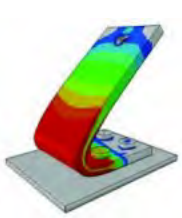
- Gravity Loading
- Dummy Seating
- Door Sag
- Roof Crush
- Seat Pull

Aerospace

- Fuselage Drop Test
- Jet Engine Start Up
- Analysis of Seats
- Consumer Goods
- Satellite Stress and Vibration Tests
- Drop Test
- Vibration computations for Acoustical Analysis

Features

- Linear Analysis
- Vibration Analysis
- Nonlinear Static and Dynamic Analysis
- Constraint and Attachment Mode Analysis



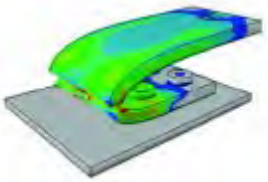
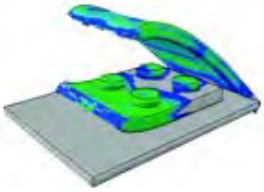
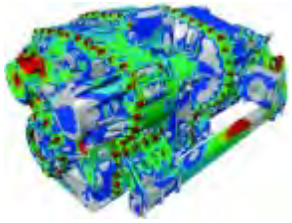
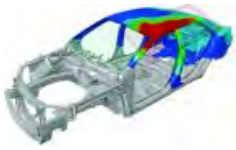


Plate Failure





Bolt Preload



Roof Crush