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LSTC Livermore Software Technology Corp.

Volume 7, Issue 10, October 2018

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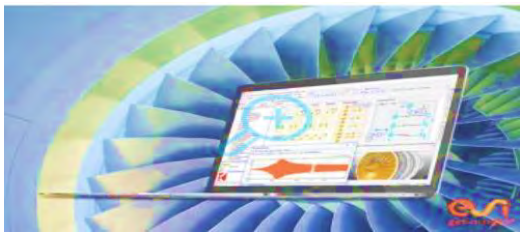
ESI Group



DYNAmore

JSOL

OASYS

LS-DYNA® Arbitrary Lagrangian Eulerian (ALE)

LS-DYNA Features

Recent Developments in LS-DYNA® S-ALE

Application:

- **Comparative Analysis of Occupant Responses between LS-DYNA® Arbitrary LaGrange in Euler and (ALE) and Structured–ALE (S-ALE) Methods**
- **Simulation of the Performance of Passenger Rail Vehicles under Blast Conditions in LS-DYNA®**

FEA Information Engineering Solutions

www.feapublications.com

The focus is engineering technical solutions/information.

FEA Information China Engineering Solutions

www.feainformation.com.cn

Simplified and Traditional Chinese

The focus is engineering technical solutions/information.

LSTC - Livermore Software Technology Corp.

Development of LS-DYNA, LS-PrePost, LS-OPT,
LS-TaSC (Topology), and LSTC's Dummy &
Barrier models for use in various industries.

www.lstc.com

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

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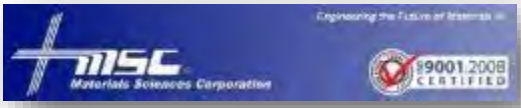
Platinum Particpants



Platinum Particpants

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Announcements

October 24th -- Oasys PRIMER: Model checking and QA

FREE WEBINAR: Oasys PRIMER: Model checking and QA

Gavin Newlands, Arup Associate and Developer of the Oasys PRIMER software will present this free webinar, which describes and demonstrates model checking and model quality tools in PRIMER.

Go to webiste……

October 31st -- LS-DYNA & JSTAMP Forum 2018

Venue : NAGOYA TOKYU HOTEL

JSOL Corporation holds an annual LS-DYNA & JSTAMP Forum to provide our users a wide range of information including the latest simulation technologies and case studies and also to offer the opportunity for information exchange among our users.

This year the venue of the LS-DYNA & JSTAMP Forum 2018 moves from Tokyo to Nagoya. It will be held at NAGOYA TOKYU HOTEL, on Wednesday 31 October 2018. Our engineers will showcase the latest simulation technologies and poster sessions will be held. **More information.....**

November 1-2, 2018 -- BETA CAE Systems Japan Open Meeting

BETA CAE Systems International AG, the leading contemporary industry supplier of simulation solutions, and its subsidiary in Japan, BETA CAE Systems Japan Inc., have the pleasure to invite you to the 2018 BETA CAE Systems Japan Open Meeting. The event will take place on November 1 & 2, 2018 in JP Tower Nagoya Hall & Conference, Nagoya, Japan.

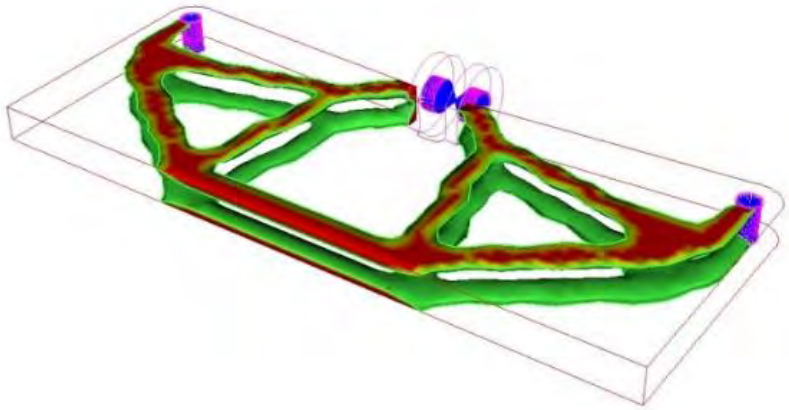
During the first day of the event, our customers will showcase a number of impressive real cases of applying our software on various CAE disciplines and industries.

The second day, expert engineers of BETA will walk you through the latest developments, our new software products and their implementation.

More information….

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., Nov.13, 2018 | 9am-5pm
Phone: (302) 690-4741 **| Email:** bzhaque@udel.edu

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…



BETA CAE Systems announces the release of the v18.1.3 of its software suite

Read from BETA CAE Systems website

About this release

For those committed to the v18.1x branch of our software, BETA CAE Systems announces the release of the new KOMVOS/ANSA/EPILYSIS/META suite v18.1.3.
In this version new features have been added and corrections have been implemented for identified issues.
The most important enhancements and fixes implemented are listed below.

Contents

Download

The following releases are now supported:

NX12; CATIA R28; Inventor 2019; Creo 5.0; Acis R27

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…

Author: Christian Frech christian.frech@dynamore.de

Since many years, the DYNAmore Group and the Livermore Software Technology Corporation (LSTC) collaborate in developing simulation software. At present, a code development group is seamlessly integrated into the release management of LSTC and is working at the DYNAmore offices in Germany, Sweden and France to implement new features and methods in LS-DYNA, LS-OPT, LS-PrePost and LS-Run for clients from all over the world.

Moreover, the DYNAmore Group also develops software on its own that is greatly appreciated among simulation engineers. The most famous ones are the so-called LS-DYNA Tools which facilitate the work with LS-DYNA. The tools are programmed in Perl and Fortran and are available for Windows and Linux. Licensing and use are free of charge for our customers. Most of these tools are available to you thanks to the kind support of Daimler, Porsche and Opel.

Also very popular are the simulation data management tools CadMe, LoCo, CAViT and Status.E, which are developed by our affiliate company SCALE.

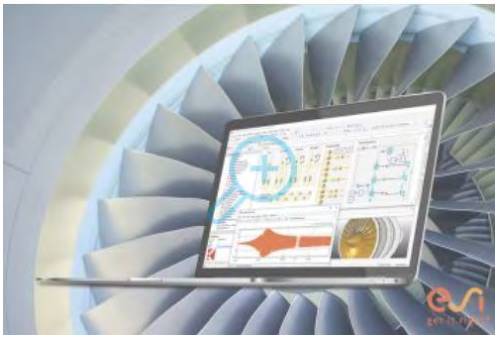
Development of LS-DYNA

Many constitutive models, e.g. for composite materials, light alloys or elastomers, were already developed and implemented by colleagues of DYNAmore in the 1990s. In general, our capabilities and skills cover the entire spectrum of finite element technology especially including constitutive models, isogeometric analysis, thermal coupling, contact interfaces, nonlinear implicit methods and thermal coupling. However, parallelization and porting of the code to various hardware platforms or operating systems is typically done at LSTC.

Examples of past implementations include:

- Mortar contact definition
- A nonlinear implicit solver and other implicit features
- User-defined friction interface for MPP versions
- Several finite element formulations and a user-element interface
- Isogeometric element formulation
- Many thermo-mechanical features
- General damage formulation with premature/initial damage (GISSMO)
- Material models for glass, paper, fibre composites, etc.
- Material models for welding and heat treatment
- Material model with mixed hardening under cyclic load/stress
- Material model for cohesive links
- Contact for modelling of failing glue joints and rivets

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.



Alternative to Traditional Test Benches with ESI's SimulationX

System Simulation Allows Virtual Testing of Aircraft Engine Operations in Real Conditions

Paris, France – September 25, 2018 – ESI Group, leading innovator in Virtual Prototyping software and services for manufacturing industries, announces its collaboration with DGA Aero-Engine Testing in the development of a virtual test bench for aircraft engines in flight conditions. DGA Aero-Engine Testing (or DGA-EP) is a non-profit public body, part of the Test and Evaluation capabilities of the French armament procurement agency. Aircraft engines, for both civil and military applications, are tested in DGA-EP facilities to verify their performance for given applications. These tests are an integral part of the engine certification process. This project leverages SimulationX, ESI's solution for system simulation, to deliver a major technological advance that will benefit the DGA in terms of resources, deadlines and budget.

DGA Aero-Engine Testing or DGA-EP – an entity dedicated to all types of aeronautical thruster tests – has a wide range of test facilities. It designs and carries out tests of aerobic aeronautical engines, their components, assemblies and sub-assemblies and associated equipment under simulated flight conditions, including icing conditions. The DGA-EP site is currently the largest center of its kind and houses nearly all high-altitude caissons in Europe. To optimize the preparation of its tests and the training of its operators, the entity launched the SIMATMOS project in 2012, with the objective to implement a virtual test bench, which will eventually be used to train its operators, check the feasibility of the tests and predict the performance of the testing installations.

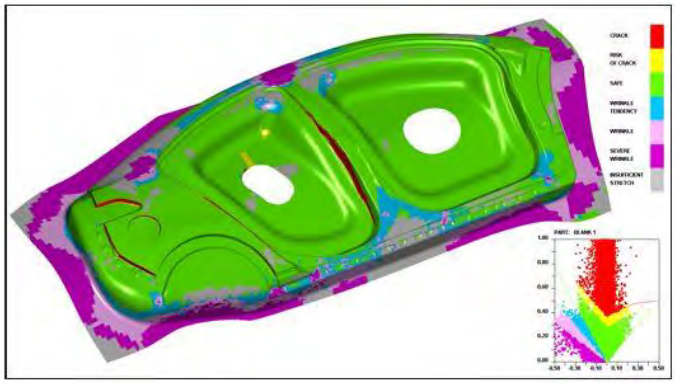
Following a public tender, DGA-EP chose ESI's system simulation solution to model the installations. The solution SimulationX empowers them to create Virtual Prototypes of the engines, and to test them virtually under real flight conditions. In addition, the open and adaptable environment provided by SimuationX will enable connections to a flight simulator in the future.

Laurent Porsain, Test Process Manager at DGA-EP, in charge of the SIMATMOS project, comments: "This success is part of our wider transition to Industry 4.0. Our objective is to take advantage of exceptional digital solutions to complete more numerous and more comprehensive tests, to work collaboratively and to train our teams. We aim to do this at a lower cost and before the final physical test, which remains regulatory."

The virtual test bench that is being built with SimulationX is one of the major elements of DGA-EP's digitalization initiative. Virtualization of both the test configuration and the engine (or other equipment) will make it possible to completely reproduce the test conditions and predict the performance of test equipment. In the longer term, DGA-EP plans to extend this work to progressively update the virtual test bench using data collected during actual physical testing, and ultimately to develop a Hybrid Twin™ of each testing installation, that will enable intelligent maintenance and support.

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.

Dynaform Modules - Blank Size Engineering



Beginning with the 3-D part geometry, BSE can quickly unfold the flanges and flatten the geometry to produce a blank outline for blank size estimation along with piece price and scrap calculation. Product feasibility and cost analysis can be thoroughly evaluated using BSE.

Part Preparation - Surface Separation
The top and bottom surfaces of a solid-model part can be separated, showing the material from both inside and outside and the mean(middle) surface can be generated automatically. There are also multiple functions to repair surface defects.

Blank Development
BSE includes an industry proven solver (MSTEP) for the accurate prediction of flat blank profiles from 3-D part geometry. Designed for cost estimators, blank predictions consider both linear bends and the material stretch that occurs during the forming process to produce the most accurate blank possible.

Nesting
The BSE module provides for 1-up, 2-up and multiple blank nesting. The material usage and fall off is calculated along with piece price. Minimum required blanking tonnage is estimated. Nesting optimization can be performed to calculate the best material utilization.

Cost Estimation Report
Automatically generate reports for cost estimation and quotation of the part material. Report output includes detailed descriptions of overall blank size, nesting configuration, pitch, coil width, material utilization, number of coils required to meet annual volume and total piece price for materials.

Feasibility Study using MSTEP
MSTEP is a one-step code which can be used for quick formability of a part. Binder, addendum and drawbeads can be simulated with pressure pads, binder and drawbead force.

Trimline Development with MSTEP
MSTEP will quickly and easily develop the trimline throughout multiple stations.

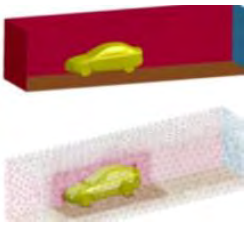
FEA Not To Miss, is a weekly internet blog on helpful videos, tutorials and other Not To Miss important internet postings. Plus, a monthly email blog.

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

10/08/2018 - Grab your cup of tea or coffee and your #2 pencil (wonder if they still use those!) AND we are having a tutorial - no need to write answers on your arms for the test - I don't like tests SO we don't have any! Did I write answers on my arms? Ooops we are out of room to type more, so I can't answer that question.

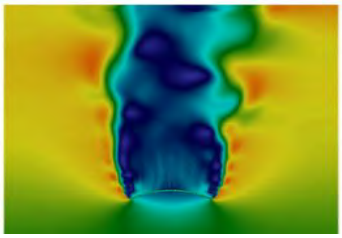


Using the new Solution Explorer in LS-PrePost to set up an LS-DYNA ICFD simulation

10/01/2018 - Grab your cup of tea or coffee, hop in our FEA Not To Miss Bus and take a ride to visit Marquis Who's Who to read about John O. Hallquist! If you don't know who he is, OH MY, you have missed a lot!!

John O. Hallquist, Ph.D., Celebrated for Innovations in Software Development - As in all Marquis Who's Who biographical volumes, individuals profiled are chosen from among a pool of the most prominent professionals and are selected on the basis of current reference value.

09/24/2018 - Well, we better drink our coffee quickly, if our parchute is doing below!! Not that I ever plan on being that high off the ground to need one. BUT, if I ever did need a parachute, below is not what I want to see happen!



LS-DYNA CFD: FSI modeling of Parachutes with Porous Elastic Fabrics.

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.

恒士达科技 Hengstar Tech.

Shanghai Hengstar Technology

Sub-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.

Shanghai Hengstar Technology Co., Ltd

hongsheng@hengstar.com

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:

LS-DYNA & JSTAMP Forum 2018

Dates : Oct..31, 2018
Venue : NAGOYA TOKYU HOTEL

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J-OCTA Users Conference 2018

Dates : Nov..21, 2018
Venue : Tokyo Conference Center SHINAG…

J-OCTA User Conference 2018 will be held for providing an up-to-date information on material property simulation and sharing information among J-OCTA users.

In this conference, we will have lectures on examples of utilization of J-OCTA and results of material research by researchers from the companies, universities and laboratories. Also, we will introduce the new functions of J-OCTA V4.1 which will be released this year, and the J-OCTA development road map.

Go to website ……

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

LS-DYNA® Arbitrary Lagrangian Eulerian (ALE)

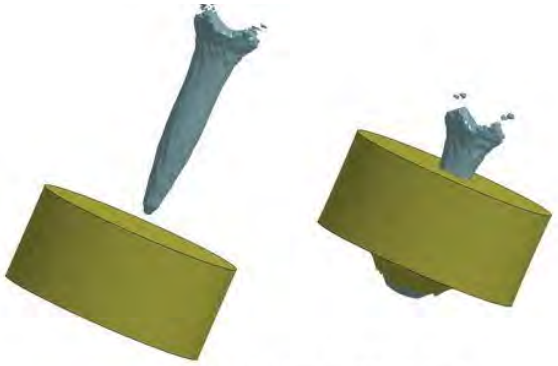
The ALE solver is tightly coupled to the LS-DYNA® multi-physics solver. It fully interacts with Lagrangian structures, smoothed particle hydrodynamics, and the discrete element method; thus, providing a computational tool for solving a wide range of practical but difficult problems.

Solver Features:

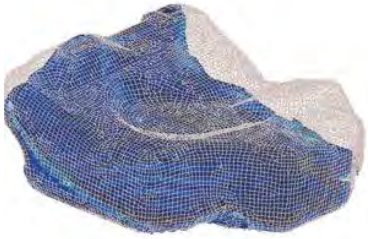
- Available on laptops, work stations, and massively parallel computers.
- 1-Dimensional, 2-Dimensional & 3-Dimensional analyses.
- Unstructured and structured mesh options.
- Mesh refinement and automatic mesh smoothing algorithms.
- Donor cell and Van Leer advection.
- Accurate interface reconstruction to support multiple materials.

Applications Include:

- Shock loading from shaped charges perforating oil well casings.
- Design of blast resistant structures.
- Ship responses due to under water explosions.
- Hyper-velocity impact (e.g. a meteor striking a satellite).
- Bird strike.
- Fuel tank sloshing, forging, hydroplaning, and airbag deployment.
- Low velocity flows such as sailing boat wave and wind interactions, water landing.



Shaped Charge Modeling



Fuel Tank Sloshing

Bird Strike

Ferryboat Sewol Rapid Turning
Sang-Gab Lee, Korea Maritime & Ocean Univ.

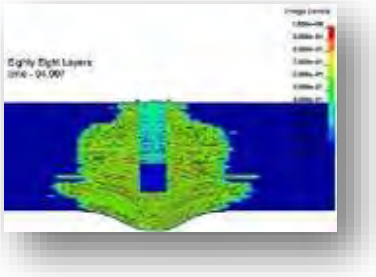
Amphibious Plane
Water Landing

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, **November** 13, 2018 | 9am-5pm



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 Post-Processing V15 Update

Jac Cross, Arup Associate and developer of the Oasys Post Processing software presents this free webinar, which describes and demonstrates some of the new and updated features in the latest Oasys D3PLOT, T/HIS, and REPORTER v15.0 release.

Please click below to view the webinar recording:
VIEW RECORDING

Oasys 15 Highlights New features in version 15

The following bullet points summarise the key updates which have been implemented and are now available in each of our Oasys version 15 programs.

This version of Oasys PRIMER includes:

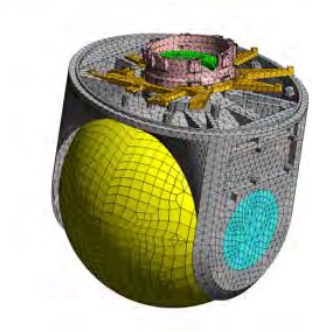
- Support for LS-DYNA R10 keywords
- Improved model read and write speed with about 60% and 70% of the time to read and write respectively compared to V14
- A new link capability is integrated into PRIMER to use the post-processing tools D3PLOT & T/HIS
- A new combined Dummy Positioning and Seatsquash tool to automatically create simulation based LS-DYNA positioning models
- New options for the orientation and alignment of spotwelds created in PRIMER
- A new mechanism type “Coupler” has been added to handle rotation against rotation or rotation against translation or translation against translation
- Improved ability to read more ANSA comments and convert them into PRIMER mechanisms

This version of Oasys D3PLOT includes:

- Quick Find feature to search for D3PLOT functions, menus and preferences
- PDF tutorials available directly through the help menu
- PRIMER/D3PLOT integration with synchronized viewing and linked functionality
- In Link mode T/HIS can be undocked and placed anywhere on the screen
- Greatly improved support for material extra variables
- Data plotting in material axes coordinate systems
- Enhanced support for solid elements with multiple integration points

More New Features in version 15

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.



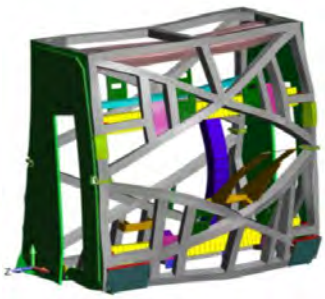
Vibration Analysis Consulting Services at Predictive Engineering

Analysis: FEA

Objective: A quick graphical overview is presented of our +20 years in the idealization of structures for finite element analysis (FEA) vibration analysis. Our goal is to keep our clients' structures from experiencing disastrous resonance during testing and in service. As part of our work, we have done User Guides on the main suite of linear dynamics from normal modes, modal frequency analysis (sine sweep), response spectrum analysis (seismic and shock) and PSD.

Besides linear dynamics, we have experience in nonlinear transient dynamics using LS-DYNA where the nonlinearity is low but the vibration response is deadly. Thru the years we have gained experience using a variety of specifications for wind turbines (IEC 61400), seismic analysis of nuclear waste storage vessels (ASCE 4-98, ASCE 7-02 or IBC) and general vibration analysis of electronic equipment and general structures using MIL-STD-810E, -810F, MIL-STD-167, RTCA DO-160F and UBC.

We don't want to bore the reader, so only a subset of our work will be presented and then burned into a video for publication. What we hope that one will take away from reading this case study is that our experience has been tested and validated in hundreds of simulations and when you work with one of our engineers, you are leveraging hard-won industry experience that is uniquely qualified to ensure that your structure will only vibrate as you want it to vibrate.



For more detail information

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.

LSIS Wins IDC Digital Transformation Award with Rescale

honors transformation initiatives using digital and disruptive technologies

San Francisco, Calif., October 2, 2018 – Rescale, the leader in enterprise big compute in the cloud, and SPK, today announced that its customer LSIS has been awarded the 2018 IDC Digital Transformation Award (IDC DXa) by executing one of the leading global digital transformation initiatives.

LSIS, a multinational supplier of smart energy equipment based in South Korea, sought to strengthen their research and development center. With Rescale, LSIS was able to build a universal, high-performance computing (HPC), cloud-based computer-aided engineering (CAE) platform that increased stability of prototypes and shortened development time.

"By moving our existing simulation work into a fully integrated cloud environment, we strengthened our ability to make quick decisions, provide technical support and control realistic problems such as security," says LSIS Chief Technology Officer, Kwon Bong-Hyun. "It's an honor to receive this award as it validates today's need of having an innovative digital transformation strategy."

LSIS' engineers will be fully enabled in the cloud, and launching machine learning initiatives, with Rescale's ScaleX® platform starting next year. Built on the world's most powerful high-performance computing infrastructure, ScaleX seamlessly matches software applications with the best architecture in the cloud or on-premise to run complex data processing and simulations.

"We would like to congratulate LSIS for winning the Digital Transformation Award from IDC and building Korea's first engineering cloud with Rescale," says Joris Poort, CEO of Rescale. "LSIS is at the forefront of driving the next generation of digital transformation in the enterprise."

The IDC Digital Transformation Awards honor the achievements of organizations that have successfully planned and executed the transformation of one or multiple areas of their business through the use of digital and disruptive technologies. For more information on the complete winners, visit https://www.idcdxawards.com/.

Read more detail info….

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.

仿坤软件 LS-DYNA China

Shanghai Fangkun Software Technology Ltd

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 021-61261195
- **Address**: Room No. 3019, 3 Floor, No.126 YuDe Road,Xuhui District,Shanghai,China 200030

October 26th -- LS-DYNA China Forum

Shanghai Fangkun Software Technology Ltd. will hold the **3rd LS-DYNA China Forum in Shanghai on October 26, 2018.**

The LS-DYNA China Forum will invite experts from domestic OEMs, auto parts factories, USA, Europe and LSTC to have technical discussions. Topics include but are not limited to simulation of vehicle structure crashworthiness, development and simulation of restraint systems, advanced failure simulation methods, implicit analysis functions in automotive parts applications, and new features and applications of LS-DYNA.

The Forum is organized by Shanghai Fangkun Software Technology Ltd (the master distributor of LS-DYNA in China), and co-organized by Arup-China (Shanghai Dynawe Information Technology Co., Ltd.), ETA-China and Shanghai Hengstar Technology Co., Ltd.

More information……

mv@feainformation.com

Wedgetail is on the Radar, Defence Secretary Announces Ahead of NATO Conference
(Source: UK Ministry of Defence; issued Oct 03, 2018)

The E-7 Wedgetail, the UK Ministry of Defence's preferred successor to the Royal Air Force's E-3 AWACS, is based on the Boeing 737, and is an in-service, off-the-shelf aircraft that presents little developmental risk. (RAAF photo)

Speaking ahead of this week's NATO conference, Defence Secretary Gavin Williamson has announced that the Ministry of Defence is in discussion with Boeing and the Royal Australian Air Force about the potential for the E-7 Wedgetail radar aircraft to replace the current Sentry fleet.

The E-7 Wedgetail Airborne Early Warning and Control (AEW&C) System is able to fly for long periods of time and manage the battlespace from the sky, providing situational awareness and tracking multiple airborne and maritime targets at the same time. It then uses the information it gathers to direct other assets like fighter jets and warships. It has already been proven on operations in the battle against Daesh in Iraq and Syria.

Further discussions are set to take place before any investment decision is made, as the MOD follows a stringent approvals process to ensure the aircraft meets the military requirement and represents value-for-money. If selected, UK industry could be involved significantly with the programme, from modification work to through life support.

Speaking ahead of the meeting of Defence Ministers in NATO, Defence Secretary Gavin Williamson said: "The Wedgetail is the stand-out performer in our pursuit of a new battlespace surveillance aircraft, and has already proved itself in Iraq and Syria. Running air operations from the sky, it could be an excellent asset for the RAF and give us a real edge in this increasingly complex world.

"Our future with Australia will already see us operate the same maritime patrol aircraft, world-class Type 26 warships and supersonic F-35 jets. Wedgetail may join that formidable armoury and help us work together to take on the global threats that we both face."

Following market analysis and discussions with other potential providers, the MOD has concluded that the potential procurement of the E-7 represents the best value for money option for the UK against need, whilst representing a significant opportunity for increased defence cooperation and collaboration with our key ally Australia.

The MOD will work closely with Boeing to ensure Britain's leading defence industry could also benefit from any deal.

Named after Australia's largest bird of prey, the wedge-tailed eagle, the high-performing aircraft has been proven on operations with the Royal Australian Air Force, having seen action against Daesh over Syria and Iraq and impressing US Forces in the 'Red Flag' series of large-scale exercises.

The Wedgetail uses a standard Boeing 737 airliner modified to carry a sophisticated Northrop Grumman active electronically-scanned radar and can cover four million square kilometres over a single 10-hour period. If selected, it would replace the E-3D Sentry, which entered service in 1992.

It is a proven and reliable aircraft that has been in service with the Royal Australian Air Force for some time, with potential to considerably reduce the risk normally associated with acquiring a complex new platform of this nature. The aircraft is based on the Boeing 737 airliner family as is the P-8A Poseidon maritime patrol aircraft due to enter service in 2019.

The news represents a further development of the UK's increasingly close military capability and industrial relationship with Australia, who recently selected the British Type 26 design for its future frigate. That decision confirmed the UK's world-leading ship design capabilities, whilst strengthening collaboration in anti-submarine warfare and demonstrating the value of the global five-eyes partnership.

With its proven interoperability, the Wedgetail could also link up with the RAF's latest arrival, the F-35 Lightning, providing pilots with the latest intelligence and situational awareness demonstrating how a modernised next generation Air Force can fight and win in an increasingly complex and dangerous environment, characterised by high speed and low observability.

With Australia also a partner in the F-35 programme, the RAF and the Royal Australian Air Force will have further opportunities to work together across platforms and with other allies such as the United States to share and collect data and conduct joint training missions, all leading to faster, more effective and more integrated combat forces.

mv@feainformation.com **Courtesy of Ford website (Excerpt)**

Ram Launches New 2018 Harvest Edition Chassis Cab Trucks

Michigan State Police Tests Show All-New Ford Police Interceptor Utility Now Quickest Cop Car in America

- All-new 2020 Ford Police Interceptor Utility, with standard all-wheel drive and available 3.0-liter EcoBoost® V6, bests all other police vehicles tested, including V8-powered sedans
- Ford Police Interceptor Utility is purpose-built for law enforcement with a hybrid powertrain that offers terrific interior space, improves pursuit performance and aims to lower fuel costs; standard hybrid engine is paired with standard all-wheel drive
- SUVs are expected to account for 50 percent of U.S. industry retail sales by 2020; Ford Police Interceptor Utility still the No. 1 selling police vehicle in America representing 52 percent of all sales to law enforcement in 2017

DEARBORN, Mich., Oct. 4, 2018 – A sport utility from Ford is the best-selling cop car in America, and now it is the best accelerating and fastest police vehicle in America, according to preliminary test data from the Michigan State Police.

This year, Ford bested all entries, including V8-equipped sedans, with its EcoBoost®-powered all-wheel-drive version of the all-new 2020 Police Interceptor Utility, posting fastest 0-60 mph and 0-100 mph times, as well as fastest lap and fastest average lap.

The standard hybrid 2020 Police Interceptor Utility also beat all competitive SUV entries, including V8-equipped models, with the fastest 0-100 mph, fastest lap and fastest average lap – making good on Ford's promise to deliver a hybrid Police Interceptor that outperforms today's 3.7-liter V6 model with all-wheel drive.

Stephen Tyler, police brand marketing manager for Ford, says America's law enforcement agencies previously have had to choose either fuel efficiency or all-out performance, but the new vehicle offers both. "The all-new 2020 Police Interceptor Utility offers significant potential fuel savings with no trade-offs in safety, passenger or cargo space – on top of bringing improved performance," he said.

Communities to cash in on potential fuel savings

While fuel economy certification isn't complete, the Police Interceptor Utility hybrid is expected to have a projected EPA-estimated combined label of at least 24 mpg – approximately 40 percent improvement over the current 3.7-liter V6. Actual mileage will vary. Final EPA-estimated ratings not yet available.

Anticipated fuel economy gains, combined with expected fuel savings from reduced engine idling time, are expected to help save law enforcement customers an estimated $3,500 per vehicle in yearly fuel bills versus the current Police Interceptor Utility.

If you applied these savings to every Ford Police Interceptor Utility sold in 2017, it would equate to more than $126 million at $2.93 a gallon, or more than 43 million gallons of fuel.

EcoBoost, hybrid one-two knockout to help fight crime

In addition to turning in the fastest times, the EcoBoost Police Interceptor Utility clocked in with the highest top speed – 150 mph in Michigan State Police evaluations, marking the first time an SUV was the overall quickest and fastest police vehicle. The hybrid version turned in a top speed of 137 mph, also besting competitive SUV entries, including those equipped with V8 engines.

Along with offering police agencies standard hybrid technology and standard all-wheel drive with no trade-offs in safety, passenger or cargo space, the all-new 2020 Police Interceptor Utility brings improved horsepower, torque, acceleration and top speed versus today's 3.7-liter V6 model. Its quickness and top speed suggests a bright future for Ford performance hybrids.

Because law enforcement use entails extensive engine idling to power lighting, radios, computers and other on-board electrical equipment, a hybrid powertrain is ideal for police departments. The hybrid allows the gas engine to shut off, powering electrical equipment from its lithium-ion battery, with the gas engine running intermittently to charge the battery.

mv@feainformation.com

LS-Run 1.0 tutorial on YouTube -

A video that explains how to use and setup LS-Run. LS-Run is a program that starts and schedules LS-DYNA simulations when using Windows. You can run both mpp and smp simulations on your laptop, on a remote computer (Linux or Windows), or on a Windows HPC server.

New: LS-Run for LS-PrePost - With the new software "LS-Run" simulations can be started in a simplified job list (queuing system) using either MPP or SMP versions of LS-DYNA on computers running Windows or Linux.

LSTC WinSuite – a complete solution for the Windows platform pdf

With the release of LS-DYNA R10, a new installer called WinSuite has been released for Windows. This installer contains a complete environment for running the major products from LSTC; LS-DYNA, LS-PrePost, LS-OPT and LS-TaSC. It also includes the new program LS-Run which can act as a control center when running LS-DYNA. WinSuite contains everything needed to get started using LS-DYNA on Windows including self-study tutorials and support for queuing up jobs on the local computer.

For LSTC WinSuite download information, please contact gunther@lstc.com or your local distributor.

LS-DYNA-Tools -DYNAmore

Tool sets that facilitate the work with LS-DYNA. The tools are written in Perl or Fortran and compiled for common operating systems. An evaluation and the usage in production are free of charge for our customers and others on request. The majority of tools are made available by courtesy of Daimler, Porsche and Opel.

KAIZENAT dynaLUPA **License utilization & Predictive Analytics**

- Total Number of licenses 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

Contact support@kaizenat.com for more information

LS-DYNA Multiphysics YouTube

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

FAQ LSTC

ftp.lstc.com/outgoing/support/FAQ

LS-DYNA Support Site

www.dynasupport.com

LS-OPT & LS-TaSC

www.lsoptsupport.com

LS-DYNA EXAMPLES

www.dynaexamples.com

LS-DYNA CONFERENCE PUBLICATIONS

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www.dummymodels.com

LSTC ATD MODELS

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

AEROSPACE WORKING GROUP

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LS-DYNA YAHOO Group

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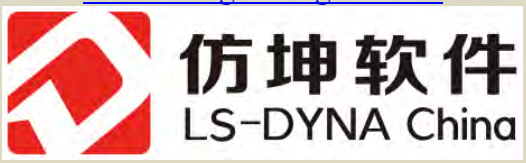
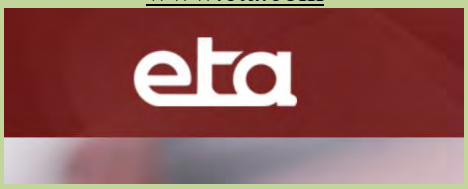


www.eta.com



www.lancemore.jp/index_en.html

LS-DYNA New Features

Recent Developments in LS-DYNA® S-ALE

Hao Chen, Ian Do
Livermore Software Technology Corporation

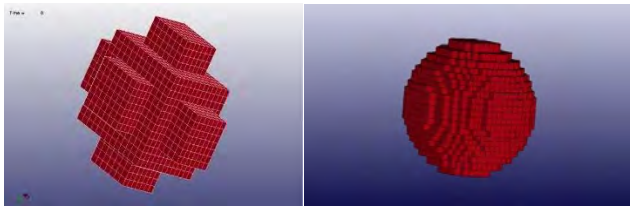
Abstract: The LS-DYNA ALE/FSI package is widely used in studying structures under blast loading. Generally, the ALE mesh is necessarily unstructured to accommodate complex geometries; however, for simple rectilinear geometries, a structured, logically regular, mesh can be utilized. Recognition of this latter case leads to algorithmic simplifications, memory reductions, and performance enhancements, which are impossible in unstructured mesh geometries.

In 2015, LSTC introduced a new structured ALE (S-ALE) solver option dedicated to solve the subset of ALE problems where a structured mesh is appropriate. As expected, recognizing the logical regularity of the mesh brought a reduced simulation time for the case of identical structured and unstructured mesh definitions.

The new S-ALE solver is easy to use, especially for users acquainted with the ALE solver. Only two new keywords are introduced:

*ALE_STRUCTURED_MESH and *ALE_STRUCTURED_MESH_CONTROL_POINTS. The former is used to generate the mesh and invokes S-ALE solver, and the latter is to provide mesh spacing information along each local directions. Other ALE keywords remain the same.

In this presentation we will introduce the new developments and enhancements in LS-DYNA S-ALE for the past two years. Read Full Paper…..



Comparative Analysis of Occupant Responses between LS-DYNA® Arbitrary LaGrange in Euler and (ALE) and Structured–ALE (S-ALE) Methods

Venkatesh Babu, Kumar Kulkarni, Sanjay Kankanalapalli, Bijan Khatib-Shahidi, Madan Vunnam

U.S. Army, Research Development & Engineering Command, (RDECOM), Tank Automotive Research Development & Engineering Center (TARDEC),

Abstract: The LS-DYNA ALE/FSI package can accurately model the dynamic response of the structure under blast loading. To simulate blast loading, High explosive, air and sometimes soil are modeled as different ALE materials which flow inside an ALE mesh that covers a spatial domain of our point of interest. If the spatial domain is of complex geometry, the ALE mesh is necessarily unstructured. But often times, the geometry is simply of a box shape so a structured (rectilinear) ALE mesh could be used.

In 2015, LSTC expanded its ALE solver by offering a structured ALE option. The Structured ALE (S-ALE) solver is dedicated to solve the subset of ALE problems where a structured mesh is appropriate. With theory and algorithms unchanged, S-ALE was implemented separately to utilize the regularity of mesh. This regularity led to simplifications in ALE algorithms and brought reductions in simulation time and memory usage.

The new S-ALE solver generates ALE mesh automatically. Two new keywords are added, *ALE STRUCTURED MESH and *ALE STRUCTURED MESH CONTROL POINTS. The former is used to generate the mesh and invokes S-ALE solver. The latter is to provide mesh spacing information along each local direction. All other ALE keywords remain the same.

TARDEC identified that this new S-ALE solver works well for structural analysis and when coupled with occupants S-ALE solver has difficulties. Venkatesh Babu of TARDEC Analytics and Dr. Hao Chen of LSTC worked continuously to root cause this issue and improved the S-ALE method further. In this proposed work, an improved S-ALE method and an equivalent ALE were analyzed in TARDEC developed generic hull structure with one occupant. Main objective of this research is to compare the structural and occupant responses between improvised S-ALE and ALE in an identical boundary conditions and initial energies.

First S-ALE mesh geometry is developed and analyzed for structural response and occupant responses. *INITIAL VOLUME FRACTION GEMOTRY was used to identify the high explosive charge, soil, and air. Mesh generated by S-ALE is written as an output and this will be used as input background ALE mesh in ALE analysis. *INITIAL VOLUME FRACTIO GEOMETRY from S-ALE was used in this ALE analysis to make sure that everything is identical. Since the mesh boundaries are not large enough, non-reflecting boundaries are used in both S-ALE and ALE methods to eliminate the reflected pressure waves from the boundaries. Occupant responses are comparable between improvised S-ALE and ALE. S-ALE response tends to be slightly higher compared to ALE. Close observation of both the S-ALE and ALE internal energy responses shows that S-ALE does not show any leakage whereas ALE shows a small amount of leakage which results in slightly lower responses. Main takeaway is that computationally S-ALE is 29% faster than ALE in this analysis and is significantly easier to use. Figure 1 shows the comparative responses of left lower tibia loads between S- ALE and equivalent ALE. Complete summary of energy responses, structural and occupant responses will be presented in this study.

Read Full Paper

Simulation of the Performance of Passenger Rail Vehicles under Blast Conditions in LS-DYNA®

Francois Lancelot, Ian Bruce, Devon Wilson, Kendra Jones *Arup*

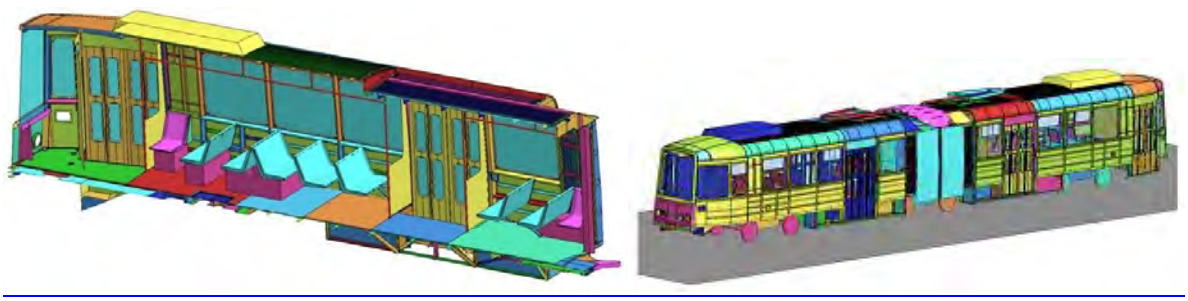
Przemyslaw Rakoczy *Transportation Technology Center Inc.*

Abstract: The protection of the national transportation systems in the face of increasing terrorist threats is of critical importance. Arup North America Ltd (Arup) and Transportation Technology Center, Inc. (TTCI) have been contracted to conduct research to quantify the vulnerability of railcars and infrastructure to damage caused by the use of explosives. The main objectives of this ongoing research program is to develop tools to evaluate the performance of existing railcar structures, develop potential mitigation measures for current railcars, and investigate advanced security systems for future designs under blast conditions.

As part of this research work, Arup has developed detailed finite element (FE) models of a series of passenger railcars and investigated a number of different methodologies for applying blast loads in LS-DYNA. The methodologies investigated included pressure mapping onto the FE model, implementation of the ConWep equations, and a fully-coupled fluid structure interaction (FSI) approach using ALE formulation in LS-DYNA.

These techniques have been thoroughly validated against full scale blast tests carried out by TTCI and the most appropriate option for railcars blast performance evaluation has been determined.

This paper summarizes the modelling methodology, LS-DYNA analysis results and the outcomes of this joint Arup-TTCI investigation.



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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

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.

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 **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

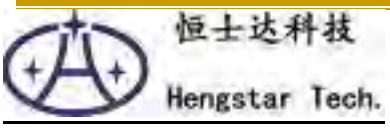
www.predictiveengineering.com

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.



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 ortfolio along with HPC and CAE expertise.

Cloud - HPC Services - Subscription JSOL

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

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.

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

Distribution, Consulting

Canada	**Metal Forming Analysis Corp MFAC** galb@mfac.com www.mfac.com			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	
	eta/DYNAFORM	INVENTIUM/PreSys		
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	
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**		info@predictiveengineering.com	
	www.predictiveengineering.com			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Barrier Models		LSTC Dummy Models	
	Distributor for Siemens PLM Software at www.AppliedCAx.com (FEMAP, NX Nastran, STAR CCM+, NX CAD/CAM/CAE)			
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			
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	

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			
	LS-DYNA, LS-OPT	LS-PrePost	Primer	DYNAFORM
	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

Distribution, Consulting

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

China	**Shanghai Fangkun Software Technology Ltd.**		
	www.lsdyna-china.com		
	LS-DYNA	LS-TaSC	LSTC Barrier Models
	LS-PrePOST	LS-OPT	
	LSTC Dummy Models		

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

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	

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			

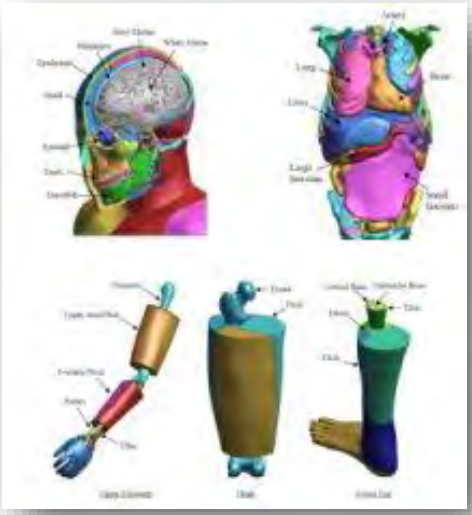
Korea	**KOSTECH**	young@kostech.co.kr		
	www.kostech.co.kr			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM
	eta/DYNAFORM	DIGIMAT	Simuform	Simpack
	AxStream	TrueGrid	FEMZIP	

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

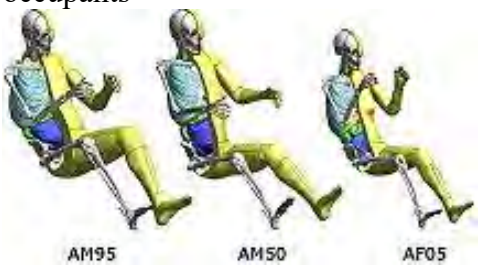
Taiwan	**SiMWARE Inc..**			
	www.simware.com.tw			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

TOYOTA - Total Human Model for Safety – THUMS

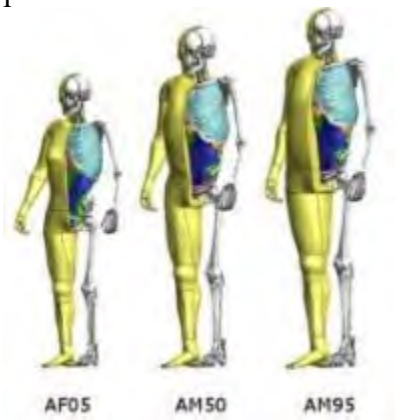


The Total Human Model for Safety, or THUMS®, is a joint development of Toyota Motor Corporation and Toyota Central R&D Labs. Unlike dummy models, which are simplified representation of humans, THUMS represents actual humans in detail, including the outer shape, but also bones, muscles, ligaments, tendons,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

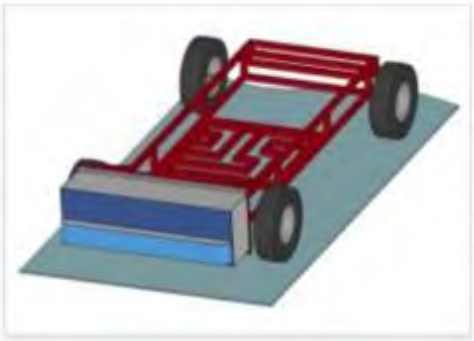
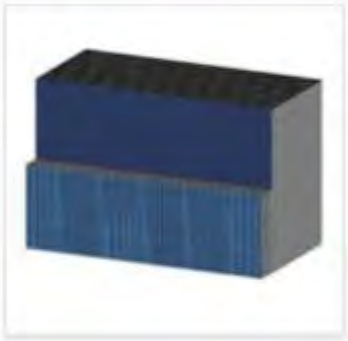
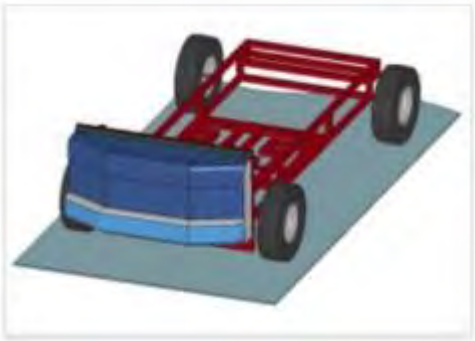
LSTC offers several Offset Deformable Barrier (ODB) and Movable Deformable Barrier (MDB) models:

- 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

LSTC ODB and MDB models are developed to correlate to several tests provided by our customers. These tests are proprietary data and are not currently available to the public.

All current models can be obtained through our webpage in the LSTC Models download section or through your LS-DYNA distributor.

To submit questions, suggestions, or feedback about LSTC's models, please send an e-mail to: atds@lstc.com. Also, please contact us if you would like to help improve these models by sharing test data.

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
OASYS	www.oasys-software.com/training-courses/
Predictive Engineering	www.predictiveengineering.com/support-and-training/ls-dyna-training

Author: Christian Frech christian.frech@dynamore.de

Seminar brochure 2018

Selection of trainings from October to November

Introduction	
Introduction to LS-DYNA	29-31 October
Crash/Short-Term Dynamics	
Joining Techniques in LS-DYNA	5 November
Passive Safety	
CPM Airbag Modeling	23 November
Metal Forming	
Applied Forming Simulation with eta/DYNAFORM	5-6 November
Metal Forming with LS-DYNA	7-9 November
Material	
Concrete and Geomaterial Modeling	29-30 October
Modeling Metallic Materials	12-13 November
Parameter Identification with LS-OPT	14 November
Material Failure	15-16 November
Implicit Capabilities	
Implicit Analysis using LS-DYNA	7-8 November (V)
High energy events	
Blast Modeling with LS-DYNA	22-23 October
Penetration Modeling with LS-DYNA	24-25 October
Explosives Modeling for engineers	26 October
Optimization	
LS-OPT - Optimization & Robustness	22-24 October

Information days (free of charge)

New Feature in LS-DYNA	22 (V), 29 (Z), 30 (T) November
Forming Trends	29 October
Welding & Heat Treatment	5 November (A)

If not otherwise stated, the event location is Stuttgart, Germany. Other event locations are:
A = Aachen, Germany, Ba = Bamberg, Germany, G = Gothenburg, Sweden; L = Linköping, Sweden,
V = Versailles, France; T = Turin, Italy, Tr = Traboch, Austria, Z = Zurich, Switzerland
We hope that our offer will meet your needs and are looking forward to welcoming you at one of the events.

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November

Date	*Location*	*Coures Title*	*Instructor(s)*
Nov 5 -Nov 6	CA	NVH & Frequency Domain Analysis	Y. Huang
Nov 7 -Nov 9	CA	Introduction to Finite Element & Mesh Free Methods for Manufacturing & Failure Analysis	Y. Wu, B. Ren
Nov 5 -Nov 6	MI	Occupant Simulation in LS-DYNA	H. Devaraj
Nov 12-Nov 16	MI	Crashworthiness in LS-DYNA	P. Du Bois, S. Bala
Nov 12	CA	Introduction to LS-PrePost	P. Ho, Q. Yan
Nov 13-Nov 16	CA	Introduction to LS-DYNA	A. Nair

December

Date	*Location*	*Coures Title*	*Instructor(s)*
Dec 4 –Dec 5	MI	Advanced LS-PrePost	A. Nair, Q. Yan
Dec 6 –Dec 7	CA	Metal Forming Training Using LS-PrePost and LS-DYNA	L. Zhang, X. Zhu
Dec 10	MI	Introduction to LS-PrePost	P. Ho, Q. Yan
Dec 11 –Dec 14	MI	Introduction to LS-DYNA	R. Chivukula

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