

# *FEA* Information <http://www.feainformation.com>

Engineering Journal and Website Resource



11<sup>th</sup> Int'l LS-DYNA Conf.



Crash Test  
Dummy Models

India  
Saifuddin S



Tata Motors Ltd, Pune,  
India



SGI Octane III

Our 9th Anniversary  
October 2000 - 2009

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# Announcement - 9th Anniversary – 2000 - 2009

On our 9th Anniversary I'd like to thank our subscription participants and the authors that have published articles. This participation has helped us to achieve success, with our publication and our websites.

We will continue to publish technical information/articles for the global engineering community.

Feel free to send articles, conferences, events, symposiums and information that you wish to share with the engineering community.

Among the articles this month:

SGI Octane III Making Supercomputing Personal

Site News: Crash Test Dummy Models sites

Suri Bala – Stress Initialization in LS-DYNA

Saifuddin S - Tata Motors Ltd, Pune, India

On October 23 I'll be attending The Korean LS-DYNA Users Conference hosted by THEME. On October 27<sup>th</sup> I'll be attending The Japan LS-DYNA Users Conference hosted by JSOL.

If you are attending the above please say hello and share any ideas or suggestion you have for our Engineering Journal and Website Resources.

**Sincerely,**

***Marsha J. Victory***

**President, FEA Information Inc.**



**Marsha Victory**

**&**

**Cody**

<http://www.livermorehorses.com>

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## FEA Information Platinum Participants

<b>OASYS Ltd:</b> <a href="http://www.oasys-software.com/dyna/en/">http://www.oasys-software.com/dyna/en/</a>	<b>JSOL Corporation:</b> <a href="http://www.jsol.co.jp/english/cae">http://www.jsol.co.jp/english/cae</a>	<b>HP:</b> <a href="http://www.hp.com/">http://www.hp.com/</a>
<b>ETA:</b> <a href="http://www.eta.com">http://www.eta.com</a>	<b>INTEL:</b> <a href="http://www.intel.com">http://www.intel.com</a>	<b>ESI Group:</b> <a href="http://www.esi-group.com">http://www.esi-group.com</a>
<b>BETA CAE Systems S.A.:</b> <a href="http://www.beta-cae.com">http://www.beta-cae.com</a>	<b>APTEK:</b> <a href="http://www.aptek.com">http://www.aptek.com</a>	<b>SGI:</b> <a href="http://www.sgi.com">http://www.sgi.com</a>
<b>NEC:</b> <a href="http://www.nec.com">http://www.nec.com</a>	<b>Voltaire:</b> <a href="http://www.voltaire.com">http://www.voltaire.com</a>	<b>CRAY:</b> <a href="http://www.cray.com">http://www.cray.com</a>
<b>LSTC:</b> <a href="http://www.lstc.com">http://www.lstc.com</a>		



## FEATURED PAPER

Available On Line

### Material Modeling of Orthopedic Insoles

S. Kolling, M. Neubert, J. Subke, J. Griesemann

<http://www.dynalook.com/european-conf-2009/E-II-02.pdf>

#### Summary:

An experimental setup is presented for the material characterization of rubber-like sensomotoric insoles. This setup consists of local hardness measurements, quasi-static compression tests and dynamic testing using the 4a Impetus II pendulum test system [1]. A correlation between the measure of shore hardness and the stress strain relation of rubber-like materials is presented and verified in order to consider the inhomogeneous properties of insoles due to milling work of the manufacturing process. The dynamic response of the material is modeled by MAT\_SIMPLIFIED\_RUBBER/FOAM (material no. 181) in LS-DYNA [2] and MAT\_SIMPLIFIED\_RUBBER\_WITH\_DAMAG E respectively. The presented modeling technique is capable to describe the entire process chain from milling of the insole up to its usage.

A further experimental setup is presented for converting the inlay and the human

foot to a finite element model. By means of the Streifenlichttopometrie (SLT) [3] it is possible to record the complete surface of the object in a practically photorealistic fashion, i.e. three-dimensionally. In comparison with the classic method of photogrammetry, Streifenlichttopometrie is remarkably faster (10,000 point/s instead of 1 point/s). In this paper we present a modification of this method towards the measurement of dynamic processes.

Keywords: Biomechanics, Insoles, Dynamic Testing, Rubber-like Foams, MAT\_SIMPLIFIED\_RUBBER.

S. Kolling; M. Neubert: Giessen University of Applied Sciences, Dept. of Mechanical Engineering Laboratory; Laboratory of Mechanics

J. Sujke; J. Griesemann: Dept. of Hospital and Clinical Engineering, Environmental and Biotechnology, Biomechanics Lab.



## **SGI**

### **SGI Octane III**

### **Personal Supercomputer**

#### **SGI Octane III - Making Supercomputing Personal:**

SGI's new personal supercomputer that combines the power and performance capabilities of a high-performance desktside cluster with the portability and usability of a workstation. Octane III permits up to 80 high-performance cores and nearly 1TB of memory for unparalleled performance, yet is whisper-quiet for the workplace. Octane III also offers advanced NVIDIA graphics and GP-GPU capabilities, is pre-configured for immediate ease-of-use right out of the box, and is powerful enough for some of the most complex HPC applications in the world.

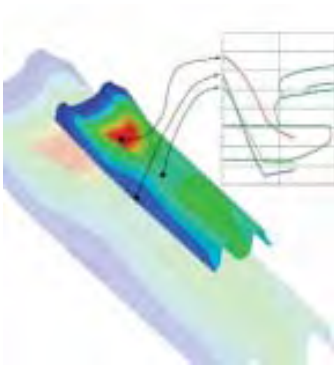
Livermore Software Technology Corporation (LSTC) continues the strong alliance and porting of LS-DYNA to SGI hardware. Dr. Wayne Mindle, LSTC Technical Sales said, "The SGI Octane III

addresses the requirements of the LS-DYNA personal supercomputer user with up to 80 high performance cores. Additionally it offers a powerful workstation solution for users of LS-PrePost obtaining dramatically higher levels of performance and advanced graphics"

Octane III takes high performance computing out of the data center and puts it at the desktside. It combines the immense power and performance capabilities of a high-performance cluster with the portability and usability of a workstation to enable a new era of personal innovation in strategic science, research, development and visualization.

For Complete Information on the Octane III visit:

<http://www.sgi.com/products/workstations/octaneIII/index.html>



## Recent Advances in Hot Stamping Simulation with LS-DYNA

Dr. Arthur Shapiro, LSTC

Dr. Xinhai Zhu, LSTC

Hosted by DYNAmore GmbH

November 11, 2009

Stuttgart, Germany

You are welcome to the event concentrating on recent advances in hot stamping with LS-DYNA. The event will be free of charge and will be held on the 11th November 2009, in Stuttgart (language: English).

Hot stamping of high strength steel grades increasingly has become established as a reliable manufacturing method for safety, relevant to car body components. Latest developments in this field resulted in more complex processes to produce components with a varying microstructure and thus with specifically adapted strength.

The process of simulation now necessitates the consideration of phase transformations. Therefore, a new material model has been implemented in LS-DYNA to allow the prediction of relevant mechanical properties of the final product. These can be used in following up crash or strength analysis. Furthermore, in the design of the recent hot stamping process types the die temperature control gains more importance. On the one hand an efficient die cooling is necessary, on the other hand die segments must be heated to specifically adapt the cooling rates of the

part. LS-DYNA offers options for thermal die design.

This event offers an insight into the current possibilities of process simulation with LS-DYNA in the context of the recent development trends of hot stamping.

We hope to have sparked your interest and would be very pleased to welcome you to the event.

1:00 pm - **Dr. André Haufe** (DYNAmore)  
Welcome/Introduction DYNAmore

1:15 pm - **Dr. Art Shapiro,**  
**Dr. Xinhai Zhu** (LSTC)  
Recent Advances in Hot Stamping  
Simulation - I

2:30 pm - Break

3:00 pm - **Dr. Art Shapiro,**  
**Dr. Xinhai Zhu** (LSTC)  
Recent Advances in Hot Stamping  
Simulation - II

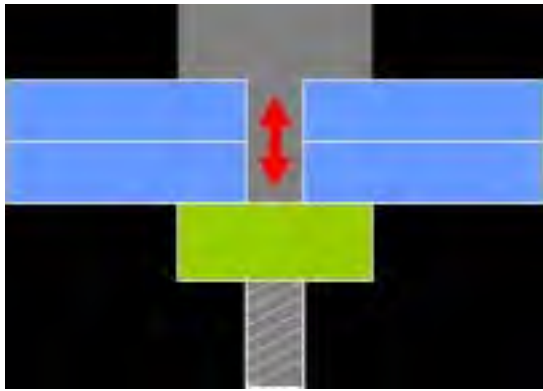
4:00 pm - **David Lorenz** (DYNAmore)  
Practical Guidelines for Hot Stamping  
Simulations with LS-DYNA

4:45 pm - Discussion

5:00 pm -End

For additional information visit <http://www.dynamore.de>

Contact: DYNAmore GmbH, Ms. Miriam Lang, [info@dynamore.de](mailto:info@dynamore.de)



## Stress Initialization in LS-DYNA

The Power Point Presentation can be viewed at:

<http://www.feapublications.com/pdf/StressInitialization.pdf>

For reprint or printing capabilities please contact Suri Bala.

The document will review all available methods to perform stress-initialization followed by transient event

Additionally, please visit two websites developed and operated by Suri Bala for LS-DYNA Information.

New way to view and explore LS-DYNA results

<http://www.d3view.com>

My LS-DYNA weblog

<http://blog.d3view.com>





## Crash Test Dummy Models Anthropomorphic Test Devices Websites/Information

Crash test dummy models simulate the human body responses related to crash impact. They are full-scale anthropomorphic test devices, also known as ATD's.

To be effective in simulating the human body these ATD's are developed to simulate varied human body proportions from weight, height, child, to an adult. The ATD's used in crash simulation additionally need to be able to simulate the responses of the human body, as it relates to such impacts as: side impact and frontal impact in a vehicle. Other uses are in determining the impact of the human body as it relates to pedestrian safety.

Among the variables that come in to use when using ATD's to determine the stress and response of the human body during impact: velocity of impact, crushing forces, how the body bends, and torque upon the body. The use of the crash test dummy models has expanded and is a necessity to be affordable to all industries from automotive to aircraft and other manufacturing, where safety and ergonomics is a key factor.

Many of the FEA Information Participants are key developers or have a major interest in the performance and availability of crash test dummy models, barrier models and models needed for safety.

In this first series on ATD's we are listing the following URL's for information and availability.

### **FEA Information**

<http://www.ls-dynadummymodels.com>

### **LSTC's Models**

<http://www.lstc.com/models/>

### **Arup Cellbond Barrier Models**

<http://www.oasys-software.com/dyna/en/fe-models/barrier.shtml>

### **Arup Pedestrian Impactor Models**

<http://www.oasys-software.com/dyna/en/fe-models/pedestrian.shtml>

### **Arup RCAR Barrier Model**

<http://www.oasys-software.com/dyna/en/fe-models/rcar.shtml>

### **DYNAMore Models for**

<http://www.dummymodels.com>

### **LS-DYNA Dummy Mailing List**

[sarba@lstc.com](mailto:sarba@lstc.com)



## Thailand

### LS-DYNA Distribution

by Kanda Chusook-Sims

#### Thailand News and FEA Thailand:

In response to local inquiries to purchase LS-DYNA locally with direct support from LSTC support engineers I have opened FEA Thailand with L.P.E. Engineering, a Thai Limited Liability Partnership through whom local sales will be processed.

FEA Thailand <http://www.feathailand.com> your internet source for demonstration licenses and pricing for Thailand. This site will be fully operational November 15<sup>th</sup> 2009. Please visit FEA Thailand now and on November 15<sup>th</sup>.

I am now in Thailand through November 30<sup>th</sup> visiting the universities that had contacted me for information.

I can be reached at [noi@lstc.com](mailto:noi@lstc.com) - I will be pleased to discuss your university requirements and needs in having LS-DYNA installed at your university.

Additionally, we are introducing into Thailand the LS-DYNA Learning Version. This version is the full version of LS-DYNA, but is restricted in elements to 10,000. The capabilities are not restricted. We have found this is an excellent way to learn LS-DYNA. It includes LSTC's software products: LS-DYNA, LS-PrePost, LS-OPT, LSTC Dummy and Barrier Models. To keep this limited learning version affordable technical support is limited.

#### About Noi

Kanda Chusook-Sims (Noi) graduated from Chiang Mai University, with a degree in Political Science and Public Administration. Currently employed by LSTC and located in Livermore, CA., You can reach her at [noi@lstc.com](mailto:noi@lstc.com) with your interests and questions on LS-DYNA.



**OASYS Nhance ARUP**

**Courtesy**

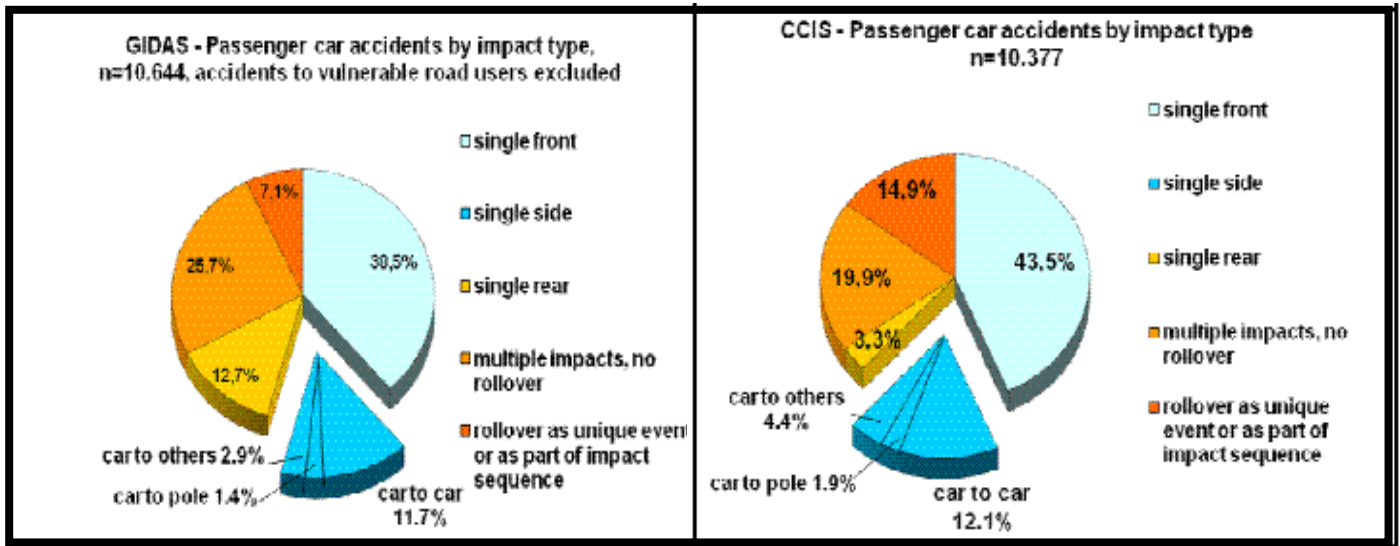
**Saifuddin S**

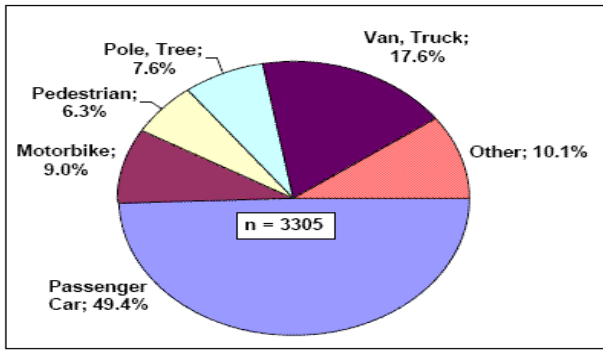
**(Tata Motors Ltd, Pune, India)**

According to the WHO, over 170,000 Europeans die in motor vehicle accidents each year, and a further 5 million are injured. Clearly, improved vehicle safety is essential to improve road transport safety. Accident patterns vary from country to country within Europe, but approximately a quarter of all serious-to-

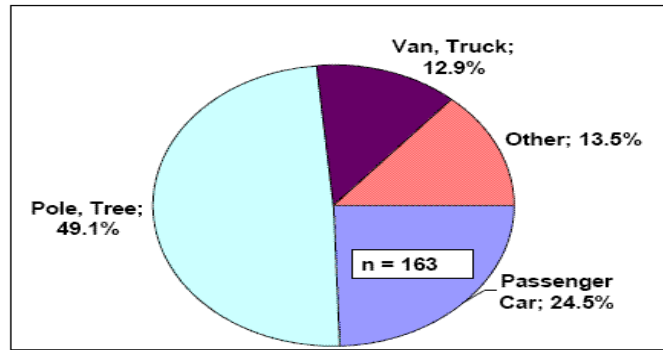
fatal injuries happen in side impact collisions.

Many of these injuries occur when one car runs into the side of another or into a fixed narrow object such as a tree or pole.





**MAIS 0+**



**MAIS 3+**

Accident Configuration	All involved occupants (MAIS0+)	Seriously injured occupants (MAIS3+)	Risk of a MAIS3+ injury
Car side - Car	1633	20	1.2%
Car side - Pole/Tree	251	40	15.9%
Car side - Truck	582	10	1.7%

**High risk in car-to-pole/tree**

The European New Car Assessment Program (Euro-NCAP) [a consortium of agencies], publish tests that provide consumers with accurate information based on in-depth research about the safety performance of individual car models in frontal and side collisions. To encourage manufacturers to fit head protection devices, pole test may be

performed. In the test, the car tested is propelled sideways at 29kph (18mph) into a rigid pole. The pole is relatively narrow, so there is major penetration into the side of the car. Since the occupant sits very close to the intruding structure, the chances of severe injuries are high. See Figure 3 for test setup and injury to occupant.

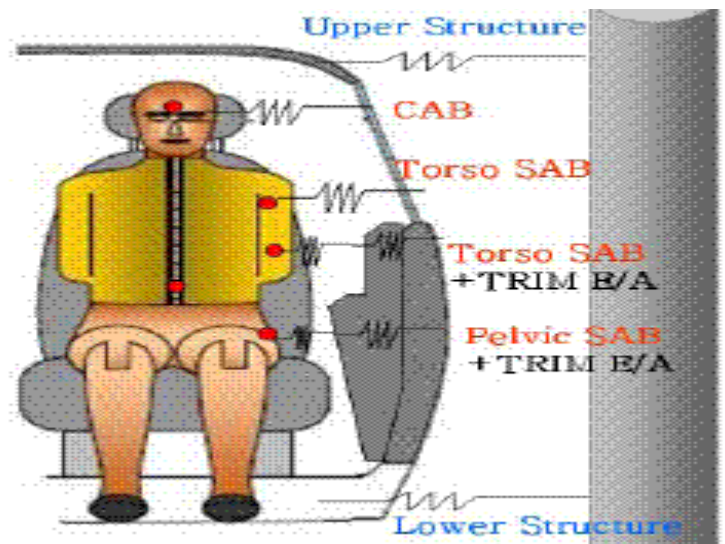
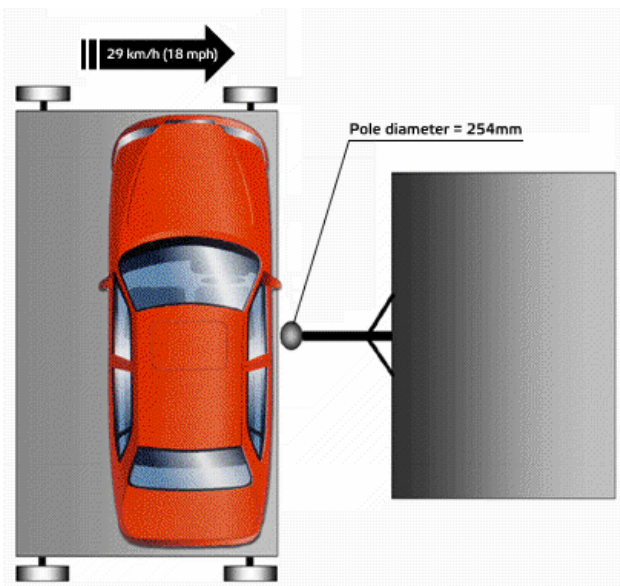
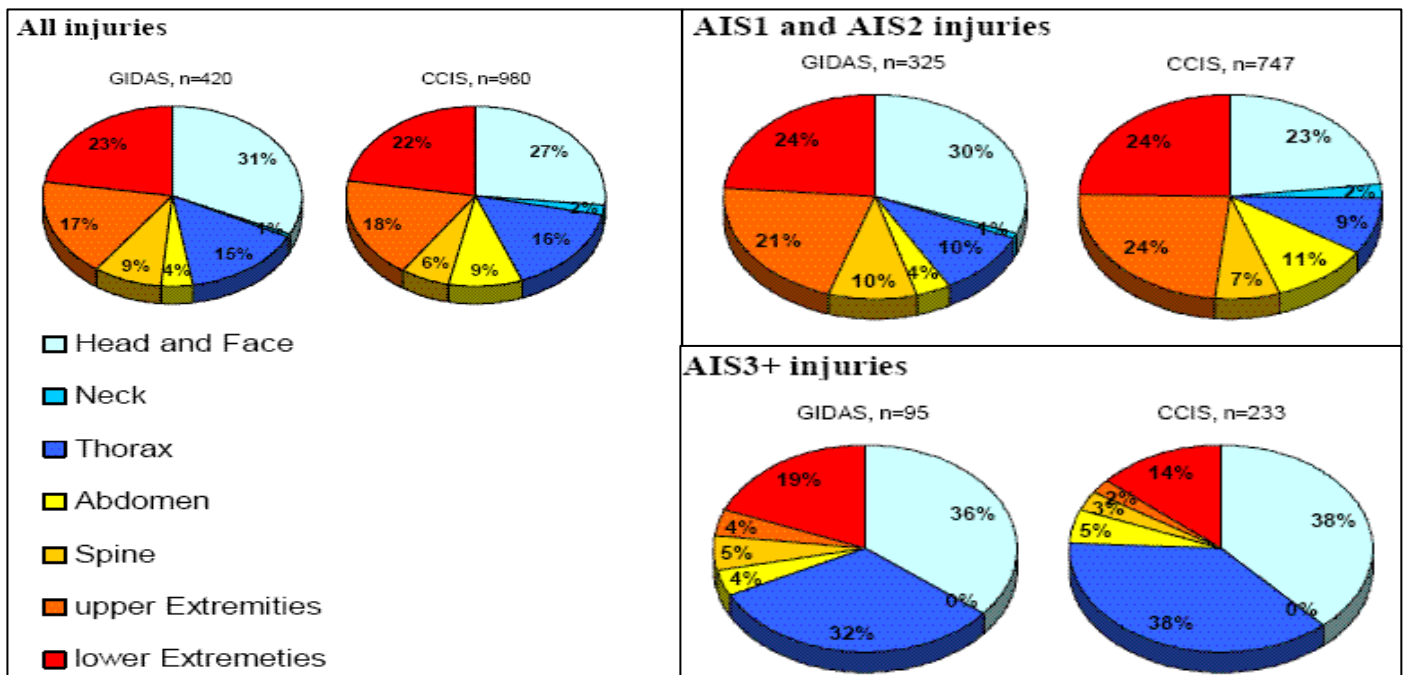


Figure 3. Euro-NCAP test procedure and dummy

Before 2009, Euro-NCAP has allowed the manufacturer to perform a pole test to demonstrate the efficacy of the head protection system where head protection safety feature is fitted. This test was optional and the assessment was focused on the head only and the result was used to augment the side impact score achieved in the MDB side impact test.

side pole impact test. The Euro-NCAP body has looked into various accident and injury statistics and has decided to make the pole test mandatory from year 2009 onwards. They have also modified the protocol to assess injuries on other critical body regions that might be affected in side pole impact event such as chest and abdomen

The side pole impact injury data collected by GIDAS and CCIS (Figure 4) shows the level of injuries to other body regions in



The new Euro-NCAP protocol with side pole impact mandatory test has definitely forced manufacturers to improve the occupant safety protection in side pole impact events. Manufacturers too have started improving their vehicle designs to cater the stringent requirements of side

pole impact. Extensive use of CAE tools not only helps in improving the vehicle design but also shortens the development time. The move in this direction will surely help in achieving the European Union's vision of zero accident fatality by year 2010.

**Courtesy: Saifuddin S (Tata Motors Ltd, Pune, India)**

For any further information on this topic, Kindly contact us at [india.support@arup.com](mailto:india.support@arup.com)





**Educational**  
**C. Greg Jensen**  
**Fulton College Professor of Global Engineering**  
**Mechanical Engineering**  
**Brigham Young University, Provo, UT**

[cjensen@byu.edu](mailto:cjensen@byu.edu)

**Reprint from a 2008 Article** with permission from Fulton College of Engineering and Technology Brigham Young University

The complete 2008 article:

<http://news.byu.edu/archive08-Jul-internationalcar.aspx>



**Note from FEA Information Inc.:**  
*"Although there were many universities, professors, students, and companies involved internationally with the F-1 racecar, we would like to introduce Professor C. Greg Jensen of Brigham Young University. Under his direction BYU's mechanical engineering students participated in four PACE global collaborative design projects to create a working F-1 racecar. C. Greg Jensen joined the faculty at BYU in 1983 and continues bringing students engineering dreams to working realities."*

Brigham Young University engineering students and faculty used their foreign language skills to lead collaborators from

20 universities in nine countries in designing and constructing a Formula One race car that was shipped to sponsor General Motors in July.



BYU was selected to lead the effort that spanned 16 time zones and nearly 12 months because of its high number of bilingual students and the caliber of its engineering program. Partner institutions are in China, South Korea, India, Brazil, Mexico, Canada, Sweden, Germany and the United States.



More than three-fourths of BYU students speak a language other than their native tongue, and that is part of what attracted GM and the Partners for the Advancement of Collaborative Engineering Education

(PACE) program, of which it is a key member.

"BYU is an ideal institution to lead the Global Vehicle Collaboration Project," said Elaine Chapman-Moore, manager of Global PACE Partnerships for GM. "The engineering curriculum at BYU embodies many of the best practices endorsed by PACE. . . [The] students speak multiple languages based upon the emphasis placed on this by the BYU and the LDS culture, and the accommodation of different cultures and ways of doing things creates a warm and inviting environment for global teams to collaborate."

Collectively, BYU team members spoke all six languages, aside from English, spoken among partner schools.

"We have top engineering students here at BYU who can use their language skills to get on the phone and speak technically with our partners abroad," said C. Greg Jensen, professor of mechanical engineering in BYU's Ira A. Fulton College of Engineering and Technology. "You can't find that at most other schools."

The students involved in the project experienced hands-on training, real-life problem-solving and exposure to the increasingly global marketplace of ideas, valuable resources in today's international economy.

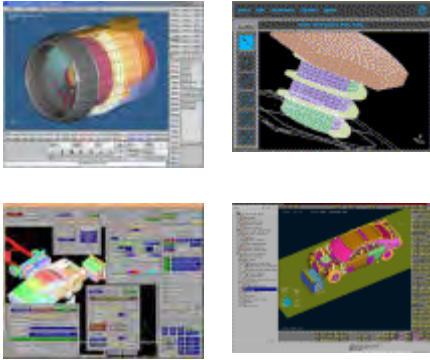
"As the liaison between the Chinese schools, it's been really interesting to see how people from different cultures bring varied perspective to a project like this," said mechanical engineering major Kenny Mix, who speaks Mandarin. "I took a class about global challenges that engineering companies are facing, and almost every class period I would think to myself, 'Yep, I see that every day with PACE.'"

Part of the global challenge included simultaneously building various automotive components thousands of miles apart. Only in February did students begin traveling to BYU from around the world to personally deliver and assemble their portions of the project.



The race car was displayed at GM for several weeks before it is shipped to South Korea, where engineers from GM Daewoo will test the car for safety and durability.

Once testing is complete, GM will work with BYU and Korean schools to make final preparations for a time trial on a Formula One race track.



## 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.  $\mu$ ETA, a thriving innovative software with special features for the high performance and effortless 3D & 2D post-processing of LS-DYNA results.

### **Engineering Technology Associates, Inc.**

<http://www.eta.com>

FEMB - Engineering Technology Associates' Finite Element Model Builder (FEMB) is a finite element pre- and post-processor for use with all major analysis codes and CAD Software.

### **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.





## Educational Community

### Global Connections

#### China

##### **Tsinghua University**

Dr. Qing Zhou

#### India

##### **Indian Institute of Science**

Dr. Anindya Deb

#### Italy

##### **Prode – Elasis & Univ. of Napoli, Frederico II**

Prof. Gennaro Monacelli

#### Russia

##### **St. Petersburg State Tech. University**

Dr. Alexey I. Borovkov

#### Turkey

##### **Bogazici University**

Dr. Sami Kilic

#### USA

##### **Northwestern University**

Dr. Ted Belytschko

##### **Univ. of California – San Diego**

Dr. David Benson

##### **Ohio University**

Dr. Bhavin V. Mehta

#### **The Ohio State U – ERC/NSM**

Dr. Taylan Altan

#### **University of Cincinnati**

Dr. Ala Tabiei

#### **University of Nebraska**

Prof. John D. Reid

#### **Connecticut State University**

Prof. Thomas Vasko



## LS-DYNA Distributors

**LS-DYNA® Solution Package**  
**One Fee All Inclusive**  
**LS-PrePost® - LS-OPT®**  
**LSTC Dummy Models**  
**LSTC Barrier Models**

### Alpha order by Country

<b>Australia</b>	Leading Eng. Analysis Providers - LEAP <a href="http://www.leapaust.com.au/">http://www.leapaust.com.au/</a> <a href="mailto:info@leapaust.com.au">info@leapaust.com.au</a>
<b>CANADA</b>	Corp. – MFAC <a href="http://www.mfac.com/">http://www.mfac.com/</a> <a href="mailto:galb@mfac.com">galb@mfac.com</a>
<b>CHINA</b>	OASYS Ltd. (software house of Arup) <a href="http://www.oasys-software.com/dyna/en">http://www.oasys-software.com/dyna/en</a> <a href="mailto:stephen.zhao@arup.com">stephen.zhao@arup.com</a>
<b>FRANCE</b>	ALYOTECH TECH. <a href="http://www.alyotech.fr">http://www.alyotech.fr</a> <a href="mailto:nima.edjitemai@alyotech.fr">nima.edjitemai@alyotech.fr</a>
<b>FRANCE</b>	ALLIANCE SVCE. PLUS - AS+ <a href="http://www.asplus.fr/ls-dyna">http://www.asplus.fr/ls-dyna</a> <a href="mailto:v.lapoujade@asplus.fr">v.lapoujade@asplus.fr</a>
<b>GERMANY</b>	CADFEM <a href="http://www.cadfem.de/en">http://www.cadfem.de/en</a> <a href="mailto:lsdyna@cadfem.de">lsdyna@cadfem.de</a>
<b>GERMANY</b>	DYNAmore <a href="http://www.dynamore.de/">http://www.dynamore.de/</a> <a href="mailto:uli.franz@dynamore.de">uli.franz@dynamore.de</a>
<b>INDIA</b>	OASYS Ltd. (software house of Arup) <a href="http://www.oasys-software.com/dyna/en">http://www.oasys-software.com/dyna/en</a> <a href="mailto:lavendra.singh@arup.com">lavendra.singh@arup.com</a>
<b>INDIA</b>	EASi Engineering <a href="http://www.easi.com/">http://www.easi.com/</a> <a href="mailto:rvenkate@easi.com">rvenkate@easi.com</a>

<b>INDIA</b>	CADFEM Eng. Svce India <a href="http://www.cadfem.in/">http://www.cadfem.in/</a> <a href="mailto:info@cadfem.in">info@cadfem.in</a>
<b>Italy</b>	EnginSoft SpA <a href="http://www.enginsoft.it/">http://www.enginsoft.it/</a> <a href="mailto:info@enginsoft.it">info@enginsoft.it</a>
<b>Italy</b>	DYNAmore <a href="http://www.dynamore.de/">http://www.dynamore.de/</a> <a href="mailto:uli.franz@dynamore.de">uli.franz@dynamore.de</a>
<b>JAPAN</b>	JSOL Corporation <a href="http://www.jsol.co.jp/english/cae">http://www.jsol.co.jp/english/cae</a> <a href="mailto:cae-info@sci.jsol.co.jp">cae-info@sci.jsol.co.jp</a>
<b>JAPAN</b>	ITOCHU Techno-Solutions Corp. <a href="http://www.engineering-eye.com/">http://www.engineering-eye.com/</a> <a href="mailto:ls-dyna@ctc-g.co.jp">ls-dyna@ctc-g.co.jp</a>
<b>JAPAN</b>	FUJITSU <a href="http://jp.fujitsu.com/solutions/hpc/app/lsdyna/">http://jp.fujitsu.com/solutions/hpc/app/lsdyna/</a>
<b>KOREA</b>	Theme Engineering <a href="http://www.lsdyna.co.kr/">http://www.lsdyna.co.kr/</a> <a href="mailto:wschung@kornet.com">wschung@kornet.com</a>
<b>KOREA</b>	Korean Simulation Tech. <a href="http://www.kostech.co.kr">http://www.kostech.co.kr</a> <a href="mailto:young@kostech.co.kr">young@kostech.co.kr</a>
<b>Netherlands</b>	Infinite Simulation Systems, BV <a href="http://www.infinite.nl/">http://www.infinite.nl/</a> <a href="mailto:j.mathjissen@infinite.nl">j.mathjissen@infinite.nl</a>
<b>SWEDEN</b>	Engineering Research AB <a href="http://www.erab.se/">http://www.erab.se/</a> <a href="mailto:sales@erab.se">sales@erab.se</a>
<b>TAIWAN</b>	Flotrend Corporation <a href="http://www.flotrend.com.tw/">http://www.flotrend.com.tw/</a> <a href="mailto:gary@flotrend.tw">gary@flotrend.tw</a>
<b>RUSSIA</b>	State Unitary Enterprise –STRELA <a href="mailto:info@ls-dynarussia.com">info@ls-dynarussia.com</a>

<b>United Kingdom</b>	<p>OVE ARUP &amp; PARTNERS</p> <p><a href="http://www.oasys-software.com/dyna/en/">http://www.oasys-software.com/dyna/en/</a>    <a href="mailto:dyna.sales@arup.com">dyna.sales@arup.com</a></p>
<b>USA</b>	<p>Livermore Software Tech. Corp. - LSTC</p> <p><a href="http://www.lstc.com/">http://www.lstc.com/</a>    <a href="mailto:sales@lstc.com">sales@lstc.com</a></p>
<b>USA</b>	<p>Engineering Tech. Assc. Inc. – ETA</p> <p><a href="http://www.eta.com/">http://www.eta.com/</a>    <a href="mailto:sales@eta.com">sales@eta.com</a></p>
<b>USA</b>	<p>DYNAMAX</p> <p><a href="http://www.dynamax-inc.com/">http://www.dynamax-inc.com/</a>    <a href="mailto:sales@dynamax-inc.com">sales@dynamax-inc.com</a></p>



## Finite Element Analysis (FEA) Consulting & Engineering Service

FEA consultants use a wide range of software simulation programs for controlling the modeling and analysis of structures, systems, products and many other applications. Used by government, homeland security, court trials, and many other industries.

### North America

<p><b>Karagozian &amp; Case (K &amp; C)</b> <a href="http://www.kcse.com">http://www.kcse.com</a> Shangrui Lan (818) 303-1268</p>	<p><b>CAE Associates</b> <a href="http://www.caeai.com">http://www.caeai.com</a></p>	<p><b>Schwer Engineering &amp; Consulting Services</b> <a href="http://schwer.net">http://schwer.net</a> Len Schwer (707) 837-0559</p>
<p><b>KBEC</b> Khan Bui (512) 363-2739</p>	<p><b>Predictive Engineering</b> <a href="http://www.predictiveengineering.com">http://www.predictiveengineering.com</a> George Laird (800) 345-4671</p>	

### EU – Pacific Rim

<p><b>AU LEAP</b> <a href="http://www.leapaust.com">http://www.leapaust.com</a> Greg Horner 02 8966 7888</p>	<p><b>UK ARUP</b> <a href="http://www.oasys-software.com/dyna/en/">http://www.oasys-software.com/dyna/en/</a> Brian Walker 44 (0) 1212 133317</p>	<p><b>UK Dutton Simulation</b> <a href="http://www.duttonsimulation.com">http://www.duttonsimulation.com</a> Trevor Dutton 44 (0) 1926 732147</p>
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Software & Hardware Alliances

Software Solutions

SMP/MPP Hardware & OS

MPP & Interconnect MPI

### **ETA – DYNAFORM**

<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.

### **APTEK**

<http://www.apttek.com>

The MMCD is a graphics-based and menu-driven program that interfaces with the LS-DYNA library of material models and the LS-OPT optimization code. The core of the MMCD is the driver, which calculates the stress-

strain behavior of material models driven by combinations of strain increments and stress boundary conditions, i.e. pure shear stress, and combinations of uniaxial, biaxial, and triaxial compression and tension. MMCD input and output is accessed via pre- and post-processors; graphical user interfaces (GUIs) for easily selecting the material model parameters and load histories, and for plotting the output in both two (stress-strain curves) and three (yield surfaces) dimensions. The pre-processor, driver, and post-processor are combined into a web downloadable software package that operates seamlessly as a single code.

#### **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 or 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

## Participant LS-DYNA® SMP & MPP Hardware and OS

### November we will adding SGI

<b>FUJITSU</b>	<b>HP</b>	<b>HP</b>	<b>HP</b>	<b>HP</b>
Prime Power	PA-8X00	IA-64	Opteron	Alpha
SUN OS 5.8	HP-UX 11.11. and above	HP-UX 11.22 and above	Linux	True 64
<b>INTEL</b>	<b>INTEL</b>	<b>INTEL</b>	<b>NEC</b>	
IA32	IA64	Xeon EMT64	SX6	
Linux, Windows	Linux	Linux, Windows 64	Super-UX	

### MPP and Interconnect MPI

<b>CRAY</b>	<b>O/S</b>	<b>HPC Interconnect</b>	<b>MPI Software</b>
CX1	Windows HPC Server 2008, Linux	InfiniB	MSMPI, HP MPI, INTEL MPI
XT5	Linux	SeaStar2	Cray MPI
XT5M	Linux	SeaStar1	Cray MPI
<b>FUJITSU</b>			
Prime Power	SUN OS 5.8		
<b>HP</b>			
PA8000	HPUX		
IA64	HPUX		
<b>INTEL</b>			
IA32	Linux, Windows	InfiniBand (Voltaire), MyriCom	MPICH, HP MPI, OpenMPI
IA64	Linux		MPICH, HP MPI, OpenMPI
Xeon EMT 64	Linux	InfiniBand (Voltaire), MyriCom, PathScale InfiniPath	MPICH, HP MPI, OpenMPI, INTEL MPI
<b>NEC</b>			
NEX SX6	Super-UX		



## Training Classes



## Training Courses

**October 2009**

Send listings to [agi99@aol.com](mailto:agi99@aol.com)

### **Alyotech Technologies located in France**

[http://www.alyotech.fr/fileadmin/DocumentsTelecharges/Planning\\_des\\_ formations\\_2009\\_V1\\_1.pdf](http://www.alyotech.fr/fileadmin/DocumentsTelecharges/Planning_des_ formations_2009_V1_1.pdf)

- October 6<sup>th</sup> & 7<sup>th</sup> Geo-material and Concrete Modeling
- October 8<sup>th</sup> & 9<sup>th</sup> Blast and Penetration
- October 22<sup>nd</sup> & 23<sup>rd</sup> The SPH Method in LS-DYNA
- November 18<sup>th</sup> – 20<sup>th</sup> Implicit Capabilities in LS-DYNA

### **CADFEM India**

<http://www.cadfem.in/training/overview.htm> |

- October 8<sup>th</sup> Introduction to LS-DYNA
- November 5<sup>th</sup> – Introduction to LS-DYNA

### **OASYS – UK**

<http://www.oasys-software.com/dyna/en/training>

- October 22<sup>nd</sup> – Implicit Capabilities



## Course Announcement Blast Effects Design and Analysis

Karagozian & Case (K&C)

The University of Western Australia

### Blast Effects Design / Analysis Short Course by K&C

Karagozian & Case (K&C), The University of Western Australia and The University of Adelaide jointly offer a short course on "Blast Effects Design and Analysis" at the University of Adelaide on December 1 to 2, 2009.

Many K&C's designs for protective structures and systems that were developed through the high fidelity physics based (HFPB) analyses (most of them are LS-DYNA models) will be presented. The program is available at

John Crawford and Shengrui Lan of Karagozian & Case, among others, will be conducting the short two-day course on Blast Effects. The seminar will cover state of the art protective technologies and blast analysis and mitigation scenarios.

[http://www.kcse.com/pdfs/BlastEffectsCourse\\_Australia.pdf](http://www.kcse.com/pdfs/BlastEffectsCourse_Australia.pdf).

**Among the Course Program are the following:**

#### Introduction:

- Overview: the state-of-the-arts in protective technology

- Protection plan and design for buildings
- Perimeter protection
- Mitigation of debris hazards
- Mitigation of progressive collapse of a building
- Mitigation of internal explosion

#### Blast loads & Engineering Tools

- Blast loads on structures
- Calculating tools for predicting blast effects
- PI-curves for components, range to effects curves for components
- Dynamic theory—lumped mass versus continuum models
- SDOF: shape function, resistance function, stiffness versus mass, ductility, algorithm
- UFC 3-340-02 / TM 5-1300 / P-397, dynamic increase factors, SDOF charts, P-I tools for predicting building response
- K&C and other design/assessment codes

#### Ground shock

- Overview, stress wave propagation

- Empirical formulae of stress wave attenuation, comparison and discussion
- Numerical simulation and field blast tests
- Rock mass damage to underground explosions
- Allowable vibration limits for underground structures, criteria for rock spall and explosion communication
- Safe separation distance of underground structures

#### **Ground shock effects on structures**

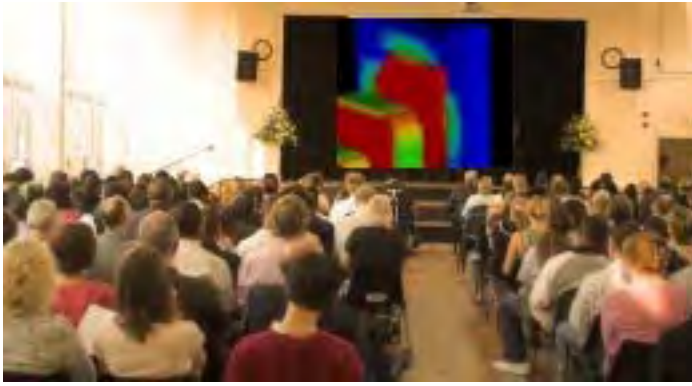
- Allowable vibration limits for above ground structures
- Response spectrum, damage criteria
- Dynamic structural response to high-frequency short duration blast ground motion

- Laboratory tests and numerical calculation
- Damage mechanism of RC Structures with or without masonry infill
- Mitigation

#### **HFPB models, use and theory**

- Continuum versus structural FEM modeling
- Formulations: CFD CSD, explicit, implicit, Lagrangian, Eulerian, etc.
- Material models for blast effects: concrete, steel, soil, polymers
- Advanced modeling: fracture, meshfree, adaptive, coupled
- Calculation/simulation examples

Registration is open until Mid November 2009.



**Conferences  
Events  
Symposiums**

<b>Start</b>	<b>Country</b>	<b>2009</b>
Nov 09	Iran	<b>ICCT09 1st International Conference on Concrete</b> <a href="http://www.icct.ir/">http://www.icct.ir/</a>
Nov 12	Germany	<b>8<sup>th</sup> German LS-DYNA Forum</b> <a href="http://www.dynamore.de/conferences/upcoming-conferences.">http://www.dynamore.de/conferences/upcoming-conferences.</a>
Nov. 14	US	<b>SC2009</b> <a href="http://sc09.supercomputing.org/">http://sc09.supercomputing.org/</a>
Nov 18	Germany	<b>ANSYS Conf. &amp; 27<sup>th</sup> CADFEM Users Meeting</b> <a href="http://www.usersmeeting.com/">http://www.usersmeeting.com/</a>

**2010**

<b>Start</b>	<b>Country</b>	
May 16	France	"Generalized/extended FEM, meshless and related approaches" <a href="http://www.eccm2010.org">http://www.eccm2010.org</a>
June 06	US	11 <sup>th</sup> LS-DYNA International Users Conference <a href="http://www.ls-dynaconferences.com">http://www.ls-dynaconferences.com</a>
June 23	US	"Predictive Science and Technology in Mechanics and Materials." <a href="http://www.cavs.msstate.edu/symposium">http://www.cavs.msstate.edu/symposium</a>

## LS-DYNA Update Forum 2009

DYNAmore invites to the LS-DYNA Update Forum, 12th November 2009, in Filderstadt near Stuttgart, Germany.

Following the successful European LS-DYNA Conference from 14th – 15th May in Salzburg, Austria, this time the local LS-DYNA conference will be held as a one day update event in German language.

The event will be ideally for LS-DYNA users to share and discuss their experiences, to obtain information on upcoming features of LS-DYNA and to learn more about new application areas.

Well known presenters from universities, research organizations and industry, e.g. BMW, Daimler, Dow Automotive, EADS, Faurecia, Matfem, Opel, Thyssen-Krupp Steel und Volkswagen will give presentations about their work with LS-DYNA focused on crash, connections, material modelling, and metal forming. Additionally, developers from LSTC and DYNAmore and Dr. John O. Hallquist (President of LSTC) will give an overview about recent and future developments in LS-DYNA.

The event will be accompanied by an exhibition featuring the latest software

and hardware developments related to LS-DYNA.

In the same week we offer a series of interesting seminars: „Material Models in LS-DYNA“ (in German), „Identification of Material Parameters with LS-OPT“ (in German) and „Corpuscular method (CPM) for airbag simulation“ (in English).

The attendance of the conference is free of charge – DYNAmore kindly asks for your registration for organization purposes.

More information at:

<http://www.dynamore.de/forum09>

Download agenda:

<http://www.dynamore.de/forum09/agenda.pdf>

For further information please contact:

DYNAmore GmbH

Industriestr. 2

70565 Stuttgart, Germany

Tel. +49 (0)711 - 459600 - 0,

Fax +49 (0)711 - 459600 - 29

E-Mail: [info@dynamore.de](mailto:info@dynamore.de)

<http://www.dynamore.de>

# LS-DYNA Update Forum 2009 Agenda

Agenda 12th November 2009

## Plenary presentations (9.00 am – 12:15 am)

### **Recent Developments in LS-DYNA - I**

J. Hallquist (LSTC)

### **Simulation durch Kombination impliziter und expliziter Verfahren in LS-DYNA**

Prof. M. Pitzer (FH Gießen-Friedberg); L. Stahl (Peng GmbH)

### **Produktiveinsatz von LS-DYNA in der Umformtechnik**

J. Meinhardt, A. Lipp, M. Fleischer (BMW AG)

### **Multi-Skalen Modellierung von Faserkunststoffverbunden: Von der Mikro- zur Makroebene**

P. Middendorf (EADS Innovation Works)

### **Ein- und mehrachsiges Werkstoffverhalten bei hohen Verformungsgeschwindigkeiten von Metallen**

Prof. L. Meyer (Nordmetall / TU Chemnitz); H. Klamser (Dr. Ing. h.c. F. Porsche AG)

## Parallel 1

### **Crash / Material**

**(2:00 pm – 4:45 pm)**

### **Simulation von pressgehärtetem Stahl mit MAT\_GURSON\_JC**

R. Müller, S. Schmitt (Adam Opel GmbH)

### **Ganzheitlicher Simulationsansatz zur Versagensprognose von widerstandspunktgeschweißten Stahlblechverbindungen**

R. Röttger (ThyssenKrupp Steel AG); D. Pieronek (FKA);  
A. Marx (DOC GmbH) \*

### **Kosten-Nutzen Konflikt bei der Materialmodellierung**

B. Reichert (Faurecia Autositze GmbH)

### **Mehrlagige Gewebestrukturen unter Impaktbelastung**

M. Boljen, Prof. S. Hiermaier (Fraunhofer-Institut EMI)

### **Potentiale polymerbasierter Karosseriewerkstoffe im Vollfahrzeug- Crash**

A. Droste, O. Bijjargi, D. Wang, B. Qi (Dow Automotive)

### **Möglichkeiten zur Modellierung von Kohäsivverbindungen in LS-DYNA**

T. Erhart, A. Haufe (DYNAmore GmbH)

## **Parallel 2**

### **Metal Forming**

**(2:00 pm – 4:40 pm)**

#### **Simulation des Rollfalzens mit LS-DYNA**

U. Eisele, Prof. K. Roll (Daimler AG)

#### **Thermo-mechanical Coupled Simulation of Hot Forming Processes Considering Die Cooling**

M. Medricky, R. Struck (Volkswagen AG)

#### **Simulation of Hot Stamping Processes with LS-DYNA**

A. Shapiro (LSTC)

#### **Verfahren zur Extrapolation der Fließkurve aus den Daten des Zugversuches jenseits der Gleichmaßdehnung**

M.-S. Aydin, J. Gerlach, L. Kessler (ThyssenKrupp Steel AG)

#### **Verbesserte Versagensprognose in der Blechumformsimulation mit dem Materialmodell MF-GenYld+CrachFEM**

G. Oberhofer, H. Gese (MATFEM)

#### **New LS-DYNA Features for Metal Forming**

X. Zhu (LSTC)

## **Plenary presentation**

**(4:40 pm – 5:30 pm)**

#### **Recent Developments in LS-DYNA - II**

J. Hallquist (LSTC)

**Beverages and Snacks - Exchange of Experience / Discussion (5:30pm – 7:00pm)**

# 9<sup>th</sup> International Symposium Computer Methods in Biomechanics and Biomedical Engineering

[www.cmbbe2010.cf.ac.uk](http://www.cmbbe2010.cf.ac.uk)

Scope and objectives:

CMBBE2010 is to be held at the Westin Hotel, Valencia, Spain, 24–27 February 2010. The themes and topics for this 9th symposium in the series have been developed through interaction with international experts and therefore reflect the latest development in computer methods in biomechanics, biomedical technology and modelling of biological structures. Key objectives are to highlight and communicate new areas of future potential as well as presenting new techniques that are being successfully applied across medical technology, biomechanics and the healthcare sector. Interdisciplinary research which overarches medical technology, imaging/tissue characterisation, biosciences and applications in clinical practice will be placed at the forefront of the meeting agenda.

LSTC and Arup are two of the sponsors of the symposium.

Symposium Organisers:

John Middleton (Chair), Sam L Evans and Cathy Holt (Cardiff University, UK)

Christopher Jacobs (Columbia University, New York, USA)

Brian Walker (Arup, Birmingham, UK)

Carlos Atienza (IBV, Valencia, Spain)

- 30 Plenary presentations by keynote speakers
- 30 Oral and 6 poster presentation sessions
- Special sessions on emerging topics
- Software and medical technology exhibits
- Sponsored prizes for best research papers and posters

Young researchers are very welcome and reduced fee together with significant student prizes are offered

The meeting has always promoted international collaboration and networking and this is evidenced through the well-known research groups, commercial companies and scientific organisations who continue to present their research and support and sponsor the CMBBE series. If you wish to exhibit, sponsor or organise a special session then please do contact the organisers.

LS-DYNA users are invited to submit papers, where the code has been used in the fields of biomechanics and biomedical engineering.





**The 11<sup>th</sup> International,  
LS-DYNA® Users Conference**

**June 06-08, 2010**

**Hosted by Livermore  
SoftwareTechnology Corp.**

To be held at The Hyatt Regency  
Dearborn, MI

<b>Abstract Due:</b>  December 4, 2009	email abstract to: <a href="mailto:papers@lstc.com">papers@lstc.com</a>  <b>subject line for e-mail – Abstract LS-DYNA Conference 2010</b>	<b>Notification:</b>  January 22, 2010
<b>Paper Deadline:</b> March 05, 2010	Conference Papers: The presenter of each accepted paper will receive free admission to the conference, provided that the presenter registers for a room at the Hyatt Regency Dearborn under LSTC Conference registration	

**Application Areas Being Accepted for Paper Submission:**

- Aerospace
- Automotive Crashworthiness
- Ballistic and Penetration
- Biomechanics
- Civil Engineering
- Compressible Fluid Dynamics
- Electro Magnetics
- Heat Transfer
- Impact and Drop Testing
- Manufacturing Processes
- Metal Forming
- Modeling Techniques
- Nuclear Applications
- Occupant Safety
- Seismic Engineering
- Ship Building
- Transportation
- Virtual Proving Ground

**Abstract Length:** Approximately 300 words, please include figures, if possible  
**Paper Length:** Maximum of 3000 words, single-spaced, on 8-1/2" x 11" paper  
**Format:** A MS Word template will be provided  
**Contact:** [papers@lstc.com](mailto:papers@lstc.com)

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**Livermore Software Technology Corp.**  
**(925) 449-2500**  
<http://www.ls-dynaconferences.com>



## Press Releases

### Alpha Order

HP

INTEL

VOLTAIRE

#### **HP Delivers Affordable, High-quality Computing with New Compaq Consumer and Commercial PCs**

PALO ALTO, Calif., Oct. 13, 2009

HP today unveiled new Compaq PCs that provide families, students and small businesses the computing capabilities they need at a price they desire.

Compaq products offer essential features, attractive designs and reliable performance at an affordable price, placing computing freedom and productivity within reach of more customers.

Available globally, Compaq PCs meet the needs of consumers and small business customers especially well in emerging and developing countries where first-time PC purchases are made on limited budgets after great consideration. In the United States, where the economy is more than ever a factor in spending, the Compaq brand provides consumers and small businesses flexibility in PC purchases.

"Everyone deserves access to a high-quality computer, and HP makes that possible with the Compaq brand," said Steven Hoffman, director of worldwide marketing, Personal Systems Group, HP. "The Compaq portfolio delivers great design, strong performance and reliability

that customers need for 'just right computing' at 'just the right price.'"

Consumers will appreciate the design of the Compaq Presario CQ61z notebook PC. It features a piano black imprint finish with a silver panel that covers the palmrest and touchpad for a clean contrast. It balances mobility and performance and has a 15.6-inch diagonal high-definition display with 16:9 ratio and six-cell lithium-ion battery. Ideal for families and students looking for a mobile PC, the CQ61z starts at \$399 after \$100 instant savings available Oct. 18 to Dec.19.(1)

The Compaq Presario 4010f desktop PC delivers all the productivity of a traditional PC in a sleek, streamlined desktop design. It comes fully loaded with essential features, including an AMD Sempron™ processor, NVIDIA GeForce integrated graphics and a 250 gigabyte (GB)(2) hard drive. Capable of storing up to 49,000 songs or 39,000 photos, this desktop PC is great for families and students and starts at \$309.(1)

The Compaq 500B Series desktop PCs are designed for budget-conscious small businesses that need PCs that are easy to set up, use and expand. The Compaq 500B and 505B desktop PCs, available with Intel or AMD processors respectively,

offer businesses efficient and reliable performance with a Windows® 7 operating system,(3) and configurable hard drives and memory. The series offers an array of bays and ports for business users who need expandability for future growth and with more than 100,000 hours of testing, they are built to last. The Compaq 500B and 505B desktop PCs start at \$359 and \$409, respectively.(1)

All products are expected to be available Oct. 22.

#### **About HP**

HP, the world's largest technology company, simplifies the technology experience for consumers and businesses with a portfolio that spans printing, personal computing, software, services and IT infrastructure. More information about HP (NYSE: HPQ) is available at <http://www.hp.com/>.

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(1) Estimated U.S. street prices. Actual prices may vary.

(2) For hard drives, 1 GB = 1 billion bytes. Actual formatted capacity is less. Up to 14 GB of storage space is reserved for the system recovery software.

(3) Systems may require upgraded and/or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. See

<http://www.microsoft.com/windows/windows-7/> for details.

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# Intel - Contest: Intel® Core™ i7 Custom Desktop Challenge -- Will Your Vision of Tomorrow Rock the World?

[http://www.intel.com/pressroom/archive/releases/20091005corp.htm?iid=pr1\\_releasepri\\_20091005r](http://www.intel.com/pressroom/archive/releases/20091005corp.htm?iid=pr1_releasepri_20091005r)

**WHEN:** Oct. 5 through Dec. 14, 2009.

**WHERE:** Intel® Core™ i7 Custom Desktop Challenge  
Contest:  
[www.intelcorechallenge.com](http://www.intelcorechallenge.com)

**WHAT:** Intel Corporation has begun a multi-country "Intel Core i7 Custom Desktop Challenge" for PC enthusiasts to build desktops powered by Intel Core i7 and Core i5 processors that envision the possibilities of tomorrow's technology – from new gaming PCs to innovative platforms for home automation.

The contest is promoted in coordination with local Intel Channel Partner members, sponsors (CPU Magazine, Extreme Tech, PC Magazine) and other media publications and blogs.

Participants can choose to compete in two contest categories with final winners receiving prizes such as gift cards (up to US \$1,500), Intel Processors, an Intel® Atom™ processor-based netbook, a Flip\* HD pocket camcorder, 160GB Intel solid-state drives and more. The contest categories are:

**Mod Creativity:** a mod PC desktop that showcases innovations in lighting, cooling, liquid emersion, cut case and creativity.

**Lifestyle Innovation:** a futuristic home automation PC platform to improve one's lifestyle through wireless media centers, lighting automation and security integration.

**Submission and Contest Rules:** Interested participants can submit entries from Oct. 5 through 11:59 p.m. PST on Nov. 16. Final submissions will be judged on five factors by a panel of judges comprised of sponsors, Intel employees and industry experts. Contestants will be awarded up to ten points per factor, for a total of 50 points. The five factors are:

- Overall mod creativity
- Mod paint job/creativity
- Technical enhancements
- Demonstration creativity
- Futuristic vision

Final submissions will also be entered into the "People's Choice" competition. From Nov. 23 through Dec. 7, entries will be displayed on the contest Web site ([www.intelcorechallenge.com](http://www.intelcorechallenge.com)) where individuals around the world can vote for their favorite mod. In addition to the "People's Choice" winner, 12 final winners will be selected for prize categories such as "Best in Show," "Best Mod Creativity," "Best Lifestyle Innovation," "Best in Country" (one prize for each country) and "Best Video." All 13 final winners will be notified on Dec. 14.

**WHO:** The contest is open to anyone 18 years or older who wants to build a desktop that demonstrates a bold vision made possible by Intel's newest, smartest and fastest processors. Participating countries are Belgium, Canada (except Quebec), Japan, Netherlands, Norway, Sweden, United Kingdom and the United States.

**CONTEST INFO & REGISTRATION:**  
[www.intelcorechallenge.com](http://www.intelcorechallenge.com)

**MEDIA CONTACT:** U.S.: Mary Ragland,  
[mary.m.ragland@intel.com](mailto:mary.m.ragland@intel.com)

About Intel: Intel (NASDAQ: INTC), the world leader in silicon innovation, develops technologies, products and initiatives to continually advance how people work and live. Additional information about Intel is available at [www.intel.com/pressroom](http://www.intel.com/pressroom) and [blogs.intel.com](http://blogs.intel.com).

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## Voltaire InfiniBand to Enhance Performance and Scalability

Businesses Worldwide Choose Voltaire InfiniBand to Enhance Performance and Scalability of Oracle® Real Application Clusters

China Mobile, Loyalty Partner Solutions and Turkcell Lower the Cost of Computing with Oracle Real Application Clusters and Voltaire InfiniBand

ORACLE OPENWORLD, BOOTH 100, San Francisco, Calif.– October 13, 2009 – Voltaire Ltd. (NASDAQ: VOLT), a leading provider of scale-out data center fabrics, today announced that its InfiniBand switches and software are helping customers in a broad array of industries worldwide to enhance the performance and scalability of Oracle Real Application Clusters. Voltaire's InfiniBand products are also supported by the newly available Oracle® Database 11g Release 2 and Oracle Real Application Clusters. Voltaire solutions bring accelerated network performance and scalability to Oracle Database clusters and enable distributed workloads over shared servers to lower overall computing costs.

Oracle Real Application Clusters enable database clustering with a shared cache architecture that overcomes the limitations of traditional shared-nothing approaches to provide highly scalable and available database solutions for business applications. By leveraging a Voltaire 20 or 40 Gb/s InfiniBand-based I/O fabric, network latency is reduced and throughput is accelerated enabling customers to increase transaction performance, scale their databases and do more with less.

China Mobile, Loyalty Partner Solutions and Turkcell are among the many businesses that have deployed Voltaire

InfiniBand switches and software as the high performance interconnect for their Oracle Real Application Clusters environments.

"As the leading mobile services provider in China, China Mobile boasts the world's largest mobile network and the world's largest mobile subscriber base," said Qiang Guo, IT manager, Henan Branch, China Mobile. "Oracle Real Application Clusters interconnected with Voltaire InfiniBand has enabled us to run our applications faster."

"As a leading provider of customer management services and the creator of Germany's most successful multi-partner loyalty program, we maintain very large databases and their scalability and reliability is critical to our success," said Harald Stefan, database manager, Loyalty Partner Solutions. "Using Voltaire InfiniBand in our large Oracle environment has enabled us to improve database performance while using inexpensive industry standard hardware to lower our cost of computing."

"Moving existing single instance database applications to a Real Application Clusters architecture may turn out to be a pain if the applications are poorly developed and the interconnect in use is 'weak'. Voltaire 20 Gb/s Infiniband switches let us keep this pain at its minimum by handing us a high speed, low latency interconnect network in our recently-built, Linux-based Oracle 11g grid which has been architected for our critical VAS [value-added] services," said Hüsnü ?ensoy, database architect, Turkcell, the leading telecommunication and technology company in Turkey and the second largest GSM operator in Europe in terms of subscriber numbers. "By ensuring any

interconnect latency will be below a few milliseconds in our grid, Voltaire InfiniBand switches give us the chance to focus on other problem areas when it comes to application tuning.”

“The combination of Oracle Real Application Clusters and Voltaire InfiniBand enables customers to expand their databases across larger clusters improving performance and efficiency,” said Asaf Somekh, vice president of marketing, Voltaire. “Our joint customers with Oracle are seeing their application performance increase significantly while simultaneously improving the bottom line.”

Voltaire is a member of the Oracle® PartnerNetwork.

#### Availability

Voltaire solutions for Oracle Real Application Clusters are available through select Voltaire OEM partners and resellers or by calling 1-800-865-8247.

#### About Voltaire

Voltaire (NASDAQ: VOLT) is a leading provider of scale-out computing fabrics for data centers, high performance computing and cloud environments. Voltaire’s family of server and storage fabric switches and advanced management software improve performance of mission-critical applications, increase efficiency and reduce costs through infrastructure consolidation and lower power consumption. Used by more than 30 percent of the Fortune 100 and other premier organizations across many industries, including many of the TOP500 supercomputers, Voltaire products are included in server and blade offerings from Bull, HP, IBM, NEC and Sun and provide the internal server-to-storage connectivity for the HP-Oracle Database Machine. Founded in 1997, Voltaire is headquartered in Ra’anana, Israel and Billerica, Massachusetts. More information is available at [www.voltaire.com](http://www.voltaire.com) or by calling 1-800-865-8247.

#### About the Oracle PartnerNetwork

Oracle PartnerNetwork is a global business network of more than 21,000 companies that deliver innovative software solutions based on Oracle software. Through access to Oracle’s premier products, education, technical services, marketing and sales support, the Oracle PartnerNetwork program provides partners with the resources they need to be successful in today’s global economy. Oracle partners are able to offer their customers leading-edge solutions backed by Oracle’s position as the world’s largest business software company. Partners who are able to demonstrate superior product knowledge, technical expertise and a commitment to doing business with Oracle qualify for the Certified Partner levels.

<http://oraclepartnernetwork.oracle.com>.