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LSTC Livermore Software Technology Corp.

Volume 7, Issue 11, November 2018

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ESI Group

Predictive Engineering

BETA CAE

Rescale

LS-OPT® for Design Optimization and Parameter Identification

LS-OPT Features

- **Classification-based Optimization and Probabilistic Analysis Using LS-OPT®**
- **DIC-based Full-Field Calibration using LS-OPT®: An Update**

LS_OPT Application:

- **Multi-disciplinary Optimization using LS-DYNA®**

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The focus is engineering technical solutions/information.

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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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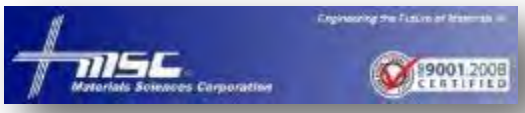
Platinum Particpants



Platinum Particpants

Table of contents

Announcements

LSTC Releases LS-DYNA R11.0.0 From George Lairds News, Blog…

Livermore Software and Technology Company (LSTC), Livermore, CA has recently released LS-DYNA R11.0.0. This release is ready-to-use and is our baseline at Predictive for implicit and explicit work. It is stable and is not a classic xx.0.0 release as is common in the software industry.

So what does this really mean? A released LS-DYNA version is not a "fresh, hot-out-of-the-developers-oven" version of the code. It has gone through months and months, if not years of bug fixes by the development team and user community. The process is quite rigorous, for example, once the LSTC team decides enough-is-enough, a branch is somewhat sealed off from any new major code changes (i.e., R11.xxxxx). While this branch is static, the Development Team continues code development under the designation of Dev_XXXXXX. As the code is fine-tuned and bugs removed, applicable updates are made to the branch and if applicable to prior released versions of the code. At this stage, if the code is deemed ready by the Team, it is run through a suite of verification problems and released to the simulation community. One will note that through-out this whole process, there is no VP of marketing or sales pushing the team to release, it is only released when it is right.

Why LS-DYNA R11.0.0?

Big jump in implicit analysis capabilities; Advanced multi-threaded implicit solver;
New element formulations for implicit; General, all around faster and better.

November 29, 2018 - 2018 BETA CAE Systems Open Meeting in Shanghai

Jinjiang Metropolo Hotel, Shanghai, China

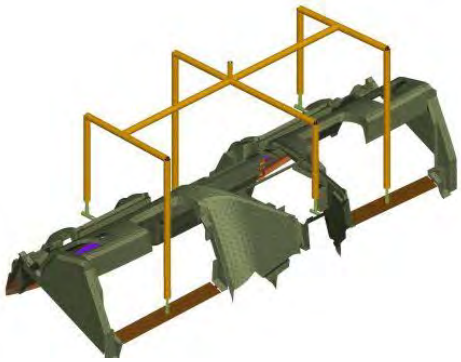
BETA CAE Systems International AG, the leading contemporary industry supplier of simulation solutions, and its business partner in the region, Shanghai Turing Info. Tech. Co., Ltd., have the pleasure to invite you to the 2018 BETA CAE Systems Open Meeting in Shanghai. The event will take place on November 29, 2018 in the Jinjiang Metropolo Hotel, Shanghai, China. **More information.....**

Editors' Choice Award — Best Use of HPC in Automotive: Rolls-Royce Corporation, LSTC, Cray, and NCSA

"Rolls-Royce has an engineering problem that needs a large-scale software solution. Solving that problem, however, requires a multi-team effort: Illinois' National Center for Supercomputing Applications (NCSA) delivers the scale courtesy of Blue Waters, its Cray® XC™ supercomputer; Livermore Software Technology Corporation (LSTC) provides the software, LS-DYNA; and Cray contributes additional expertise to help ensure the software setup is optimal for the machine. By working together, these four players are creating a wide-reaching solution that no single player could achieve alone. As the common denominator among these disparate groups, NCSA is helping to facilitate the collaboration."

More information.....

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 v19.0.1 of its software suite

Read from BETA CAE Systems website

About this release

BETA CAE Systems announces the new v19.0.1 release of her software suite .

In this version of the KOMVOS / ANSA / EPILYSIS / META suite, new features have been added and corrections have been implemented for identified issues.

The most important enhancements and fixes implemented are listed below.

Contents

November 26, 2018
Zpark Plaza Yitel Premium Beijing

November 29, 2018
Jinjiang Metropolo Hotel, Shanghai

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

15th German LS-DYNA Forum 2018
A successful conference

More than 350 participants, 113 presentations, 9 workshops and 30 exhibitors.

High-class presentations, inspiring discussions and a lively exchange of ideas - the German LS-DYNA Forum 2018 was an excellent conference all round. Also this time the attendees could inform and exchange in five parallel sessions about current trends and developments in LS-DYNA and LS-OPT as well as the corresponding CAE process chains.

Renowned Keynote-Speakers

In addition to the technical presentations, which provided insights into a variety of different applications, the popular workshops were also part of the agenda again. In nine workshops, the users had the opportunity to work intensively on various topics and deepen their expertise. The daily keynote presentations by renowned speakers from industry and academia rounded off the conference program.

A perfect platform for discussions

As always, the accompanying hardware and software exhibition offered plenty of opportunities for conversations. In a relaxed atmosphere this was the ideal place to discuss own topics with other users, to foster existing contacts and to find new ones. The range of present exhibitors once again clearly showed how diverse and extensive the application possibilities of LS-DYNA are.

Thanks to all involved

At this point, DYNAmore would like to thank all involved for a successful conference. Without the dedication and commitment of the participants, exhibitors, session chairs and everyone else involved, a conference of this size would not be possible.

The presentations of the conference will soon be published on the DYNAmore website at www.dynamore.de.

12th European Conference

The next event is the 12th European LS-DYNA Conference 2019. From 14-16 May DYNAmore welcomes all LS-DYNA users in Koblenz, Germany. The Call for Papers is already running. DYNAmore is looking forward to numerous submissions and many participants.

Abstract submission

E-Mail: conf@dynamore.de
Online: www.dynamore.de/en/conf2019

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.

ESI Virtual Manufacturing Solutions Support the Digital Transformation of SMEs

Paris, France – October 31, 2018 – ESI Group, leading innovator in Virtual Prototyping software and services for manufacturing industries, announces its participation in SIMSEO, an initiative aimed at democratizing the use of CAD/ CAE solutions and to support the digital transformation of smaller businesses. Several of ESI's software solutions, specifically in the field of Virtual Manufacturing, have been granted the SIMSEO label, highlighting their ability to support Small- and Medium- Enterprises (SMEs) as they seek to leverage digital tools to increase their competitiveness.

At a time of globalization and digitization, SMEs try to stay in the race for innovation, despite their limited resources. Entering emerging markets or implementing new production methods can be tough as the associated risk is often too high. However, smaller companies ─ and even start-ups ─ have succeeded in making a shift towards numerical simulation: Expliseat and Gazelle Tech are two great examples of SMEs who managed to develop highly innovative products faster and at lower cost using ESI's solutions. "Simulation helps decreasing the financial risk associated with innovation, but SMEs need support to implement it. That's precisely the objective of the SIMSEO program," says Karim Azoum, SIMSEO Program Coordinator.

SIMSEO, a government-sponsored initiative carried out by the French association for numerical simulation, Teratec, has been running roadshows across the country since 2016. They visit local SMEs to offer innovative solutions that deliver a cost-effective alternative to traditional trial and error testing. The scheme offers to fund up to 50% of simulation software investment, with a maximum contribution of SIMSEO up to 10,000 Euros. Local businesses can select software solutions from the SIMSEO catalogue, in which tools have been carefully chosen to address recurrent challenges of the manufacturing and building industries. The SIMSEO label has been granted to ESI solutions in the following manufacturing fields: casting, stamping, welding, assembly heat treatment, composites and plastics. Amongst the industry leaders using the above ESI solutions we find Renault, ArcelorMittal, Framatome and Safran; all compelling references for SMEs.

ESI's solutions for Manufacturing come as flexible packages, including the appropriate training and support to allow smaller businesses to rapidly implement innovative technologies and reap the benefits of digitization in terms of production quality and volume.

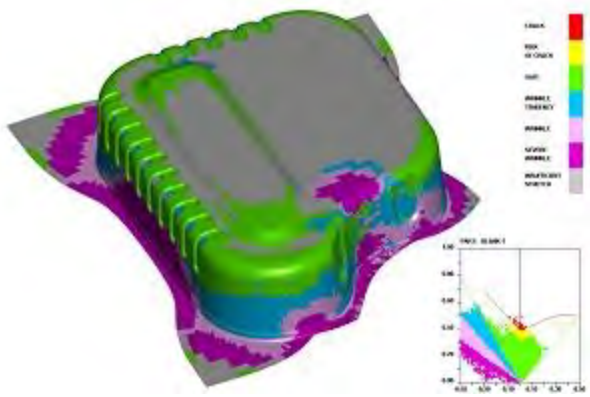
In their catalogue, SIMSEO is promoting, for instance, ESI's simulation solutions for metal fabrication, enabling manufacturers to maximize product quality and reduce scrap rates by getting the parts cast right the first time. .

Read more ……..

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 - Formability Simulation

The Formability Simulation module uses LS-DYNA for accurate physics modeling, efficient calculation and in-depth simulation of the formability based on the die design. The FLD (forming limit diagram), thinning map, wrinkling, material draw-in, circular grid, light strip and skid mark results identify weaknesses of the die design.



New! Optimization Capability

With DYNAFORM Version 5.9, the engineer can more effectively design drawbeads that restrict the blank from wrinkling & splitting during the forming process, significantly reducing the time required to achieve a formable part. It streamlines the challenging and time consuming process of laying out drawbeads for large and complicated parts and guides the engineer to efficiently achieve optimum configurations for drawbead forces. This feature streamlines die design, improves product performance and reduces manufacturing time by using simulation iterations as a search engine for the best possible design solution. As a result, higher performing, higher quality products can be developed, while greater manufacturing efficiency is achieved.

MSTEP & QuickSetup

In this module, a one-step solution using MSTEP is included to perform a quick evaluation of part formability. FS includes a QuickSetup for standard single-stage draw die and springback simulations.

Autosetup and Multiple-Stage Simulations

AutoSetup is available for complicated multiple-stage forming setups for all formability applications of various die systems. The AutoSetup interface visually guides the user through the setup process. All travel curves are automatically generated and multiple-stations can be setup seamlessly.

Hydroforming Capabilities

FS can support tube bending, tube hydroforming and sheet hydroforming.

Springback & Springback Compensation Process (SCP)

Using the DYNAFORM SCP, the user can determine and simulate the amount of springback compensation; simply define the selected tool to be compensated in SCP.

Read more……..

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

11/11/18 - Well, glad my coffee shop is not in the below building. We are safe! No spills! Sit and relax, learn simulation and what happens below!!

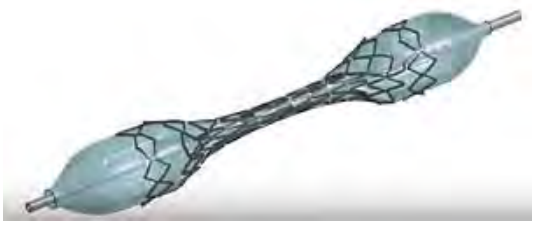
Progressive collapse concrete building

Pavel Nikandrov

11/05/18 - Yes, it is tutorial day! At least it is not a surprise exam - remember those? SO, just relax, no tests, grab you coffee, click below and relax and learn.

How to perform simulations with discrete element spheres (DES) in LS-DYNA by David Aspenberg, DYNAmore Nordic

10/29/2018 This stent simulation is really important - well at my age it's really important and ranking right up there with drinking coffee!!!



Deploying a coronary stent (LS-DYNA implicit) by el Gei Tho

Hengstar Technology

www.hengstar.com

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

Shanghai Hengstar Technology

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.

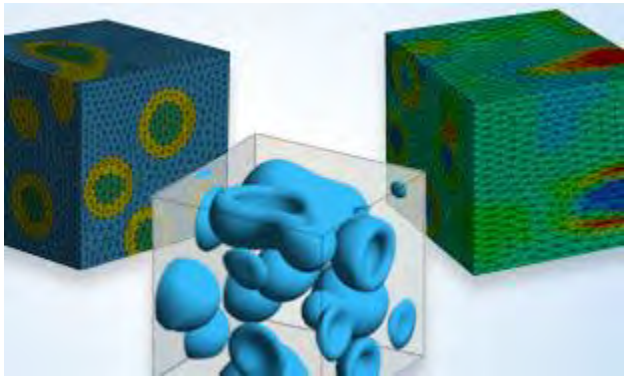
The challenges of trial and error. JSTAMP provides an adequate result and reduces the lead time and cost of tool design.

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.

J-OCTA

J-OCTA is useful at the forefront of material research and development

J-OCTA is a material property analysis software that predicts material properties from atomic scale to micrometer scale on a computer when developing a wide range of materials such as rubber, plastics, thin films, paints and electrolytes. It can be used as a knowledge discovery tool to understand complicated phenomena and physical properties which could not be grasped only by experiment results. We will support state-of-the-art material design and material development by linking and operating simulators corresponding to each scale on a common platform.



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-OPT® for Design Optimization and Parameter Identification

LS-OPT® is a simulation-based optimization tool which enables the solution of complex, multi-stage design processes or regression/classification tasks. LS-OPT interfaces with LS-DYNA® (e.g. result extraction) and also supports popular pre- and post-processors, e.g. for shape optimization. For visualization of results, graphical pre- and post-processing tools are included in the package.

Tasks:

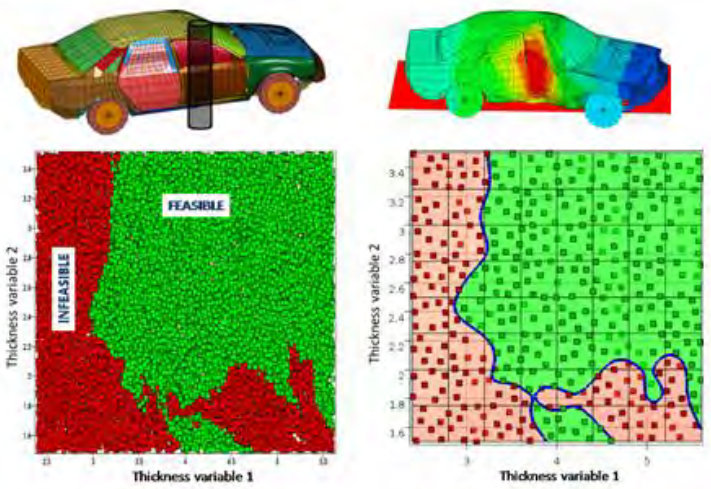
- Multidisciplinary and Multi-Objective Optimization (MDO/MOO)
- Discrete and Mixed Optimization
- Global Optimization
- Robust and/or Reliability-based Optimization
- LS-DYNA statistics, including outlier analysis and LS-PrePost® support
- Parameter Identification with matching of noisy, steep and hysteretic curves
- Full-field calibration using Digital Image Correlation
- Uncertainty Quantification
- Sensitivity Analysis

Solvers and Methods:

- Sequential Response Surface Method
- Genetic Algorithm and Efficient Global Optimization (EGO)
- NSGA-II algorithm for MOO
- Monte Carlo methods (direct and metamodel-based)
- Outlier Analysis
- Support Vector Machines (SVMs) for Statistical Classification
- Taguchi Method
- Curve similarity measures: Dynamic Time Warping (DTW), Partial Curve Mapping and Discrete Fréchet
- Experimental Design: Space-filling, Full or Fractional Factorial, Latin Hypercube

LS-OPT GUI Defining Process Flow

Parametric Vehicle Intrusion Using a Classifier



Actual (LS-DYNA) Classifier (blue outline)

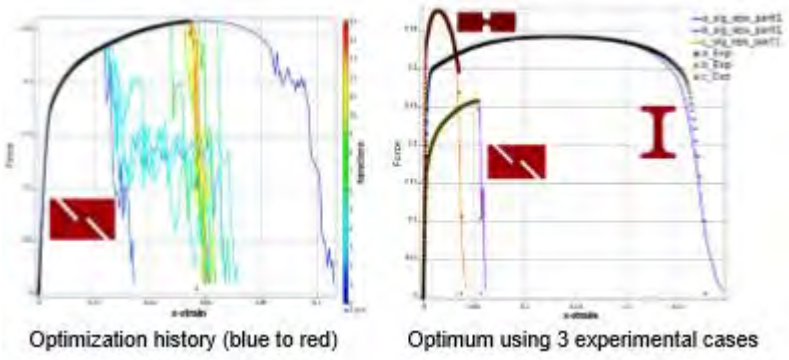
LS-OPT is capable of performing optimization with multiple objectives, disciplines and load cases. It can account for uncertainties in the design or loading (stochastic analysis and optimization), and can also be used to optimize tolerances with a multi-level setup.

Graphical Post-Processing:

- Result plots (Correlation Matrix, Scatter plots, Parallel Coordinate, Self-Organizing Maps, Time-history, Statistical)
- Metamodel plots (Surface, 2D cross-sections, Accuracy, Global sensitivities, History sensitivities)
- Classification boundary plot
- Pareto plots (Scatter plots, Parallel Coordinate, Self-Organizing Maps)
- Stochastic Analysis (Statistical tools, Correlation, Stochastic Contribution)
- Effect plot (Taguchi)
- Optimization History
- Tables with interactive features

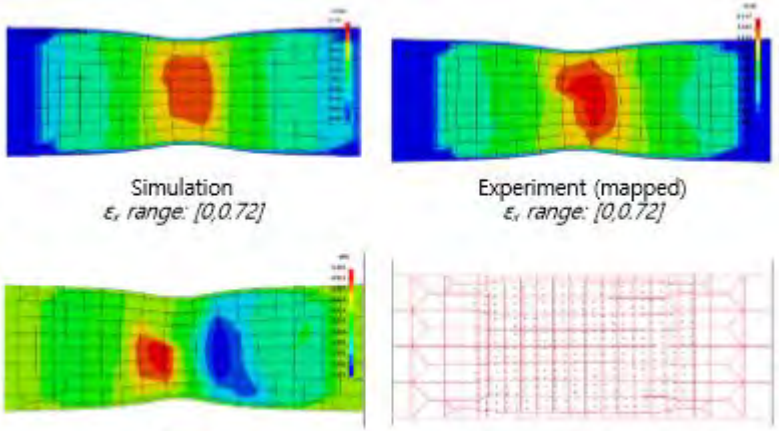
Material Parameter Identification

GISSMO Failure Model Calibration Using DTW

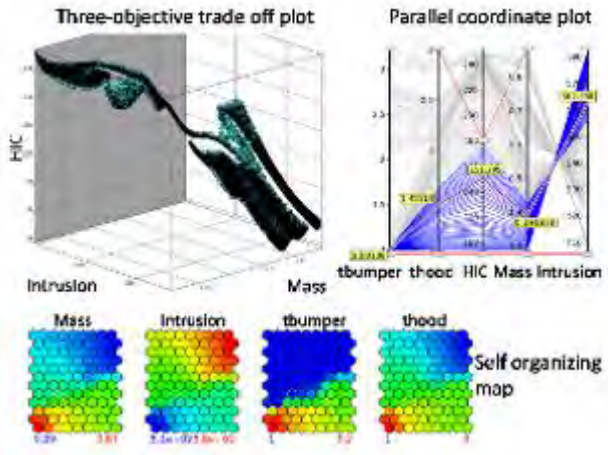


Optimization history (blue to red) | Optimum using 3 experimental cases

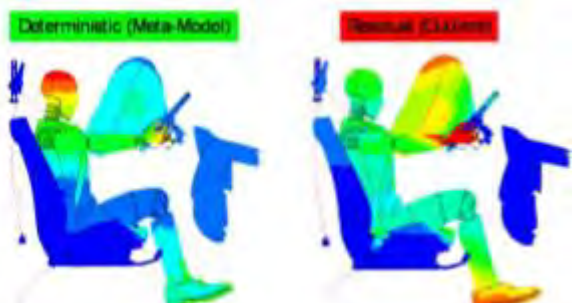
Full Field Calibration (Digital Image Correlation)



Multi-Objective Optimization



Stochastic Analysis: displacement standard deviation



Website: https://www.lsoptsupport.com/

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

MAT162 is a material model for use in LS-DYNA that may be used to simulate the onset and progression of damage in unidirectional and orthotropic fabric composite continua due to 3D stress fields. This failure model can be used to effectively simulate fiber dominated failures, matrix damage, and includes a stress-based delamination failure criterion.

Simulation Movie

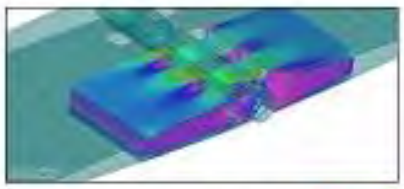
Penetration and Perforation of Moderately Thick Composites

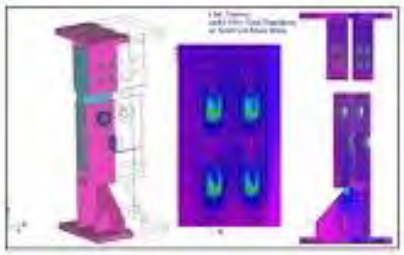
Examples are located at www.ccm.udel.edu/software/mat162/examples/

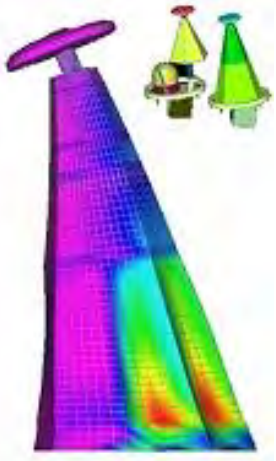
Example 1: Sphere Impact on a Composite Laminate
Example 2: Sphere Impact on a Perfectly Clamped Composite Plate
Example 3: Sphere Impact on Elliptical Carbon/Epoxy Tube

High Velocity Impact of Square Plate using MAT161/162
www.youtube.com/watch?v=NgjncjfLKGw

Engineering Services







MSC brings a long-range perspective to its engineering services clients. We understand the history of our core technologies, and can project likely new developments, and seek to provide innovation. A keen appreciation of the materials and structures state-of-the-art gives us the ability to create a development roadmap that efficiently reaches the clients goal, while taking full advantage of what already exists. We have an unusually broad exposure to materials applications; we have been involved with everything from infrastructure applications to spacecraft. This broad perspective allows us to draw on approaches and trends in one application area, and apply it to another. This helps our clients avoid pitfalls, and make exceptionally rapid technological progress. The same broad reach allows us the opportunity to interact with, and evaluate a wide range of suppliers.

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

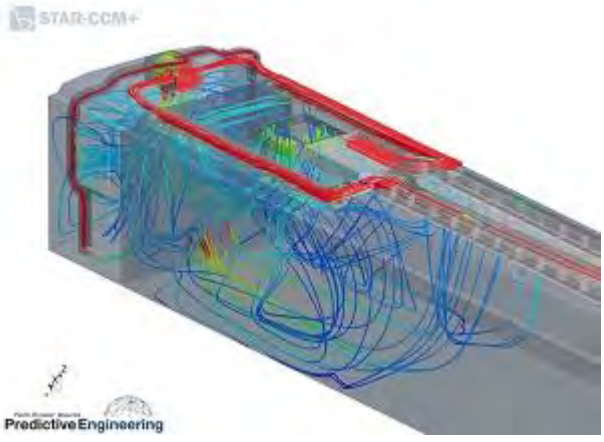
More New Features in version 15

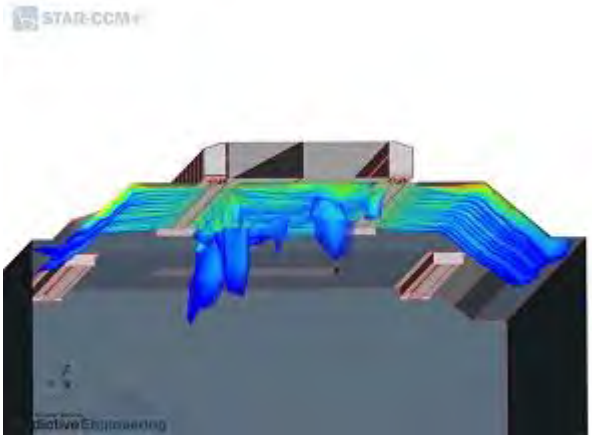
Predictive Engineering provides finite element analysis consulting services, software, training and support to a broad range of engineering companies across North America. We strive to exceed client expectations for accuracy, timeliness and knowledge transfer. Our process is both cost-effective and collaborative,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

CFD Analysis of CRRC's LACMTA Heavy-Rail Rapid Transient Vehicle

This has been an on-going project for our CFD consulting services team during most of 2018. As we all know, there is nothing like a "site visit" to meet your fellow engineers and see hardware. In early September, Drs. Laird and Hearn visited the CRRC Changchun Railway Vehicles Co., Ltd in Changchun, China. This is a cooperative project where Predictive has partnered with Hengstar Technology, Shanghai, China. The project work requires a complete flow and thermal analysis of Los Angeles County Metropolitan Transportation Authority (LACMTA) new passenger transit vehicle. The CFD requirements are a notch above normal specifications with tight controls on air flow volume, maximum velocity and distribution. Thermal analysis looks at vehicle cool down on hot days (transient thermal with solar radiation and lots of internal heat generation) and also thermal management within the electronics and motor drive bay at bogie level. All simulation work will be validated against vehicle mock-ups.

Read more…..





Rescale

www.rescale.com

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

Rescale Delivers Secure HPC to the Public Sector

Share via Twitter Share via Facebook Share via LinkedIn

Samantha Lindsay - November 9, 2018

San Francisco, CA, November 9, 2018 – Rescale, the leader in enterprise big compute in the cloud, announced today they are delivering secure HPC to the public sector.

Rescale meets or exceeds the strictest industry security standards and conforms to enterprise accepted assurance programs and controls. Each year Rescale is independently audited to ensure SOC 2 Type 2 attestation, which evaluates the security, availability, processing integrity, confidentiality, and privacy of Rescale's platform, data, policies, and procedures. Rescale's platform solutions are both ITAR and EAR compliant. Additionally for those concerned with safeguarding medical information, Rescale's platform solutions are HIPAA compliant. Leading the industry, Rescale has been entrusted with mission-critical and highly sensitive proprietary data by over 125 enterprises globally.

Joris Poort, CEO, Rescale says, "Our customers rely on Rescale for meeting and exceeding some of the most stringent industry security standards for protection of their sensitive data. Security is our top priority at Rescale. In our core platform development we have taken numerous steps towards protecting customers through the security of our platform. We are proud to be the first HPC platform solution in the industry to be ITAR and EAR compliant, and the only HPC platform company that is comprehensively independently SOC 2 Type 2 attested. Currently we are working towards FedRAMP authorization in early 2019."

Rescale ensures the security of its customers' data from the outset. Its platform solutions perform automated provisioning, configuration, and updating on all compute and storage resources, reflecting up-to-date security best practices. Rescale also offers comprehensive enterprise controls, allowing administrators to configure a broad range of policies, including fine-grained budgets, access controls and more. Rescale unifies HPC management with a single solution that offers turnkey industry-leading security and compliance capabilities for both hybrid and cloud HPC deployments.

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

The 3rd China LS-DYNA Forum

The 3rd China LS-DYNA Forum was successfully held by Shanghai Fangkun Software Technology Ltd and LSTC on Oct. 26 2018 in Shanghai. About 150 researchers and engineers, who came from various application fields such as vehicle OEMs, components factories, die & tooling, aerospace and electronics industries, etc. attended this forum.

Dr. Isheng Yeh from LSTC presented the lecture on "New Functions and Recent Advances in Automobile Application with LS-DYNA". Then Dr. Jiaquan Chen from FAW R&D Center brought us the speech with the topic of "Development and Practice of the technology of Virtual Proving Ground". And the other speakers, senior manager Haihua Wang from Yanfeng Adient Seating Co.,Ltd, senior expert Benhuai Li from CRRC Changchun, senior manager Qiang Liu from Autoliv, and Dr. Zhexin Pan from Tsinghua University, shared their LS-DYNA experience and applications in the different fields such as design of energy absorber components, seat design, airbag design, implicit & explicit analysis, forming analysis, failure analysis of battery, NVH analysis etc. with the attendees.

In the afternoon Dr. Wei Hu from LSTC introduced some new applications and new features of LS-DYNA, especially in the material design and manufacturing with the advanced FEM and meshfree & particles methods; senior developer Wenhui Yu from DLFK introduced the feature and application of the LS-PrePost, which is the advanced Pre &Post processor on keyword support for LS-DYNA solver.

The China LS-DYNA forum provides a platform for LS-DYNA customers, developers, and researchers and experts from all fields of applications. Through one day event, lectures and attendee shared the advance experience, knowledge, and the new features and various applications of LS-DYNA. All of us are looking forward to the next China LS-DYNA user conference in 2019.

Website: http://www.lsdyna-china.com **Sales Email**: sales@lsdyna-china.com
Technical support Email: support@lsdyna-china.com **Phone:** 400 853 3856 021-61261195

Army Start Biggest Military Robot Exercise In British History, Defence Secretary Announces -

This unmanned tracked load carrier is one of the systems to be tested during the Autonomous Warrior exercise which kicked off this morning. (Qinetiq photo)

British troops will today begin testing out over 70 examples of futuristic technology including enhanced surveillance drones and unmanned vehicles on the fields of Salisbury Plain, Defence Secretary Gavin Williamson has announced.

The game-changing Autonomous Warrior experiment will last four weeks and test a range of prototype unmanned aerial and autonomous ground vehicles which aim to reduce the danger to troops during combat. The exercise will finish with a battlegroup experiment, where the best ideas and products will be tested in the toughest of simulated operational environments.

One of the key areas it is set to test is the autonomous last mile resupply. The 'last mile', Which represents the extremely dangerous final approach to the combat zone, is crucial to ensuring soldiers have the food, fuel and ammunition to keep them alive.

Defence Secretary Gavin Williamson said: "Our troops now have the chance to test out a huge range of robotic kit in what will be the biggest exercise of its kind in our history. We're always working with the brightest minds in Britain and across the world to see how they can support our military of the future, but now the frontrunners have the chance to prove what they can really do on a battlefield. This equipment could revolutionise our Armed Forces, keeping them safe and giving them the edge in an increasingly unstable world."

The exercise aims to test technologies in surveillance, long-range and precision targeting, enhanced mobility and the re-supply The Royal Tank Regiment Battle Group from 1 Armoured Infantry Brigade are providing the bulk of exercising troops and taking responsibility of command and control. Overall The Royal Tank Regiment Battle Group from 1 Armoured Infantry Brigade are providing the bulk of exercising troops and taking responsibility of command and control. Over all there will be over 200 multi-national, cross-service personnel. The US Army, Royal Marines, RAF and the Defence Science and Technology Laboratory (Dstl) will join industry partners and academia in working alongside them, experimenting with over 70 products and systems.

of forces, urban warfare and enhanced situational awareness.

Autonomous Warrior will play an integral role within the £800 million Defence Innovation Fund which supports ground-breaking ideas aimed at transforming both defence and British industry.

The land-based exercise follows on from the hugely successful 'Unmanned Warrior' which the Royal Navy demonstrated autonomous systems diving, swimming and flying together to engage in surveillance, intelligence-gathering and mine countermeasures.

mv@feainformation.com - I am pleased to let everyone know I have ordered a 2019 Ford Ranger Lariat!

Ford Ranger makes a triumphant return for 2019

Ford Ranger makes a triumphant return for 2019 – a midsize pickup engineered Built Ford Tough, ready for adventure and packed with driver-assist technologies to enable easier driving both on and off-road. Anchored by a high-strength steel frame and powered by a 2.3-liter EcoBoost® paired to an efficient 10-speed automatic, the all-new Ranger is available in either SuperCab or SuperCrew configuration. It can be optioned with 4x2 or 4x4, and comes in three trim levels – XL, XLT and Lariat. Chrome and Sport Appearance Packages are available.

Technology comes built-in, starting with an 8-inch touch screen for available SYNC® 3, while a single or dual LCD productivity screen is available for real-time vehicle, navigation and audio information. Ranger has standard Pre-Collision Assist with Automatic Emergency Braking. A Lane-Keeping System that includes lane-keeping assist, lane-departure warning, reverse sensing and class-exclusive Blind Spot Information System with trailer coverage is standard on XLT and Lariat. Adaptive Cruise Control is standard on Lariat.

Ranger's muscular body features a high beltline, while a raked grille and windshield lend an athletic appearance and aid in aerodynamics and reduced wind noise. Short overhangs mean better approach and departure angles off-road. Available FX4 Off-Road Package features off-road-tuned suspension, all-terrain tires, frame mounted heavy-gauge steel front bash plate and skid plates, rear locking differential, innovative Terrain Management System™ with four distinct drive modes and Trail Control™. Ranger makes for a great piece of off-road gear, but it also gets work done on the pavement. Its rugged steel bumper with available integrated trailer hitch receiver means towing campers, ATVs or watercraft is a breeze.

New colors: Shadow Black, Oxford White, Ingot Silver, Magnetic, Blue Lightning, Saber, Hot Pepper Red, White Platinum Tri-Coat

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Ford Ranger makes a triumphant return for 2019

STANDARD FEATURES

•18.0-gal. fuel tank capacity
•Auto Start-Stop Technology
•Black vinyl floor covering
•Cargo box tie-downs (4)
•Carpeted flooring (XLT and above)
•Co-Pilot 360 (XLT and above)
•Daytime running lamps
•Electronic shift-on-the-fly (ESOF) (4x4)
•Engine – 2.3L EcoBoost®
•Mirrors – Power sideview (XL and above)
•Power windows and door locks
•Seats – Front buckets with flow-through console
•SYNC® with 4.2-inch color LCD screen (XL, XLT)
•SYNC 3 with 8-inch color LCD capacitive touchscreen with AppLink,® 911 Assist® and 2 smart-charging USB ports (XLT 301A and above)
•SYNC Connect
•Transmission – 10-speed SelectShift® automatic

STANDARD SAFETY & SECURITY

•Airbags – Dual-stage driver and right-frontpassenger front
•Airbags – Front-seat side
•Airbags – Safety Canopy® System with side-curtain airbags and rollover sensor
•Automatic Emergency Braking (AEB)
•Brakes – Anti-Lock Brake System (ABS)
•MyKey® (XLT)
•Rear view camera
•Remote Keyless Entry with remote tailgate lock (XL and above)
•SecuriLock® Passive Anti-Theft System
•SOS Post-Crash Alert System™
•Tire Pressure Monitoring System (TPMS; excludes spare)
•Trailer sway control

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

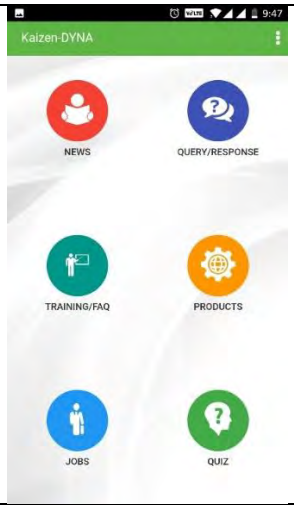
Contact support@kaizenat.com for more information

Kaizenat Technologies Pvt Ltd (KTPL)

A leading LS-DYNA support partner for the LS-DYNA users.
KTPL has been launching various applications to help LS-DYNA users.

Kaizen-DYNA

- Mobile App (Android & IOS)
- And Web App
- LS-DYNA Knowledge Platform
- CAE International News
- Queries & Answers by Expert
- Training & FAQ materials
- Innovative Products
- QUIZ -> LS-DYNA score
- LS-DYNA jobs/opportunities



dynaLUPA

LICENSE UTILIZATION & PREDICTIVE ANALYTICS

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Contact support@kaizenat.com for more information

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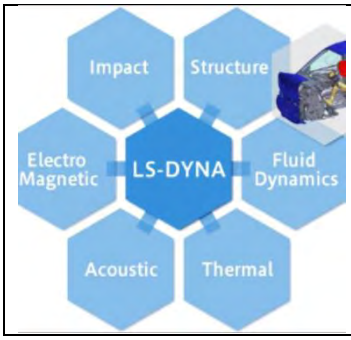
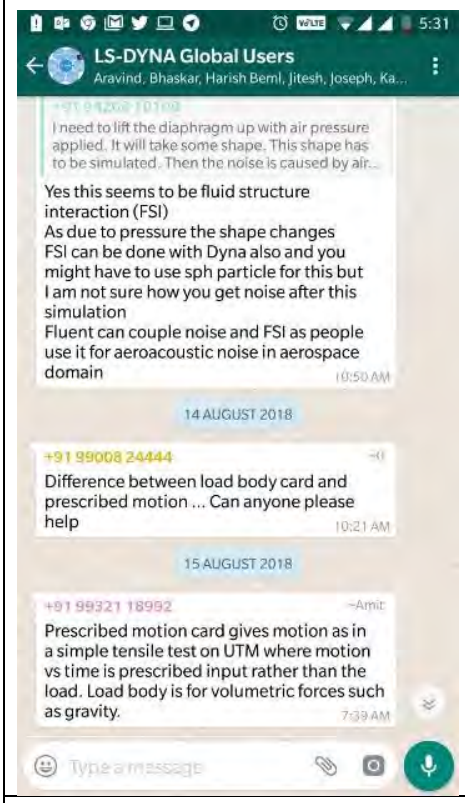
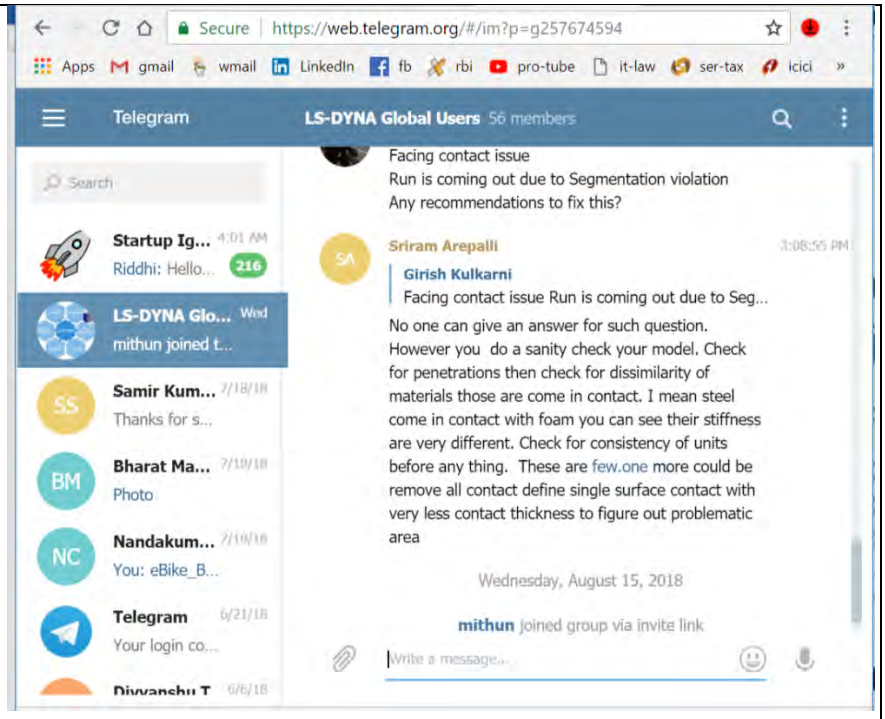


LS-DYNA Global Users Group
➔ LS-DYNA queries & instant responses

- Kaizenat started LS-DYNA Global users group in instant messengers like whatsapp & telegram.
- This really helps in getting answer for their queries instantly since people are more active on such applications now days compared emails.
- Users also can use webapp if required to use using computers.



Whatsapp



Telgram webapp

Whatsapp group is full within few days. Please do join the telegram group (LS-DYNA Global Users) using below link & enjoy the INSTANT answers - https://t.me/joinchat/JN3HNg9bzWLuAx5gu6qGRA Please feel free to write to support@kaizenat.com if you have any queries.

mv@feainformation.com

1D Beam Analysis have been performed for calculating the joint forces using LS-DYNA.

Here * BOUNDRAY_SPC card has used for constraining the bottom beam . Then Joint used for this simulation is *CONSTRAINED_JOINT_SPHERICAL after that * LOAD_ NODE _POINT has been used for applying the static load of 1 KN at the center of the top beam and its length is 7400mm. Beams are modeled with Truss(resultant), to invoke the same *SECTION_BEAM has used where ELFORM 3 has been selected. Also 2L KN force applied to middle joint of the beam to check the joint forces on each joint.

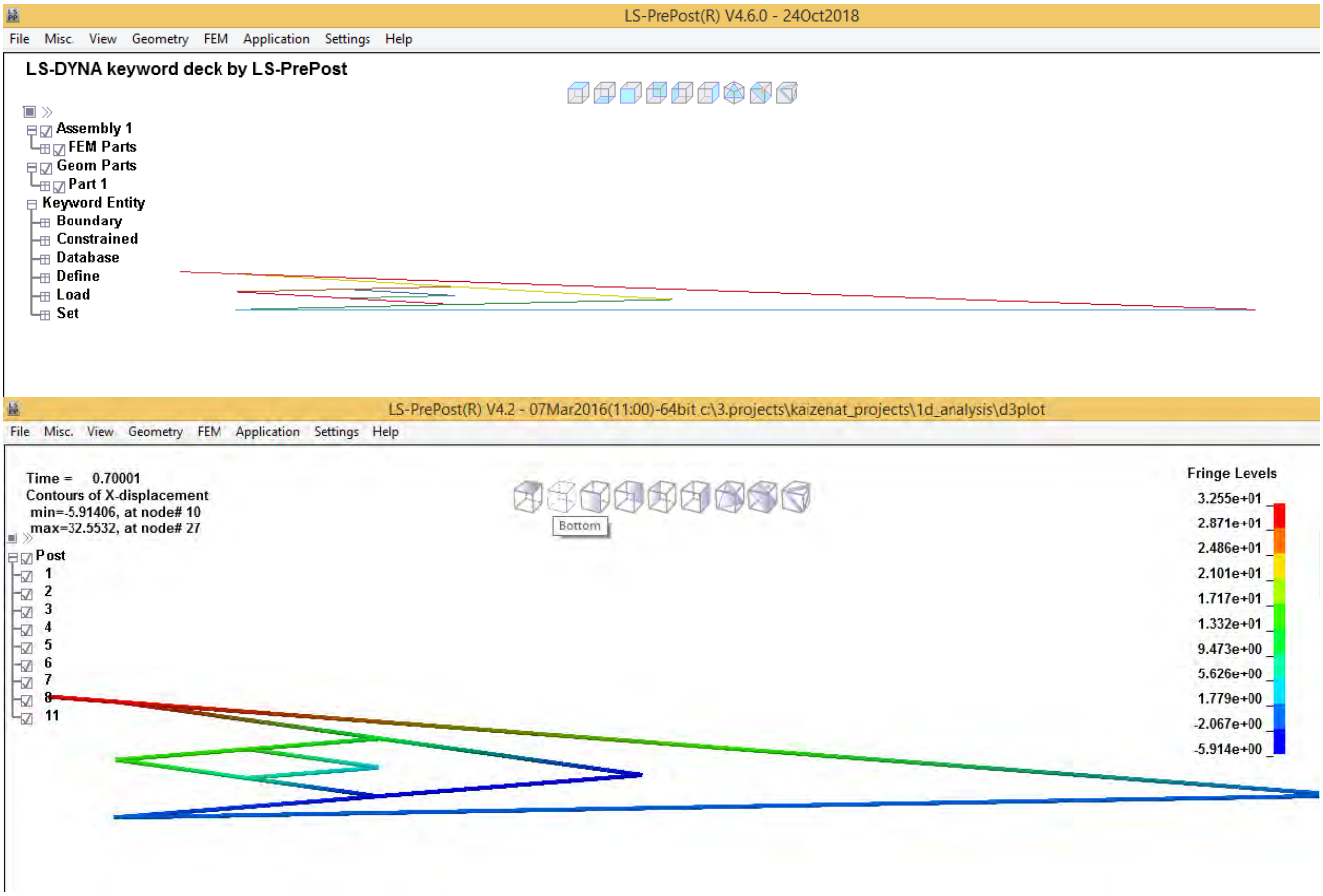


Figure: Joint Force calculation of 1D beam analysis.

To know more about the simulation, please contact support@kaizenat.com

mv@feainformation.com

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

www.dynalook.com

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www.dummymodels.com

LSTC ATD MODELS

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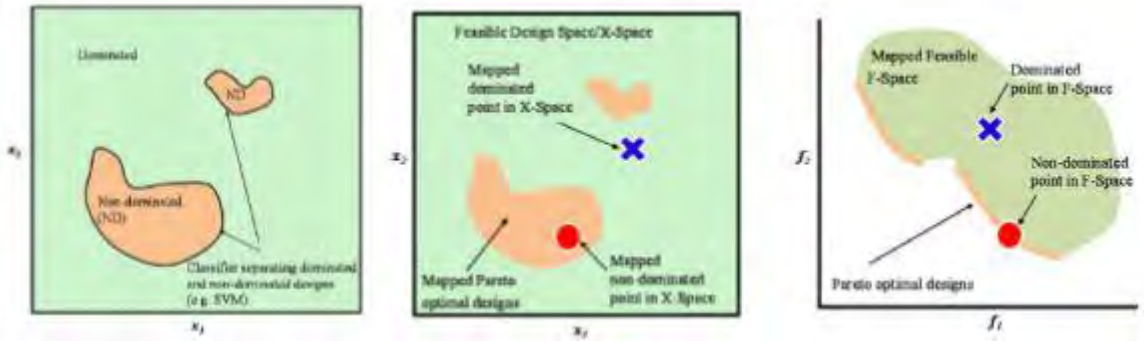
Classification-based Optimization and Probabilistic Analysis Using LS-OPT®

Anirban Basudhar[1], Katharina Witowski[2], Imtiaz Gandikota[1]
[1]*Livermore Software Technology Corporation, Livermore CA, USA*
[2] *DYNAmore GmbH, Germany*

Abstract:

LS-OPT is a standalone Design Optimization and Probabilistic Analysis package with an interface to LS-DYNA® that is capable of solving a variety of reliability assessment and single or multi-disciplinary design problems. It consists of a flexible framework with various methods that are suited to specific types of problems. The solution methods in LS-OPT are broadly categorized as direct or metamodel-based. Metamodel-based methods build approximations of the system responses using only a few samples, before applying core optimization or probabilistic analysis methods on these inexpensive surrogate models. They are particularly attractive due to higher efficiency compared to direct methods, which on the contrary can be prohibitively expensive in some scenarios. However, metamodel-based approximation is hindered in certain situations, such as due to discontinuous or binary responses. Instances of such responses include buckling during impact, aerodynamic flutter, fluid leakage simulation, nonlinear energy sinks etc. To overcome such issues, a classification-based method has been developed, which only uses binary safe/failed (or feasible/infeasible) information to approximate the decision boundary in the design space.

Read Full Paper…..



DIC-based Full-Field Calibration using LS-OPT®: An Update

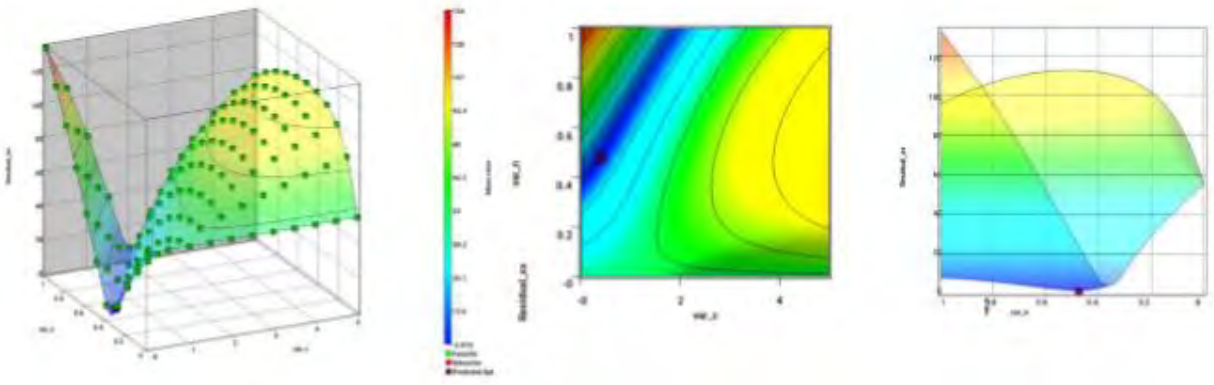
[1]Stander,N, [2]Witowski,K, [2]Ilg,C, [1]Basudhar,A, [3]Svedin,Å, [1]Gandikota,I, [2]Haufe,A, [1]Du Bois,S, [1]Kirpicev,D

[1]Livermore Software Technology Corporation, Livermore, CA
[2]DYNAmore GmbH, Stuttgart, Germany
[3]DYNAmore Nordic, Linköping, Sweden

Abstract

This paper extends a 2017 study on full-field calibration using Digital Image Correlation (DIC) and the Finite Element Method to identify parameters of a material model developed for elastoplasticity. DIC is an optical method which provides full-field displacement or strain measurements for mechanical tests of materials and structures. It can be combined with the corresponding fields obtained from a Finite Element Analysis to identify constitutive properties. The methodology, which involves the solution of an inverse problem, consists mainly of two new core features namely (i) multi-point histories and (ii) suitable curve similarity measures. Multi-point histories are response curves which are evaluated at multiple spatial locations and extracted from simulations and experimental data. To improve on the previously used Euclidean curve distance measure, the Discrete Fréchet (DF), Dynamic Time Warping (DTW) and Partial Curve Mapping (PCM) measures were developed and validated for multi-point histories. An interface to a commercial DIC package, as well as two text-based generic interfaces, was also developed. A tensile test example was used to validate and demonstrate the methodology based on the DIC measurement of spatial point-wise strains. The example validated the code but revealed potential problem areas, such as solution stability, requiring further investigation.

Read Full Paper…..



Multi-disciplinary Optimization using LS-DYNA®

Mr. Azhar rehmani A. Saiyed, MS, B.Eng.
(Wayne State University)
Dr. Bijan Khatib Shahidi, PhD, MBA
(US Army, TARDEC)
Mr. Madan Vunnam, MS, PMP®
(US Army, TARDEC)

Abstract

Crashworthiness, NVH (Noise Vibration & Harshness) are two distinct as well as very inter-connected attributes/disciplines of vehicle development process. As objectives of both are very differing, it is a challenge to design a vehicle equally performing in both with the global objectives of mass reduction and comfort. LS-OPT® is the tool, which can perform a multi-disciplinary optimization. Here we will perform a frontal crash of the vehicle (/frame) and Optimize as per the FMVSS 208. On the other side, Vibration Analysis and optimization of BIW for the same vehicle will be conducted. Then, we will perform an overarching Multi-Disciplinary Optimization and compare it with the individual optimization. Lastly, we will run a LS-DYNA model with optimized parameters for the validation of the model.

Introduction

Weight reduction is a common objective for every automotive manufacturer and supplier to make the product lighter. As conventional materials are widely used in automotive industries, there are limited options to switch materials within economical range. Other widely adopted weight reduction strategy is to optimize the thicknesses of parts to reduce the weight and saves material cost. Obviously, there are limitations of economical manufacturing processes to reduce the thickness after certain extent but this method proves its effectiveness and as a result automaker as well as supplier bolster about their lighter products. Since, every vehicle sub-system development process must need to satisfy specific objectives, which makes optimization problem complex and it is very crucial to satisfy each objective in desired range with reduced weight.

For every multi-disciplinary optimization, it is very preliminary and important to understand the relation between each attribute/discipline prior to conduct an analysis. Without establishing concrete relationship between disciplines, we cannot interpret the desired results as well as set a realistic goal for optimization. Also, it is very important to conduct an individual optimization of each discipline prior to solve a multi-discipline optimization problem. Which further gives us a broader picture of system response for defined objective and constraints. A selection of objective and constraints also plays a vital role in results of analysis.

In this paper, we will conduct an individual optimization of crash and NVH and compare the results with

the baseline model to establish a simple relationship between the parameters and the objective. We will follow this with a multi-disciplinary optimization of both discipline with global objective of mass optimization and low injury criteria according to FMVSS 208.

We will be running simulations on LS-DYNA 9.1.0 version while running single precision for impact explicit analysis and double precision for Eigen value implicit analysis. For this study, we will only run a metamodel optimization and validate the results of it. Direct optimization is computation time costly but there is no doubt about it accuracy.

Simplification of Problem

Here instead of solving a whole vehicle model with 700,000+ elements, we will reduce it to save considerable time and computation resources. Which will give us capabilities to conduct iterative study easily without loss of actual goal to reduce weight and improve the safety and vibrations.

In frontal crash, structural frame plays a major role in energy management. We can see reduced frame model in fig.1 without body, engine, transmission, suspension system, exhaust system, interior.

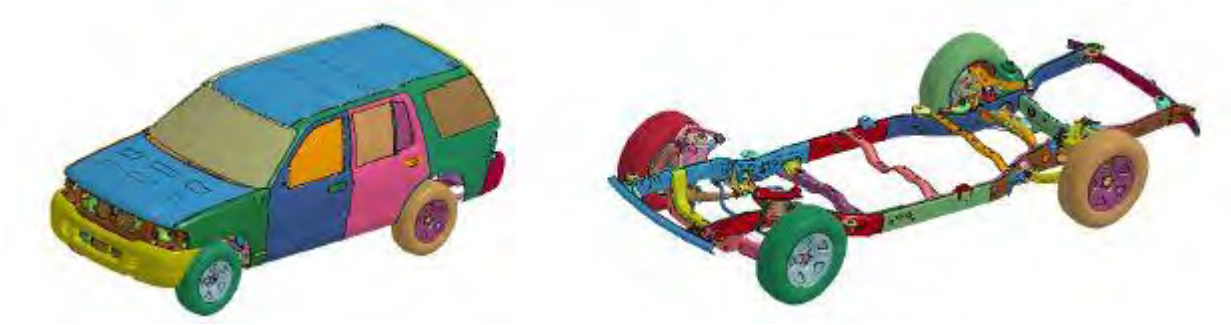


Fig. 1) Reduction of Vehicle model to Frame

Here to restore the mass and inertia of frame model to represent the exact same physical characteristics, we must have to add mass and inertia of the removed parts to the center of mass and connect that center of mass to the body and engine mounts.

In vibration analysis, instead of analyzing the whole vehicle model, we will reduce the model to BIW (Body In White). The only reason behind this is to reduce the complexity of the problem and remove the small and fragile part out of the consideration. Since, it will take the most of eigen value and eigen vectors during an analysis. Also, it will help us to focus on BIW only and improve its natural frequencies of vibration. The important thing to note here is removing the excess spot-welds after the reducing of parts, which can constrain the body and may lead to incorrect results.

Read Full Paper…..

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:

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Products made of composite materials - Analysis Tools -
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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.

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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.

恒士达科技
Hengstar Tech.

Shanghai Hengstar www.hengstar.com

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

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

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

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

Consulting

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

www.lenovo.com

Lenovo is a USD 39 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.

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 expensive 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** www.eta.com		etainfo@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

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	

Distribution, Consulting

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			

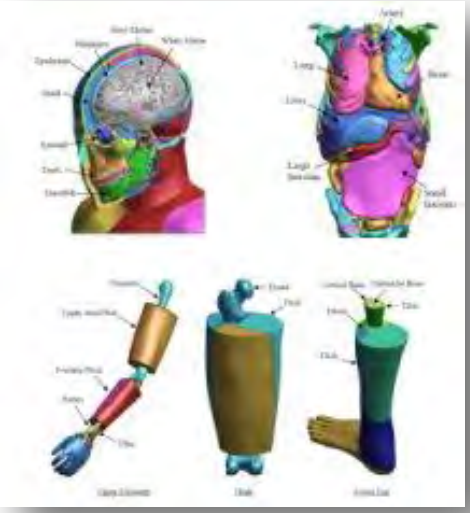
Korea	**KOSTECH**	young@kostech.co.kr		
	www.kostech.co.kr			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM
	eta/DYNAFORM	DIGIMAT	Simuform	Simpack
	AxStream	TrueGrid	FEMZIP	

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

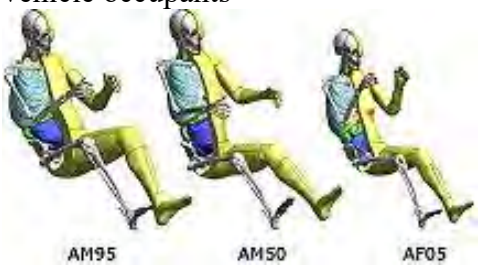
Taiwan	**SiMWARE Inc..**			
	www.simware.com.tw			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

TOYOTA - Total Human Model for Safety – THUMS

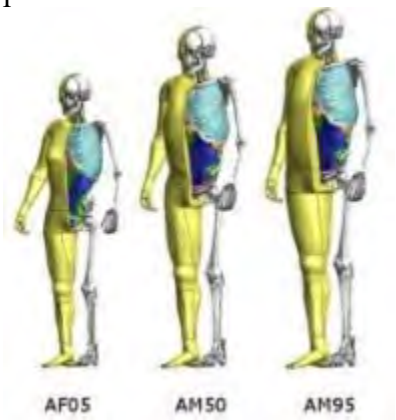


The Total Human Model for Safety, or THUMS®, is a joint development of Toyota Motor Corporation and Toyota Central R&D Labs. Unlike dummy models, which are simplified representation of humans, THUMS represents actual humans in detail, including the outer shape, but also bones, muscles, ligaments, tendons,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

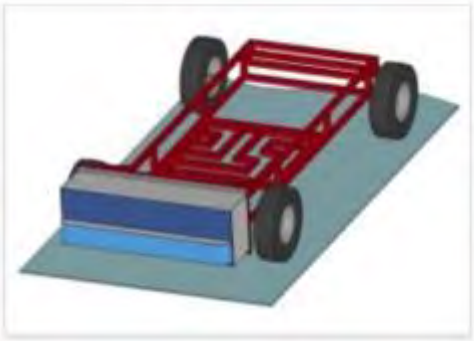
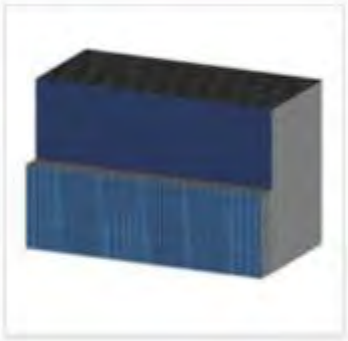
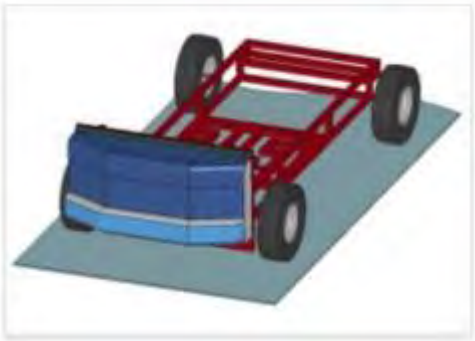
- IIHS MDB modeled with shell elements
- IIHS MDB modeled with solid elements
- RCAR bumper barrier

- 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.

Training - Webinars

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
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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

Visit the website for complete overview and registration www.dynamore.de/seminars

Download full seminar brochure (pdf): www.dynamore.de/seminarbroschure2018

Selection of trainings for December

Introduction	
Introduction to LS-DYNA	4-6 December
Nonlinear Implicit Analyses	7 December
Crash/Short-Term Dynamics	
Crash Analysis with LS-DYNA	10-13 Dezember
Multiphysics	
ICFD Incompressible Fluid Solver	10-11 December
Inductive Heating and Battery Modeling	12 December
Pre- and Postprocessing	
Introduction to PRIMER for LS-DYNA	14 December

We are working on the seminar dates for 2019. You will find the dates for January and February 2019 in the next issue.

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.

www.lstc.com

December 2018

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

January 2019

Date	*Location*	*Coures Title*	*Instructor(s)*
Jan 21 – Jan 25	MI	Introduction to LS-DYNA® and LS-PrePost®	A.Nair
Jan 28	CA	Discrete Elements in LS-DYNA®	H.Teng

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ETA	www.eta.com
Lancemore	www.lancemore.jp/index_en.html
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