FEA Information http://www.feainformation.com
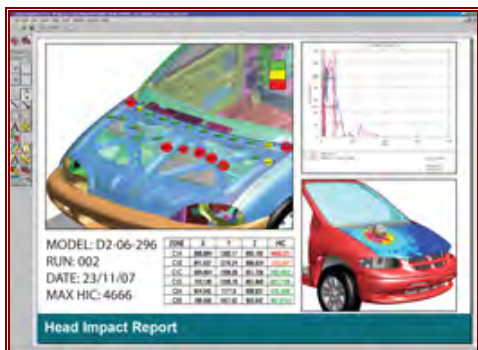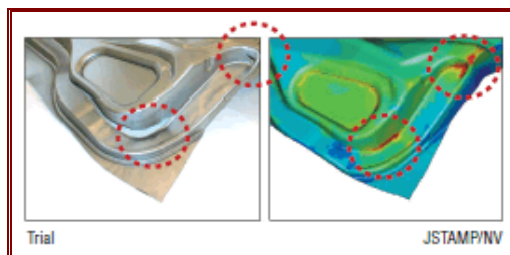
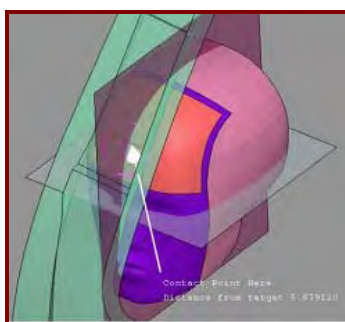# Engineering Journal and Website Resource

OASYS – Reporter

JSOL – JSTAMP/NV

K&C - Experimental Munitions
Test Facility

LSTC – LS-DYNA®, LS-PrePost®
LS-OPT®, Dummy/Barrier Models

$\beta^{™}$ BETA
CAE Systems SA
Pre-processing tools

2010 Global CAE Technical Innovation
TMM Awards
Laurent Chappuis, Jizhou Chen and
Danielle Zeng (front row, l-r)

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FEA Information will be hosting the Grand Reception at the LS-DYNA Users Conference – For those attending please join us Sunday Evening.

Dr. John O. Hallquist developed, and continues development on LS-DYNA, with his team of engineers, mathematicians, and computer scientists at LSTC. LSTC was founded in 1987 to commercialize the public domain code, that he developed at LLNL. Then, today and into the future LSTC's product LS-DYNA continues to raise the bar of development, with one code methodology and new features.

11th International
LS-DYNA® Users Conference 2010

June 6-8, 2010
Dearborn, Michigan, USA

LSTC
Livermore Software
Technology Corp.

The pages you've been waiting for are published this month.

The 11th LS-DYNA Users Conference Sessions – Times – Papers – Exhibitors and their booth numbers – Sponsors – and times for the Grand Reception and Grand Banquet.

On June 6th – 8th engineers, software companies, hardware companies, consultants, students, professors, distributors, and many others will attend the most important and technically excellent Users Conference Worldwide – The 11th International LS-DYNA® Users Conference.

FEA Information is sponsoring the Grand Reception please say hello.

Sincerely,   Marsha J. Victory,
President,   FEA Information Inc

From engineering to horses - my miniature team:

Dusty & Quincy-hua
(Quincy-hua: multitasking running & eating)
http://www.livermorehorses.com

OASYS Ltd: http://www.oasys-software.com/dyna/en/	**JSOL Corporation**: http://www.jsol.co.jp/english/cae	**HP**: http://www.hp.com/
ETA: http://www.eta.com	**INTEL**: http://www.intel.com	**ESI Group**: http://www.esi-group.com
BETA CAE Systems S.A.: http://www.beta-cae.com	**LSTC:** http://www.lstc.com	**SGI:** http://www.sgi.com
MICROSOFT http://www.microsoft.com	**Voltaire:** http://www.voltaire.com	

April & May Featured: CHINA —Participants

Dalian Fukun Distribution/Training/Support	**ETA China** Distribution/Training/Support	**ARUP — China** Distribution/Training/Support
		Hengstar Tech. Co. Ltd. Training — Support

Booth 103 at the 11th International LS-DYNA Users Conference

FEA Information Inc. was founded April, 2000 publishing its first edition of the FEA Information Engineering Journal October, 2000. Since then, the Journal has been published monthly and distributed worldwide to over 6,000 readers.

FEA Information Inc. is an on line resource/magazine specifically geared for the engineering community.

Participants are the leaders in their fields and dedicated to the latest technology, resources, innovations and solutions.

In today's world the key is technical excellence. This combined with robust software, and hardware solutions, brings effective cost-saving time to market products.

Our concentration is on:

- Software
- Hardware
- Engineering Services
- Consulting Firms
- Pre-Post Software
- Optimization Software
- Engineering Applications
- Dummy & Barrier Models

Our websites are designed to showcase technical information and easy navigation to the material. We've opted for simple designs, without additional software to download - all sites are static. On a few pages we use in-line frames to carry information over multiple sites.

Committed to being a leading global provider of technical information, we accomplish this through our knowledge of the engineering application fields, and industry leaders publishing accurate and up to date information on their products and solutions.

If you have any questions or input for our company please feel free to contact Anthony: agiac99@feainformation.com

Conference Papers

DYNALOOK
Courtesy of
LSTC & DYNAmore

The site presents papers from European and International LS-DYNA User Conferences and papers provided by other users. The papers are accessible via search functionality.
http://www.dynalook.com

...

Future postings from the 11th International LS-DYNA Conference will be published on DYNAlook.

CD's of the conference papers will be available for mailing in July:

Contact vic@lstc.com no fee for mailing or for the CD.

2010 Global CAE

Technical Innovation TMM Awards

Laurent Chappuis, Jizhou Chen and Danielle Zeng (front row, l-r)
2010 Global CAE Technical Innovation TMM Awards
  Copyright 2010 Ford Motor Company

The Full news can be viewed at:
http://www.at.ford.com/news/cn/Pages/2010GlobalCAETechnicalInnovationTMMAwards.aspx

DEARBORN -- Ford employees Laurent Chappuis, Jizhou Chen and Danielle Zeng (front row, l-r) won the Executive Award, the top honor at the 2010 Global CAE (Computer-Aided Engineering) Technical Innovation TMM (Technical Maturity Model) Awards held May 12 in Dearborn with global participation from Merkenich, Dunton, South America and Mexico. In addition, the trio's work on the springback of high strength steels also captured the Engineer Choice Award as voted by Ford CAE peers around the world.

Recognizing all of the teams' contributions to One Ford, Nand Kochhar, executive technical leader of Global CAE expanded on the importance and value of CAE now and into the future. Kochhar challenged the teams to look into the future of emerging technologies and develop new capabilities.

Paul Mascarenas, Vice President of Engineering for Global Product Development, delivered the keynote address from Mexico, where he participated in events related to production of the new North American Ford Fiesta at the Cuautitlan Stamping and Assembly Plant.   Mascarenas thanked CAE employees for their excellent work and pointed out specific features and technologies on the new Fiesta that were made possible by their contributions.

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The following is an announcement release, by LSTC, in regard to the above article:

LSTC would like to take this opportunity to recognize the outstanding performance of Xinhai Zhu, LSTC Senior Engineer and Technical Support for Metal Stamping, who offered exceptional support to the Stamping CAE TEam at Ford.

Thomas J.R. Hughes

Institute for Computational Engineering and Sciences (ICES)

Department of Aerospace Engineering and Engineering Mechanics

University of Texas at Austin
hughes@ices.utexas.edu

Thomas J.R. Hughes holds B.E. and M.E. degrees in Mechanical Engineering from Pratt Institute and an M.S. in Mathematics and Ph.D. in Engineering Science from the University of California at Berkeley. He taught at Berkeley, Caltech and Stanford before joining the University of Texas at Austin. At Stanford he served as Chairman of the Division of Applied Mechanics, Chairman of the Department of Mechanical Engineering, Chairman of the Division of Mechanics and Computation, and occupied the Mary and Gordon Crary Family Chair of Engineering. At the University of Texas at Austin he is Professor of Aerospace Engineering and Engineering Mechanics and occupies the Computational and Applied Mathematics Chair III.

Dr. Hughes is a fellow of the American Academy of Mechanics (AAM), the American Institute of Aeronautics and Astronautics (AIAA), the American Society of Civil Engineers (ASCE), the American Society of Mechanical Engineers (ASME), the U.S. Association for Computational Mechanics (USACM), the International Association for Computational Mechanics (IACM), the Society of Industrial and Applied Mathematics (SIAM), and the American Association for the Advancement of Science (AAAS). He is co-editor of the international journal Computer Methods in Applied Mechanics and Engineering, a founder and past President of USACM and IACM, past Chairman of the Applied Mechanics Division of ASME, and Chairman of the U.S. National Committee on Theoretical and Applied Mechanics (USNC/TAM).

He has been awarded the Walter L. Huber Civil Engineering Research Prize and the von Karman Medal from ASCE, the Melville, Worcester Reed Warner, and Timoshenko Medals from ASME, the Computational Mechanics Award from the Japan Society of Mechanical Engineers, the von Neumann Medal from USACM, the Gauss-Newton Medal from IACM, the Grand Prize from the Japan Society of Computational Engineering and Science (JSCES), and the Humboldt Research Award for Senior Scientists from the Alexander von Humboldt Foundation.

He has received honorary doctorates from the Universite Catholique de Louvain, the University of Pavia, the University of Padua, and the Norwegian University of Science and Technology

(Trondheim). He held the Cattedra Galileiana (Galileo Galilei Chair), Scuola Normale Superiore, Pisa, in 1999, and the Eshbach Professorship, Northwestern University, in 2000.

Dr. Hughes is a member of the U.S. National Academy of Sciences, the U.S. National Academy of Engineering, the American Academy of Arts and Sciences, the Istituto Lombardo Accademia di Scienze e Lettere (Mathematics Section), and the Academy of Medicine, Engineering and Science of Texas.

The Special Achievement Award for Young Investigators in Applied Mechanics is an award given annually by the Applied Mechanics Division of ASME. In 2008 this award was renamed the Thomas J.R. Hughes Young Investigator Award.

Dr. Hughes has been a leading figure in the development of Computational Mechanics and is one of the most widely cited authors in the field. His research has included many pioneering studies of basic theory as well as diverse applications to practical problems. In a series of seminal contributions on contact and impact, plates and shells, structural dynamics, incompressible materials response, and large-deformation constitutive equations, he developed fundamental computational solid mechanics methodology that became an integral component of nonlinear structural analysis computer programs. He was also the first to solve a basic problem in computational fluid dynamics with the development of SUPG, demonstrating that higher-order accuracy and stability could be simultaneously achieved by the same method. The original paper (CMAME, v. 32, pp. 199-259, 1982) is the most cited in the history of the Finite Element Method. SUPG has been applied to numerous problems in engineering and initiated a new area of research, referred to as Stabilized Methods. His most recent work includes the development of patient-specific simulation technologies for cardiovascular disease, variational multiscale methods for complex fluid flows and turbulence, and Isogeometric Analysis: geometrically exact methods in computational mechanics that hold promise to unify computer aided design and engineering analysis methodologies.

Dr. Hughes was identified by ISI as among the 15 most highly cited authors in Scientific Computing and the original 100 most highly cited authors in Engineering (all fields). Citation data can be found in ISI Web of Science, Google Scholar, and Publish or Perish under "Hughes TJR". According to Publish or Perish (December 27, 2009), Dr. Hughes's total number of citations is 31,799 and his h-index is 77 (but who's counting?).

Booth 103 for information - 11th Int'l LS-DYNA Users Conference

Hello LS-DYNA® DUMMY Users Worldwide:

I'd like to make sure that you're aware of the Post-Conference "Occupant Safety Class".

This two-day course will held on June 9th & 10th (Wednesday and Thursday), immediately following the LSTC International Conference at Dearborn (June 6th - 8th).

I'd like to take this opportunity to introduce the course and invite you to attend if you're in the area June 9th & 10th - if you'd like information, about a future offering, contact Marsha Victory: vic@lstc.com

I will be the instructor on Day 1 and start the course with information on the Basic Learning Aid Model that we have distributed worldwide.

1) Day-1 (June 9, Wednesday)

On Day 1, I will discuss:

a) The intricacies of the Seat-Belt Model (Slip-Ring, Retractor, Single-Line or Segment Belts and Fabric Belts). Much of it is already there well-described in the Belt Model itself but a front-to-front discussion with further notes and pictures will certainly clarify things and reinforce them in the minds of the attendees.

b) The intricacies of the Vehicle Model (Pitch, Drop, Yaw Motion of the Vehicle, Application of Pulse and One-Way Contact). Again, much of it is already described in the files but a detailed discussion in person and some interaction in a class room helps people understand the same subject better.

c) How to Quickly Modify Existing Models and turn them into a new one.

Learning Aid Models:

Using the Learning Aid Models as the base, I will discuss the following:

(i) A Simple Belt Modification Method

(ii) Belt Modification Procedure due to Translation and Pelvic Rotations of the Dummy

(iii) Belt Modification if a "Fresh Routing" of the Belt becomes absolutely necessary

(iv) Modifying Belt Attachment Points to the Vehicle (D-ring, Buckle, Retractor and Anchors)

(v) Reflecting the Belts and Vehicle Model to convert from a Driver Side to a Passenger Side Model

(vi) Modifying the Existing Model to Represent a Totally Different Model

What sets this course above others is all attendees will take home the Course Notes, which are over 70-pages. In most cases there will be detailed step-by-step instructions with pictures. This will make it easier for attendees, of the course, to have a referral to review, at a later date. For those attending the course, I am always available by e-mail for questions.

This course is being offered for the first time. I have done an enormous amount of work to prepare these notes, trying to make it "totally practical" from a day-to-day work related standpoint. My great hope is that anyone attending this course and having a copy of the document will greatly benefit from it.

Day-2 (June 10, Thursday)

Morning Session

External Speaker from the Automotive Industry

We have invited an Automotive Safety Expert for this portion. He will speak on the following:

(i) Occupant Injury Metrics

(ii) Review of Regulations and Safety Ratings

(iii) Numerical Data Processing

The above subjects will be discussed in great detail. The most important portions of FMVSS 208, CMVSS 208, ECE94, IIHS and NCAP Ratings will be covered.

It will include FMVSS 208, 214, 301, 201, 216, US Public Domain Safety Ratings (with both IIHS Side, NCAP Frontal and IIHS Frontal Offset Deformable Barrier), European Regulatory (ECE94) and European Public Domain Safety Ratings (Euro-NCAP).

All of the above will be neatly and methodically included in the Class Notes (over 60-pages for this section).

It is true that much of the Material being presented is Public Domain and can be found on the Web. However, to find everything being offered in a neatly laid out form is not possible. One would have to spend many hours locating, understanding and then documenting this material in an organized fashion for future reference.

I anticipate that this session will be the HIGHLIGHT of the two day course.

I think that it is imperative for everyone working in Automotive Safety to know the contents of this portion of the class.

Day-2 (June 10, Thursday)

Afternoon Session

Two Speakers from LSTC

Day two will be "overview" types of presentations, with certain usages discussed.

Dilip Bhalsod of the LSTC Troy Office will be speaking on the different Barrier Models that he and others have developed, many of which are distributed to the world via the LSTC Website.

Christoph Maurath of the Livermore Office will be discussing many of the Dummy Models he and others have been working on. Among his discussion and presentation he will focus on the Side Impact Models.

Remaining Time:

If there is any remaining time, I will discuss a few other things that will be in the Class Notes, but which I did not find time to discuss the previous day.

That will close-out the session.

I personally have high expectations for this Two-Day Course. Anyone unfamiliar with this material, should seriously consider attending this course, or a future one.

If you wish to register for it, please contact vic@lstc.com

Thanks very much,

Sarba Guha

LSTC, Troy Office, Michigan, USA

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Models Available From LSTC:

The following models are available:

- Hybrid III Adults (Rigid-FE)
- Hybrid III 50th percentile
- EuroSID 2 and EuroSID 2re
- SID-IIs Revision D

- USSID
- Free Motion Headform
- Pedestrian Legform Impactors

All available models can be obtained through LSTC's ftp site or through your LS-DYNA distributer.

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
- IIHS MDB modeled with shell elements
- IIHS MDB modeled with solid elements
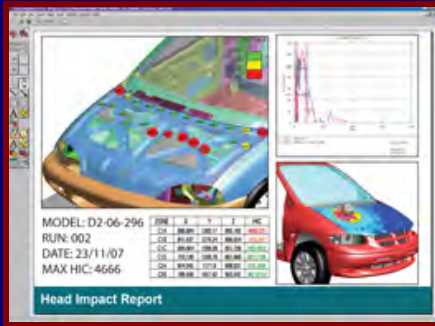
**Oasys
REPORTER**

**Fast and convenient post-processing
Of
LS-DYNA results**

MODEL: D2-06-296
RUN: 002
DATE: 23/11/07
MAX HIC: 4666

Head Impact Report

Booth #101 - 11th International LS-DYNA Users Conference

http://www.oasys-software.com/dyna/en/software/reporter.shtml

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

We have been working with Livermore Software Technology Corporation (LSTC), the developers of LS-DYNA, for over twenty years and have an in-depth knowledge of this powerful analysis tool. During this period we have also been involved in developing some of the features within LS-DYNA such as seatbelt system modeling, staged construction, and various material models

Oasys REPORTER

Oasys REPORTER is a program that enables fast and convenient post-processing of LS-DYNA results through the use of templates and scripts.

The user creates a report template using Oasys REPORTER, this template forms the basic structure of the report, and defines areas on the pages that are intended for text, pictures or graphs.

These are then linked to scripts either user-defined or from the built-in library that will generate the actual content .
When generating a report from a completed template Oasys REPORTER will execute each of the scripts, automatically opening D3PLOT and T/HIS to produce the required images, and place them at the defined position in the report.

The user can also define variables which are passed between Oasys REPORTER and other Oasys programs as well as user-written scripts and programs. These variables can then be used to replace file and directory names, node and element numbers, or any other information the user wishes to include. This allows the user to use the same report for multiple runs simply by specifying the value of a small set of variables when generating a report rather than having to edit a whole series of scripts and command files.

Main features:

- Full support for LS-DYNA version 971 and Oasys software

- Compatible with scripts written in all major computer languages

- Supports files from a mixed UNIX / PC system

- Reports can be output in postscript, HTML, PDF and PowerPoint VBA formats

- Use of user defined variables allows one report templates to be used with a series of different models

- Eliminates the need for time consuming manual post-processing

- Enable easy review and comparison of large sets of data

Built-In Library of Scripts

Oasys REPORTER includes a library of pre-defined scripts for extracting a range of data from an LS-DYNA run. These include data from the keyword file such as initial velocity and include files used and data from the OTF file such as amount of added mass, timestep, analysis run time and termination status.

Oasys D3PLOT and T/HIS Integration

Oasys REPORTER is fully integrated with D3PLOT and T/HIS.
This allows users to interactively in D3PLOT or THIS arrange a particular view they want and REPORTER will automatically generate the script to create the image, rather than the user having to write the script by hand.
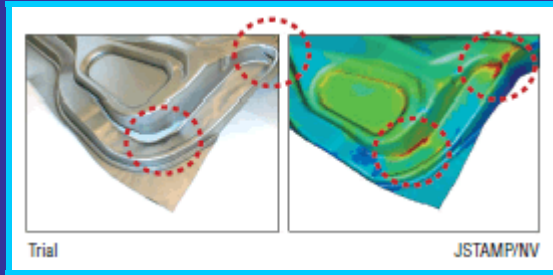
**JSTAMP/NV
Integrated Forming Simulation System for
Virtual Tool Shop
Convenient, Accurate, and Robust**

Complete Information can be found on the website:

Booth 207 – JSOL - the 11th International LS-DYNA Users Conference

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

- **JSTAMP/NV** was firstly programmed for automobile die-tool engineers by JSOL Corporation in 1996.   As an integrated forming simulation system for virtual tool shop the JSTAMP/NV meets the various industrial needs from the engineers of automobile, electronics, iron and steel, etc. The JSTAMP/NV gives convenience to engineers, reliability to products,and robustness to tool shop via the advanced technology of the JRI Solutions Limited.
- **JSTAMP/NV** is widely used in many companies, mainly automobile companies and their suppliers, electronics, and steel/iron companies in Japan. The JSTAMP/NV will be the long-term solution of forming simulation software to companies who want to get reliability and efficiency through CAE technology as in Japan.
- **JSTAMP/NV** includes various robust solvers, LS-DYNA,

JOH/NIKE, and HYSTAMP, which are being renewed progressively.

Robust CAD Interfaces High-quality Mesh Generator

- Enhanced CAD interface and automatic CAD data healing function
- Direct readers for CATIA V4/V5 and IGES
- Automatic CAD data healing
- Stitching tolerant edges
- Correction of self-intersecting surfaces
- Cleanup of tolerant edges
- Elimination of duplicated faces
- Elimination of unused surface patches
- Alignment of front-back face direction
- Correction of degenerated curves
- Elimination of small-width faces
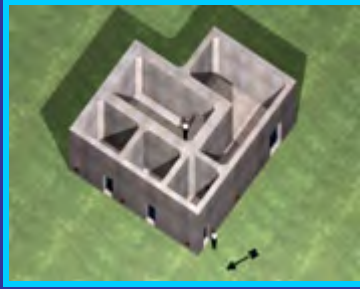
Note: Roof structure not shown to reveal interior wall

Experimental Munitions Test Facility

http://www.kcse.com/projects3.php?id=projects_3a5

Project description

Design a facility for the testing of munitions. The facility is to respond largely in an elastic manner and remain intact under repeated internal detonations testing of significant weights of explosive. Full containment of blast and detonation products is required for the protection of existing buildings in the immediate vicinity of the test facility and to mitigate environmental hazards.

Services Provided

- Design of a hardened reinforced concrete test facility for the evaluation of innovative concepts in munition design.
- Structure required to withstand repeated testing with internal detonation of significant weight of explosive.

- Full containment of blast and detonation products required to protect existing buildings in immediate vicinity of test facility and mitigate environmental hazards.
- Detailed finite element modeling used to generate a design that would respond with limited plasticity. The accumulated deformations are expected to be sufficient for at least five tests at the maximum charge level, or for many more tests for lower charge sizes.
- Design reviewed by the DoD Explosives Safety Board.

Engineering services provided

- Blast and impact resistant design
- Blast effects assessment
- Hardened structure design

Karagozian & Case Awarded Blast Resistant Curtain Wall R&D Program by Department of State - March 16, 2010

http://www.kcse.com/news_2010.php

A team led by Karagozian & Case (K&C) was recently awarded a multi-year program to continue development of a blast, ballistic, and forced entry resistant curtain wall facade for the United States Department of State, Bureau of Diplomatic Security (DOS-DS). Under this new research and development (R&D) program, a façade initially intended for new construction will be adapted for use in retrofitting existing structures. K&C has worked closely with DOS-DS continuously for over a decade providing blast-resistant design, high-fidelity physics-based analysis, and test planning support for numerous programs related to enhancing the blast resistance of facilities. According to Ruben Martinez, a senior engineer with K&C, "The Department of State has for many years required their oversea's buildings to perform to a much higher standard as compared to most other kinds of facilities. This is particularly true in regions where threats from numerous sources are high."

To assist with this program, K&C teamed with Wiss, Janey, Elstner Associates, Inc. (WJE), a firm with broad experience with design and installation of curtain walls. They offer a valuable resource for information concerning the design of façades for retrofit applications, forensic investigation of problematic facades and the development of façade repair solutions. This capability is useful in meeting the specialized objectives of DOS-DS. The Energetic Materials Research and Testing Center (EMRTC), a research division of New Mexico Tech, is also participating in the program and will execute a full-scale high explosive test to verify the capability afforded by a new type of façade, which was adapted by K&C from existing designs to afford better blast resistance. K&C and EMRTC have a history of planning and executing cost effective component-level and full-scale blast tests to validate the performance of engineered blast resistance systems.

"This program embodies the four core areas of expertise K&C has diligently maintained for the past several decades: high-fidelity engineering analysis, performance-based blast-resistant design, development of blast-resistant criteria, and blast effects test planning," says John Crawford, president of K&C. "K&C's dedication and ability to provide these diverse but closely interconnected groups of skill areas is unmatched in our industry."

ESI North America Booth #201 11th International LS-DYNA Users Conference	Visual-Crash for LS-DYNA® solver

For Complete Information

Booth #201 - 11th International LS-DYNA Users Conference

Visual-Crash for Dyna is a competitive environment solution for LS-DYNA solver. It helps engineers get their job done in the smoothest and faster possible way by offering an intuitive windows-based graphical interface with customizable toolbars and complete session support. Being integrated in an open collaborative engineering framework called the Open VTOS (Virtual Try-Out Space) Visual-Crash for DYNA allows users to focus and rely on high quality digital models from start to finish as it addresses the coupling with competitive finite element or rigid body based software. Leveraging this state of the art environment, a visualization and plotting solution helps analyze LS-DYNA results within a uniform interface. The Viewer performs automated tasks and generate customized reports therefore increasing engineers productivity.

Among the Key Features:

- Support of LS-DYNA 971 and lower
- versions

- Model Assembler
- Intersection and Penetration check
- Advanced Part Replace
- Coupling with Madymo Dummy
- Positioning and Auto Seat Belt
- Creation
- Entity Visualization
- Global Find and Replace
- Time Savers

Among the Benefits:

- One complete solution for Crash and Safety Applications
- Handles large data models
- Native Windows
- Fast iteration and rapid model revision process
- Process Compliant GUI
- All functionalities generate session
- Dialogs and Database are accessible for scripting which enables quick customization.

Advances in Simulation for the Engineering & Construction Industry

CAE Associates & ANSYS Hosted Seminar for the Engineering & Construction Industry

http://www.caeai.com/engineering-analysis-news.php?news=CAE+Associates+%26+ANSYS+Host+Seminar+for+the+Engineering+%26+Construction+Industry+&newsID=49

If you would like information regarding the topics discussed at this seminar, please contact Christina Capasso at CAE Associates at (203) 758-2914

On March 11, CAE Associates and ANSYS, Inc. collaborated to host "Advances in Simulation for the Engineering & Construction Industry in New York City. The seminar featured a discussion of role of engineering simulation for innovation in these industries and also featured a presentation on High Performance Computing and by Microsoft.

With more complex designs, stringent safety requirements and increasing energy concerns, designing or improving commercial structures is a critical engineering challenge. Whether trying to achieve LEED certification or demonstrate structural survivability, companies that innovate with new thinking and technology will lead the way.

Topics of discussion included:

- Green buildings and energy efficiency (LEED): offices, atria, data centers, public buildings, underground trains and stations

- Specialist design/analysis considerations: seismic response, soil structure interaction, nonlinear response of large, complex structures
- Civil/Structural/Geotechnical engineering: building, bridge, foundation and tunnel design, construction simulation and code checking
- Wind engineering: pressure mapping, pedestrian comfort, structural loading
- Fire and safety: fire modeling, smoke transport, fire suppression, structural resilience
- Homeland security: blast response, progressive collapse, chemical and biological gas spread

Please click here to download a copy of the presenation given at this seminar, which explores the benefits of using ANSYS software to perform analyses in the Engineering and Construction industry.
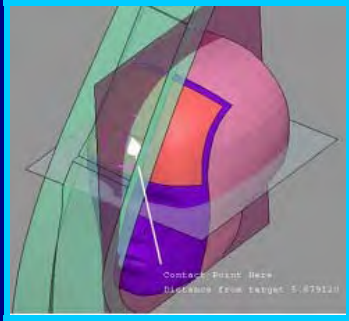
**β™ BETA
CAE Systems SA
Pre-processing tools
for Interior Safety simulation
in ANSA**

Booth 203 at the 11th International LS-DYNA Users Conference

Introduction: Regulations for occupant safety were introduced in the 90s for the enhancement of the occupant protection and the reduction of occupants' injuries and fatalities. Since then, occupant-friendly design influences the styling and the engineering of the vehicle interiors.

Several regulations were introduced for the occupant safety during interior impact. The most prevailing of those are the US Federal Motor Vehicle Safety Standard (FMVSS) 201U and the European Regulation ECE R-21.

The **FMVSS 201U** specifies the upper interior head impact protection requirements, for a wide range of vehicles, to provide protection when an occupant's head strikes upper interior components, including pillars, side rails, headers, and the roof during a crash. The protocol sets up the protection criteria, and corresponding threshold values, for the impact of a regulated Free Motion Headform (FMH) against specified target locations.

The respective Test Procedure (TP 201U) used for compliance testing includes information regarding the setup, targeting, testing, and data analysis, regardless of the vehicle type.

The targeting procedure, which locates all applicable target points on the upper interior trim of a vehicle, is considered to be one of the most complex and time-consuming testing protocols developed in recent years.

The ANSA FMVSS 201U Tool addresses this complexity issue and allows the robust FE model preparation for simulation scenarios according this regulation. The tool offers the functionality for the automatic definition of the impact target points and the positioning of the FMH FE-model on them, as prescribed by the test procedure.

In a respective manner, the **ANSA FMVSS201 / ECE R-21** Tool accommodates the requirements of the FE-modeling for the simulation of the Test Procedure **TP-201** for the **FMVSS 201** regulation and of the **ECE R-21** regulation, for Occupant Protection in Interior Impact. These regulations set the minimum requirements for vehicle interior components to afford impact protection for occupants.

ANSA FMVSS 201U tool: The ANSA FMVSS 201U tool is used for the identification of target points and the positioning of the FMH for the simulation of the occupant protection in interior impact laboratory test.
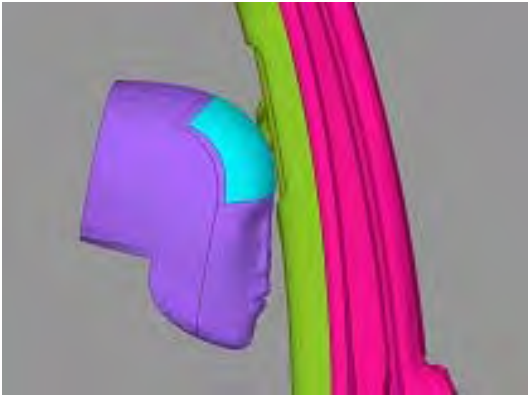
FMH after its positioning on one of the identified points.

The following actions can be performed with this tool, according to TP 201U procedure:

- Identification of the Target Points on the interior components of the vehicle.
- Positioning of the FMH on a selected Target Point of the upper interior of the car (TRIM).
- Calculation of the horizontal approach angle.
- Calculation of the maximum vertical approach angle.

The above operations can be performed both on FE-mesh and unmeshed analytic geometric data.

Target Points Identification on the interior components of the vehicle

The first step to be performed is the Target Points identification on the vehicle's interior.

Target Points on the interior of the model can be identified automatically using the tool's interface, and always in accordance to the requirements of the TP 201U procedure.

Based on the above, ANSA calculates the Target Points where the FMH should be positioned for the test.
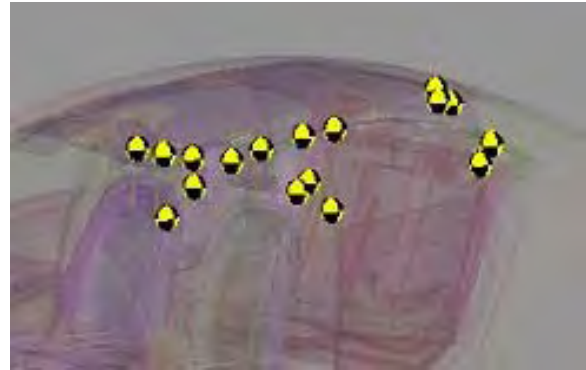
All Target Points identified with ANSA according to the TP 201U protocol

Positioning: After the determination of the Target Points, the next step is the positioning of the FMH on these locations.

The positioning movement is done according to a local coordinate system defined on the FMH FE-model nodes. The positioning is performed for each one of the identified points separately. For each Impact Point, the Horizontal and Vertical angle limits are respected.

FMH positioning takes into account the following factors in order to find for each one of the impact points the "worst case" for the FMH:

- The angle limits respected during the positioning procedure are either the default values dictated by the TP 201U protocol or may have been automatically calculated within ANSA. In the latter case, the calculation is made during the identification procedure of Target Points and values are transferred for each Impact Point zone respectively.
- ANSA calculates the horizontal angle that leads to the worst HIC value. To do so, an alignment algorithm finds the horizontal angle at which the midsagittal

planes of the FMH and the interior trim surface line up.

- Initial contact (using contact algorithm) is performed while moving the FMH from its initial position to the impact point.
- Moving the FMH after Horizontal positioning to Vertical positioning, ANSA rotates the FMH about its local y-axis and adheres to a contact condition with the trim surface by translating the FMH in the local x-z plane. When a second contact is found between the trim surface and the nose or chin of the FMH of the vertical limit is reached, the rebound angle is enforced.
- Vertical impact angle influences the HIC value a lot and thus the correct vertical positioning is very important. It is necessary to set the vertical angle so as to achieve the worst case HIC(d) value.
- ANSA finds the final vertical impact angle while the FMH stays in contact with the impact surface. This ensures that the test will be held with the worst HIC(d) value.
- The user is allowed to perform some alterations for the limit angle values in order to improve the positioning result.
- In cases of very complex interior geometry, where the first contact with the FMH Impact Zone cannot be found, FMVSS tool allows the user to set manually the vertical angle to an allowed value prior to finding first contact with the trim surface.
- During alignment of the horizontal angle in cases where collision between the FMH Impact Zone with other interior trim surfaces

happen, ANSA attempts, in the correct order, different alignment angle combinations.

- Many times, due to the geometrical form and complications encountered positioning the FMH the first point of contact between the FMH and the interior trim does not lies on the midsagittal plane of the FMH. For this reason the "out of position" that occurs between these two points is calculated allowing contact based algorithm to output an exact value of the "out of position" that will occur during impact.

Finally FMH is positioned on the identified Target Point according the regulation using contact algorithm for such horizontal and vertical angles resulting to the worst HIC values.
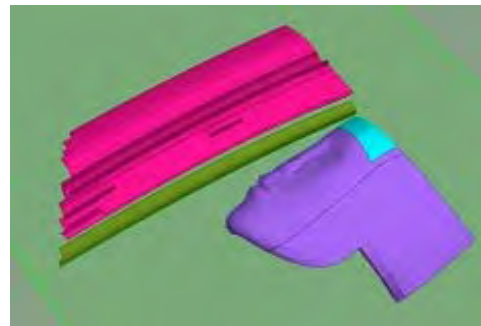
FMH after its positioning on one of the identified points. The positioning can be inspected with the aid of cutting planes

Manual Operations: The user has the ability to manually manipulate the FMH's final position and get live update of distances and contacts.

These movements are performed incrementally through the Manual Operations tab.

Transformations: The user can convert the final state after positioning for each point to NODE_TRANSFORM

keyword in order to use it with Include files.

ANSA FMVSS 201 / ECE R-21 Tool:
The ANSA FMVSS201 / ECE R-21 Tool is widely used for the fast and proper positioning of the pendulum model against the FE-model of vehicles' dashboard for the impact simulation.

This tool is used to:

 - Position the Pendulum on a selected Target Point

 - Automatic position the Pendulum's pivot point on

   the predefined level set by the user.
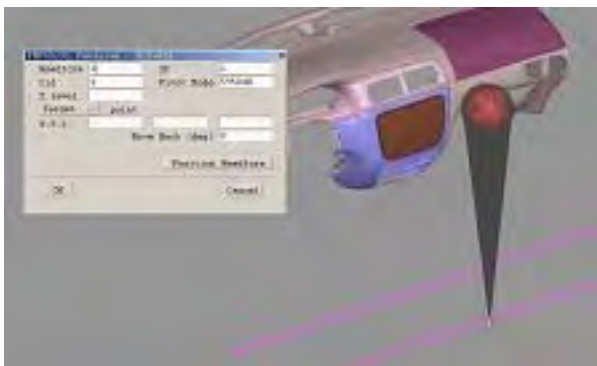
FMVSS 201/ECE R-21 tool interface for test device positioning on the dashboard area.

Conclusions − Benefits: ANSA offers unique functionality for the fast and robust modelling of interior safety simulations.

Initially, Target Points are identified automatically in the vehicles interior trim according the TP 201U protocol. Afterwards the FMH is positioned on those Target Points with the aid of contact algorithm. The positioning is performed in two steps, horizontally and vertically leading at that location with the worst HIC(d) value.

This interior safety related functionality, combined with that for pedestrian safety modelling and that the car test dummy seating, positioning and restraining comprise a powerful suite for performing safety simulations modeling.

References

1. ANSA version 13.0.2, User's Guide, BETA CAE Systems SA, September 2009.
2. NHTSA, Laboratory Test Procedure For FMVSS 201 Occupant Protection in Interior Impact, TP-201-02, March 3, 1989
3. NHTSA, Laboratory Test Procedure For FMVSS 201U, Occupant Protection in Interior Impact Upper Interior Head Impact Protection, TP201U-01, April 3, 1998
4. Palacio A., Latorre X., Mitjans C.,Cruz P., "Automation Of Cae Pre & Post Processing Activities Using Ansa & Meta Scripting Capabilities", 3rd ANSA & μETA International Conference, September, 2009
5. Williamson P., Rorris L., ''A CAE Tool for Processes Optimization According to FMVSS201U'', 2nd ANSA & μETA International Conference, June, 2007
6. Rychlewski H.A., Smith M. J., "FMVSS 201U Testing - Vehicle Targeting Using Both Manual and Computer-Aided Methods", SAE 1999-01-0434
7. Safety Companion 2010, carhs.training gmbhUnited Nations, E/ECE/324, E/ECE/TRANS/505, Regulation No. 21, Revision 2. October 1993

For more information contact:
BETA CAE Systems S.A.
Email: ansa@beta-cae.gr
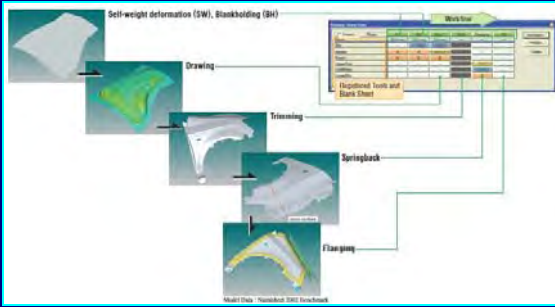
Nhance Engineering Solutions Ltd News – India

JSTAMP-integrated Forming Solution &HYCRASH -one step stamping

Booth 207 JSOL - JSTAMP – HYCRASH - 11th Int'l LS-DYNA Users Conference

Nhance Engineering Solutions Ltd, an Arup Group company, is pleased to announce agreement to distribute JSTAMP and HYCRASH software of JSOL Corporation in India. This agreement means Indian OEMS, suppliers and consultancy companies can source both LS-DYNA and Integrated Forming solutions directly from nhance.

JSOL's JSTAMP is market leading software in Japan for formability simulation.

JSTAMP:

An integrated forming simulation system for virtual tool shop, with extensive functionality that includes

1. Formability evaluation (crack & wrinkle prediction, forming/ holding force prediction, contact force calculation, contact map visualization, material flow evaluation, shock line evaluation, characteristic line movement, trim line evaluation, initial blank line prediction, sectional measurement)

2. High accuracy springback analysis and evaluation (Customized Yoshida-Uemori material model, geometry evaluation function for comparing CAD surface/ Cloud data/ FE mesh, geometry fit function)

3. Accurate initial blank line and trim line prediction, speedy solutions.

4. Robust process management to perform multi-stage forming process

5. convenient database functions for material database and numerical draw bead database

6. Quick feedback solutions like automatic re-analysis, fillet radius magnification on FE mesh, springback compensation, quality surface generation from FE mesh for use in CAD systems.

7. HYSTAMP for early design stage solution

8. Hot-forming solutions that consider hardness/ tensile strength evaluation, diagrams for continuous cooling of temperature and material models considering micro-structural changes.

9. Interface with various CAD systems (supporting IGES, JAMA-IS, CATIA V4/V5).

HYCrash

A a single step inverse forming solution tool. It does not need forming tool setup and rather takes the crashworthiness/ structural analyses input file as input and couples conveniently between forming and crash/ structural analyses, by performing a inverse forming solution within minutes with competent accuracy and automatically assigning pre-strain/ thickness on crashworthiness/ structural analyses input file.

Contact:

For information, training and support of LS-DYNA and JSOL software.

Mail:

 india.support@arup.com

Phone at +91 (0) 40 44369797

Nhance Engineering Solutions Ltd

3rd Series Oasys LS-DYNA Indian Update Meetings 2010

Booth 101 OASYS/ARUP - 11th International LS-DYNA Users Conference

The third in the series of update meetings for Oasys LS-DYNA users were held in the Pride Hotel, Pune on 27th April 2010 and in the Taj Vivanta Hotel, Bangalore on 29th April 2010.

This event brought together nearly 75 delegates in Pune and over 100 delegates in Bangalore, all users of the LS-DYNA and Oasys software to obtain information on upcoming features of LS-Dyna and Oasys software.

The users at both events were updated on new features in release 5.0 of LS-DYNA 971 & Oasys 9.4.1; they were also introduced to the upcoming features in LS-DYNA 980 and Oasys software.

Attendees at Pune enjoyed talks by guest speakers Mr. Ganesh Gadekar (Tata Motors) and Mr. Vijay Kotak (Mahindra & Mahindra). Attendees at Bangalore enjoyed talks by guest speakers Mr. Saleem Mohammed (General Motors Ltd) and Prof. Anindya Deb (Indian Institute of Science, Bangalore).

Users at both events were introduced to the implicit capabilities of LS-DYNA by Dr. Ushnish Basu (Livermore Software Technology Corporation). Other guest speakers presented FEMZIP-FE results compression (The Fraunhofer Institute) and JSTAMP – integrated forming simulation system (JSOL Corporation)

Please contact either by mail at india.support@arup.com or by phone at +91 (0) 40 44369797 for information, training and support of LS-DYNA and Oasys software.

Presentations can be downloaded from the events page at http://www.oasys-software.com/dyna/en/ .

Fraunhofer Institute for Algorithms and Scientific Computing SCAI

Booth 202 - 11th International LS-DYNA Users Conference

Fraunhofer Institute for Algorithms and Scientific Computing SCAI

In addition to conducting research in the field of computer simulations for product and process development, the Fraunhofer Institute SCAI designs and optimizes industrial applications.

Compression Techniques for Simulations

- FEMZIP – tool for compression of simulation results – Supported codes:
  - o LS-DYNA™
  - o PAM-CRASH™
  - o MSC Nastran™

Multiphysic Simulation

- MpCCI – Multi-Physics Code Coupling Interface
- SCAIMapper – Mapping tool for manufacturing process chains in metal forming
- MapLib – Software library for data mapping and mesh comparisons in CAE applications

Robust Design for Products and Production Processes

- DIFFCRASH – software package for the stability analysis of crash simulations

-

- DESPARO – toolbox for optimization of design parameters

Contact

Fraunhofer SCAI
  Schloss Birlinghoven
    53754 Sankt Augustin

info@scai.fraunhofer.de

www.scai.fraunhofer.de

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TOP Crunch for LS-DYNA software benchmarks.

Intel® Xeon® Quad Core X5560 @2.80GHz

Processor: Intel® Xeon® Quad Core X5560 @2.80GHz
Submission Date 04/08/2010 – 04/09/2010
    Vendor/Submitter Org. – Bull/Bull

Computer/Interconnect	#Nodes x #Processors per Node x #Cores Per Processor = Total #CPU	Time (Sec)	Benchmark Problem
bullx blade cluster/IB QDR	16 x 2 x 4 = **128**	108	Neon refined revised
bullx blade cluster/IB QDR	8 x 2 x 4 = **64**	163	Neon refined revised
bullx blade cluster/IB QDR	4 x 2 x 4 = **32**	259	Neon refined revised
bullx blade cluster/IB QDR	2 x 2 x 4 = **16**	443	Neon refined revised
bullx blade cluster/IB QDR	1 x 2 x 4 = **8**	803	Neon refined revised
bullx blade cluster/IB QDR	16 x 2 x 4 = **128**	9991	car2car car2car
bullx blade cluster/IB QDR	8 x 2 x 4 = **64**	17040	car2car
bullx blade cluster/IB QDR	4 x 2 x 4 = **32**	30941	car2car
bullx blade cluster/IB QDR	2 x 2 x 4 = **16**	58283	car2car
bullx blade cluster/IB QDR	1 x 2 x 4 = **8**	113803	car2car

Booth 103 - The 11th International LS-DYNA® Users Conference

Sensor Definitions in LS-DYNA

Sensors can be used to trigger entities based on certain criteria. The following image is a high-level steps involved to take advantage of sensors in LS-DYNA

*RIGIDWALL_{DISPLAY} option - May 3rd, 2010 in LS-DYNA Bytes and LS-DYNA Elements.

Rigidwalls are analytical representations of surfaces or volumes that are frequently used to represent stiff structures that are either stationary or in motion. Viewing of such analytical definitions in D3PLOTs were not possible for most rigidwalls. A new option in LS-DYNA named DISPLAY that can now be used to any *RIGIDWALL definitions which causes LS-DYNA [...]

LS-DYNA Examples Blog by Student Qui - April 29th, 2010 in LS-DYNA Bytes.

http://ls-dyna-examples.blogspot.com

I recently came across a nice blog written by QUI. It is remarkable that he is willing to share examples and his experiences in LS-DYNA. The broad spectrum of LS-DYNA applications can never be fully covered by a single blog or a small set of publications. It is great to see such new sites emerging and I hope more users come forward to share their experiences.
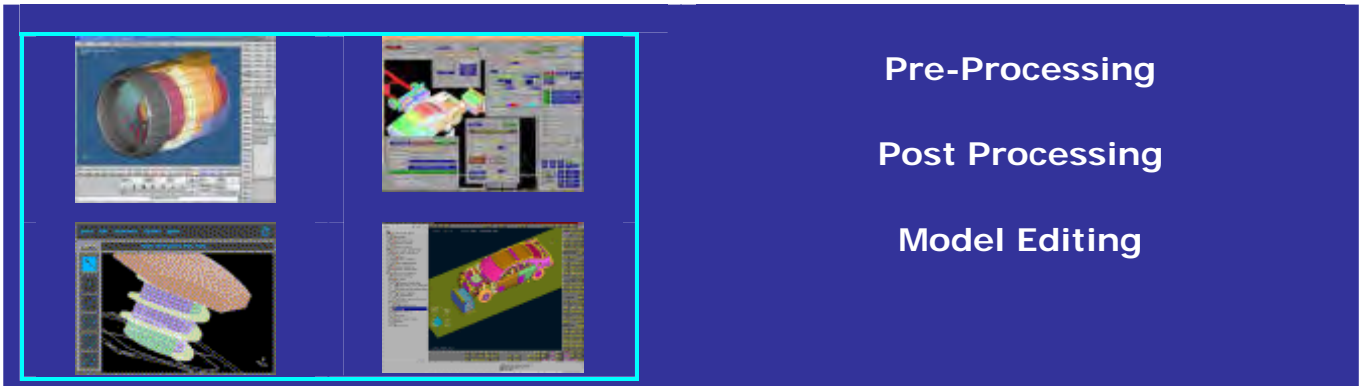
Pre-Processing

Post Processing

Model Editing

A preprocessor is a program that processes its input data to produce output. This data is then used as input to another program.

BETA CAE Systems S.A.

http://www.beta-cae.gr/

Provides complete CAE pre- and post-processing solutions. ANSA, the world wide standard pre-processor and full product modeler for LS-DYNA, with integrated Data Management and Task Automation. µETA, with special features for the high performance an effortless 3D & 2D post-processing of LS-DYNA results.

Engineering Technology Associates, Inc.

http://www.inventiumsuite.com

PreSys is an advanced Pre/Post Processor. PreSys is a full-featured, core solution that can be used on its own or with a variety of available add-on applications. The system offers advanced automeshing tools to provide the highest quality mesh with little CAD data preparation. It also features a scripting interface and model explorer feature for in-depth data navigation.

Oasys, Ltd

http://www.oasys-software.com/dyna/en/

Oasys Primer is a model editor for preparation of LS-DYNA input decks. - Oasys D3Plot is a 3D visualization package for post-processing LS-DYNA analyses using OpenGL® (SGI) graphics.

JSOL Corporation

http://www.jsol.co.jp/english/cae/

JVISION is a general purpose pre-post processor for FEM software. Designed to prepare data for, as well as support, various types of analyses, and to facilitate the display of the subsequent results.

Livermore Software Technology Corporation

http://www.lstc.com

LS-PrePost is an advanced interactive program for preparing input data for LS-DYNA and processing the results from LS-DYNA analyses.

Alpha Order by Country

Australia	Leading Eng. Analysis Providers - LEAP http://www.leapaust.com.au/ info@leapaust.com.au
Canada	Metal Forming Analysis Corp - MFAC http://www.mfac.com/ galb@mfac.com
China	OASYS Ltd. (software house of Arup) http://www.oasys-software.com/dyna/en stephen.zhao@arup.com
France	ALYOTECH TECH. http://www.alyotech.fr nima.edjtemai@alyotech.fr
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Germany	DYNAmore http://www.dynamore.de/ uli.franz@dynamore.de

India	OASYS Ltd. (software house of Arup) http://www.oasys-software.com/dyna/en lavendra.singh@arup.com
India	EASi Engineering http://www.easi.com/ rvenkate@easi.com
India	CADFEM Eng. Svce India http://www.cadfem.in/ info@cadfem.in
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Predictive Engineering	**Schwer Engineering**
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KBEC	**AEG Product Engineering Svce.**
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ETA – DYNAFORM & VPG

http://www.eta.com

Includes a complete CAD interface capable of importing, modeling and analyzing, any die design. Available for PC, LINUX and UNIX, DYNAFORM couples affordable software with today's high-end, low-cost hardware for a complete and affordable metal forming solution.

ETA – VPG

http://www.eta.com

Streamlined CAE software package provides an event-based simulation solution of nonlinear, dynamic problems. eta/VPG's single software package overcomes the limitations of existing CAE analysis methods. It is designed to analyze the behavior of mechanical and structural systems as simple as linkages, and as complex as full vehicles.

OASYS software for LS-DYNA

http://www.oasys-software.com/dyna/en/

Oasys software is custom-written for 100% compatibility with LS-DYNA. Oasys PRIMER offers model creation, editing and error removal, together with many

specialist functions for rapid generation of error-free models. Oasys also offers post-processing software for in-depth analysis of results and automatic report generation.

ESI Group Visual-CRASH For DYNA

http://www.esi-group.com

Visual-Crash for LS-DYNA helps engineers perform crash and safety simulations in the smoothest and fastest possible way by offering an intuitive windows-based graphical interface with customizable toolbars and complete session support. Being integrated in ESI Group's Open VTOS, an open collaborative multi-disciplinary engineering framework, Visual-Crash for DYNA allows users to focus and rely on high quality digital models from start to finish. Leveraging this state of the art environment, Visual Viewer, visualization and plotting solution, helps analyze LS-DYNA results within a single user interface.

BETA CAE Systems S.A.— ANSA

http://www.beta-cae.gr

Is 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 S.A.— μETA

http://www.beta-cae.gr

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

9th German LS-DYNA User Forum

12th – 13th October, 2010,

Bamberg, Germany

DYNAmore invites you to contribute to the 9th German LS-DYNA Forum. The conference will be held in the marvellous city of Bamberg, awarded as Unesco world cultural heritage.

The conference will be an ideal forum to share and discuss experiences, to obtain information on upcoming features, and to learn more about new application areas of LS-DYNA and LS-OPT.

All users are kindly encouraged to submit a paper on any application of LS-DYNA or LS-OPT. Dr. John Hallquist as well as other developers from LSTC already confirmed contributions on new LS-DYNA and LS-OPT features. Almost all presenters will use English slides and many of the presentations will be held in English language.

Please download a Call for Papers and further information at

http://www.dynamore.de/german-forum-2010

Deadline for Abstract Submission:
  21 May 2010.

Additionally, the conference offers information about products related to LS-DYNA and LS-OPT in a comprehensive hardware and software exhibition. Please find more details about exhibition and sponsorship at

http://www.dynamore.de/conferences/upcoming/2010-german-forum/exhibition-sponsoring

We are looking forward to welcoming you either as presenter, exhibitor, sponsor, or attendee.
Please find more information at www.dynamore.de

For more than 20 years, the EnginSoft International Conference on "CAE Technologies for Industry" has been the reference event for the VP community in Italy, offering unique insights into: current and future values of software technologies, background trends, outstanding achievements, groundbreaking scientific developments and the visions of those who realize advancements.The Conference reflects and meets industry needs on different levels, from the perspective of managers and decision makers, technical experts, software users up to human resources analysts.

The accompanying exhibition will see the world's leading CAE and VP solution providers showcasing products and services covering all aspects of the technologies and their successful implementation.

Delegates and exhibitors use the exhibition as an international networking forum to gain new insights, share experiences and find new business opportunities.

The 2010 EnginSoft International Conference also offers:

- a think tank bringing together executives from industry, research, academia and technology providers
- a panel of simulation-based engineering and science experts and technology experts

- an informal environment for delegates, technology providers, managers and experts to meet and share experiences, address key industry issues and challenges, and explore new business opportunities

...in a word: the ideal occasion to discuss today's limitless applications of "simulation based engineering and sciences" in the true sense of the conference motto: "Believe in innovation: simulate the world"

The annual conference takes place concurrently with the ANSYS Italian Users' Meeting.

The conference program highlights applications in automotive, aerospace, energy, marine, oil&gas, consumer goods, environment, biomedicine and others

and presents the use of the following software: ANSYS - ANSYS CFX - ANSYS FLUENT - ANSYS ICEM CFD - modeFRONTIER - ANSOFT - - FLOWMASTER - MAGMASOFT - FORGE - FTI - THIRD WAVE SYSTEM

LSTC's LS-DYNA®

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11th International LS-DYNA® Users Conference

Our exciting Conference Program Begins now:

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  Dr. Thomas J.R. Hughes, *Professor of Aerospace Engineering and Engineering Mechanics, Computational and Applied Mathematics Chair III, Institute for Computational Engineering and Sciences (ICES), The University of Texas at Austin*

  Dr. David J. Benson, *Professor of Structural Engineering, Jacobs School of Engineering, University of California, San Diego*

  Mr. Thomas J. Lange, *Director, Corporate R&D, Modeling and Simulation, Procter & Gamble*

  Dr. Yuichi Kitagawa, *Group Manager, Advanced CAE Division, Toyota Motor Corporation*

  Dr. Rahul Gupta, *U.S. Army Research*

We hope you have a most enjoyable time

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  Mr. Paul A. Du Bois, *Consulting Engineer*
- Exhibition Featuring State-of-the-Art Hardware and Software
- Presentation by **Dr. John O. Hallquist**, President, LSTC

Included in the conference packet are the Conference Agenda and Technical Session Locator with Map, our Sponsor Appreciation page, Exhibition Area Layout, and a general Hotel Map.

Remember to fill out your Drawing Entry Form and have it stamped by each Exhibitor. All completely filled entries will be eligible for the Conference Drawing!

If you have any questions regarding the conference, members of our staff will be available to assist you at the Registration Desk. The Registration Desk will also act as a Lost and Found and Message Center for you to contact other attendees.

Please take the time to visit the conference sponsors and the many other companies in the Exhibition Area.

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	Beta CAE Systems S.A.	Break (Tuesday - A.M.)
	d3View	Break (Tuesday – P.M.)
	Penguin Computing Inc.	Break (Monday - P.M.)

SUNDAY	5:00 p.m. - 8:00 p.m.	Registration	**Regency Ballroom J**

SUNDAY 5:00 p.m. - 8:00 p.m.	Exhibition	**Great Lakes Center**

SUNDAY   6:00 p.m. - 8:00 p.m.
Welcome Reception
Sponsored by FEA Information, Inc.

Great Lakes Center

MONDAY – JUNE 7th

7:30 a.m. – 4:00 p.m.   Registration
                        Great Lakes Center

7:30 a.m. – 8:20 a.m.   Continental Breakfast
                        Great Lakes Center

8:00 a.m. – 6:00 p.m.   Exhibition
                        Great Lakes Center

8:20 a.m.   Welcome and Opening Remarks – Wayne L. Mindle (LSTC)   **Great Lakes Center**

8:35 a.m.   Plenary Presentations   **Great Lakes Center**

Session Chair: John O. Hallquist (LSTC)

8:35   **Dr. Thomas J.R. Hughes**   _"Isogeometric Analysis (Introduction and Overview)"_
       Professor of Aerospace Engineering
        and Engineering Mechanics
       Computational and Applied Mathematics Chair III
       Institute for Computational Engineering and Sciences (ICES)
       The University of Texas at Austin

9:15   **Dr. David Benson**   _"Isogeometric Analysis in LS-DYNA$^®$"_
       Professor of Structural Engineering
       Jacobs School of Engineering
       University of California, San Diego

9:55 a.m.   **Coffee Break – _Sponsored by ARUP_**   **Great Lakes Center**

10:05   **Mr. Rick Young**   _"Microsoft Windows HPC: Vision and Roadmap"_
        Business Development Manager
        MS HPC Group
        Microsoft Corporation

10:15   **Mr. Thomas J. Lange**   _"Virtualizing Everyday Life, P&G's use of Modeling Simulation"_
        Director
        Corporate R&D
        Modeling and Simulation
        Procter & Gamble

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11:05 a.m. Keynote Presentation   Regency Ballroom A-B

11:05   **Dr. Yuichi Kitagawa**   *"Development of New Generation THUMS"*
        Group Manager
        Advanced CAE Division
        Toyota Motor Corporation

11:05 a.m. Keynote Presentation   Regency Ballroom C-D

11:05 **Dr. Rahul Gupta**   *"Multi-Phase, Multi-Material, LS-DYNA ALE-FSI Approach and*
      U.S. Army Research Laboratory   *Development of an Automated Tool for Blast Simulation"*
      Aberdeen Proving Ground

11:05 a.m. Keynote Presentation   Regency Ballroom E-F

11:05   **Mr. Paul A. Du Bois**   *"Development, Implementation, and Validation of 3-D Failure*
       Consulting Engineer   *Model for Aluminum 2024 for High Speed Impact Applications"*

11:45 a.m.   Lunch   Great Lakes Center

1:00 p.m.   Session 1 — Aerospace (1)   Desoto Ballroom

Session Chair: Thomas J. Vasko (Central Connecticut State University)

1:00 *Blinzler, B.J., University of Akron,*
     Investigation of *MAT_58 for Modeling Braided Composites

1:25 *Chuzel, Y., LaMCoS – INSA,*
     Development of Hail Material Model for High Speed Impacts on Aircraft Engine

1:50 *Hu, S., Hamilton Sundstrand,*
     Engine Impeller Sub-Fragmentation Simulation Using EFG Method

2:15 *Selezneva, M., Ryerson University,*
     Modeling Bird Impact on a Rotating Fan: The Influence of Bird Parameters

2:40 *Rajan, S.D., Arizona State University,*
     LS-DYNA[®] Implemented Multi-Layer Fabric Material Model Development for Engine Fragment Mitigation

1:00 p.m.   Session 2 — Automotive (1)   Marquis Ballroom

Session Chair: Stephen Kang (Ford Motor Company)

1:00 *Chatiri, M., CADFEM GmbH,*
   **An Assessment of the New LS-DYNA® Multi-Layered Solid Element: Basics,
   Patch Simulation and its Potential for Thick Composite Structural Analysis**

1:25 *Perillo, M., EnginSoft SpA,*
   Validation of Material Models for the Numerical Simulation of Aluminum Foams

1:50 *Kolokythas, Y., BETA CAE Systems SA,*
   **LS-DYNA® Durability Load Cases: An Automated Template Driven Process Using
   the ANSA Task Manager**

2:15 *Tsuda, T., ITOCHU Techno-Solutions Corporation,*
   **Implementation of the Tanimura-Mimura's Strain Rate Dependent Constitutive Model
   in
   LS-DYNA® Using User Defined Material Model**

2:40 *Shetty, S.H., ESI Group,*
   LS-DYNA® "Model Compare" in Visual-Environment

1:00 p.m.   Session 3 — Simulation (1)   Pierce Arrow Suite

Session Chair: Nima Edjtemai (Alyotech Technologies)

1:00 *Feng, W.W., Livermore Software Technology Corporation,*
   On the Prony Relaxation Function

1:25 *Shor, O., Rafael,*
   **Simulation of a Thin Walled Aluminum Tube Subjected to Base Acceleration Using
   LS-DYNA®'s Vibro-Acoustic Solver**

1:50 *Schwer, L.E., Schwer Engineering & Consulting Services,*
   A Brief Look at *MAT_NONLOCAL: A Possible Cure for Erosion Illness

2:15 *Magallanes, J.M., Karagozian & Case,*
   Recent Improvements to Release III of the K&C Concrete Model

2:40 *Sato, K., JSOL Corporation,*
   **LS-DYNA® and JMAG® Coupling Simulation for Change of SPM Motor Magnetic
   Properties
   Due to Press-Fitting**

Session Chair: Matthias Hörmann (CADFEM GmbH)

1:00 *Huang, Y., Livermore Software Technology Corporation,*
New Developments of Frequency Domain Acoustic Methods in LS-DYNA®

1:25 *Mendes, S., Worcester Polytechnic Institute,*
Investigation of LS-DYNA® Modeling for Active Muscle Tissue

1:50 *Guo, Y., Livermore Software Technology Corporation,*
XFEM and EFG Cohesive Fracture Analysis for Brittle and Semi-Brittle Materials

2:15 *Makino, M., Dynapower Corporation,*
Stone Skipping Simulation by ALE and SPH

2:40 *Van Dorsselaer, N., Alliance Services Plus,*
A Contribution to New ALE 2D Method Validation

Session Chair: Ronald L. Hinrichsen (RHAMM Technologies, LLC.)

1:00 *Nilakantan, G., University of Delaware,*
Novel HPC Using LS-DYNA® to Computationally Assess the V_0-V_{100} Impact Response of Flexible Fabrics Through Probabilistic Methods

1:25 *Gama, B.A., University of Delaware,*
Modeling Blast Damage of Composite Structures

1:50 *Lapoujade, V., Alliance Services Plus,*
A Study of Mapping Technique for Air Blast Modeling

2:15 *McLean, J.G., State University of New York at Geneseo,*
Simulation of Granular Ceramic Armor Under Impact from Bullets

2:40 *Mossakovsky, P.A., Moscow State University,*
Investigation of the Shear Thickening Fluid Dynamic Properties and its Influence on the Impact Resistance of Multilayered Fabric Composite Barrier

3:05 p.m.   Coffee Break — *Sponsored by Penguin Computing* Great Lakes Center

3:25 p.m.   Session 6 — Fluid / FSI   Desoto Ballroom

Session Chair: Mohammad Usman (Ford Motor Company)

3:25 *Del Pin, F., Livermore Software Technology Corporation,*
Advances on the Incompressible CFD Solver in LS-DYNA®

3:50 *Ghorbanie, M., AMEC Americas,*
Structure-Fluid Interaction Analysis of an Existing Water Tank

4:15 *Zhang, Z.C., Livermore Software Technology Corporation,*
How to Use the New CESE Compressible Fluid Solver in LS-DYNA®

4:40 *Im, K.S., Livermore Software Technology Corporation,*
**Module Development of Multiphase and Chemically Reacting Flow in LS-DYNA®
Compressible Flow Solver**

5:05 *Seguro, J.V., The Procter & Gamble Co.,*
Fluid Structure Interaction (FSI) Applications to Consumer Products

5:30 *Souli, M., University of Lille,*
ALE Incompressible Fluid in LS-DYNA®

3:25 p.m.   Session 7 — Occupant Safety   Marquis Ballroom

Session Chair: Wenyu Lian (General Motors Company)

3:25 *Shah, C.S., First Technology Safety Systems,*
A New Development in Pedestrian Safety: The FLEX-PLI GTR LS-DYNA® Model

3:50 *Malcolm, S., Honda R&D Americas, Inc.,*
Side Impact Occupant Modeling Practices in Comparison to Test Results

4:15 *Stahlschmidt, S., DYNAmore GmbH,*
WorldSID 50th vs. ES-2: A Comparison Based on Simulations

4:40 *Maurath, C., Livermore Software Technology Corporation,*
Overview of LSTC's LS-DYNA® Anthropomorphic Models

5:05 *Mohan, P., NCAC, The George Washington University,*
LSTC / NCAC Dummy Model Development

5:30 *Canadas, C., LMS International,*
**An Integrated Process for Occupant Safety Simulations with LS-DYNA® & MADYMO
Coupling**

Session Chair: Alex Akkerman (Ford Motor Company)

3:25 *Posey, S., NVIDIA,*
Performance Benefits of NVIDIA GPUs for LS-DYNA®

3:50 *Grimes, R., Livermore Software Technology Corporation,*
The Potential Impact of GPUs on LS-DYNA® Implicit

4:15 *Schreiber, O., SGI,*
LS-DYNA® on Advanced SGI® Architectures

4:40 *Lin, Y.Y., Hewlett-Packard Company,*
A Study on the Scalability of Hybrid LS-DYNA® on Multicore Architectures

5:05 *Meng, N., Intel Corporation,*
New Features in LS-DYNA® HYBRID Version

5:30 *Shainer, G., HPC Advisory Council,*
LS-DYNA® Best-Practices: Networking, MPI and Parallel File System Effect on LS-DYNA® Performance

3:25 p.m.   Session 9 — Simulation (3)   Rolls Royce Suite

Session Chair: John D. Reid (University of Nebraska — Lincoln)

3:25 *Blanco, D.H.,* Dainese S.p.a.,
FE Modeling of Innovative Helmet Liners

3:50 *Syma, A., Black & Decker GmbH,*
Usage of LS-DYNA® in the Development of Professional Hammer Drills

4:15 *DePolo, D., US Army Corps of Engineers,*
The Use of LS-DYNA® Models to Predict Containment of Disk Burst Fragments

4:40 *Carney, K., NASA Glenn Research Center,*
Modeling the Effects of Laser Peening on Friction Stir Welding Residual Stresses

5:05 *Huang, Y., Livermore Software Technology Corporation,*
Mode-based Frequency Response Function and Steady State Dynamics in LS-DYNA®

Session Chair: Changqing Du (Chrysler Group, LLC)

3:25 *Ren, F., Ford Motor Company,*
Process Modeling of Freeform Incremental Forming Using LS-DYNA®

3:50 *Hu, W., Livermore Software Technology Corporation,*
LS-DYNA® Meshfree Interactive Adaptivity and Its Application

4:15 *Shang, J., American Trim LLC,*
Numerical Simulation and Experimental Study of Electromagnetic Forming

4:40 *Lu, H., Shanghai Hengstar Technology Co. Ltd.,*
**An Improved 3D Adaptive EFG Method for Forging and Extrusion Analysis
with Thermal Coupling in LS-DYNA®**

5:05 *L'Eplattenier, P., Livermore Software Technology Corporation,*
**An MPP Version of the Electromagnetism Module in LS-DYNA® for 3D Coupled Mechanical-
Thermal-Electromagnetic Simulations**

5:30 *Sözen, L., TOBB University of Economics and Technology,*
Prediction of Springback in CNC Tube Bending Process Based on Forming Parameters

7:00 p.m. — 9:00 p.m.

Conference Banquet —

Sponsored by Microsoft

Great Lakes Center

Entertainment — *Sponsored by LSTC*

TUESDAY – June 8th

8:25 a.m.   Session 11 – Simulation (4)   Desoto E

Session Chair: Ligong Pan (Ford Motor Company)

8:25 *Stolle, C.S., University of Nebraska-Lincoln,*
   Modeling Wire Rope Used in Cable Barrier Systems

8:50 *Sheikh, N.M., Texas Transportation Institute,*
   **Finite Element Modeling and Validation of Guardrail Steel Post Deflecting in Soil
   at Varying Embedment Depths**

9:15 *Park, C.K., NCAC, The George Washington University,*
   Meshfree Analysis Using the Generalized Meshfree (GMF) Approximation

9:40 *Narkhede, S., Tata Technologies Ltd.,*
   **Bolted Joint Representation in LS-DYNA® to Model Bolt Pre-Stress and Bolt Failure
   Characteristics in Crash Simulations**

8:25 a.m.   Session 12 – Automotive (2)   Marquis E

Session Chair: Tau Tyan (Ford Motor Company)

8:25 *Wood, P.K.C., University of Warwick,*
   A Smoothed-Particle Hydrodynamics (SPH) Model for Machining of 1100 Aluminum

8:50 *Shkolnikov, M.B.,*
   Vehicle Structures Experimental Analyses

9:15 *Rorris, L., BETA CAE Systems SA,*
   **Latest Developments in Crash Pre Processing and Post Processing –
   Innovative Ideas Brought
   to the Industry**

9:40 *Chickmenahalli, A., International Automotive Components,*
   Innovative Impact Absorbing Countermeasure for Door Side Impact

8:25 a.m.   Session 13 — Crash Safety   Pierce Arr

Session Chair: Chin-Hsu Lin (General Motors Company)

8:25 *Janapala, N.R., Stanford University,*
Crashworthiness of Composite Structures with Various Fiber Architectures

8:50 *Haufe, A., DYNAmore GmbH,*
Comparison of Recent Damage and Failure Models for Steel Materials in Crashworthiness Applications in LS-DYNA®

9:15 *Kosaka, I., Vanderplaats R&D Inc.,*
Improvement of Energy Absorption for the Side Member Using Topography Optimization

9:40 *Cerit, M.E., TOBB University of Economics and Technology,*
Improvement of the Energy Absorption Capacity of an Intercity Coach for `Frontal Crash Accidents`

8:25 a.m.   Session 14 — Optimization (1)   Rolls Roy

Session Chair: Larsgunnar Nilsson (Engineering Research Nordic AB)

8:25 *Roux, W., Livermore Software Technology Corporation,*
LS-OPT®/Topology Version 1

8:50 *Stander, N., Livermore Software Technology Corporation,*
An Overview of LS-OPT® Version 4.1

9:15 *Goel, T., Livermore Software Technology Corporation,*
Variable Screening Using Global Sensitivity Analysis

9:40 *Witowski, K., DYNAmore GmbH,*
**Capabilities of Result Visualization in LS-OPT® V4.1 - Demonstrated by Means
of Industrial Problems**

Session Chair: Cedric Xia (Ford Motor Company)

8:25 *Kato, Y., JSOL Corporation,*
Recent Developments in JSTAMP/NV for the Best Stamping Simulation Environment

8:50 *Li, K., Chrysler Group LLC,*
A Simple, Efficient and Robust Way to do Binder Wrap Simulation with LS-DYNA®
Implicit Solver

9:15 *Wiegand, K., Daimler AG,*
Developments in Line-Die Simulation and Exterior Surface Quality Check

9:40 *Zhu, X., Livermore Software Technology Corporation,*
Advancements in Material Modeling and Implicit Method for Metal Stamping Applications

Session Chair: Sunil Sinha (GE Infra Aviation US)

10:25 *Annett, M.S., NASA Langley Research Center,*
LS-DYNA® Analysis of a Full-Scale Helicopter Crash Test

10:50 *Shi, Y., Engineered Arresting Systems Corporation,*
EMAS Core Material Modeling with LS-DYNA®

11:15 *Barsotti, M., Protection Engineering Consultants, LLC,*
Comparison of FEM and SPH for Modeling a Crushable Foam Aircraft Arrestor Bed

11:40 *Polanco, M., ATK Space Systems,*
Use of LS-DYNA® to Assess the Energy Absorption Performance of a Shell-Based Kevlar™/Epoxy Composite Honeycomb

12:05 *Jackson, K.E., NASA Langley Research Center,*
Predicting the Dynamic Crushing Response of a Composite Honeycomb Energy Absorber Using Solid-Element-Based Models in LS-DYNA®

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10:25 a.m. Session 17 — Optimization (2)　　　　　　　　　Marquis E

Session Chair: R.J. Yang (Ford Motor Company)

10:25 *Sharma, N., Detroit Engineered Products Inc.,*
Multi-Disciplinary Optimization of a Sedan Using Size and Shape Parameterization

10:50 *Bojanowski, C., Argonne National Laboratory,*
Safety Assessment and Multi-Objective Optimization of a Paratransit Bus Structure

11:15 *Nilsson, L., Engineering Research Nordic AB,*
A New Method for the Structural Optimization of Product Families

11:40 *Cooper, J., Denton ATD, Inc.,*
Optimization Techniques in Conjunction with Complex ATD FE Models Using LS-DYNA®

12:05 *Müllerschön, H., DYNAmore GmbH,*
Application of Topology Optimization for Crash with LS-OPT®/Topology

10:25 a.m. Session 18 — Automotive (3)　　　　　　　　　Pierce Arro

Session Chair: Ye-Chen Pan (General Motors Company)

10:25 *Yang, S., IMMI,*
Investigations of Generalized Joint Stiffness Model in LSTC Hybrid III Rigid-FE Dummies

10:50 *Thole, C.A., Schloß Birlinghoven,*
Advanced Mode Analysis for Crash Simulation Results

11:15 *Liu, Y., University of Louisiana,*
Crashworthiness Analysis of Finite Element Truck Chassis Model Using LS-DYNA®

11:40 *Teng, H., Livermore Software Technology Corporation,*
The Recent Progress and Potential Applications of Corpuscular Method in LS-DYNA®

12:05 *Kondo, K., Fujitsu Limited,*
The Performance of Car Crash Simulation by LS-DYNA® Hybrid Parallel Version on Fujitsu FX1

Session Chair: Chris Galbraith (MFAC)

10:25 Vézina, *M., SimuTech Group Inc.*,
     Drop Test into Water and Wave Impact Simulations of a Novel 7-Meter Plastic Boat with LS-DYNA$^®$

10:50 *D'Amours, G., National Research Council Canada*,
     **Heat Transfer Simulation to Determine the Impact of Al-5Mg Arc Sprayed Coating onto
7075 T6 Al Alloy Fatigue Performance**

11:15 *Tutt, B., Airborne Systems*,
     Development of Parachute Simulation Techniques in LS-DYNA$^®$

11:40 *Ensan, M.N., National Research Council Canada*,
     Response of the Enhanced Polar Outflow Probe (e-POP) Instrument Under Shock Loading

12:05 *Abramov, A.V., STRELA*,
     Mathematical Modeling of Asteroid Falling into the Ocean

Session Chair: Mohamed S. Hamid (Delphi Corporation)

10:25 *Chen, M.M., U.S. Army Research Laboratory*,
     High Fidelity In-Bore Pressure Modeling

10:50 *Song, G., Wayne State University*,
     Vehicle and Occupant Safety Protection CAE Simulation

11:15 *Ibrahim, A., University of Missouri*,
     Numerical Prediction of the Dynamic Response of Prestressed Concrete Box Girder Bridges Under Blast Loads

11:40 *Ward, E., The Johns Hopkins University, APL*,
     Applying the Dynamic Relaxation Step to Determine Influence on Global Model Response from Shock Tube Loading for Mounted Hybrid III Head Neck Assembly

12:30 p.m.	Lunch	Great Lake

1:45 p.m.   Plenary Session -- Technology Today   **Great Lake**

1:45	Engineering Technology Associates, Inc.
1:55	FEA Information, Inc.
2:05	SGI
2:15	ARUP
2:25	Beta CAE Systems S.A.
2:35	d3View®
2:45	Penguin Computing Inc.

3:00 p.m.   **Coffee Break — *Sponsored by d3View***   **Great Lake**

3:15 p.m.   **Conference Prize Drawing**   **Great Lake**

3:30 p.m.   Plenary Presentation   **Great Lake**

John O. Hallquist   *"LS-DYNA® Recent Developments"*
President, LSTC

Closing Remarks: Wayne L. Mindle, LSTC

Post-Conference Training Seminars
June 9th & 10th

Seminars are conducted at the UNIVERSITY OF MICHIGAN-DEARBORN

Registration Opens at 8:30 a.m.
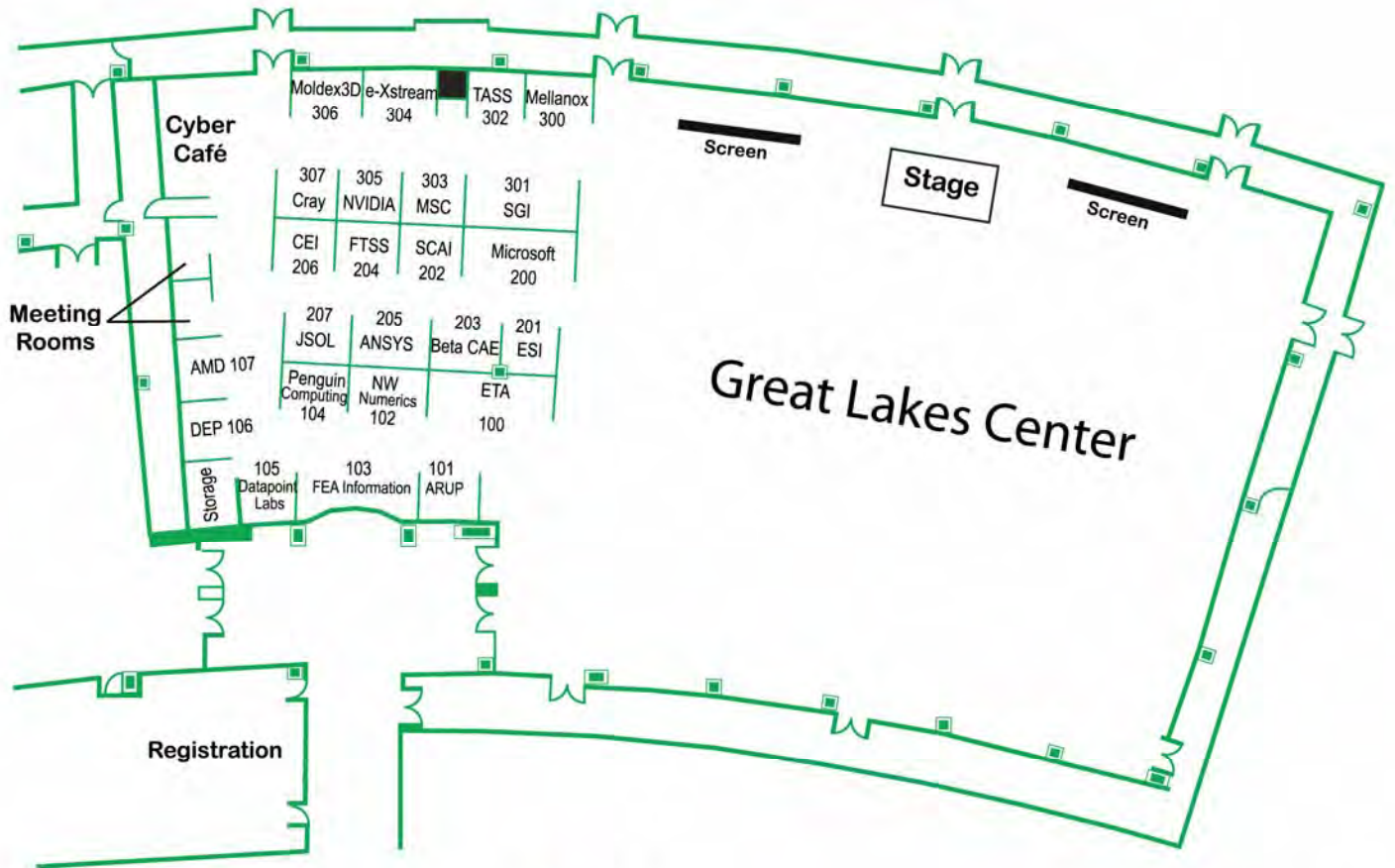**9:00 a.m. – 5:00 p.m.**

(Lunch is provided)

ALE & FSI in LS-DYNA®	*Mhamed Souli, Ph.D.*
Heat Transfer & Hot Stamping	*Arthur Shapiro, Ph.D.*
Impact / Dummies & Barriers	*Sarba Guha* *Christoph A. Maurath, D.Sc.* *Dilip Bhalsod*
Implicit Analysis	*Ala Tabiei, Ph.D.*
LS-OPT®	*Nielen Stander, Ph.D.*
Polymeric Material with LS-DYNA®	*Paul A. Du Bois*

EXHIBITORS MAP

11TH INTERNATIONAL LS-DYNA® USERS CONFERENCE

LSTC
Livermore Software
Technology Corp.

107 AMD
205 ANSYS
101 ARUP
203 Beta CAE
206 CEI
307 Cray
105 DatapointLabs
106 Detroit Engineered Products
201 ESI North America

100 ETA
304 e-Xstream Engineering
103 FEA Information Inc.
204 FTSS
207 JSOL Corporation
300 Mellanox
200 Microsoft
306 Moldex3D

303 MSC.Software
305 NVIDIA
102 NW Numerics
104 Penguin Computing
202 SCAI
301 SGI
302 TASS

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