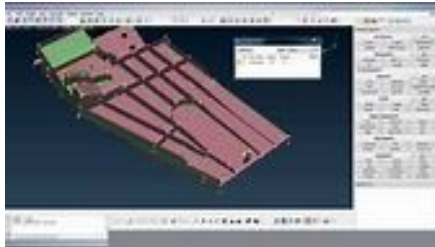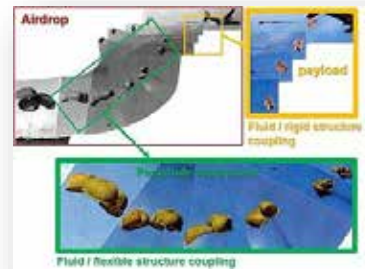**BETA CAE Systems**
Automatic generation of middle surface
for Casted parts with ANSA

15th LS-DYNA® Int'l Conference
Airdrop Sequence Simulation using
LS-DYNA® ICFD Solver and FSI Coupling
DynaS+, Toulouse, France

OASYS
Reporter

JSOL
JSTAMP

LS-DYNA New Features:

· *LS-DYNA Linear Solver Development*
   Zhe Cui and Yun Huang
· *A One Step Simulation Approach Using Isogeometric Shells in LS-DYNA*
   Liping Li, Xinhai Zhu (Metal Forming feature)

FEA Information Engineering Solutions

www.feapublications.com

The focus is engineering technical solutions/information.

FEA Information China Engineering Solutions

Simplified and Traditional Chinese

The focus is engineering technical solutions/information.

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Platinum Particpants

Platinum Particpants

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JSOL

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The Software House of Arup

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恒士达科技
Hengstar Tech.

rescale

Table of contents

Articles – Blogs – News

Resources

LS-DYNA New Features - Editor Yanhua Zhao yanhua@lstc.com

LS-DYNA Conference Presentation Showcase & Distributor News

Announcements

FEA Information Engineering Solutions Announcement of changes:

  First, welcome Noi Sims, as a contributing editor.
  Noi will be contributing many of the sections, in our solutions news.

  I was pleased to greet many of our readers at our booth, at the LS-DYNA
  Conference and learned of changes you would like to see in the publication.

  This month starts changes in formats, by removing columns.
  This will make it easier for longer URL's, keyword notations, and is due to reader
  requests.   If you have other recommendations please feel free to contact us.

        Yanhua - yanhua@feainformation.com
        Noi - noi@feainformation.com

June showcase paper from the 15th Int'l LS-DYNA Conf. & Users Meeting 2018

Airdrop Sequence Simulation using LS-DYNA® ICFD Solver and FSI Coupling
DynaS+, Toulouse, France

Course: **Progressive Composite Damage Modeling in LS-DYNA (MAT162 & Others)**
   **Offered:**   in-house and as a web conference.
   Information: www.ccm.udel.edu/software/mat162_workshop
   Dates: Tues., **July** 17, 2018 | 9am-5pm
                Tues., **Nov.**13, 2018 | 9am-5pm

BETA CAE Systems

www.beta-cae.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…
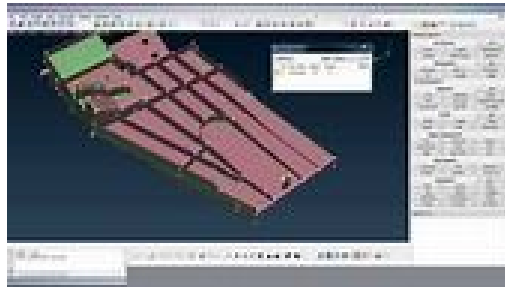
June Video published on YouTube
https://www.youtube.com/watch?v=U3NiFbcSdzE

Automatic generation of middle surface for Casted parts with ANSA - Showcasing the newly introduced Casting tool, available with the ANSA v18.0.0. Demonstrating how to easily fix the result using the Align Entities tool.

Video Webinar Directory

Automatic
middle surface generation
for casted parts
with ANSA

Correlation between
test & simulation using
META photorealism

Fearured ANSA add-on:
Xpress PL from Xitadel

Products

SPDRM
WORKFLOW MANAGER
The unique solution for CAE workflow, data and resources management

KOMVOS
SDM CONSOLE
The interactive console for browsing, visualizing and handling all the CAE data

ANSA
PRE PROCESSOR
The advanced CAE pre-processing software for complete model build up

EPILYSIS
SOLVER
The new FEA solver

META
POST PROCESSOR
The high performance multi-disciplinary CAE post-processor

RETOMO
PIXEL TO OBJECT
The key to 3D-modeling from CT-data of physical objects

FEA Information Engineering Solutions   Page 7

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.

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.

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 GmbH

www.dynamore.com

Author: Christian Frech christian.frech@dynamore.de   Contact: forum@dynamore.de

2nd Call for Papers
15th German LS-DYNA Forum 2018
October 15 - 17 2018, Bamberg, Germany
www.dynamore.de/forum2018-e

2nd Call for Papers: The deadline for submission of abstracts for the 15th German LS-DYNA Forum from October 15-17 in Bamberg has been **extended to June 29**. DYNAmore kindly invites you to participate at the event and encourages you to actively contribute to the conference agenda by submitting a presentation about your experience with the LSTC product range. Participation without a presentation is also worth-while to exchange your knowledge and discuss new solution approaches with other users.

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

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

Abstract submission: Please submit your abstract (maximum length 2,500 characters) by e-mail to forum@dynamore.de or online at www.dynamore.de/abstract-2018.

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

Participant fees

Industry speaker:	380 Euro	Academic speaker:	280 Euro
Industry:	530 Euro [1] / 600 Euro	Academic:	380 Euro [1] / 430 Euro

[1] Registration before 25 June 2018. All plus VAT.

Venue: Welcome Kongresshotel Bamberg
Mußstraße 7, 96047 Bamberg, Germany www.welcome-hotels.com/welcome-kongresshotel-bamberg
**Conference language:** German and English
Contact: DYNAmore GmbH, Industriestr. 2, D-70565 Stuttgart, Germany,
Tel. +49 (0) 7 11 - 45 96 00 - 0   **E-mail:** forum@dynamore.dewww.dynamore.de/forum2018-e

ESI Group

www.esi-group.com

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.

Space Structures Grows Their Business and Customer Satisfaction with Help from ESI VA One
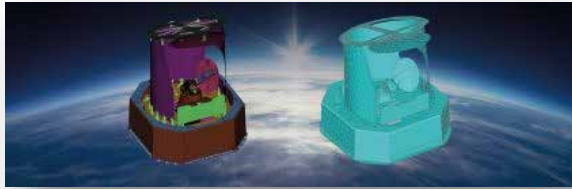
ESI VA One is an outstanding software product. However, the real success is provided in the proactive, flexible, timely and high-quality support of the ESI team from our first contact with the sales team to our contact with technical support." *Florian Ruess, Managing Director Space Structures GmbH*

Challenge: Accurate models are required to ensure the integrity of vital launch equipment subject to the high-intensity acoustic field experienced during the launch process. Modeling launch acoustic conditions using traditional calculation methods relies on assumptions that can lead to an inaccurate result, conservative assumptions, and neglect of frequency dependency of the responses. Space Structures realized they needed a more advanced simulation methodology when designing structures for vibro-acoustic loading (e.g.) for the development of a multi-functional panel for large satellites under ESA contract.

Story: The aerospace industry has been striving to find a tool that can accurately predict acoustic and vibration responses under rocket launch conditions, which create an intense diffuse acoustic field during the early launch phase. This can compromise the integrity of both the spacecraft and protective fairing, along with sensitive ground-based equipment.

Benefits: Using ESI VA One, Space Structures was able to create predictive vibro-acoustic models, which made it possible to quickly and accurately simulate interlayer carbon fiber composite stresses. ESI's exceptional technical service and the comprehensive capabilities of VA One enabled Space Structures to perform necessary calculations and analyses to support and optimize their designs. As a result, Space Structures received a high return on investment and increased customer satisfaction.

Page 10

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.
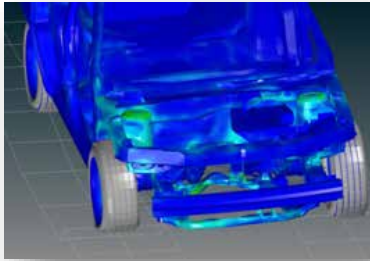
VPG - a set of plug-ins, which allow the user to quickly & efficiently create finite element models & define the models for mechanical system analyses.

VPG can be used to simulate common automotive safety test conditions, drop tests, fluid-structure interaction & structural analysis accurately.

The Drop Test plug-in enables engineers to simulate designs undergoing the abuse of everyday use & the extremes of the product lifetime.

The FSI application allows the user to create advanced fluid-structure interaction simulations, automatically creating ALE mesh zones & explosive pressure sources. The user can set-up LS-DYNA® models with multiple fluid zones & variable charge shapes using a simple parametric model definition.

Safety: The Safety plug-in allows the user to set-up LS-DYNA® safety simulations, including FMVSS & ECE vehicle safety test simulations. Occupant modeling is supported to interactively position finite element dummy models & add seatbelts.

With the Structure plug-in, the user can analyze tire models, suspension models & road surfaces. The plug-in offers a dynamic non-linear analysis approach, using real-time boundary conditions consistent with common test environments.

Learn more about VPG at www.eta.com

FEA Not To Miss

FEA Not To Miss, is a weekly internet blog on helpful videos, tutorials and other Not To Miss important internet postings. Plus, a monthly email blog.

Welcome to Monday - grab a cup of coffee, tea or protein drink and join me for FEA Not To Miss Monday
Postings every Monday on what you have missed

www.feantm.com

06/10 - UH you all went to the LS-DYNA conference. My shop is empty!!! Okay back to engineering: I will walk down the street, scone to go, and visit the Video store for LS-DYNA CFD :
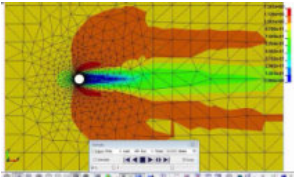
Short video on LS-PrePost Solution Explorer - This short (and soundless) video quickly shows how to reproduce the input deck of the simple cylinder flow problem

06/04/2018 - AND its Monday! Just love coffee mornings - AND is that a bell I hear? Coffee and that sound!!! Although I do like the bell, I am heading for some ear plugs.   I guess we can say I don't quite understand it, BUT that is why I only serve the coffee and don't do the engineering! You do that!!
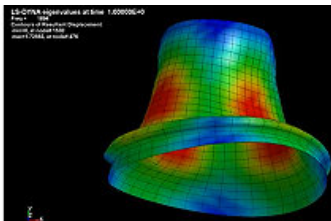
LS-DYNA modal analysis of Bell + audio from ffmpeg

05/28/2018 AND we raise our cups of coffee in honor of Memorial Day - Never forget! NOW - who wants to fly a rubber band propeller plane? ME ME ME!   I just ordered one from Amazon!! Can't wait to buzz my boss's office!!
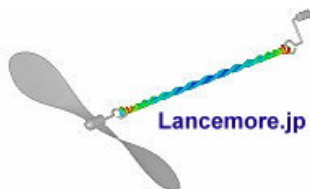
LS-DYNA Sample Model No.004   Rubber Band Powered Propeller

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.

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.

hongsheng@hengstar.com   **-** Shanghai Hengstar Technology Co., Ltd
        http://www.hengstar.com
        Enhu 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.

Designers can avoid the challenges of trial and error. JSTAMP provides an adequate result and reduces the lead time and cost of tool design.

JSTAMP Functions Address various tasks in tool shop

JSTAMP represents the Sheet metal forming process virtually by numerical simulation. Users can examine the simulation result, output it to CAD, and directly use the CAD as a countermeasure by using JSTAMP.

JSTAMP provides comprehensive support throughout the design process from the first trial to the final stage. The feature for addressing complicated process stages, low formability materials, and latest technologies covers various tasks in the Sheet metal forming process.

EVENTS:

J-OCTA Users Conference 2018
  Dates :   Nov..21, 2018
  Venue : Tokyo Conference Center SHINAG…

LS-DYNA & JSTAMP Forum 2018
  Dates :   Oct..31, 2018
  Venue : NAGOYA TOKYU HOTEL

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

GALLERy Showcase CESE Solver
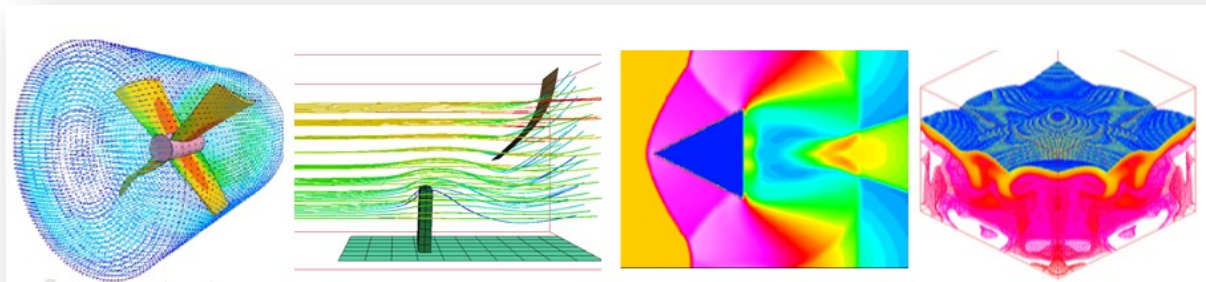
The CESE solver is a compressible flow solver based upon the Conservation Element/Solution Element (CE/SE) method originally proposed by Dr. Chang in NASA Glenn Research Center. Some applications of this method include solving many different types of flow problems, such as detonation waves, shock/acoustic wave interaction, cavitating flows, and chemical reaction flows, fluid-structure interaction problems with the embedded (or immersed) boundary approach or moving (or fitting) mesh approach, airbag deployement and so forth.

Videos Available with descriptions at http://www.lstc.com/applications/cese_cfd/gallery
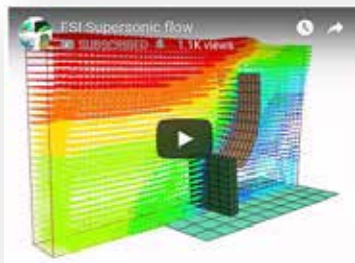
Description: This example is to test the interaction of fluid/shell and fluid/solid volume elements. A high-pressure (two atmospheres) air flows from left to right passing over a solid block and a shell structure, pushing both while moving to the right. The pressure initial condition is one atmosphere everywhere. A prescribed boundary condition is used on the inlet face (left), a solid wall boundary condition on the bottom right, and all other boundaries treated as open boundaries.

Demo license available for LS-DYNA and all LSTC solvers, additionally includes LS-PrePost, LS-OPT, LS-TASC, LSTC Barrie and ATD Models. sales@lstc.com

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.

Course Offered - **Progressive Composite Damage Modeling in LS-DYNA (MAT162 & Others)**
Bazle Z. (Gama) Haque, Ph.D. - Sr. Scientist, Univ. of Delaware Ctr. for Composite Materials (UD-CCM)

2018 Workshops: Tuesday, **July** 17, 2018 | 9am-5pm   Tuesday, **November** 13, 2018 | 9am-5pm

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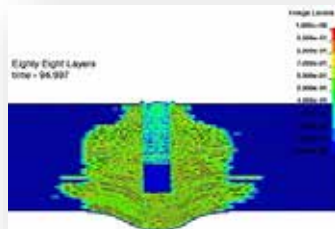
Simulation Movie

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

www.oasys-software.com/dyna

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.
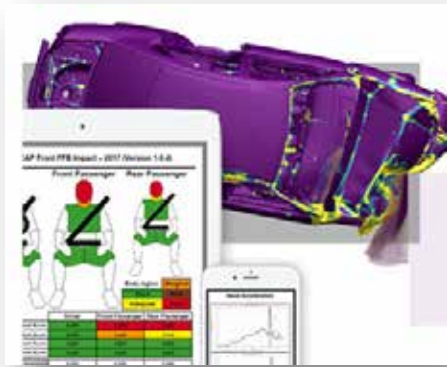
Oasys REPORTER offers automatic report generation using numerous layout tools with the ability to auto-create images through embedded D3PLOT, T/HIS and FAST-TCF scripts.

Generate your report for multiple simulations, extract key data points and combine into one document, complete with automatically collated summary tables, color coding and company logos.

Main Features

· Fast and convenient post-processing of LS-DYNA results using templates and scripts.
· Can be used to produce reports automatically after an LS-DYNA analysis finishes.
· Using command files and scripts, Oasys REPORTER links with D3PLOT, PRIMER, T/HIS, and other programs, to create the images and graphs for your report.
· Compatible with scripts written in all major programming languages.
· Supports files from a mixed UNIX / PC system.
· Reports can be output in PDF, PowerPoint VBA, HTML and postscript formats.

Standard Loadcase Templates

· EuroNCAP – Frontal ODB & FFB
· EuroNCAP – Side MDB & Pole
· CNCAP – Frontal ODB
· EuroNCAP Pedestrian Head & Leg
· GTR Pedestrian Head
· IIHS ODB & SOB
· USNCAP – Front and Side
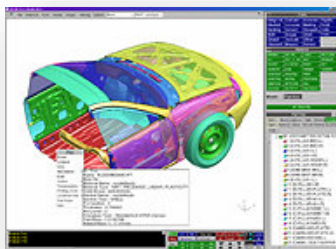
Oasys PRIMER: The Oasys PRIMER pre-processor is designed to make preparation and modification of LS-DYNA models as fast and as simple as possible, improving user productivity and efficiency and reducing the time spent manipulating and developing models suitable for LS-DYNA.

FEA Information Engineering Solutions   Page 17

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.
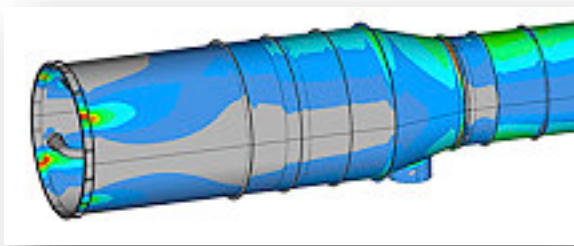
Predictive Engineering specializes in "design-by-analysis" pressure vessel work following ASME Section VIII, Div. 2 (BPVC) and Nuclear Quality Assurance (NQA-1) Certification codes.
asme-bpvc-pressure-vessel-consulting-services

Our FEA BPVC consultants have successfully completed a broad range of analysis work on hundreds of pressure vessels. Within this body of work, we have applied the following codes:

- ASME BPVC Section VIII, Divison 2 (Design-by-Analysis)
- ASME Pressure Vessels for Human Occupancy (PVHO)
- ASCE 4-98 and ASCE 7-02
- AISI N690
- ABS Underwater Vehicles, Systems & Hyperbaric Facilities

These FEA pressure vessel consulting projects cover a wide variety of analyses, from differential thermal-stress analysis of heat exchangers utilizing mixed materials, to stress and fatigue analysis of large-diameter vessels, to analyses of vessels with complex internal structures subjected to sloshing, seismic and added-mass effects or lifting and transportation analyses and transient thermal-fatigue of thick-walled tanks. We have also done stringent code work under the ASME PVHO and ABS Underwater Vehicles, Systems and Hyperbaric Facilities on several types of passenger submarines. In one particular case, our FEA PVHO-ABS consulting allowed our client to certify their submarine via FEA in lieu of the standand design rules. This exception was approved by the ABS since the FEA results tightly correlated with the strain-gauge results from the dive test. More results on this investigation can be found at NASA Tech Briefs

To support our pressure vessel work, we have developed custom software for stress and fatigue evaluation of thin and thick-walled vessels. Some of this PV consulting work has helped SpaceX launch their next generation of rockets.

In the nuclear field, Predictive is certified to generate NQA-1 seismic, buckling and fatigue analysis reports on some of the most complex vessels installed at the Hanford Tank Waste Treatment and Immobilization Plant. These reports are all focused on the "design-by-analysis" rules within the ASME Section VIII, Division 2 specification. Working collaboratively with Department of Energy contractors, Predictive has pioneered many of the seismic and buckling analysis procedures based on interpretation of ASCE 4-98 and ASME Section VIII, Div. 2 Codes for pressure vessels containing large submerged internal components that are subjected to the added mass requirements within ASCE 4-98.

From seismic to buckling to fatigue analysis, Predictive can assist in validating the most challenging pressure vessel designs. Our hard-earned experience allows us to safely classify tanks and vessels as "fit-for-service" that would typically have required extensive rework by the standard ASME Section VIII, Division 1 hand-calculations.

In brief, clients come to us when they need high-quality work executed and documented to withstand the most rigorous reviews.

Please download our project portfolio for our ASME BPVC pressure vessel consulting services

asme-bpvc-pressure-vessel-consulting-services

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.

Rescale and EDRMedeso Announce Partnership

Article on the Rescale Website by Annette Dehler.

Top European supplier of software for technical simulation becomes new ScaleX distributor

San Francisco, Calif., May 23, 2018 – Rescale, the HPC in the cloud company, today announced EDRMedeso will be joining Rescale's strategic partner ecosystem, allowing simulation engineers to quickly access virtually unlimited compute on Rescale's ScaleX® Enterprise platform. EDRMedeso is a world-class leading channel partner with over 30 years of experience providing industry-leading simulation software from ANSYS® across European markets. The partnership brings EDRMedeso the ability to provide an end to end, turnkey solution for their existing and new European market segments.

"Computer power is often a bottleneck when our customers deploy our Digital Labs. With the scalable and easily accessible solutions from Rescale we are confident that we can help our customers be even more innovative while they at the same time deliver their products faster to the market," said Niklas Lindwall, CEO, EDRMedeso. "We are always looking for best in class partners and with Rescale we certainly have found a new one."

Traditionally, ANSYS' simulation tools ran on-premise, but with the latest advancements in specialty infrastructure such as CPUs, GPUs and FPGAs over the last several years, clients are looking to cloud hosting providers to offer access to scalable computing for a fraction of the cost. Rescale's HPC cloud platform automates the deployment of engineering applications through cloud, bare metal, and on-premise computing. Users can now instantly expand compute resources to thousands of cores and choose hardware configurations pre-optimized to all ANSYS simulation solutions.

This partnership will continue the EDRMedeso vision of Perfect Engineering, delivering local support, training, consulting services and HPC expertise.

"We are thrilled about our partnership with EDRMedeso," said Tyler Smith, Head of Partnerships, Rescale. "We believe that EDRMedeso has been a pioneer in providing cutting edge thought leadership in their market. EDRMedeso shares our vision of transitioning simulation workloads to cloud HPC. Our partnership provides EDRMedeso a turn-key full stack solution to offer their clients a more cost-effective alternative to on-premise compute."

For more information, visit https://eu.rescale.com/edr/signup/

About EDRMedeso: EDRMedeso is the leading supplier of software for technical simulation and related services in Northern Europe. With its Digital Lab strategy EDRMedeso supplies more than 800 customers in the Nordics, Baltics, and U.K. with ANSYS software for fluid dynamics (CFD), mechanical/thermal/dynamic analysis (FEA), and electromagnetic calculations including electronic and system simulations. EDRMedeso also represents world leading products such as Building Information Modeling (BIM) from Trimble Tekla, as well as products from CSI (SAP2000, ETABS, SAFE and CSIBridge) and Sigma GmbH (ROHR2).

About Rescale: Rescale is the HPC in the cloud company. Trusted by the Global Fortune 500, Rescale empowers the world's top executives, IT leaders, engineers, and scientists to securely manage product innovation and perform groundbreaking research and development faster at a lower cost. The Rescale platform transforms traditional fixed IT into flexible hybrid, private, and public cloud resources with enterprise level administration and security. Rescale instantly enables over 250 ported and tuned applications to run on the largest and most powerful high performance computing infrastructure network in the world. For more information on Rescale, visit www.rescale.com.

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.

CAE consulting - Software selection, CAE software sale & customer support , initial launch-up support, periodic on-site support

Engineering Services - Timely solutions, rapid problem set up, expert analysis - all with our Engineering Services. Terrabyte can provide you with a complete solution to your problem; can provide you all the tools for you to obtain the solution, or offer any intermediate level of support and software.

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.

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.

Shanghai Fangkun Software Technology Ltd.

Shanghai Fangkun Software Technology Ltd
Established in May 2018

This is to announce and confirm that effective on June 1, 2018, LSTC has appointed Dalian Fukun, as our Master Distributor in China.

Dalian Fukun, in turn, has designated Shanghai Fangkun Software Technology Ltd. as its exclusive representative. Shanghai Fangkun responsibilities will cover but not be limited to the purposes of initially processing LS-DYNA sales, marketing activities, day-to-to day management responsibilities, and for providing LS-DYNA technical support throughout China.

Shanghai Fangkun Software Technology Co., Ltd. was established in May 2018. It is fully responsible for sales, marketing, technical support and engineering consulting services of LS-DYNA software in China. It will meet this responsibility through the integration and management of various resources of LS-DYNA's Chinese sub-distributors and partners, providing expert technical support services for China's LS-DYNA users, helping customers to use LS-DYNA software more efficiently and effectively for product design and development, thereby improving the efficiency and effectiveness of LS-DYNA software usage by the customers.

The sub-distributors under Shanghai Fangkun are ARUP-China, ETA-China and Shanghai Hengstar. Through cooperation with sub-distributors and partners, Shanghai Fangkun will provide customers with a full range of LSTC products: LS-DYNA, LS-OPT, LS-PREPOST, LS-TASC and LSTC's dummy and barrier models. Shanghai Fangkun Software Technology Co., Ltd. brings together a group of top application engineers of LS-DYNA software, focusing on sales and technical support in various industries such as automotive, aerospace and general machinery.

- **Website**: http://www.lsdyna-china.com
- **Sales**   Email:sales@lsdyna-china.com
- **Technical support** Email: support@lsdyna-china.com
- **Customer Service Number**: 400 853 3856

China FEA News Participants

www.eta.com

www.flotrend.com.tw

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Hengstar Tech.
www.hengstar.com

www.dynawe.com

ARUP
www.oasys-software.com/dyna

AgileSim
www.agilesim.com.tw

www.pan-i.com

DLFK
http://dalianfukun.com

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BETA CAE Systems.   www.beta-cae.com

BETA CAE Systems - ANSA

BETA CAE Systems μETA

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.

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 company 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.

Engineering Solutions   ETA

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

etainfo@eta.com

Inventium Suite™

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

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

PreSys

Inventium's core FE modeling toolset. It is the successor to ETA's VPG/PrePost and FEMB products. PreSys offers an easy to use interface, with drop-down menus and toolbars,

increased graphics speed and detailed graphics capabilities. These types of capabilities are combined with powerful, robust and accurate modeling functions.

VPG

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

DYNAFORM

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

Latest Release is ESI Visual-Environment 12.0

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

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

Visual-Crash DYNA provides advanced preprocessing functionality for LS-DYNA users, e.g. fast iteration and rapid model revision processes, from data input to visualization for crashworthiness simulation and design. It ensures quick model browsing, advanced mesh editing capabilities and rapid graphical assembly of system models. Visual-Crash DYNA allows graphical creation, modification and deletion of LS-DYNA entities. It comprises tools for checking model quality and simulation parameters prior to launching calculations with the solver. These

tools help in correcting errors and fine-tuning the model and simulation before submitting it to the solver, thus saving time and resources. Several high productivity tools such as advanced dummy positioning, seat morphing, belt fitting and airbag folder are provided in **Visual-Safe,** a dedicated application to safety utilities.

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

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

ESI Group <u>**www.esi-group.com**</u>

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 Corporation

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

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

www.oasys-software.com/dyna

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

Engineering Solutions   Predictive Engineering

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.

Engineering Solutions   Shanghai Hengstar Tech.

恒士达科技
Hengstar Tech.

Shanghai Hengstar   <u>**www.hengstar.com**</u>

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   *JSOL*

Contact: **JSOL Corporation Engineering Technology Division <u>cae-info@sci.jsol.co.jp</u>**

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. - <u>http://jpn.nec.com/manufacture/machinery/hpc_online/</u>

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

Platform Computation Cloud - CreDist.Inc.

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

SCSK Corporation - <u>http://www.scsk.jp/product/keyword/keyword07.html</u>

Cloud - HPC Services - Subscription   RESCALE

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

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

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

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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** Armando Toledo
www.complx.com.mx / armando.toledo@complx.com.mx

LS-DYNA LS-OPT	LS-PrePost
	LS-TAsc Barrier/Dummy Models

United States **DYNAMAX** sales@dynamax-inc.com
www.dynamax-inc.com

LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
LSTC Dummy Models		LSTC Barrier Models	

United States **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	

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	VA One	CFD-ACE+	ProCAST	
	Weld Planner	Visual-Environment	IC.IDO

United States	**Engineering Technology Associates – etainfo@eta.com**		
	ETA www.eta.com		
	INVENTIUM/PreSy	NISA	VPG	LS-DYNA
	LS-OPT	DYNAform		

United States	**Predictive Engineering** info@predictiveengineering.com		
	www.predictiveengineering.com		
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	LSTC Barrier Models		LSTC Dummy Models	
	Distributor for Siemens PLM Software at www.AppliedCAx.com (FEMAP, NX Nastran, STAR CCM+, NX CAD/CAM/CAE)		

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	

Distribution, Consulting, Training

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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

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			LSTC Barrier Models	LS-TaSC

China	**Oasys Ltd. China**		de-long.ge@arup.com	
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	Enki Bonnet	Visual Environement		

Distribution, Consulting, Training

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	

Distribution, Consulting, Training

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

## TOYOTA - Total Human Model for Safety – THUMS
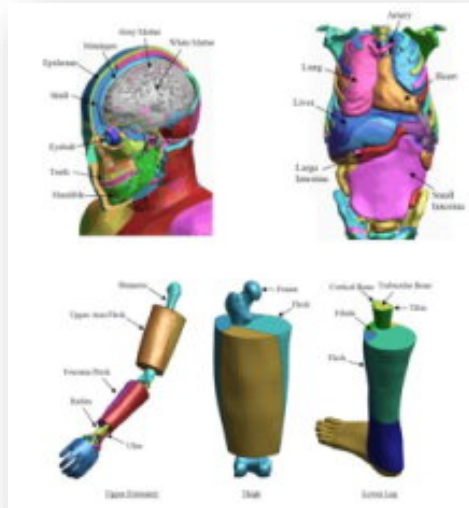
The Total Human Model for Safety, or THUMS®, is a joint development of Toyota Motor Corporation and Toyota Central R&D Labs. Unlike dummy models, which are simplified representation of humans, THUMS represents actual humans in detail, including the outer shape, but also bones, muscles, ligaments, tendons, 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
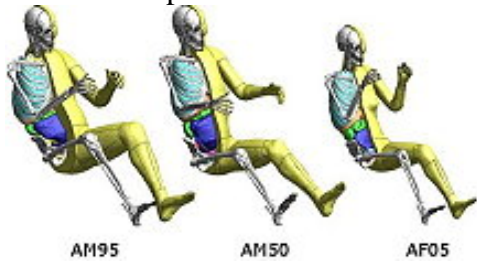
and as standing model to represent pedestrians.
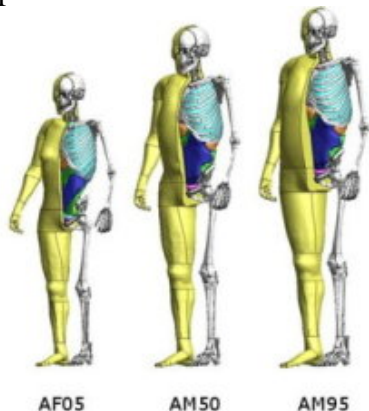
The internal organs were modeled based on high resolution CT-scans.

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.

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
Dynardo	http://www.dynardo.de/en/wost.html
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

Seminar Brochure 2018

Visit the website for complete overview and registration www.dynamore.de/seminars
**Download full seminar brochure (pdf):
www.dynamore.de/seminarbroschure2018**

Introduction

Introduction to LS-DYNA	17-19 July	
	11-13 September (Tr)	18-20 September
Introduction to LS-PrePost	10 September (T)	17 September

Metal Forming

Applied Forming Simulation with eta/DYNAFORM	9-10 July
Sheet Metal Forming in OpenForm	11 July
Hot Forming with LS-DYNA	12-13 July

Implicit Capabilities

NVH, Frequency Domain, Fatigue	4-5 July
Implicit Analysis using LS-DYNA	24-25 September

Particle Methods

Smoothed Particle Hydrodynamics	13-14 September
Discrete Element Method	26 September

Multiphysics/Biomechanics

ALE and FSI	11-12 September

Optimization

GENESIS - Structural Optimization	24-25 July
LS-OPT - Optimization & Robustness	18-20 September

Information days (free of charge)

Fatigue, Acoustics, NVH	3 July
Verification & Validation	23 July
Infoday LS-DYNA/Implicit	17 September
Infoday Optimization	24 September
Simulation of Plastics	26 September

Support days (free of charge)

Occupant Safety	27 July

Locations:

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, Z = Zurich, Switzerland

Training - LSTC

JULY					
12-13	Thurs-Fri	CA	Smoothed Particle Galerkin Method And Peridynamics For Failure Analysis	2	Y. Wu / B. Ren
30	Mon	CA	Material Characterization for Metals, Plastics & Polymers: From Test Data to Material Model	1	S. Bala
31	Tues	CA	Contact in LS-DYNA	1	S. Bala

Aug 2-Aug 3	CA	Advance LS-DYNA	
Aug 6-Aug 7	CA	Plasticity, Plastics, and Viscoplastic Materials in LS-DYNA	
Aug 9-Aug 10	CA	Fracture, Failure, and Damage in LS-DYNA	
Aug 13-Aug 14	CA	Blast Using LS-DYNA	
Aug 16-Aug 17	CA	Penetration Using LS-DYNA i	
Aug 20-Aug 22	CA	ALE/Eulerian & Fluid/Structure Interaction in LS-DYNA	
Aug 23-Aug 24	CA	Smoothed Particle Hydrodynamics (SPH) in LS-DYNA	
Aug 27	CA	Introduction to LS-PrePost	
Aug 28-Aug 31	CA	Introduction to LS-DYNA	
Aug 14	MI	Electromagnetism	
Aug 15-Aug 16	MI	ICFD	
Aug 20	MI	Introduction to LS-PrePost	
Aug 21-Aug 24	MI	Introduction to LS-DYNA	

Sep10-Sep 14	CA	Crashworthiness	
		(This class is 4 days of instruction; 5th day is an optional workshop.)	
Sep 11-Sep 12	MI	Airbag Folding	
Sep 13-Sep 14	MI	Airbag Modeling in LS-DYNA	
Sep 26-Sep 28	MI	Advance ALE & S-ALE Applications	

Social Media

FACEBOOK

BETA CAE Systems   CADFEM

ESI Group   Lenovo

TWITTER

BETA CAE Systems   ESI Group

ETA   CADFEM   Lenovo

LINKEDIN

BETA CAE Systems   CADFEM

DYNAmore Nordic   ETA

ESI Group

Social Media

YOUTUBE

YOUTUBE Channel	WebSite URL
BETA CAE Systems	www.beta-cae.com
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

LS-DYNA Metal Forming New Features - Table 1: www.lstc.com/new_features

1-12. A OneStep Simulation Approach Using Isogeometric Shells in LS-DYNA
L. Li, X. Zhu

1-1 A Customized Job Manager for Metal Forming Simulations
      Y. Xiao, X. Zhu, L. Zhang, H. Fan
	1-2 Conversion between FLD and Stress Triaxial Limit Curve
	      X. Zhu, L. Zhang, Y. Xiao

1-3 Best Fit GUI for Metal Forming in LS-PrePost® 4.5
      Q. Yan, X. Zhu, P. Ho, L. Zhang, Y. Xiao
	1-4 Improvement of Sandwich Structure Part Adaptivity in LS-DYNA
	      X. Zhu, H. Fan, L. Zhang and Y. Xiao

1-5 Defining Hardening Curve in LS-DYNA®
      X. Zhu, L. Zhang, Y. Xiao
	1-6 Lancing features in LS-DYNA
	      Q. Yan, L. Zhang, Y. Xiao, X. Zhu, P. Ho

1-7 Improvements to One-Step Simulation in LS-DYNA,
      X. Zhu, H. Fan, L. Zhang, Y. Xiao
	1-8 Recent improvements in LS-DYNA® hot stamping simulations
	      J. Zheng, X. Zhu and H. Fan

1-9 Improve time step size sensitivity in transient mechanical simulations
      J. Zheng and X. Zhu
	1-10 Introducing *BOUNDARY_SPC_SYMMETRY_PLANE (SET)
	      X. Zhu, Li Zhang, and Y. Xiao

1-11 On Mesh Fusion Scheme in LS-DYNA® N. Ma, Osaka Univ - H. Fan & X. Zhu, LSTC	**1-12. A One Step Simulation Approach Using Isogeometric Shells in LS-DYNA** L. Li, X. Zhu

Editor: Yanhua Zhao - yanhua@feainformation.com


New Features on the website www.lstc.com/new_features

2-14 LS-DYNA Linear Solver Development
       Z. Cui and Y. Huang

Among the Previous Months Postings on New Features Table 2

- 2-13 - Scalability study of particle method with dynamic load balancing in LS-DYNA®
- LS-DYNA's Linear Solver Development — Phase 1: Element Validation
- Recent updates in fatigue analysis with LS-DYNA
- Discussion on acoustic databases in LS-DYNA
- Modeling of Ductile Failure in Destructive Manufacturing Process Using the Smoothed Particle Galerkin Method
- A non-orthogonal material model of woven composites in the preforming process
- LSTC WinSuite – a complete solution for the Windows platform
- Modeling and Numerical Simulation of Afterburning of Thermobaric Explosives In a Closed Chamber
- Thick Shell Element Form 5 in LS-DYNA
- New Inflator Models in LS-DYNA®
- New features of 3D adaptivity in LS-DYNA
- Thermal Coupling Method Between SPH Particles and Solid Elements in LS-DYNA
- LS-DYNA Smooth Particle Galerkin (SPG) Method
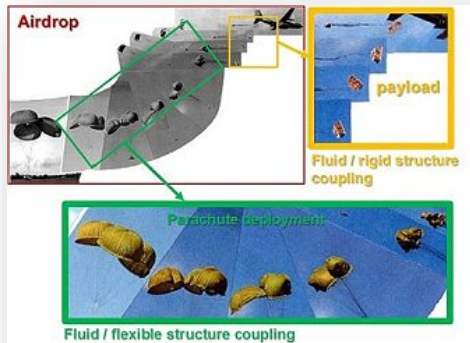
Airdrop Sequence Simulation using LS-DYNA® ICFD Solver and FSI Coupling (pdf)

Morgan Le Garrec
Matthieu Seulin
Vincent Lapoujade
DynaS+
For Information contact:
Vincent: **v.lapoujade@dynasplus.com**

Abstract: DynaS+ is a French, Spanish and Portuguese distributor of LS-DYNA. It was awarded a RAPID financing by the French government for project Paraflu. This project objective is to simulate a complete airdrop sequence, including three main phases:

i) the payload freefall;
ii) the parachute deployment;
iii) the deployed phase with the payload descending under the canopy.

In this framework, the payload freefall is considered for the present paper, from the airplane cargo bay up until the initiation of parachute deployment. The LS-DYNA simulations include multi-physics and fluid-structure interaction coupling. The currently developed ICFD solver is used in conjunction with the non-linear dynamic structural solver.

The fluid domain includes the external shape of the airplane and the ramp in order to simulate the actual flow surrounding the payload during its exit.

For an accurate representation of the payload movement at the beginning of the freefall phase, initial conditions and contact management need to be representative of the physical phenomena involved. Challenges arise with ICFD meshing, as the fluid volume needs to surround the payload. This is dealt with a contact thickness between the payload and the ramp in order to keep a small fluid layer at this location.

A sensitivity analysis on turbulence models and payload weight and shape is performed. It includes a qualitative comparison between both RANS and LES models, as well as between various boundary layer mesh sizes. Aerodynamic loads exerting on the payload are computed and compared to drag and lift databases. Computer time is optimized in a manageable way for reasonable cluster usage.

The consolidated methodology is used for test cases adapted from the literature. The results are compared for validation purpose

Introduction: The main goal of military airdrops is the accurate delivery of cargo released from a moving air vehicle via parachute. The airdrop trajectory results from the movement of the dropped package and the dynamics of the parachutes deployment (Figure 1). Although multi-physics modelling is now being used to analyze the flow around inflated parachute canopies [1][2], very little has been done in the area of payload aerodynamics [3][4].

Additional complexity ensues due to the fact that there are many different dynamic regimes characterizing the flow around the parachute and payload during a typical airdrop operation, i.e.:
   i) ramp roll-out and tip-over;
   ii) freefall prior to and during parachute deployment;
   iii) descent and landing under a fully inflated canopy.

The payload undergoes translation, rotation and combination of both, for Reynolds numbers ranging from 104 to 106.

This paper follows the work of Michel et al.[8] and uses its conclusions to take the matter one step further. Previous work focused on the capabilities of the ICFD solver in stationary and nonstationary flows and permitted to show that the loads predictions were in agreement with the literature. In particular, the remeshing performance with moving and rotating objects was studied.
Exhaustive sensitivity analyses on the mesh and domain sizes were performed and permitted to conclude on slightly less conservative criteria than generally recommended, mostly due to the global nature of the observed phenomena.

Objectives: The objective of this paper is to show the ICFD capabilities to model more operational problems than previously considered for airdrop applications. The freefall of rigid objects in a non-uniform air flow is considered. Several freefall cases are presented with increasing complexity, from a sphere in a steady fluid to a payload ejected from a plane with a constant velocity. For the latter, the structural model interaction with the exit ramp is accurately modelled in order to initiate the object rotation.
From a computational point of view, these cases show the ICFD mesher robustness and new mesh refinement options. Finally, the trajectories are compared to wind tunnel tests ones in order to validate the accuracy of the involved aerodynamic loads.

For information contact: Vincent: v.lapoujade@dynasplus.com

dynaLUPA
LICENSE UTILIZATION & PREDICTIVE ANALYTICS

At the recently concluded 15th LS-DYNA International conference at Detroit, Kaizenat Technologies Pvt Ltd showcased its new analytics framework named as dynaLUPA.

dynaLUPA's Analytics engine offers various kinds of data visualizations for license usage. An enterprise level deployment of LUPA can churn out data that can help the CAE department heads and higher management to make judicious decisions rather than going by approximations.

It helps 1. Users, 2. Department Managers (for department) & 3.IT head to check(organization)

- · Total Number of license used
- · Comparison of YOY, MOM usage,
- · Number of hours delayed/wasted in queue
- · Justifying number of license requirement
- · Forecast usage pattern based on current usage pattern
- · User with highest utilization in a department
- · User with lowest utilization in a department
- · Track license usage/user & Forecast and allocate

We are excited to see many enquires within couple of days. Write to us on support@kaizenat.com to know more about dynaLUPA & free trail

Kaizenat also presented a technical paper on topology Optimization of Die structure using LS-TaSC & LS-DYNA