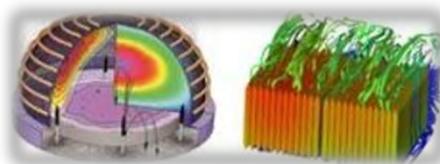**BETA CAE Systems New release**

Rescale

ESI Group

**JSOL
JSTAMP**

ESI Visual-Environment 14.0

LS-DYNA New Features:

- **Development of a One-Step Preforming Analysis for Woven Carbon Fiber Composites**

- **Smoothed Particle Galerkin Method with a Momentum-Consistent Smoothing Algorithm for Coupled Thermal-Structural Analysis**

- **Development of New Simulation Technology for Compression Molding of Long Fiber Reinforced Plastics using LS-DYNA®**

New website: Computational and Multi-scale Mechanics Group: https://www.lstc-cmmg.org/

FEA Information Engineering Solutions

www.feapublications.com

The focus is engineering technical solutions/information.

FEA Information China Engineering Solutions

www.feainformation.com.cn

Simplified and Traditional Chinese

The focus is engineering technical solutions/information.

Editor and Contact: Yanhua Zhao - yanhua@feainformation.com

Noi Sims – noi@feainformation.com

Platinum Particpants

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Livermore Software Technology Corp.

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DELL

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& Computer Simulation

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rescale

FINITE ELEMENT ANALYSIS — **Predictive Engineering**

FEA Not To Miss

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LS-DYNA New Features

LS-DYNA Conference Presentation Showcase

Announcements

BETA CAE Systems announces the release of the ANSA/EPILYSIS/META suite v17.1.5.

This maintenance release is focused on the correction of identified issues and is addressed to those who wish to continue to use the v17.1x branch with its issues resolved and not upgrade to v18.x.

The most important enhancements and fixes implemented are listed in the website. More...

Rescale announces new hybrid innovations to its HPC cloud platform

San Francisco, Calif., June 25, 2018 – Rescale, the HPC in the cloud company, today announced new hybrid cloud innovations to enable organizations to extend their fixed on-premise high performance computing (HPC) systems to the cloud. The majority of the HPC market is highly invested in on-premise infrastructure. However, leading organizations are benefiting from the flexibility, scalability and rapid innovation of the cloud.

Course: **Progressive Composite Damage Modeling in LS-DYNA (MAT162 & Others**)
   Offered: in-house and as a web conference.
   Information: www.ccm.udel.edu/software/mat162_workshop
   Dates: Tues., **Nov.**13, 2018 | 9am-5pm
   Phone: (302) 690-4741 **| Email:** bzhaque@udel.edu

LSTC announces Workshop: Meshfree Method and Computational Mechanics

April, 2019 Livermore, CA, 94550
Hosted by Livermore Software Technology Corp.(LSTC)

This workshop will focus on recent work by a number of distinguished researchers in Meshfree Method and Computational Mechanics. It is also an opportunity to recognize Professor J.S. Chen's contribution in Computational Mechanics. More…

More information, please see website: https://www.lstc-cmmg.org

If you have any questions, suggestions or recommended changes, please let us know.
               Contact: Yanhua yanhua@feainformation.com

BETA CAE Systems

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

BETA CAE Systems announces the release of the v18.1.2 of its software suite

About this release BETA CAE Systems announces the release of the new ANSA/EPILYSIS/META suite v18.1.2.In this version new features have been added and corrections have been implemented for identified issues. The most important enhancements and fixes implemented are listed below.

[Enhancements and known issues resolved in ANSA](#)

[Enhancements and known issues resolved in META](#)

ANSA files saved by all the first and second point releases of a major version are compatible to each other. New major versions can read files saved by previous ones but not vice versa.

META Project files saved from version 18.1.2 are compatible and can be opened by META version 16.0.0 or later. To be readable by META versions earlier than v16.0.0, they have to be saved selecting the option "Version <16.0.0". Support for 32-bit platform has been discontinued for all operating systems.

Customers who are served directly by BETA CAE Systems, or its subsidiaries, may download the new software, examples and documentation from their account on our server. They can access their account through the "user login" link at http://www.beta-cae.com/

Contact us if you miss your account details. The Downloads menu items give you access to the public downloads.

Customers who are served by a local business agent should contact the local support channel channel for software distribution details.

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

LS-DYNA Forum 2018 – register now!
DYNAmore France - new address

Register now for the German LS-DYNA Forum

From 15-17 October 2018 the 15th German LS-DYNA Forum will take place in Bamberg. With renowned keynote-speakers from industry and academia, more than 100 presentations and several workshops on various topics the conference is an ideal opportunity to exchange knowledge and discuss new solution approaches with other users. As always, many accompanying seminars will be offered after the conference. Register now and take the change to talk with industry experts and learn more about the software and its applications.

Exhibiting and sponsoring

In the accompanying exhibition, numerous hardware and software manufacturers offer an insight into the latest news and trends around LS-DYNA. If you want to contribute, please request additional exhibitor and sponsoring information.

Participant fees

Industry speaker: 380 Euro
Academic speaker: 280 Euro
Industry: 600 Euro
Academic: 430 Euro

Venue

Welcome Kongresshotel Bamberg
Mußstraße 7, 96047 Bamberg, Germany
www.welcome-hotels.com/welcome-kongresshotel-bamberg

DYNAmore France – new address in Versailles

DYNAmore France is pleased to announce that a new office location in Versailles has been found.
From now on you will find DYNAmore France at the following address:

DYNAmore France SAS
21 av. de Paris
78000 Versailles

The new location in the heart of Versailles offers ideal conditions for further growth and to expand and improve the services for our customers.
"At the moment, five experienced engineers are taking care of customers' needs in Versailles. But of course the offices have been chosen so that we can continue to grow and recruit new, qualified people", says Nima Edjtemai, Commercial Manager of DYNAmore France.

In addition to offices, there is also a seminar room in the building, where DYNAmore's wide range of seminars will be held.

For more information please contact our office in Versailles or our headquarters in Stuttgart.

Contact

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Industriestr. 2
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www.dynamore.de/forum2018-e

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.

Latest Software Release of ESI Visual-Environment 14.0 supports Additive Manufacturing

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

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

Release Highlights across Visual-Environment platform

- Evolution of the environment in line with updates in the various solvers supported by **Visual-Environment**
- NEW! **Visual-AM** (Additive Manufacturing) is a new module in Visual-Environment for metallic additive manufacturing process modeling and optimization. The two solvers supported include Distortion and Prescan.
- **Visual-SDK Batch** is a Python interface to APIs. Scripts for Crash, Safe and Impact can be run directly from console without launching VE.
- **Visual-Crash DYNA** improved Airbag Reference Geometry and supports many new keywords.
- **Visual-CEM** addresses the brand new CEM-TD solver with 3D3D chaining, restart or extended simulations, GUI panels revamping and generic E-mesh with progress bar.
- Mesh motion in **Visual-CFD** is enhanced to support multiple motion. It supports translation, rotation, oscillation or user-defined type of mesh motion.
- **Visual-Composer** allows automatic association of Mesh with CAD, while keeping Part ID consistency across simulation Models.
- Penetration/intersection checks is redesigned in the **VPS modules**.
- **Visual-SYSTUS** provides an advanced computation manager allowing you to access easily every option available in the SYSTUS solver
- For Composites, a new tool to create resin channels automatically is introduced within **Visual-RTM**.
- **Visual-Mesh** continues to upgrade its support for the latest CAD formats, besides a host of other improvements to enhance your experience with the Geometry and Meshing module.
- **Visual-Viewer** comes with remarkable performance improvements of the native ERF 2.X model loading and first cycle animation. It also supports upload of ERF files to Visual*DSS* Cloud in just one click. You can visualize contour values along sections as section thickness.
- **Visual-Assembly** and **Visual-Systems** are supported under Context Strategy and Tokens Strategy for licensing, checking out 6 tokens each. Visual-Composer checks out 6 tokens from this release.
- **Visual-Systems** now allows building a co-simulation mechanism with VPS.

- **Meshing (module: Visual-Mesh)**

CAD Import: Supporting new formats: XCGM: R2012 – 2018 1.1; JT:8.x, 9.x and 10.x – on Windows only; CATIA V4: .session

CAD Export: For 3D PDF format, version 1.7 is supported (3D PDF is available on Windows only)

Connect to CAD System: CREO format is supported; usability and performance are improved.

Curve Offset: Offset of the surface edges and curves on surfaces is supported. They can be offset with a constant or a variable distance.

Surface Sweep - Grow along Source Normal: Grow option, is supported to sweep the source curve along the normal of reference entitiesThe reference entities can be surfaces or elements. They can either be selected or auto detected. This option is mainly useful for the creation of ribs / fins.

Surface Repair: Stitch adjacent surfaces is supported under advanced options.

Simplify Geometry: GUI usability is improved with dedicated tabs for each major option. Splitting surface is supported as well as the Auto Correct All for cleanup of small entities. The identification of Lock Edges is also improved.

Node Move: Moving nodes along their element edges, outside of the element boundary is allowed. Internal nodes can be moved only with Shift+Pick.

Node Replace: Distance moved is displayed on the panel, with its XYZ components. Standard session and Python scripting interfaces are supported.

2D Remesh: Selection of elements with a desired range of sizes (taken in terms of area) is supported. This helps to quickly remesh complex parts with good control on curved areas.

3D by Node: Standar session and Python scripting interfaces are supported.

Tetra Mesh: Multi-layer tetra mesh at thin regions is supported. The software will automatically identify thin sections based on number of layers of tetra elements at a given section.

Element Quality: Computation of Jacobian values for quadratic tetra elements is supported as well as quality improvement based on Jacobian for quadratic elements.

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

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

Airbag Reference Geometry: Import of airbag reference (and airbag shell reference) geometry from a file is supported. An option to add airbag reference geometry to a new include file is provided. And the creation of airbag geometry is supported by selecting the nodes/shell elements. Modify airbag reference geometry and adding/removing nodes/elements to the existing reference geometry is supported. It is also possible to change the type of the reference geometry. The saving of airbag reference geometry is also supported as well as saving reference geometry into a LS-DYNA file format. Deletion is supported and deleting the existing reference geometry from the model is possible.

Part Export: Export selected parts into a LS-DYNA file format. Elements, nodes, material, section and all referred in entities are exported. Define curve and table referred in the part material is also exported. Exported parts are complete by itself and exported file directly can be used in any other model.

Add to New Set: Add selected entities (parts/nodes/elements) to new *SET. Heterogeneous selection is allowed and selection of parts/node/elements together to add them into new *SET is possible. As many *SET are created (as per LS-DYNA keyword rules) as required based on the different selected entity types.

Improvements in Entity Creation GUI: Card data visualization area is improved with new color combination to improve the visibility. Based on the field type, appropriate icon is displayed.

Visibility Update: One-click operation in the Visibility toolbar to show only the mesh model without connections

Post-Processing (module: Visual-Viewer)

Performance Improvement for ERF 2.X: VE14.0 has significant performance improvements over VE 13.5 and earlier versions. The native ERF 2.X model loading and first cycle animation has improved multi-fold.

Section Thickness as per the Contour Value: Visualize the Contour vales along the section line as Section thickness. It varies with the contour value at the section.

User Variable Support for Zones and Split: The definition of a custom contour which divides the existing contour into zones based on the required conditions is supported. Thickness contour can be split into six zones based on its value and can be visualized as shown below by using the equation.

Template Layers Management: Template Curves Layer allows to change the display properties of curves in a template layer. Switch on/off layer and change the name, color, style, and thickness at the layer level is supported. Changes will be applied to all curves in that layer. Save and restore layer information by saving it as "Layered Template" is supported as well as add/delete layers in the Layer Template to use it for further iterations.

User Variable Dialog Enhancements: User variable dialog is enhanced to create and plot variables with curve data. It allows to create expressions using THP entities.

Trajectory Enhancements: Once a trajectory is created, Annotation is also displayed by default. The Trajectory name, positions, Distances and Total distances are displayed.
- Show only Camera Trajectory: If a camera is also applied, you can display only the camera trajectory as well as its respective annotation.
- Refresh Trajectories: After applying a trajectory and selecting some states to animate in the Animation Control dialog, clicking on Refresh Trajectories button recomputes the trajectory considering only the selected states to animate.

Grid Tracing Enhancements: Option to rotate the grid mesh, before dropping the same grid is provided. New grid contours which will only be applied on the projected grid, are added.
- Segment True Strain   - Element Engineering Strain   - Element True Strain

Section Cut with Local Frame: Section cut can be done with respect to selected local co-ordinate system. By selecting the local co-ordinate system, standard cut plane will be defined with respect to the selected local frame.

Process Automation

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

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

Software Development Toolkit

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

Visual-SDK Batch is a Python interface to APIs that facilitates access to Visual-Environment's Core Data-Model. This interface allows you to import the APIs as a Python module namely VistaDb in the Python scripts. The scripts can be run directly from console without launching VE.

VistaDb Python module provides access to around 2,000 APIs using which files can be imported, required operations can be performed on any entity and finally, the data can be exported back into a file.

Simulation Lifecyle Management

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

It further provides a local data management, called "Simulation Content Manager (SCM)", which manages the simulation content locally.

System Modeling (module: Visual-Systems)
Co-Simulation World Enhancement: Co-simulation World is enhanced to select pc (PAM-CRASH) model. Upon selection, the path is realized for vpsModel in actuators and sensors. Supported solver types are: SimulationX and SimulationX_FTire*Co-Simulation*
Library Management: Library packages like Modelica, Cosim, Modelica Services are enabled.
Model Edit Features using sxapi: Enabled model edit features using sxapi are: - Modelica Class Creation, Update, Delete.   - Drag and drop, connect, save. - Modelica code get/set. - Undo/Redo. - Parameter Edit.
Implementation of Search and Help: The Search mechanism is much faster compared to the previous version and displays the first 10 component names under the search folder. Help is enabled for all the inbuilt models.
Post-process Enhancement: Deletion of the csv file from the tree deletes the respective curves from the respective plot windows.

Computational Fluid Dynamics (CFD) (module: Visual-CFD)
OpenFOAM Version Support: All physics/features those were supported in Visual-Environment 13.5 version are supported in this version as well. Latest version supports OpenFOAM 5.0 and OpenFOAM 1712 versions.
Suppress Parts during Meshing: This feature ensures, parts that have been tagged with it will not participate during snappyHexMeshing. This is very useful when user have many variants of a part in a single file and wants to create different models by turning ON / OFF some of the parts / variants of the part. This option is available on right-clicking on Surface parts. The suppressed part will be moved to a group named as Suppress Part.
Derived Variables Support during Runtime: There are plenty of variables that can be calculated based on primary solved variables. These variables are very useful for result interpretation, for example, Wall Y plus, Heat Transfer Coefficient, Wall Shear Stress, etc. Now, user has an option to write them out. These variables could be written along with primary variables during intermediate saving of result files, or at the end of simulation.
Derived Variable Support after Simulation: With current feature, user can calculate and write out derived variables even after completion of runs. Most commonly used variables are given as a drop-down list. Apart from variables available in the drop-down list, if user wants to calculate any other specific variable, he can use the file option for the same, where function object is written in a file.
Function Object Supply: OpenFOAM has many utilities that can be executed during run time. Such as: image dumping, writing out derived variables, etc. Now, user can put all the required function objects in a file and the file can be linked to Visual-CFD so that functions will be executed during simulation.
Mesh Motion: Mesh motion has been enhanced to support multiple motion. Earlier, Visual-CFD supported only rotating motion. Now, it supports translation, rotation, oscillation, or user-defined, as per user's wish.
Patching of Variables: Patching any volume part or predefined shape (primitive shape) with any variables is possible now. This is very useful for initialization of different variables in different domains or volume zones.
Enhancement of External Aero and Front-End cooling application: With latest version of Visual-Environment, user can dump force development plot data, or aerodynamic forces acting at different components of the vehicle. In case of front end cooling application, user can now predict Top Water Temperature or Heat Rejection from it based on provided inputs.

NEW: Additive Manufacturing (module: Visual-AM)

Introduction of the new module: ESI Additive Manufacturing is an Integrated Computational Material Engineering Platform (ICME) for metallic additive manufacturing process modeling and optimization. Several modules interact to provide a comprehensive understanding of how process parameters affect material quality and component manufacturability. The different modules will be released successively. In Version 14.0 of the Visual-AM module two solvers are supported, namely Distortion and Prescan, which are mainly dedicated to manufacturability of a material and a component. In later versions, additional solvers will be implemented like powder coating, melt pool simulation, thermal model for scanning strategies and many more. The research prototype already includes these modules and could be provided upon request. For both, Distortion and Prescan, you are neither requested to do any meshing nor to type any complex commands to launch different scripts or solvers. All set-up steps are organized in a very simple procedure that you can go through from top to bottom.

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

ESI's customer portal myESI is available for all ESI customers to access updated product information, tips & tricks, training information, and selected software downloads.
For additional product information, please feel free to visit our website, contact any of the local ESI subsidiaries or contact Andrea Gittens, Product Marketing Manager for ESI Visual-Environment.
For more ESI news, visit www.esi-group.com/press

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.

PreSys

PreSys is an engineering simulation solution for the development of finite element analysis models. It offers an intuitive user interface with many streamlined functions, allowing fewer operation steps with a minimum amount of data entry along the way. Using PreSys, the user can analyze product designs, view simulation results and analyze/predict how the product will perform in a given circumstance.
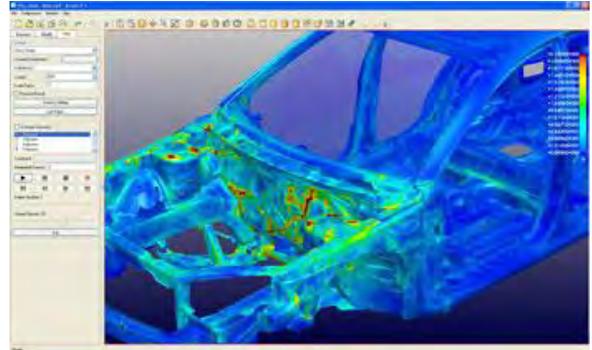
PreSys works the way you do.
The PreSys interface is fully customizable to suit user-specific needs. Also, a model explorer feature provides streamlined data navigation.

Menus, toolbars & many other user interface features can be customized by the user to streamline the guided user interface.

Developed by the leader in the creation & implementation of new CAE tools & methodology, PreSys is ETA's 4th generation Pre/Post Processor. It delivers the capability to handle finite element modeling with ease.

Why PreSys?

ETA's PreSys™ is a solver and CAD-neutral Finite Element modeling and analysis solution. A price/performance leader, the tool delivers precise modeling results with advanced graphics capabilities. With fewer steps, a customizable interface, streamlined functions and scripting access, the user can simulate and analyze designs quicker than ever. PreSys™ also offers vertical application toolsets which drill-down to application-specific requirements, including drop testing and fluid-structure interaction analysis.

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

07/16/2018 No way in an airplane seat below can I hold my vanilla almond coffee. I do kind of look like that without coffee just reaching! Anyway, we have ot thank Predictive Engineering for helping with coffee on an airplane, how to avoid spilling coffee,m OR it is a sled test!
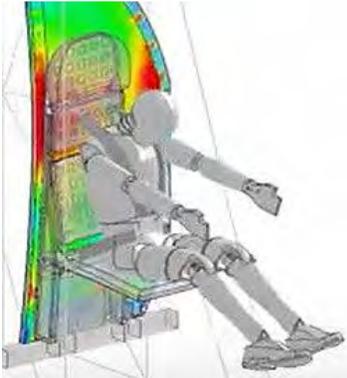
The engineering of airplane seats is quite complex due to competing demands for lightness and the ability to survive a 16g sled test.

07/02/2018 - has anyone recently landed a space shuttle? planning on landing one? wanting to land one? WELL, if you do AND it is on water, I have a simulation you need to see first!   How to land a space shuttle on water and not spill your coffee (I lied about the coffee - that would be me sitting on the shore drinking coffee while YOU land the shuttle!
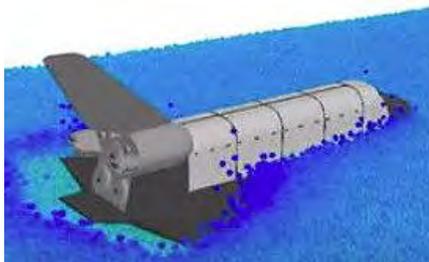
Space shuttle landing - LS-DYNA discrete method (DEM)

www.FEAntm.com   *feaanswer@aol.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.

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

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

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

JSTAMP Functions Address various tasks in tool shop

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

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

EVENTS:

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

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

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

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

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

LS-DYNA® Advanced FEM, Meshfree & Particle Methods
Material Design & Manufacturing

Mechanical performance of material:

- Composite material modeling in multiple scales
- Bottom-up material data processing

Features:
- Representative volume element (RVE)
- Reduced-order homogenization
- Deep material network (machine learning)

Manufacturing analysis:

- Bulk forming: forging, extrusion
- Machining: cutting, shearing, polishing
- Jointing: riveting, welding, drilling
- Brittle, ductile and rubber-like materials
- 3D printing process and performance test

Features:
- Multiple advanced numerical tools
  Element free Galerkin (EFG)
  Meshfree-enriched FEM (ME-FEM)
  Smoothed particle Galerkin (SPG)
  Smoothed particle hydrodynamics (SPH)
  Peridynamics
  eXtended FEM (X-FEM)
- 2D and 3D (shell & solid)
- Particle immerse
- Explicit and Implicit analysis
- Coupled thermal mechanical analysis
- Adaptive re-meshing
- Physics-based failure model

Nano-particle
reinforced rubber

RVE
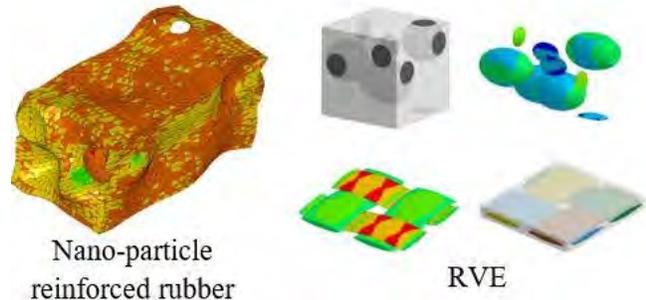
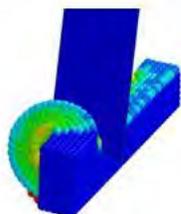*RVE analysis (Virtual material test module)*
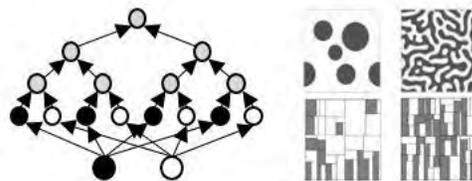
Homogenization
(Model reduction & deep material network)
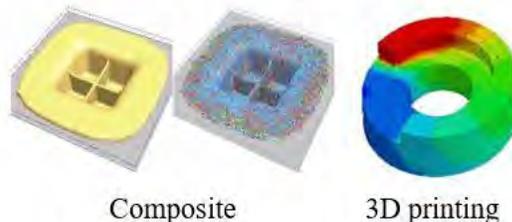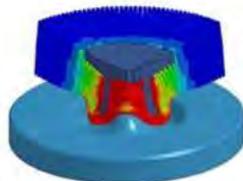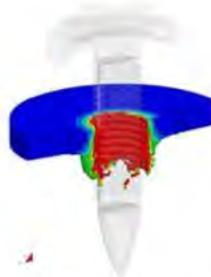
Composite   3D printing
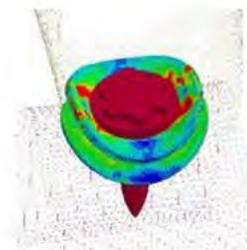
Metal cutting   Riveting   Flow drill screw: metal drilling process & tearing

Material failure analysis (SPG and particle immerse)
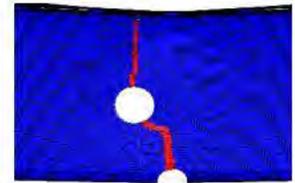
Structural Analysis:

- Virtual mechanical testing
- Manufacturing-induced structural response
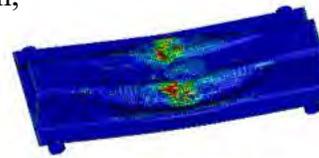- Material failure characterization

Features:
- Model building and showing by LS-Pre/Post
- Failure analysis in base materials including brittle, semi-brittle and ductile fracture
- Failure analysis in CFRP including delamination, in-plane failure and their interaction
- Failure analysis in various joints including spot weld, bolt, screw, FDS, SPR

Impact/penetration:

- High strain rate and high momentum
- Large and extreme deformation
- Material failure, separation and fragmentation
- Secondary damage induced by debris

Features:
- Galerkin particle formulation with Lagrangian kernel for convergence and stability
- Bond failure mechanism for material failure without material deletion
- Bond failure criteria calculated by phenomenological material laws
- Self-contact algorithm to deal with interaction of failed particles

Bird striking engine blades (SPH)

Metal 3-point bending (X-FEM shell)

CFRP 3-point bending (Peridynamics)

Ball impact on CFRP (Peridynamics)
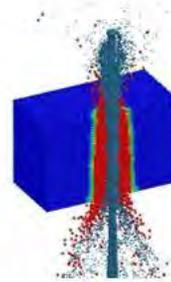
Water jet impacting concrete block (SPH-SPG)

Bird striking CFRP laminate (SPH-Peridynamics)

Computational and Multi-scale Mechanics Group (CMMG) was formed in 2003 at LSTC to offer the state-of-the-art capabilities of CAE tools in product design and engineering. Our research philosophy is to foster virtual product development validation by enabling materials scientists and manufacturers to integrate advanced technology into the conceptual design phase of their product development process.

Our research group has been working closely with academia and industry on the cutting-edge technologies to solve the challenging computational problems across different spacial scales in solid and structure analyses. Our research and development have been implemented into LS-DYNA® commercial software package and widely used in various industrial applications from material design, manufacturing to structural analysis. We are actively looking for collaboration with research institutes and industries to continuously improve and advance the methodology and application of CAE software that helps design teams in their high-level product development.

Websit: https://www.lstc-cmmg.org

Long fiber compression molding

- MAT_277 developed by DOW and Ford for resin curing process
- MAT_278 micro mechanics model for woven prepreg compression molding
- MAT_293 non-orthogonal model for compression molding developed
- MAT_249 developed by BMW for woven prepreg forming simulation
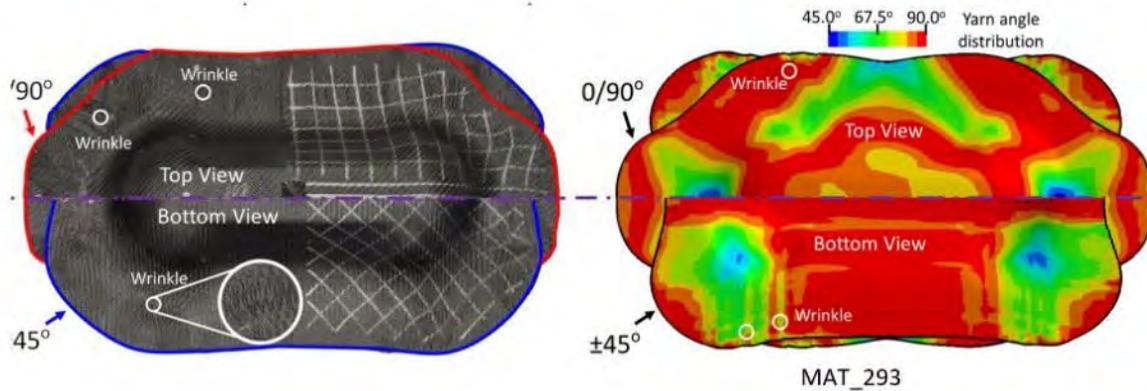
Short fiber from molding to crash

- New interface program to utilize Moldflow and MoldEx3D molding result for LS-Dyna crash analysis is recently implemented in LS-Prepost
- MAT_157 with *INITIAL_STRESS card for elasticity tensor Cij
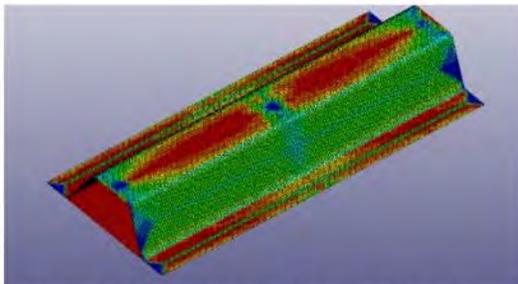
Fiber orientation result from Moldflow
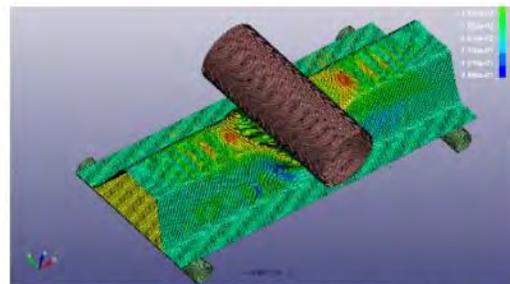
LS-Dyna 3 point bending simulation

For more information, please contact LSTC Senior software developer
John Zhao : zhao@lstc.com

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

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

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

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

Simulation Movie

[Penetration and Perforation of Moderately Thick Composites](#)

Examples are located at   www.ccm.udel.edu/software/mat162/examples /
   Example 1:   Sphere Impact on a Composite Laminate
   Example 2:   Sphere Impact on a Perfectly Clamped Composite Plate
   Example 3:   Sphere Impact on Elliptical Carbon/Epoxy Tube
High Velocity Impact of Square Plate using MAT161/162
www.youtube.com/watch?v=NgjncjfLKGw

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

Advances in Engineering Software – GSA Wall Element Development

Finite element (FE) analysis produces results, which, in most cases, gain in accuracy, as the size of the FE mesh is reduced. However, this is not necessarily the case when beam and shell element connections induce in-plane torsional effects in the shell. In such situations, shell elements either do not allow for an in-plane torsional stiffness, or, when present, the in-plane torsional stiffness is incorrectly affected by the sizes of the elements. To overcome this problem, we propose a macro- panel element that has fewer degrees of freedom, includes a new model for in-plane torsional stiffness, and produces results with sufficient accuracy to meet engineering requirements. The panel element is based on the principle of sub-structuring, i.e., the panel is meshed internally by smaller shell elements. As shown in the paper, the proposed panel element can be quite large, yet, it can give accurate analysis results. This work helps to overcome a common dilemma in practical use of finite element analysis, where finite element theory requires element sizes to be sufficiently small, but practical considerations suggest the use of large-size elements that simplify the modelling process and reduce excesses in generated results. A model built using macro-panel elements is equivalent to the model built using smaller shell elements, with the normal and shear stresses in the former being the same as the stresses in the finely meshed shell element model, We identify a number of performance benefits that become available as a consequence of modelling the shell elements at a higher level of abstraction.

Model I   Model II   Model III   Model IV

total height = 40 m;   total width = 14 m;   link length = 2 m
wall thickness = 200 mm;   material $E = 2.8 \times 10^{10}$ N/m^2 one point load = 30 kN
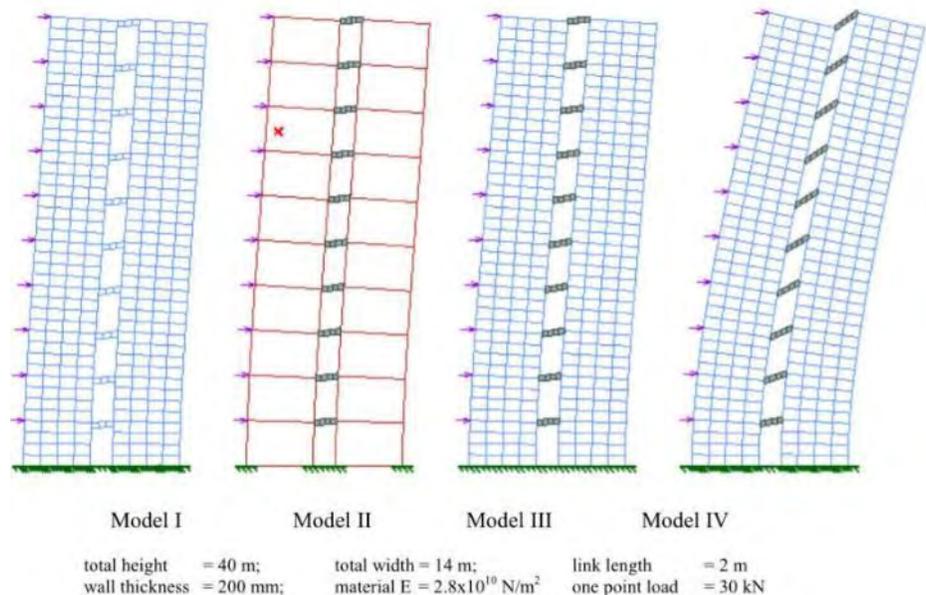
Fig. 6. The linked shear wall models with deformed shapes.

The paper written by Thomas Li (Oasys), T. Ward (Arup), and W.J. Lewis (University of Warwick) has been published on sciencedirect.com. The paper researches the topic of In-plane torsional stiffness in a macro-panel element for practical finite element modelling with the support of Oasys GSA software.

Read Full Paper

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.

15th LS-DYNA International Conference & Users Meeting

Every year, Predictive Engineering attends an LS-DYNA Conference, this year it was in Dearborn, MI and next year, it'll be in Koblenz, Germany. The technical sessions were the usual mix of sleepers with just enough talks that set off mental sparks to keep you motivated. There were three stand-out talks for me:

(i) Modeling & Simulation Challenges at the Interface between Man and Machine: Medical Devices by Dr. M. Palmer
(ii) Modeling of a Cross-Ply Thermoplastic for Thermoforming of Composite Sheets in LS-DYNA by K. White and
(iii) An Enhance Assumed Strain (EAS) Solid Element for Nonlinear Implicit Analysis by T. Borrvall.

The first paper was by Medtronic and the background gossip is that they are moving away from other commercial solvers to focus on just LS-DYNA due to its multi-physics capabilities and especially its strong nonlinear implicit performance. The second paper was a stunner and showed how thermoplastics can easily reach their glass transition temperature under moderate strain rates. In essence, whenever composites are simulated under dynamic environments, one should consider temperature effects on the resin and how it will lower its elasticity. The third paper was just plain fun mechanics and how LS-DYNA is continually expanding its capabilities in the implicit arena.

Team members also attended short courses after the Conference on Implicit Analysis, LS-Opt (optimization) and Material Failure Modeling. As usual, a big part of the Conference was the social aspects and every night there was some sort of dinner party with our colleagues from around the world. If you are interested in LS-DYNA or a current user, we would heartily recommend attending these Conferences. If you come to Koblenz, please visit our booth and get your ticket for the dinner cruise on the Mosel.

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 announces new hybrid innovations to its HPC cloud platform

Annette Dehler

New capabilities enable organizations to extend on-premise HPC to the cloud

Rescale, the HPC in the cloud company, today announced new hybrid cloud innovations to enable organizations to extend their fixed on-premise high performance computing (HPC) systems to the cloud. The majority of the HPC market is highly invested in on-premise infrastructure. However, leading organizations are benefiting from the flexibility, scalability and rapid innovation of the cloud.

Modern enterprises are looking to extend their on-premise HPC and supercomputing systems to take advantage of the immediate cost benefits and price performance the cloud offers. Rescale gives customers an easy, software-only path into high performance cloud computing environments.

Industries of all types are going through digital transformation. For many, a hybrid or public cloud strategy is the cornerstone of this disruption. "Rescale is at the forefront of cloud innovation in the HPC space," said Steve Conway, senior vice president, Hyperion Research. "Rescale provides access to multiple cloud providers to help organizations run their jobs in the best environment for them. Rescale's new hybrid capabilities provide an entry point for companies to start their cloud transformation journey."

To help organizations extend their on-premise HPC to the cloud, Rescale released the following new innovations:

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.

Shanghai Fangkun Software Technology Ltd.

Shanghai Fangkun Software Technology Ltd
Established in May 2018

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

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

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

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

- **Website**: http://www.lsdyna-china.com
- **Sales Email**: sales@lsdyna-china.com
- **Technical support** Email: support@lsdyna-china.com
- **Customer Service Number**: 400 853 3856 021-61261195
- **Address**: Room No. 3019, 3 Floor, No.126 YuDe Road,Xuhui District,Shanghai,China 200030
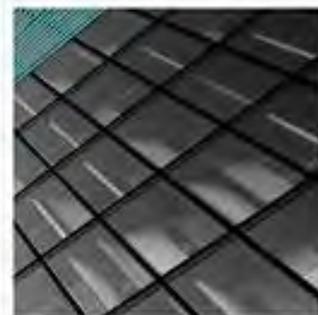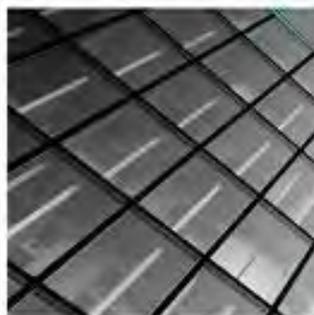
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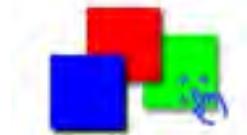
www.simware.com.tw

www.agilesim.com.tw

www.pan-i.com

www.hirisoft.com

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Yanhua@feainformation.com

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

BETA CAE Systems - ANSA

An advanced multidisciplinary CAE pre-processing tool that provides all the necessary functionality for full-model build up, from CAD data to ready-to-run solver input file, in a single integrated environment. ANSA is a full product modeler for LS-DYNA, with integrated Data Management and Process Automation. ANSA can also be directly coupled with LS-OPT of LSTC to provide an integrated solution in the field of optimization.

BETA CAE Systems µETA

Is a multi-purpose post-processor meeting diverging needs from various CAE disciplines. It owes its success to its impressive performance, innovative features and capabilities of interaction between animations, plots, videos, reports and other objects. It offers extensive support and handling of LS-DYNA 2D and 3D results, including those compressed with SCAI's FEMZIP software

Solutions for:

Process Automation - Data Management – Meshing – Durability - Crash & Safety NVH - CFD - Thermal analysis - Optimization - Powertrain

 Products made of composite materials   -   Analysis Tools   -

Maritime and Offshore Design   -   Aerospace engineering   -   Biomechanics

DatapointLabs

Testing over 1000 materials per year for a wide range of physical properties, DatapointLabs is a center of excellence providing global support to industries engaged in new product development and R&D.

The compary meets the material property needs of CAE/FEA analysts, with a specialized product line, TestPaks®, which allow CAE analysts to easily order material testing for the calibration of over 100 different material models.

DatapointLabs maintains a world-class testing facility with expertise in physical properties of plastics, rubber, food, ceramics, and metals.

Core competencies include mechanical, thermal and flow properties of materials with a focus on precision properties for use in product development and R&D.

Engineering Design Data including material model calibrations for CAE Research Support Services, your personal expert testing laboratory Lab Facilities gives you a glimpse of our extensive test facilities Test Catalog gets you instant quotes for over 200 physical properties.

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

etainfo@eta.com

Inventium Suite™

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

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

PreSys

Inventium's core FE modeling toolset. It is the successor to ETA's VPG/PrePost and FEMB products. PreSys offers an easy to use interface, with drop-down menus and toolbars, increased graphics speed and detailed graphics capabilities. These types of capabilities are combined with powerful, robust and accurate modeling functions.

VPG

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

DYNAFORM

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

ESI Group   www.esi-group.com

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

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

and fine-tuning the model and simulation before submitting it to the solver, thus saving time and resources.

Several high productivity tools such as advanced dummy positioning, seat morphing, belt fitting and airbag folder are provided in **Visual-Safe,** a dedicated application to safety utilities.

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

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

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

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

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

Visual*DSS* is a framework for Simulation Data and Process Management which connects with Visual-Environment and supports product

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

JSOL Corporation

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

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)

www.oasys-software.com/dyna

- 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.

Engineering Solutions   Shanghai Hengstar Tech.

Shanghai Hengstar

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

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

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

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

Consulting

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

Lenovo

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

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

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

Cloud - HPC Services - Subscription   *JSOL*

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

**Cloud computing services
for
JSOL Corporation LS-DYNA users in Japan**

**JSOL Corporation is cooperating with chosen
cloud computing services**

JSOL Corporation, a Japanese LS-DYNA distributor for Japanese LS-DYNA customers.

LS-DYNA customers in industries / academia / consultancies are facing increased needs for additional LS-DYNA cores

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

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

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

The following services are available (only in Japanese). HPC OnLine:

NEC Solution Innovators, Ltd.   -   http://jpn.nec.com/manufacture/machinery/hpc_online/

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

Platform Computation Cloud -   CreDist.Inc.

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

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

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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

Aerospace Monthly Showcase

- NASA's remotely-piloted Ikhana aircraft, based at the agency's Armstrong Flight Research Center, is flown in preparation for its first mission in public airspace without a safety chase aircraft.

Credits: NASA/Carla Thomas

NASA Flies Large Unmanned Aircraft in Public Airspace Without Chase Plane for First Time

NASA's remotely-piloted Ikhana aircraft, based at the agency's Armstrong Flight Research Center in Edwards, California, successfully flew its first mission in the National Airspace System without a safety chase aircraft on Tuesday. This historic flight moves the United States one step closer to normalizing unmanned aircraft operations in the airspace used by commercial and private pilots.

Flying these large remotely-piloted aircraft over the United States opens the doors to all types of services, from monitoring and fighting forest fires, to providing new emergency search and rescue operations. The technology in this aircraft could, at some point, be scaled down for use in other general aviation aircraft.

"This is a huge milestone for our Unmanned Aircraft Systems Integration in the National Airspace System project team," said Ed Waggoner, NASA's Integrated Aviation Systems Program director. "We worked closely with our Federal Aviation Administration colleagues for several months to ensure we met all their requirements to make this initial flight happen."
Flights of large craft like Ikhana, have traditionally required a safety chase aircraft to follow the unmanned aircraft as it travels through the same airspace used by commercial aircraft. The Ikhana flew in accordance with the Federal Aviation Administration's (FAA) Technical Standard Order 211 -- Detect and Avoid Systems -- and Technical Standard Order 212 -- Air-to-Air Radar for Traffic Surveillance.

The FAA granted NASA special permission to conduct this flight under the authority of a Certificate of Waiver or Authorization on March 30. The certificate permitted Ikhana's pilot to rely on the latest Detect and Avoid technology, enabling the remote pilot on the ground to see and avoid other aircraft during the flight.

NASA successfully worked with its industry partners to develop a standard for Detect and Avoid technologies, complied with the requirements of the FAA Technical Standard Orders, and garnered flight approval from the FAA.

Aerospace Monthly Showcase

The Ikhana aircraft was equipped with detect and avoid technologies, including an airborne radar developed by General Atomics Aeronautical Systems, Inc., a Honeywell Traffic Alert and Collision Avoidance System, a Detect and Avoid Fusion Tracker, and an Automatic Dependent Surveillance-Broadcast capability – a surveillance technology where the aircraft determines its position via satellite navigation and periodically broadcasts this information so other aircraft can track it.

The flight took off from Edwards Air Force Base in California and entered controlled air space almost immediately. Ikhana flew into the Class-A airspace, where commercial airliners fly, just west of Edwards at an altitude of about 20,000 feet. The aircraft then turned north toward Fresno, requiring air traffic control to be transferred from the Los Angeles Air Route Traffic Control Center to the Oakland Air Route Traffic Control Center. On the return trip, the pilot headed south toward Victorville, California, requiring communication control to be transferred back to Los Angeles.

During the return flight, the pilot began a gentle descent over the city of Tehachapi, California, into Class E airspace -- about 10,000 feet -- where general aviation pilots fly. The pilot initiated an approach into Victorville airport at 5,000 feet, coordinating in real time with air traffic controllers at the airport. After successfully executing all of these milestones, the aircraft exited the public airspace and returned to its base at Armstrong.

"We are flying with a suite of sophisticated technology that greatly enhances the safety capabilities of pilots flying large unmanned aircraft in the National Airspace System," said Scott Howe, Armstrong test pilot. "We took the time to mitigate the risks and to ensure that we, as a program, were prepared for this flight."

Tuesday's flight was the first remotely-piloted aircraft to use airborne detect and avoid technology to meet the intent of the FA

A's "see and avoid" rules, with all test objectives successfully accomplished.
For more information on NASA's Unmanned Aircraft Systems Integration in the National Airspace System project, visit: https://go.nasa.gov/2sx9VCn

Distribution, Consulting

Canada   **Metal Forming Analysis Corp MFAC**   galb@mfac.com
www.mfac.com

LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
LSTC Dummy Models	LSTC Barrier Models	eta/VPG	
eta/DYNAFORM	INVENTIUM/PreSys		

Mexico   **COMPLX**   Armando Toledo
www.complx.com.mx /   armando.toledo@complx.com.mx
LS-DYNA LS-OPT   LS-PrePost
LS-TAsc Barrier/Dummy Models

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

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

United States   **Livermore Software Technology Corp**   sales@lstc.com
LSTC   www.lstc.com

| LS-DYNA | LS-OPT | LS-PrePost | LS-TaSC |
| LSTC Dummy Models | LSTC Barrier Models | TOYOTA THUMS | |

United States   **ESI Group N.A**   **info@esi-group.com**
www.esi-group.com
PAM-STAMP

QuikCAST	SYSWELD	PAM-COMPOSITES	CEM One
VA One	CFD-ACE+	ProCAST	
	Weld Planner	Visual-Environment	IC.IDO

United States   **Engineering Technology Associates – ETA**   etainfo@eta.com
www.eta.com

| INVENTIUM/PreSy | NISA | VPG | LS-DYNA |
| LS-OPT | DYNAform | | |

Distribution, Consulting

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-OPT	Primer	DYNAFORM
	LS-PrePost			
	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	

Distribution, Consulting

The Netherlands **Infinite Simulation Systems B.V**   j.mathijssen@infinite.nl

www.infinite.nl

ANSYS Products	CivilFem	CFX	Fluent
LS-DYNA	LS-PrePost	LS-OPT	LS-TaSC

Russia **Limited Liability DynaRu** office@lsdyna.ru

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

Spain **DYNAmore France SAS** sales@dynamore.eu

www.dynamore.eu

LS-DYNA, LS-OPT	LS-PrePost	Primer	DYNAFORM
DSDM Products		LSTC Dummy Models	FEMZIP
LSTC Barrier Models		DIGIMAT	

Sweden **DYNAmore Nordic** marcus.redhe@dynamore.se

www.dynamore.se Oasys Suite

ANSA	μETA	LS-DYNA	LS-OPT
LS-PrePost	LS-TaSC	FastFORM	DYNAform
FormingSuite		LSTC Dummy Models	
		LSTC Barrier Models	

Switzerland **DYNAmoreSwiss GmbH** info@dynamore.ch

www.dynamore.ch

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

Distribution, Consulting

UK   **ARUP**   dyna.sales@ arup.com

www.oasys-software.com/dyna   TOYOTA THUMS

LS-DYNA		LS-OPT	LS-PrePost
LS-TaSC		PRIMER	D3PLOT
REPORTER	SHELL	FEMZIP	HYCRASH
DIGIMAT	Simpleware	LSTC Dummy Models	
		LSTC Barrier Models	

China   **Shanghai Fangkun Software Technology Ltd.**

www.lsdyna-china.com

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

India   **Oasys Ltd. India**   lavendra.singh@arup.com

www.oasys-software.com/dyna

PRIMER	D3PLOT	T/HIS	
	LS-OPT	LSTC Dummy Models	LS-PrePost
	LS-DYNA	LSTC Barrier Models	LS-TaSC

India   **CADFEM India**   info@cadfem.in

www.cadfem.in

ANSYS	VPS	optiSLang
LS-DYNA	LS-OPT	LS-PrePost

India   **Kaizenat Technologies Pvt. Ltd**   support@kaizenat.com

http://kaizenat.com /

LS-DYNA	LS-OPT	LSTC Dummy Models	LS-PrePost
Complete LS-DYNA suite of products		LSTC Barrier Models	LS-TaSC

Distribution, Consulting

Japan	CTC		LS-dyna@ctc-g.co.jp	
	www.engineering-eye.com			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	CmWAVE	

Japan	JSOL			
	www.jsol.co.jp/english/cae		Oasys Suite	
	JSTAMP	HYCRASH	JMAG	
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	TOYOTA THUMS	

Japan	FUJITSU			
	http://www.fujitsu.com/jp/solutions/business-technology/tc/sol/			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	CLOUD Services	
	Inventium PreSys	ETA/DYNAFORM	Digimat	

Japan	LANCEMORE		info@lancemore.jp	
	www.lancemore.jp/index_en.html			
	Consulting			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models		

Japan	Terrabyte		English:	
	www.terrabyte.co.jp		www.terrabyte.co.jp/english/index.htm	
	Consulting			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	AnyBody	

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
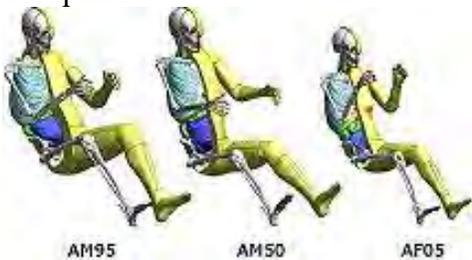
and as standing model to represent pedestrians.
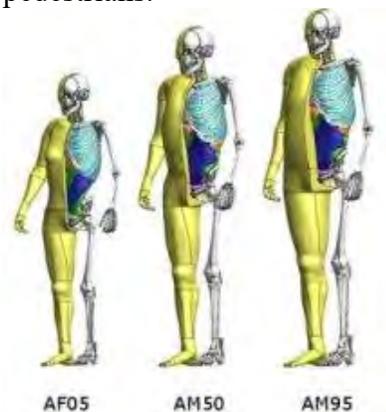
The internal organs were modeled based on high resolution CT-scans.

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

e-mail to: atds@lstc.com.

Training - Webinars - Events - Conferences

Participant's Training Classes

Webinars

Info Days

Class Directory

Directory

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

Training - Dynamore

Author: Christian Frech christian.frech@dynamore.de

Seminar brochure 2018

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

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

Selection of trainings from September to October

Introduction

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

Crash/Short-Term Dynamics

Contact Definitions in LS-DYNA	21 September

Passive Safety

Introduction to Passive Safety	27 September

Metal Forming

Introduction to Welding Simulation	18 October (BA)

Material

Advanced Damage Modeling: Orthotropic Materials	18 October (BA)
Concrete and Geomaterial Modeling	29-30 October

Implicit Capabilities

Implicit Analysis using LS-DYNA	24-25 September
NVH, Frequency Domain, Fatigue	18 October (BA)

Particle Methods

Smoothed Particle Hydrodynamics	13-14 September
Meshfree EFG, SPG, Advanced FE	18 October (BA)

Multiphysics/Biomechanics

Electromagnetism in LS-DYNA	18 October (BA)

High energy events

Methods for Simulating Short Duration Events	18 October (BA)

Information days (free of charge)

Infoday LS-DYNA/Implicit	17 September
Infoday Optimization	24 September
Simulation of Plastics	26 September
Fatigue, Acoustics, NVH	24 October

If not otherwise stated, the event location is Stuttgart, Germany. Other event locations are:
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.

Training - LSTC

www.lstc.com

August

Date	Location	Coures Title	Instructor(s)
Aug 20 - Aug 22	CA	ALE/Eulerian & Fluid/Structure Interaction in LS-DYNA	M. Souli
Aug 23 - Aug 24	CA	Smoothed Particle Hydrodynamics (SPH) in LS-DYNA	M. Souli
Aug 27	CA	Introduction to LS-PrePost	P. Ho, Q. Yan
Aug 28 -Aug 31	CA	Introduction to LS-DYNA	A. Nair
Aug 20	*MI*	Introduction to LS-PrePost	P. Ho, Q. Yan
Aug 21 -Aug 24	*MI*	Introduction to LS-DYNA	H. Devaraj

September

Date	Location	Coures Title	Instructor(s)
Sep 10 - Sep 14	CA	Crashworthiness (This class is 4 days of instruction; 5th day is an optional workshop.)	P. Du Bois, S. Bala
Sep 11 - Sep 12	*MI*	Airbag Folding	R. Chivakula
Sep 13 - Sep 14	*MI*	Airbag Modeling in LS-DYNA	A. Nair
Sep 26 - Sep 28	*MI*	Advance ALE & S-ALE Applications	I. Do

October

Date	Location	Coures Title	Instructor(s)
Oct 1	*MI*	Contact in LS-DYNA	S. Bala
Oct 9 – Oct 12	*MI*	Optimization and Probabilistic Design Analysis Using LS-OPT	A. Basudhar
Oct 22	*MI*	Introduction to LS-PrePost	P. Ho, Q. Yan
Oct 23 – Oct 26	*MI*	Introduction to LS-DYNA	A. Nair

Social Media

FACEBOOK

BETA CAE Systems   CADFEM
ESI Group   Lenovo

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

1-13. Development of a One-Step Preforming Analysis for Woven Carbon Fiber Composites
[a]Danielle Zeng, [b]Xinhai Zhu, [b] Li Zhang, [a]Jeff Dahl

[a]*Ford Motor Company, Dearborn, MI, USA*

[b]*Livermore Software Technology Corporation, Livermore, CA, USA*   *Read Full Paper*

1-1. A Customized Job Manager for Metal Forming Simulations Y. Xiao, X. Zhu, L. Zhang, H. Fan	**1-2. Conversion between FLD and Stress Triaxial Limit Curve** X. Zhu, L. Zhang, Y. Xiao
1-3. Best Fit GUI for Metal Forming in LS-PrePost® 4.5 Q. Yan, X. Zhu, P. Ho, L. Zhang, Y. Xiao	**1-4. Improvement of Sandwich Structure Part Adaptivity in LS-DYNA** X. Zhu, H. Fan, L. Zhang and Y. Xiao
1-5. Defining Hardening Curve in LS-DYNA® X. Zhu, L. Zhang, Y. Xiao	**1-6. Lancing features in LS-DYNA** Q. Yan, L. Zhang, Y. Xiao, X. Zhu, P. Ho
1-7. Improvements to One-Step Simulation in LS-DYNA, X. Zhu, H. Fan, L. Zhang, Y. Xiao	**1-8. Recent improvements in LS-DYNA® hot stamping simulations** J. Zheng, X. Zhu and H. Fan
1-9. Improve time step size sensitivity in transient mechanical simulations J. Zheng and X. Zhu	**1-10. Introducing *BOUNDARY_SPC_SYMMETRY_PLANE (SET)** X. Zhu, Li Zhang, and Y. Xiao
1-11. On Mesh Fusion Scheme in LS-DYNA® N. Ma, Osaka Univ - H. Fan & X. Zhu, LSTC	**1-12. A One Step Simulation Approach Using Isogeometric Shells in LS-DYNA** L. Li, X. Zhu

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

> **2-15. Development of New Simulation Technology for Compression Molding of Long Fiber Reinforced Plastics using LS-DYNA®**
> Shinya Hayashi[1], Hao Chen[2], Wei Hu[2]
> *1.JSOL Corporation, Japan*
> *2. Livermore Software Technology Corporation*   *Read Full Paper*
>
> **2-16. Smoothed Particle Galerkin Method with a Momentum-Consistent Smoothing Algorithm for Coupled Thermal-Structural Analysis**
> X. Pan, C.T. *Wu*, W. Hu, Y.C. Wu
> *Livermore Software Technology Corporation*   *Read Full Paper*

Among the Previous Months Postings on New Features Table 2

2-1. Discussion on acoustic databases in LS-DYNA

2-2. Modeling of Ductile Failure in Destructive Manufacturing Process Using the Smoothed Particle Galerkin Method

2-3. A non-orthogonal material model of woven composites in the preforming process

2-4 - LSTC WinSuite – a complete solution for the Windows platform

2-5. Modeling and Numerical Simulation of Afterburning of Thermobaric Explosives In a Closed Chamber

2-6. Thick Shell Element Form 5 in LS-DYNA

2-7. New Inflator Models in LS-DYNA®

2-8. New features of 3D adaptivity in LS-DYNA

2-9. Thermal Coupling Method Between SPH Particles and Solid Elements in LS-DYNA

2-10. LS-DYNA Smooth Particle Galerkin (SPG) Method

2-11. Recent updates in fatigue analysis with LS-DYNA

2-12. LS-DYNA's Linear Solver Development — Phase 1: Element Validation

2-13. Scalability study of particle method with dynamic load balancing in LS-DYNA®
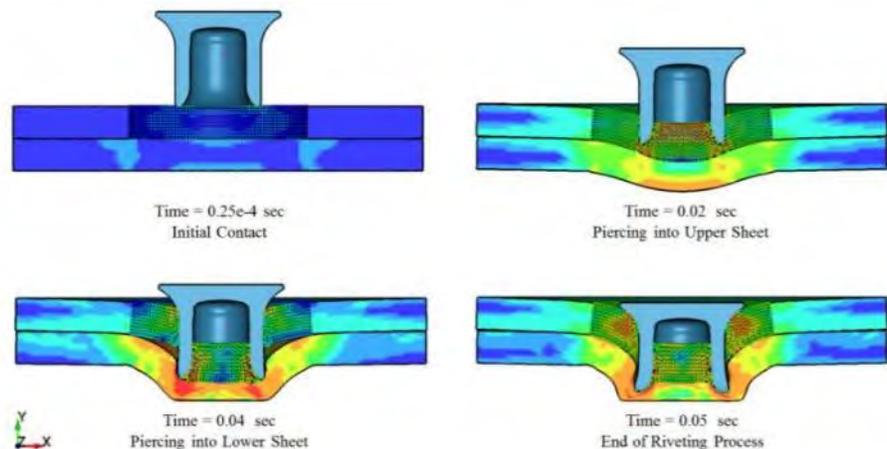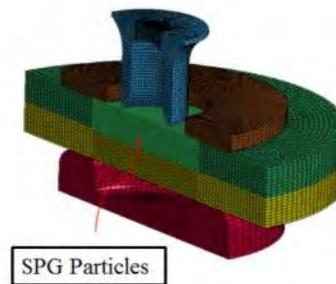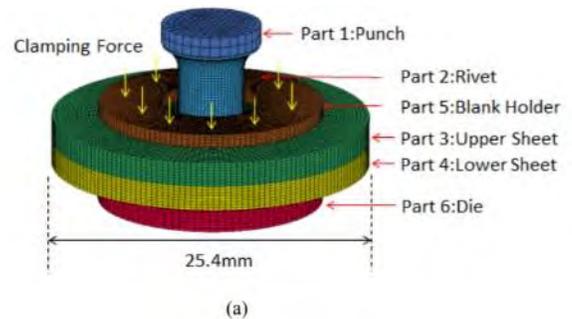
2-14. LS-DYNA Linear Solver Development

Simulation of Self-Piercing Rivet Insertion
Using Smoothed Particle Galerkin Method

The Paper from Materials and Process Research, Ford Motor Research and Engineering Center, Nanjing, Jiangsu, China, Research and Advanced Engineering Center, Ford Motor Company, Dearborn, USA and LSTC

Abstract: Self-piercing rivets (SPR) are efficient and economical joining elements for lightweight automotive body structures. In this paper, a meshfree Smoothed Particle Galerkin (SPG) method was applied to the simulation of the SPR insertion process. Two layers of aluminum alloy 6111-T4 were joined using a full three-dimensional (3D) model with LS-DYNA®/explicit. The severely deformed upper sheet was modeled using the SPG method with activated bond failure, while the rest of the model was modeled using the traditional finite element approach. An extensive sensitivity study was conducted to evaluate the proposed approach, including bond failure criteria, kernel update frequency, kernel support size, mesh refinement, etc. The numerical results were compared to experimental data to demonstrate the robustness and effectiveness of the pre sent method.

Keywords: Smoothed Particle Galerkin (SPG); self-piercing rivet (SPR); Meshfree

- Introduction
- Experiments and Material Properties
- Numerical Modeling
- Result and Discussion
- Summary

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