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Aerospace - X-29 research aircraft

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FEA Information Inc. Publishes:

FEA Information Engineering Solutions

FEA Information Engineering Journal

FEA Information China Engineering Solutions

FEA Information Engineering Solutions:

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FEA Information China Engineering Solutions

The first edition was published February 2012. It is published in Simplified and Traditional Chinese in pdf format. Published : February, April, June, August, October, December. The China Solutions is archived on the website FEA Publications. www.feapublications.com
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Announcements

You must not miss the following articles:

FEA Information Inc. and D3View will be exhibiting - 13th LS-DYNA Conference

June 08-10, 2014

Additional Platinum Participants that will be exhibiting:

ETA	BETA CAE Systems	Datapoint Labs	ESI Group
Oasys	GOMPUTE	JSOL	D3VIEW
LSTC	CRAY		

13th LS-DYNA US & International Conference & Users Meeting

Registration is open – register now at www.ls-dynaconferences.com

Quincy and Dusty sponsored by Rebecca Mueller, daughter of Christoph Mueller and the CADFEM Family.

Quincy and Dusty seem to have adopted a chicken that you can see in the background. It follows them all over and when the chicken is afraid it stands under them.

Sincerely, Marsha Victory, Trent Eggleston - FEA Information Inc. USA edition

http://awg.lstc.com
The LS-DYNA® Aerospace Working Group (AWG)

The LS-DYNA® Aerospace Working Group (AWG) is a partnership of federal agencies, corporations, and universities working together to develop and publish aerospace test cases and modeling guidelines for finite element analyses with LS-DYNA®.

X-29 research aircraft

This look-down view of the X-29 research aircraft in flight over California's Mojave Desert during the 1980s and 1990s shows its striking and unique forward swept wing and canard design.

Image Credit: NASA

It looked like someone had installed the wings on backwards, and it was so unstable in flight that no pilot could fly it without the help of a computer, but the X-29A was a marvel in its day and provided research information useful for many aircraft designs still to come.

A pair of the Grumman-built X-29A experimental aircraft flew 436 times between December 1984 and August 1992, with all but 14 of those trips into the air serving as research flights – a record for X-planes at that time.

One of the strangest looking airplanes ever flown in modern times, its extraordinary story is told in "Sweeping Forward: Developing and Flight Testing the Grumman X-29A Forward Swept Wing Research Aircraft," the latest publication in NASA's aeronautics book series.

The 328-page book was written by Frederick Johnsen, a former NASA public affairs director of the Dryden Flight Research Center at Edwards Air Force Base, Calif., and recently retired director of the Air Force Flight Test Center Museum.

While Johnsen said he hopes the book has wide appeal, he says there are two groups of people who will find the book particularly helpful and interesting.

The first would include engineers and students who might find that some of the technologies or methodologies used in the X-29 could have applications for what they may be working on today or be worthy of additional detailed study.

And the second group would be anyone who considers themselves an aerospace technology enthusiast who has a "fondness for what NASA stands for and a penchant for aircraft that push the limits," Johnsen said.

The X-29A aircraft certainly did that.

Its forward swept wings were designed to improve the handling characteristics of a fighter jet, making it more maneuverable and less susceptible to stalling, especially in extremely tight turns, at high speeds, with its nose almost pointed straight up.

According to Johnsen, these breakthrough capabilities were made possible by two technologies that were still emerging during the 1980s: the use of redundant computer flight controls and the availability of composite materials in building major structural components.

The X-29A featured a sophisticated fly-by-wire system installed in an airplane that was assembled from components of other aircraft. Its cockpit and nose came from an F-5, while the rear of the airplane was crafted to hold the jet engine of an F-18. And the whole thing sat on the landing gear of an F-16.

"Sweeping Forward" details all of this, and more. It is available online at no cost as an e-book, while printed versions of the book may be purchased from NASA's Information Center.

Publication of "Sweeping Forward" was sponsored and funded by the communications and education department of NASA's Aeronautics Research Mission Directorate.

› "Sweeping Forward" E-Book
› X-29 Flight Maneuver Video from 1980s

Jim Banke
Aeronautics Research Mission Directorate

BMW i8 deliveries to customers starting in June.

Performance and fuel economy specifications further improved – Real life fuel consumption reaches small-car level – World's first production car with innovative laser light technology.

Munich. With the completion of the development work and final preparations for production at the BMW Group plant in Leipzig, the launch of the BMW i8 approaches its peak. Delivery of the first customer cars will start in June 2014, beginning with the main European markets.

Beforehand, special public events will be held in various regions all over the world to meet the enormous interest in the BMW i8. For this purpose BMW i agents will be equipped with separate demonstration vehicles. The start of series production of customer vehicles will commence in April. Customers have already been able to place pre-orders for the BMW i8 in all major markets since autumn 2013. However, demand for the BMW i8 is already exceeding the planned production volume during ramp-up.

Further improvements to the BMW i8 specifications

In parallel to the completion of the statutory type approval the BMW engineers were also able to achieve a further improvement of key driving performance and fuel consumption data. Thanks to its novel powertrain concept BMW eDrive in plug-in hybrid configuration, the i8 combines a 0–100 km/h (62 mph) sprint time of 4.4 seconds with an EU test cycle average fuel consumption of 2.1 litres/100 km (134.5 mpg imp) and CO2 emissions of 49 g/km. The related electricity consumption was measured at 11.9 kWh per 100 km .

Every-day fuel economy substantially better than all conventional sports car concepts - Although the results achieved in the EU test cycle allow for quick comparisons with other vehicles and despite their relevance for a favorable taxation in many countries, the BMW i8 engineers hat a particular focus on low fuel consumption in real life. As a result the BMW i8 shows extraordinary efficiency not only in standardized testing procedures, but also in the practice of everyday traffic:

In typical everyday commuting, with the battery fully charged at the beginning, the BMW i8 can return a fuel consumption below 5 litres/100 km (more than 56 mpg imp) around town. If the commute includes extra-urban or motorway driving less than 7 litres (more than 40 mpg imp) are achievable.. Even in longer-distance operation at higher speeds, drivers can keep their average fuel consumption below 8 litres/100 km (more than 35 mpg imp). Overall, the fuel consumption of the plug-in hybrid model therefore works out around 50 per cent better than that of conventionally powered sports car models.

World's first production car with laser light.

Introduction of the optional BMW laser headlights is scheduled for autumn 2014, when the BMW i8 will become the world's first production car to offer this innovative lighting technology. BMW laser headlights are around 30 per cent more energy-efficient than the BMW i8's standard LED headlights and provide considerably more powerful road illumination, with a range of up to 600 metres. Highly concentrated beams of light from high-performance laser diodes act on a fluorescent phosphor material inside the headlight, which projects a sharply focused beam of light onto the road. The laser headlights produce a light similar to natural daylight and are therefore always easy on the eye.

BMW eDrive: Sports car powertrain of the future. - The BMW i8's plug-in hybrid system comprises a 170 kW/231 hp, 320 N m (236 lb-ft) three-cylinder petrol engine with BMW TwinPower Turbo technology and a 96 kW/131 hp, 250 N m (184 lb-ft) hybrid synchronous electric motor. The BMW eDrive system also includes a lithium-ion high-voltage battery (with a usable capacity of 5,2 kW h) and intelligent energy management that uses the combined output of 266 kW/362 hp to provide breathtaking performance and maximum efficiency, while always taking into account the driving situation and driver requirements. The excellent balance between driving pleasure and fuel economy is aided by a low vehicle weight of 1,485 kg (DIN kerb weight) and an unusually good drag coefficient (Cd) for a sports car of 0.26. In zero-emission all-electric mode, the BMW i8 has a top speed of 120 km/h (75 mph) and a range of 37 kilometres (23 miles) within the EU test cycle. Depending on whether the plug-in hybrid sports car's lithium-ion battery is recharged at a household power socket or BMW i Wallbox, or at a public charging station, charging times range from less than two up to three hours. In Sport mode the BMW i8 offers mid-range acceleration from 80 to 120 km/h (50 to 75 mph) in 2.6 seconds. The electronically governed top speed is 250 km/h (155 mph).

OASYS Software HPM / HRMD Positioning Tool OASYS Software

http://www.oasys-software.com/dyna/en/fe-models/hpm-hrmd.shtml

These JavaScript tools developed by Arup are intended for use in conjunction with the Oasys Primer and LS-DYNA Software. The tools allow for a prediction of the H-Point based on the SAE J826 regulation and seat head restraint assessment following IIHS, NHTSA, EuroNCAP and C-NCAP, respectively.

H-Point Machine (HPM)

The Oasys HPM Positioning Tool provides an interactive environment to set-up and analyse the positioning of the H-Point Machine (HPM) in a seat.

Using the Oasys HPM positioning tool gives seat engineers confidence in the H-Point of a new seat design and allows them an opportunity to adjust the design if necessary.

This improved understanding of the seat will allow more accurate predictions of whiplash performance and other crash test simulations where dummy positioning is critical.

Head Restraint Measurement Device (HRMD)

The Oasys HRMD Positioning Tool provides an interactive environment to set-up and analyse the positioning of the H-Point Machine in a seat and to assess the head restraint scoring.

All pre-simulation positioning of the HPM is completed automatically within Oasys PRIMER, and the output is a ready-to-run LS-DYNA model. Once the analysis is completed, Oasys PRIMER is used for interpretation of the results to report the H-point co-ordinates and back angle of the HPM.

Koric achieves new world record in parallel scaling of commercial engineering code

With his expertise in both high-performance computing and mechanical engineering, Koric was able to examine the physics of the problem and suggest specific algorithms that might benefit from further parallelization.

LS-DYNA, an explicit finite element code used for simulations in the auto, aerospace, manufacturing, and bioengineering industries, was recently scaled to 15,000 cores on N CSA's Blue Waters supercomputer—a world record for scaling of any commercial engineering codes A few academic or engineering codes scale so wide (or wider) on HPC, but this is the first time that a popular commercial engineering code such as LS-DYNA scales so wide while solving extreme size real-world industrial problems with complex shapes, multiple nonlinearities and difficult contact conditions included.

Both software developers and end-users face constraints when it c omes to testing the limits of commercial codes. They often don't have access to truly massive supercomputers, and their resources and staff are focused on daily business needs—they can't spare the time and manpower to attempt extreme scaling studies. NCSA's Private Sector Program (PSP) is able to bring all of the key components together: LS-DYNA developer LSTC; the petascale Blue Waters supercomputer and its hardware manufacturer, Cray; the industrial users with real challenges; and the expertise of PSP's staff.

"Once Blue Waters was in production, we looked for test cases to run at extreme scale," said Seid Koric, a s enior computational resources coordinator with NCSA's PSP and a University of Illinois

adjunct professor of Mechanical Science and Engineering. Software company LSTC provided a large license pool for LS-DYNA for this benchmarking. This enabled the collaborative team to run the software across as many cores as possible. LS-DYNA was quickly scaled to 1,000 cores on Blue Waters; Koric continued to run larger and larger real-world problems provided by a PSP partner on Blue Waters, pushing the code to 8,000 cores.

Progress was iterative, with repeated analysis of bottlenecks addressed by the software development team. For example, Koric worked with Cray and LSTC to distribute the problem across the system's memory efficiently. Performance was also boosted when the team switched from an MPI solver to a hybrid MPI/OpenMP solver with lower communication overhead and a smaller memory requirement.

With his expertise in both high-performance computing and mechanical engineering, Koric was able to examine the physics of the problem and suggest specific algorithms that might benefit from further parallelization. Cray profiled the code, confirming Koric's assessment, and LSTC removed those algorithmic bottlenecks.

"Cray was very helpful in understanding the system," Koric says. "They know all the tricks of the hardware, particularly when it comes to load balancing and profiling the code, while the same applies to LSTC and their LS-DYNA code."

Intrigued by the performance gains, a second PSP partner provided a complex engineering problem, which the team was able to scale to a world-record 15,000 cores on Blue Waters in January 2014.

For more details on the project, contact Seid Koric at skoric@ncsa.illinois.edu or 217-265-8410.

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Aerodynamic Analysis of an Airbrake System
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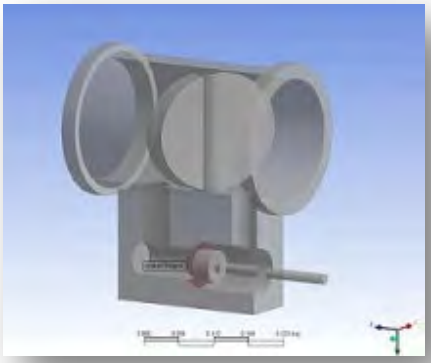
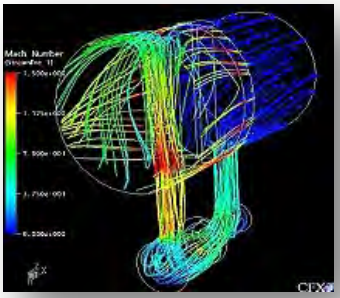


Airbrake Geometry

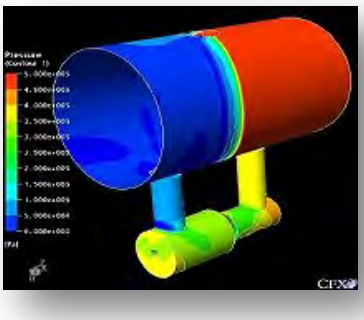
Traditional flowfield analysis includes the predictions of design parameters such as surface pressures distributions, force (loading) responses, velocity profiles, three-dimensional flow visualizations for laminar or turbulent, incompressible or compressible, subsonic or supersonic, and steady or unsteady flows.

The following is an example for an airbrake system flowfield analysis. This is a braking system used by heavy vehicles. The geometry includes an external housing, a butterfly valve, a leakage flow path (a small gap between the butterfly valve and the external housing), a by-pass flow path, and a by-pass valve. The valves are used to control the mass flow split into the leakage and by-pass flow path.

The inflow speed at the external housing inlet is about 10 m/s, and the inlet pressure is 5 atm. Roughly about 60% of the flow will pass through the leakage path, while the remaining enters the by-pass flow path. Because the leakage gap is extremely small, the incoming flow pressure is high enough to choke the gap. The flow then continues to accelerate to a maximum Mach number of 1.85 be fore expanding to the vast exiting region downstream of the butterfly valve. Throughout the domain, the maximum flow speed exceeds over 700 m /s. The resultant surface pressure information can be used to analyze deformation based on the uneven aerodynamics loading on various parts. The CFD analysis successfully provides critical three-dimensional flowfield information for design engineers to improve existing designs



Surface pressure distribution on various parts.



Streamline distributions in the system.
Streamlines are colored by Mach numbers .

Respirator Modeling:
Fit (LS-DYNA) and Function (CFdesign)

LS-DYNA simulation
View a movie of mask fit simulation on our website Predictive Engineering

Engineering Safety: Respirator masks have historically been designed with a lot of silicone rubber to slop over a range of faces. This works adequately for many facial sizes but not for all. For face profiles that don't follow the norm, the use of respirators can lead to a false sense of security due to air leakage or a contamination threat. The National Institute of Science and Technology has been engaged in a multi-year program to improve the safety and effectiveness of full-face respirator masks. To meet some impending deadlines on this project, Predictive Engineering was competitively awarded an investigative project to study the fit and function of an industry standard respirator mask. A key finding of this work was that the modeling of human skin is best represented as a flexible bag of viscous fluid and not as an semi-elastic solid as has been done in prior work external to NIST. CFD studies also indicated that air flow within the respirator mask is not optimized and could be improved with some minor geometric changes. These and other findings are scheduled for publication under the NIST banner with a gracious co-authorship to Predictive Engineering for meeting project goals on time and on target.

Model Details: The project involved the complete analysis of the fitting process between a respirator mask and a human head. The respirator seal geometry was provided as IGES data generated from laser scanning process over the original respirator. Head geometry was likewise provided in a similar format. Femap was able to parse the skins together and create a clean manifold skin that facilitated a quad-dominate mesh for the respirator and likewise a smooth tet mesh for the head. This model was then submitted to LS-DYNA for a complete fit and contact analysis. The mast was actually pulled against the face and allowed to seal. Seal pressures were then generated.

For functional analysis, a transient CFD analysis was performed using CFdesign. This was quite tricky since the original geometry was not quite representative of the flow passage within the respirator. With some cleanup help from Femap, a clean model was then submitted to CFdesign. It was impressive how well CFdesign handled the transient flow conditions for inhalation and exhalation through the use of ramped flow-rate curves. CFD results were checked for convergence with the mass balance error under 1%

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http://www.gompute.com/events/gum2014

Gompute User Meeting is an event that gathers all aspects related to Simulation and Technical Computing.

At Gompute User Meeting 2014 you can:

- Discover the latest simulation and HPC software developments.
- Learn about how the Gompute software delivers comprehensive HPC and where it is used
- Meet experienced analysts.
- Learn about the state of the art on commercially available computing services.
- Meet colleagues active in the field of technical computing and simulation.
- Attend workshops on l atest techniques in HPC and simulation tools.

At the 2014 Gompute User Meeting, Engineers, Scientific Users, Designers, contractors, Analysts, Academics, Managers and Executives will meet up to share best practices and tips from their simulation experience.

This convention of Comprehensive Technical Computing is free of charge for attendees, and here you can meet engineers and experts of several related fields in order to improve your engineering and simulation skills.

Topics:

- Simulation Tools,
- Simulation techniques,
- Computing hardware,
- Linux for High Performance Computing,
- HPC Cloud,
- Remote Visulization

May 6-7, 2014 - Elite Park Avenue Hotel
Kungsportsavenyen 36-38
,Gothenburg, Sweden

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For sponsorship packages or exhibiting in our event, please contact Maria Dahlquist: mimi@gridcore.se

Bringing Space Communications to Ford

A new partnership with Russia's St. Petersburg State Polytechnic University has Ford studying robot communication systems on the International Space Station to improve vehicle communication on Earth.

Ford technical leader Oleg Gusikhin says the main roadblock to transforming cars into mobile messengers (like robots) is that no network offers 100% coverage nationwide. "The problem has been around in space communication for quite some time," Gusikhin says. "[We're trying to] leverage the lessons learned and the technology they already have to the vehicle."

Associate Professor Vladimir Mulukha, Ph.D., Telematics Department of St. Petersburg Polytechnic University, shakes hands with the mobile humanoid "Justin."

One idea involves vehicles relaying an automatic signal after an accident occurs. "If a cellular network is unavailable, you could send a message to another vehicle passing by and then it can send it to the cell network," Gusikhin says. These next-level systems could also allow traffic lights to anticipate and respond to oncoming traffic—and they might not be far off. Says Gusikhin, "I think it's reasonable to assume that it's going to be within five years."

How Ford Vehicles Could Soon Speak Robot

1. The communication system consists of an Earth control center, a near-Earth satellite and a space-stationed robot group.

2. The Earth control center broadcasts a task to the near-Earth satellite through a dedicated channel.

3. At a specified time, the near-Earth satellite passes the task to a group of robots for completion.

4. To execute the task, the synchronized group of robots exchange information with each other in real time.

5. The robot group relays the results of the task back home to the Earth control center for data analysis.

Students from the Telematics Department of St. Petersburg Polytechnic University and Professor Mikhail Kurochkin analyze model space rover movements.

New Modular Ecotec Engines are More Adaptable, Efficient

- Modular architecture streamlines powertrain portfolio, reduces manufacturing complexity
- Global design and manufacturing processes enhance adaptability, with 11 engine variants ranging from 1.0L to 1.5L
- Up to 2.5 million annual production at five global plants by 2017

DETROIT – A new generation of Ecotec small-displacement engines streamlines General Motors' global powertrain portfolio with a modular architecture that broadens its adaptability to global markets and reduces manufacturing complexity – while offering customers leading-edge efficiency, refinement and durability.

The new engines were developed for GM's global vehicle portfolio and will power many of the company's highest-volume small cars and compact crossovers – including the next-generation Chevrolet Cruze specifically tailored for China, which launches in 2014 as a 2015 model.

By 2017, more than 2.5 million new Ecotec engines are projected to be built annually in at least five manufacturing locations around the globe: Flint, Mich. (U.S.); Shenyang, China; Szentgotthárd, Hungary; Toluca, Mexico; and Changwon, South Korea. The Flint facility alone represents an investment of more than $200 million in technology and tooling to support the engines' production.

"Transportation solutions vary around the world and GM is committed to developing engines matched to the needs of the regions where they're sold," said Steve Kiefer, GM vice president, Global Powertrain Engineering. "The new engine family is designed to achieve segment-leading refinement and efficiency, and will make its way into five GM brands and 27 models by the 2017 model year."

The new Ecotec portfolio will include 11 engines, with three- and four-cylinder variants ranging from 1.0L to 1.5L – including turbocharged versions – and power ratings ranging from 75 horsepower (56 kW) to 165 horsepower (123 kW), and torque ranging from 70 lb-ft (95 Nm) to 184 lb-ft (250 Nm). The architecture is also designed to support hybrid propulsion systems and alternative fuels.

The first production applications include a 1.0L turbocharged three-cylinder for the Opel ADAM in Europe, and 1.4L turbocharged and 1.5L naturally aspirated four-cylinder engines for the 2015 next-generation Chevrolet Cruze in China.

The turbocharged variants enable the engines to deliver the power and torque of larger-displacement engines with the efficiency of smaller engines. For example, the turbocharged 1.0L three-cylinder used in the Opel ADAM makes as much power as the naturally aspirated 1.6L four-cylinder it replaces – with an estimated 20-percent improvement in efficiency.

In fact, the new Ecotec family is on the leading edge of efficiency, with the new 1.4L turbo up to five percent more efficient than the 1.4L turbo engine it will replace. The new Ecotec engines also deliver segment-challenging refinement. Noise intensity is up to 50-percent quieter than Volkswagen's EA211 1.4L four-cylinder and up to 25-percent quieter than Ford's 1.0L turbo three-cylinder.

Clean-sheet design

The new Ecotec engines represent a clean-sheet design and engineering process, leveraging the diverse experience of GM's global resources. Technologies such as central direct fuel injection, continuously variable valve timing, turbocharging and variable intake manifold airflow help achieve efficiency goals with broad power bands, for an optimal balance of strong performance and lower fuel consumption.

"The new Ecotec architecture represents the most advanced and efficient family of small-car gas engines in GM's history," said Tom Sutter, global chief engineer. "Along with performance and efficiency targets, we've also aimed for segment-leading refinement with low noise and vibration – and we've hit the bulls-eye."

Modularity in parts – such as four-cylinder and three-cylinder blocks – that share bore spacing, bore diameter, liners and other dimensions, reduces complexity while increasing the flexibility to quickly adapt the architecture for new applications.

The new Ecotec engines are calibrated to run on regular unleaded gas – even the high-output turbo variants.

The new 1.4L turbo for the 2015 next-generation Chevrolet Cruze in China is estimated at 148 horsepower (110 kW) and 173 lb-ft of torque (235 Nm). The 1.5L is rated at an estimated 113 horsepower (84 kW) and 108 lb-ft of torque (146 Nm).

In China, Cruze models with the 1.4L turbo engine will also feature an all-new dual-clutch gearbox.

General Motors Co. (NYSE:GM, TSX: GMM) and its partners produce vehicles in 30 countries, and the company has leadership positions in the world's largest and fastest-growing automotive markets. GM, its subsidiaries and joint venture entities sell vehicles under the Chevrolet, Cadillac, Baojun, Buick, GMC, Holden, Isuzu, Jiefang, Opel, Vauxhall and Wuling brands. More information on the company and its subsidiaries, including OnStar, a global leader in vehicle safety, security and information services, can be found at http://www.gm.com.

Call for Papers

LS-DYNA Forum 2014

6 – 8 October 2014, Bamberg, Germany

www.dynamore.de/forum2014-e

DYNAmore invites you to attend 13th LS-DYNA Forum which will take place from 6 - 8 October in Bamberg, Germany. This year, the conference is extended by half a day with the successful Developer Forum, which will take place before the main two-day User Forum.

You are warmly welcome to participate at the event as well as to actively contribute to the conference agenda by submitting an abstract. In your presentation you may report about your experience with LS-DYNA or LS-OPT as well as exchange your knowledge and discuss your problems with other users.

Additionally, there will be selected keynote lectures of renowned speakers from industry and universities. Software developers from LSTC and DYNAmore will present the latest features in LS-DYNA and the associated new application possibilities. In the accompanying exhibition, numerous hardware and software manufacturers will offer an insight into the latest news and trends around LS-DYNA.

Moreover, we are pleased to offer you several English spoken seminars in the week before, during and after the Forum, which will be either held by LS-DYNA developers or experienced consulting engineers

Presentation topics are:
Crashworthiness, passenger and pedestrian safety, metal forming, optimization and robustness, materials (composites, polymers, ...), joining techniques, implicit, impact, droptest, ballistics and penetration, fluid-structure interaction, computational fluid dynamics (CFD), heat transfer, electromagnetics, multiphysics, manufacturing processes, CAE process integration,…

from the industry areas:

- automotive,
- aerospace,
- mechanical engineering,
- shipbuilding/offshore,
- transportation,
- biomechanics,
- civil engineering,
- medical engineering,
- packaging, ...

Seminars

We offer pre and post conference seminars in English language on:

- Meshless Methods in LS-DYNA - EFG
- Meshless Methods in LS-DYNA - SPH
- NVH & Frequency Domain Analysis
- ALE und Fluid-Structure Interaction
- Concrete and Geomaterial Modeling
- Blast Modeling with LS-DYNA
- Penetration with LS-DYNA
- Explosives Modeling for Engineers

We hope that we have stimulated your interest and are looking forward to receiving your abstract and to seeing you in Bamberg.

Invitation to free of charge –
LS-DYNA information days
LS-DYNA – a Numerical Simulation Program for Numerous Applications

DYNAmore invites you to participate at our free-of-charge information day series on LS-DYNA. The aim behind these events is to inform you about the general-purpose computational software LS-DYNA and its associated optimization program LS-OPT.

LS-DYNA is one of the world's leading finite element software systems and is perfectly suited to perform numerical simulations of highly nonlinear problems encountered in industry and research. Typical applications include crash worthiness, metal forming, impact and drop tests, detonations, penetration/perforation and fluid-structure interaction as well as therm

With LS-DYNA, the Livermore Software Technology Corporation (LSTC) offers a well-equipped toolbox that includes explicit and implicit time integration schemes which can be combined with spatial discretization methods such as FEM, BEM and ALE as well as meshfree .

methods like EFG, SPH and DEM. The primary focus of the developers at LSTC lies on a one-code-strategy to integrate different solution algorithms within a single software environment which includes coupling abilities of the structural solver with the solvers for incompressible and compressible fluids, temperature and electromagnetism.

This allows different simulation stages to be joined together within LS-DYNA without the need to define a time-consuming transition to other software packages. And this in turn means that LS-DYNA can be used to efficiently perform simulations across multiple processes.

Besides LS-DYNA and LS-OPT, LSTC also develops the free pre- and post-processor known as LS-PrePost. The programs support the Linux, Windows and Unix operating systems as well as various cluster architectures and HPC systems

To give you a clear idea of the computation capabilities of LS-DYNA and LS-OPT, we have prepared interesting presentations for each of the events.

We hope that we were able to arouse your interest and we look forward to seeing you at this event.

Dates: **Zurich (Switzerland):**
31 March, 13:30 – 17:30
Flyer Zurich Registration

Torino (Italy): 1 April, 13:30 – 17:30
Flyer Torino Registration

Berlin (Germany): 3 June, 13:30 – 17:30
Flyer Berlin Registration

Please find more information and online registration here.

February FEA Information Engineering Solutions

January FEA Information Engineering Solutions

BETA CAE Systems S.A. www.beta-cae.gr

BETA CAE Systems S.A.– ANSA

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

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

CRAY www.cray.com

Cray CS300-AC Cluster Supercomputer

§ The Cray CS300-AC cluster supercomputer features an air-cooled architecture based on blade server or rackmount server building block platforms. The system is built for capacity and data-intensive workloads. It delivers turnkey high performance computing with a broad range of flexible system configuration options.

§ The CS300-AC system features two new preconfigured ready-to-go solutions, the CS300 shared memory parallel and the CS300 large memory systems.

Cray CS300-LC Cluster Supercomputer

§ The Cray CS300-LC cluster solution features a direct liquid-cooled architecture using warm water heat exchangers instead of chillers. It delivers a turnkey, energy-efficient solution that reduces datacenter power and cooling operation costs for faster ROI while addressing capacity and data-intensive workloads.

Cray XC30 Supercomputer Series

§ The Cray XC30 family delivers on Cray's commitment to an adaptive supercomputing architecture that provides both extreme scalability and sustained performance. The flexibility of the Cray XC30 platform ensures that users can configure the exact machine to meet their specific requirements today, and also remain confident they can upgrade and enhance their system to address the demands of the future.

Cray Sonexion Scale-out Lustre Storage System

§ Brought to you by Cray, the world's leading experts in parallel storage solutions for HPC and the technical enterprise, the Cray Sonexion is a fully integrated, modular and compact scale-out storage system for Lustre.

DatapointLabs www.datapointlabs.com

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

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

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

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

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

ETA – Engineering Technology Associates

www.eta.com

etainfo@eta.com

Inventium Suite™

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

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

PreSys

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

VPG

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

DYNAFORM

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

ESI Group www.esi-group.com

Visual-Environment: Visual-Environment is an integrated suite of solutions which operate either concurrently or standalone within a common environment. It aims at delivering an open collaborative engineering framework. As such, it is constantly evolving to address various disciplines and available solvers.

Visual-Crash is a dedicated environment for crash simulation: It helps engineers get their job done in the smoothest and fastest possible way by offering an intuitive windows-based graphical interface with customizable toolbars and complete session support.

For LS-DYNA users, Visual-Crash DYNA allows 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. This very open and versatile environment simplifies the work of CAE engineers across the enterprise by facilitating collaboration and data sharing.

Further tools are integrated in Visual-Environment enhancing CAE engineers work tasks most efficiently.

Visual-Mesh generates 1D, 2D and 3D elements for any kind of simulation.
Visual-Mesh provides automatic and guided surfaces clean up, application specific mesh generation and intuitive post mesh editing features..

Visual-Viewer is a complete, productive and innovative post-processing environment for CAE applications.

Visual-Viewer delivers a dedicated plotting and animation control solution. It offers a multi page, multi plot environment, allowing to group data into pages and plots. It is designed with a Windows GUI based on an intuitive and sleek user interface.

Visual-Process Executive is an advanced CAE environment for process customization and automation.

VisualDSS is an End-to-End Decision Support System for CAE. Manufacturers widely resort to Simulation-Based Design to gain a competitive edge in product development.

GNS - Gesellschaft für Numerische Simulation mbH

www.gns-mbh.com

Animator4

A general finite element post-processor and holds a leading position in its field. Animator4 is used worldwide by almost all automotive companies, a great number of aerospace companies, and within the chemical industry.

Generator2.

A specialized pre-processor for crashworthiness applications and has become very successful in the field of passenger safety and pedestrian protection. It is mainly used as a positioning tool for finite element component models by a great number of automobile companies throughout the world.

Indeed

An easy-to-use, highly accurate virtual manufacturing software that specializes in the simulation of sheet metal forming processes. Indeed is part of the GNS software suite and works concurrently with all other GNS software products.

OpenForm

A pre- and post-processor independently of a particular finite element forming simulation package. The software is extremely easy to handle and can be used as was designed to enable those who are not finite element experts to carry out multi-stage forming simulations with even complex multi purpose finite element codes.

Gompute on demand®/ Gridcore AB Sweden
www.gompute.com www.gridcore.se

Gompute is owned, developed and operated by Gridcore AB in Sweden. Founded in 2002, Gridcore is active in three areas: Systems Integration, Research & Development and HPC as a service.

Gridcore has wide experience of different industries and applications, developed a stable product portfolio to simplify an engineer/scientist's use of computers, and has established a large network of partners and collaborations, where we together solve the most demanding computing tasks for our customers. Gridcore has offices in Gothenburg (Sweden), Stuttgart (Germany), Durham NC (USA) and sales operations in The Netherlands and Norway.

The Gridcore developed E-Gompute software for internal HPC resources gives end users (the engineers) an easy-to-use and complete environment when using HPC resources in their daily work, and enables collaboration, advanced application integrations, remote pre/post, accounting/billing of multiple teams, license tracking, and more, accelerating our customers usage of virtual prototyping

JSOL Corporation www.jsol.co.jp/english/cae/

HYCRASH

Easy-to-use one step solver, for Stamping-Crash Coupled Analysis. HYCRASH only requires the panels' geometry to calculate manufacturing process effect, geometry of die are not necessary. Additionally, as this is target to usage of crash/strength analysis, even forming analysis data is not needed. If only crash/strength analysis data exists and panel ids is defined. HYCRASH extract panels to calculate it's strain, thickness, and map them to the original data.

JSTAMP/NV

As an integrated press forming simulation system for virtual tool shop the JSTAMP/NV meets the various industrial needs from the areas of automobile, electronics, iron and steel, etc. The JSTAMP/NV gives satisfaction to engineers, reliability to products, and robustness to tool shop via the advanced technology of the JSOL Corporation.

JMAG

JMAG uses the latest techniques to accurately model complex geometries, material properties, and thermal and structural phenomena associated with electromagnetic fields. With its excellent analysis capabilities, JMAG assists your manufacturing process

Livermore Software Technology Corp. www.lstc.com

LS-DYNA

A general-purpose finite element program capable of simulating complex real world problems. It is used by the automobile, aerospace, construction, military, manufacturing, and bioengineering industries. LS-DYNA is optimized for shared and distributed memory Unix, Linux, and Windows based, platforms, and it is fully QA'd by LSTC. The code's origins lie in highly nonlinear, transient dynamic finite element analysis using explicit time integration.

LS-PrePost

An advanced pre and post-processor that is delivered free with LS-DYNA. The user interface is designed to be both efficient and intuitive. LS-PrePost runs on Windows, Linux, and Macs utilizing OpenGL graphics to achieve fast rendering and XY plotting.

LS-OPT

LS-OPT is a standalone Design Optimization and Probabilistic Analysis package with an interface to LS-DYNA.

The graphical preprocessor LS-OPTui facilitates definition of the design input and the creation of a co mmand file while the postprocessor provides output such as approximation accuracy, optimization convergence, tradeoff curves, anthill plots and the relative importance of design variables.

LS-TaSC

A Topology and Shape Computation tool. Developed for engineering analysts who need to optimize structures, LS-TaSC works with both the implicit and explicit solvers of LS-DYNA. LS-TaSC handles topology optimization of large non-linear problems, involving dynamic loads and contact conditions.

LSTC Dummy Models

Anthropomorphic Test Devices (ATDs), as known as "crash test dummies", are life-size mannequins equipped with sensors that measure forces, moments, displacements, and accelerations.

LSTC Barrier Models

LSTC offers several Offset Deformable Barrier (ODB) and Movable Deformable Barrier (MDB) model.

Oasys, Ltd **www.oasys-software.com/dyna**

Oasys LS-DYNA® Environment

The Oasys Suite of software, exclusively written for LS-DYNA®, is at the leading edge of the market and is used worldwide by many of the largest LS-DYNA® customers.

Oasys PRIMER is a model preparation tool that is fully compatible with the latest version of LS-DYNA®, eliminating the risk of data loss or corruption when a file is manipulated, no matter what operations are performed on it:

Key benefits:

- Maintains data integrity
- Finds and fixes model errors (currently over 5000 checks)
- Specialist tools for dummy positioning, seatbelt fitting, mechanisms, interior head impact etc.
- Connection manager for spotwelds, bolts, adhesive etc.
- Intelligent editing, deletion and merging of data
- Customisable with macros and JavaScript.

Oasys D3PLOT is a powerful 3D visualization package for post-processing LS-DYNA® analyses

Key benefits:

- Fast, high quality graphics
- Easy, in-depth access to all LS-DYNA® results.
- User defined data components
- Customisable with JavaScript.

Oasys T/HIS is an X-Y graph plotting package for LS-DYNA®

Key benefits:

1. Automatically reads all LS-DYNA® results.
2. Wide range of functions and injury criteria.
3. Easy handling of data from multiple models
4. Scriptable for automatic post-processing

Oasys REPORTER is an automatic report generation tool, for use with LS-DYNA®. which allows fast automatic report creation for analyses.

Shanghai Hengstar www.hengstar.com

Center of Excellence

Hengstar Technology is the first LS-DYNA training center of excellence in China. As part of its expanding commitment to helping CAE Engineers, Hengstar Technology will continue to organize high level training courses and seminars in 2012.

The lectures/training are taught by senior engineers and experts mainly from LSTC, Carhs, OEMs, and other consulting groups.

On Site Training

Hengstar also provides customer customized training programs on-site at the company facility.

Training is tailored for company needs using LS-DYNA or the additional software products by LSTC.

Distribution & Support

Hengstar Distributes and supports LS-DYNA, LS-OPT, LS-PrePost, LS-TaSC. H ongsheng Lu, previously was directly employed by LSTC before opening his distributorship in China for LSTC software.

Hongsheng travels to LSTC often to keep current on the latest software features and support to continue to grow Hengstar as a CAE consulting group.

Comet Solutions www.cometsolutions.com

Comet enables rapid and robust design space exploration from concept discovery and selection through concept validation using a model-based engineering approach. We empower our customers to discover an array of possible design concepts, evaluate which ones are feasible, then select the best.

Comet software is a tool-open, extensible, vendor-neutral performance engineering workspace that lets engineers and engineering project teams readily carry out multi-fidelity, multi-physics modeling and simulation.

In the Comet workspace, companies can better leverage all of their simulation assets – "best practices" expertise, COTS as well as in-house engineering tools, and product performance data.

Canada	**Metal Forming Analysis Corp MFAC** www.mfac.com		galb@mfac.com	
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	
	eta/DYNAFORM	INVENTIUM/PreSys		
United States	**CAE Associates Inc.** www.caeai.com		info@caeai.com	
	ANSYS Products	CivilFem	Consulting ANSYS Consulting LS-DYNA	
United States	**DYNAMAX** www.dynamax-inc.com		sales@dynamax-inc.com	
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models		LSTC Barrier Models	

United States	**ESI-Group N.A** www.esi-group.com			
	QuikCAST	SYSWELD	PAM-RTM	PAM-CEM
	VA One	CFD-ACE+	ProCAST	Visual-Process
	VisualDSS	Weld Planner	Visual-Environment	IC.IDO
United States	**Engineering Technology Associates – ETA** www.eta.com		etainfo@eta.com	
	INVENTIUM/PreSy	NISA	VPG	LS-DYNA
	LS-OPT	DYNAform		
United States	**Gompute** www.gompute.com		info@gompute.com	
	LS-DYNA Cloud Service		Additional software	
	Additional Services			
United States	**Comet Solutions** Comet Software		steve.brown@cometsolutions.com	

United States	**Livermore Software Technology Corp**		sales@lstc.com	
	LSTC www.lstc.com			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	TOYOTA THUMS	

United States	**Predictive Engineering** www.predictiveengineering.com		george.laird@predictiveengineering.com	
	FEMAP	NX Nastran	LS-DYNA	LS-OPT
	LS-PrePost	LS-TaSC	LSTC Dummy Models	
			LSTC Barrier Models	

France	**DynaS+**		v.lapoujade@dynasplus.com	
	www.dynasplus.com		Oasys Suite	
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	DYNAFORM	VPG	MEDINA	
	LSTC Dummy Models		LSTC Barrier Models	

Germany	**CADFEM GmbH**		lsdyna@cadfem.de
	www.cadfem.de		
	ANSYS	LS-DYNA	optiSLang
	ESAComp	AnyBody	
	FTI FormingSuite		

Germany	**DYNAmore GmbH**		uli.franz@dynamore.de	
	www.dynamore.de			
	PRIMER	LS-DYNA	FTSS	VisualDoc
	LS-OPT	LS-PrePost	LS-TaSC	DYNAFORM
	Primer	FEMZIP	GENESIS	Oasys Suite
	TOYOTA THUMS		LSTC Dummy & Barrier Models	

Germany	**GNS**		mbox@gns-mbh.com	
	www.gns-mbh.com			
	Animator	Generator	Indeed	OpenForm

The Netherlands	**Infinite Simulation Systems B.V**		j.mathijssen@infinite.nl	
	www.infinite.nl			
	ANSYS Products	CivilFem	CFX	Fluent
	LS-DYNA	LS-PrePost	LS-OPT	LS-TaSC

Italy	**EnginSoft SpA**		info@enginsoft.it	
	www.enginsoft.it			
	ANSYS	MAGMA	Flowmaster	FORGE
	CADfix	LS-DYNA	Dynaform	Sculptor
	ESAComp	AnyBody	FTI Software	
	AdvantEdge	Straus7	LMS Virtual.Lab	ModeFRONTIER
Russia	**STRELA**		info@dynarussia.com	
	LS-DYNA	LS-TaSC	LS-OPT	LS-PrePost
	LSTC Dummy Models		LSTC Barrier Models	
Sweden	**DYNAmore Nordic**		marcus.redhe@dynamore.se	
	www.dynamore.se		Oasys Suite	
	ANSA	µETA	LS-DYNA	LS-OPT
	LS-PrePost	LS-TaSC	FastFORM	DYNAform
	FormingSuite		LSTC Dummy Models	
			LSTC Barrier Models	
Sweden	**GOMPUTE**		info@gridcore.com	
	www.gridcore.se		www.gompute.com	
	LS-DYNA Cloud Service		Additional software	

Switzerland	**DYNAmoreSwiss GmbH**		info@dynamore.ch	
	www.dynamore.ch			
	LS-DYNA		LS-OPT	LS-PrePost
	LS-TaSC		LSTC Dummy Models	
			LSTC Barrier Models	
UK	**Ove Arup & Partners**		dyna.sales@arup.com	
	www.oasys-software.com/dyna		TOYOTA THUMS	
	LS-DYNA		LS-OPT	LS-PrePost
	LS-TaSC	PRIMER	D3PLOT	T/HIS
	REPORTER	SHELL	FEMZIP	HYCRASH
	DIGIMAT	Simpleware	LSTC Dummy Models	
			LSTC Barrier Models	

Australia	**LEAP**			
	www.leapaust.com.au			
	ANSYS Mechanical	ANSYS CFD	ANSYS EKM	Recurdyn
	ANSYS DesignXplorer	ANSYS HPC	FlowMaster	Ensigh
	LS DYNA	DYNAform	Moldex 3D	FE-Safe
China	**ETA – China**		lma@eta.com.cn	
	www.eta.com/cn			
	Inventium	VPG	DYNAFORM	NISA
	LS-DYNA	LS-OPT	LSTC Dummy Models	LS-PrePost
			LSTC Barrier Models	LS-TaSC
China	**Oasys Ltd. China**		Stephen.zhao@arup.com	
	www.oasys-software.com/dyna			
	PRIMER D3PLOT	HYCRASH	T/HIS REPORTER	SHELL
	LS-DYNA	LS-OPT	LSTC Dummy Models	LS-PrePost
	DIGIMAT	FEMZIP	LSTC Barrier Models	LS-TaSC
China	**Shanghai Hengstar Technology**		info@hengstar.com	
	www.hengstar.com			
	LS-DYNA	LS-TaSC	LSTC Barrier Models	
	LS-DYNA Courses	LS-OPT	LSTC Dummy Models	LS-PrePost

India	**Oasys Ltd. India**		lavendra.singh@arup.com	
	www.oasys-software.com/dyna			
	PRIMER	D3PLOT	T/HIS	
			LS-OPT	LSTC Dummy Models	LS-PrePost
			LS-DYNA	LSTC Barrier Models	LS-TaSC

India	**CADFEM Eng. Svce**		info@cadfem.in	
	www.cadfem.in			
	ANSYS	VPS	ESAComp	optiSLang
	LS-DYNA	LS-OPT	LS-PrePost	

India	**Kaizenat Technologies Pvt. Ltd**		support@kaizenat.com	
	http://kaizenat.com /			
	LS-DYNA	LS-OPT	LSTC Dummy Models	LS-PrePost
	Complete LS-DYNA suite of products		LSTC Barrier Models	LS-TaSC

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

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

Japan	**FUJITSU**			
	http://jp.fujitsu.com/solutions/hpc/app/lsdyna			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	CLOUD Services	

Japan	**LANCEMORE**	info@lancemore.jp		
	www.lancemore.jp/index_en.html			
	Consulting LS-DYNA			

Japan	**Terrabyte Co.**			
	www.terrabyte.co.jp	**English:** www.terrabyte.co.jp/english/index.htm		
	Consulting LS-DYNA			

Korea	**THEME**	wschung@kornet.com		
	www.lsdyna.co.kr		Oasys Suite	
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	Planets
	eta/DYNAFORM	FormingSuite	Simblow	TrueGRID
	JSTAMP/NV	Scan IP	Scan FE	Scan CAD
	FEMZIP			

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

Taiwan **Flotrend** gary@flotrend.tw

www.flotrend.com.tw

LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

Taiwan **APIC**

www.apic.com.tw

LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

Germany	Gompute www.gompute.com	
Sweden	Gompute www.gompute.com	
United States	Gompute www.gompute.com	

Training Classes Germany CADFEM GmbH Training Classes

The Complete Courses Offered Can Be Found At: www.cadfem.de

Training Classes Germany DYNAmore Training Classes

The Complete Courses Offered Can Be Found At: www.dynamore.de/en

Training Classes United States LSTC Training Classes

The Complete Courses Offered Can Be Found At: www.lstc.com

Training Classes Sweden DYNAmore Nordic Training Classes

The Complete Courses Offered Can Be Found At: www.dynamore.se

Training Classes France DynAS+ Training Classes

The complete Training Courses offered can be found at www.dynasplus.com

Training Classes	Thailand	Training Classes

Complete Courses offered can be found at: **http://www.dfe-tech.com/training.html**

Training Classes	United States ETA	Training Classes

The Complete Courses Offered Can Be Found At: www.eta.com etainfo@eta.com

Training Classes	United States CAE Associates	Training Classes

The Complete Courses Offered Can Be Found At: www.caeai.com

Training Classes	France Alyotech Technologies	Training Classes

For course location visit www.alyotech.fr

Training Classes	UK ARUP	Training Classes

For course location visit www.oasys-software.com/dyna/en/training

The training classes are held at our Bangalore and Pune locations

Details about the trainings offered are given below

LS- DYNA Basic Training
Apr 9-11

Advanced Crash Analysis
Apr 17-18

LS- DYNA Basic Training
Apr 23-25

LS- DYNA Basic Training
May 7-9

Airbag Deployment Application
May 15-16

LS- DYNA Basic Training
May 21-23

LS- DYNA Basic Training
Jun 11-13

Advanced Material Forming Analysis
Jun 19-20

LS- DYNA Basic Training
Jun 25-27

Information and Agenda

Classes generally start at 9:30 a.m. and end at 5:00 p.m. Access to computer for workshop exercises and lunch each day are included with the registration.For any queries/clarification please contact us @ support@kaizenat.com

 **FACEBOOK**

BETA CAE SYSTEMS SA
http://www.facebook.com/pages/BETA-CAE-Systems-SA/193472524006194

Cray Inc.
http://www.facebook.com/crayinc

ESI Group
http://www.esi-group.com/corporate/facebook/

 **TWITTER**

BETA CAE SYSTEMS SA
http://twitter.com/betacae

Cray Inc.
http://www.twitter.com/cray_inc

ESI Group
http://twitter.com/ESIgroup

ETA
http://twitter.com/ETA_Inc

GNS
https://twitter.com/gnsmbh

 **LINKEDIN**

BETA CAE SYSTEMS SA

http://www.linkedin.com/company/beta-cae-systems-s.a.?trk=fc_badg

Cray Inc.

http://www.linkedin.com/company/4936

DYNAmore Nordic

http://www.linkedin.com/company/dynamore-nordic-ab

ETA

http://www.linkedin.com/groupRegistration?gid=1960361

Oasys

http://www.linkedin.com/groups/Oasys-LSDYNA-Environment-Software-4429580?gid=4429580&trk=hb_side_g

 **YOUTUBE**

BETA CAE SYSTEMS SA

http://www.youtube.com/user/betacae

Cray Inc. http://www.youtube.com/user/crayvideo

ESI Group http://www.youtube.com/ESIgroup

ETA http://www.youtube.com/user/etainfo1

Lancemore http://www.youtube.com/user/LancemoreJP?feature=watch

 **NEWS FEEDS** ETA: http://eta.com/company/news-eta?format=feed&type=rss

GOMPUTE
A GRIDCORE COMPANY

HPC on-demand for academic users

Run your LS-DYNA simulations and pay for what you use on a turn-key environment

- For LSTC academic customers.
- Run your simulations from 0.05 €/CCH without reservation
- Remote visualization using LS-PrePost
- Avoid installation and maintenance costs
- Other simulation applications also ready to use
- Global connectivity, remote graphics and collaborative environment
- Large number of cores available

For more information please visit: www.gompute.com

Price for computing-core/hour (CCH). Licenses and account set up are not included. Pricing valid only for universities, academic centers and research institutes. The following are trademarks or registered trademarks of Livermore Software Technology Corporation in the United States and/or other countries: LS-DYNA, LS-OPT, LS-PrePost, LS-TaSC. Gompute is owned and operated by Gridcore AB, 2012 All rights reserved.

For the complete list of ATD Models developed and/or offered by DYNAmore visit
http://www.dynamore.de/en/products/models/side

PDB WorldSID-50

DYNAmore has developed a model of the WorldSID 50%. The model is validated with material, component and sled tests. The model was developed with a consortium of the German OEMs (PDB: Audi, BMW, Daimler, Porsche, and VW). The methods applied are the same as in the previous projects with the FAT for the ES-2, ES-2re, USSID, and BIORID model. The table below provides some general information about the release 2.0.1 of the WorldSID 50th percentile male model:

FAT ES-2 and ES-2re Dummy Model

The dummy is used in US-NCAP- and Euro-NCAP side impact assessment, the ES-2re will be used in the new FMVSS214. The dummy is also used for the legal authorization in Europe, Japan and the United States. The table below provides some general information about the release v5.01 of FAT ES-2 model. The version v5.01 of the ES-2re, a variation of the ES-2 for the authorization and the evaluation in the United States, is also available with a comparable number of entities.

FTSS SID-IIs Model

The dummy represents a small female body and is used in an IIHS side impact load case, in the FMVSS214 and the US-NCAP load cases. The table below provides some general information about the release 3.1a of the SID-IIs model. A version for Build Level C (BLC) and Level D (BLD) is available.

FAT EuroSID Model

The dummy is used in the legal authorization in South Korea, Australia, China and India. The table below provides some general information about the actual release 3.6 of the model.

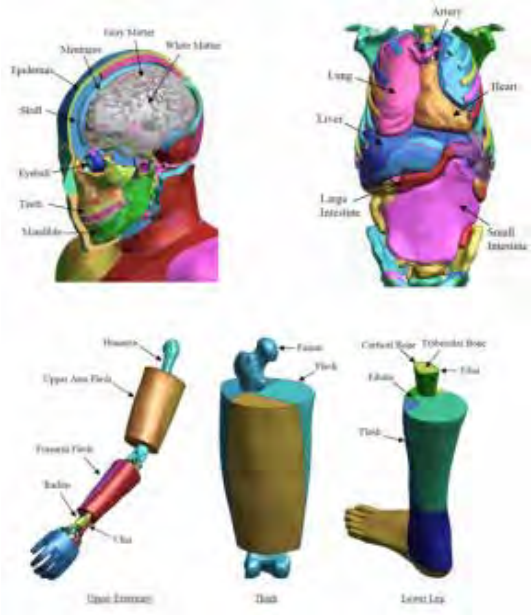
FAT US-SID and SIDHIII Model

The latest model of the FAT US-SID is version v5.0. The dummy is used in the subsiding FMVSS214 regulation and in the SINCAP load case. The modified version, the SIDHIII v5.1 is used in lateral impact to a pole. For both dummies a detailed model is available. The table below provides some general information about the actual multiple validated model of the US-SID.

Total Human Model for Safety - THUMS
LSTC is the US distributor for THUMS

About

The Total Human Model for Safety, or THUMS®, is a joint development of Toyota Motor Corporation and Toyota Central R&D Labs. Unlike dummy models, which are simplified representation of humans, THUMS represents actual humans in detail, including the outer shape, but also bones, muscles, ligaments, tendons, and internal organs. Therefore, THUMS can be used in automotive crash simulations to identify safety problems and find their solutions.

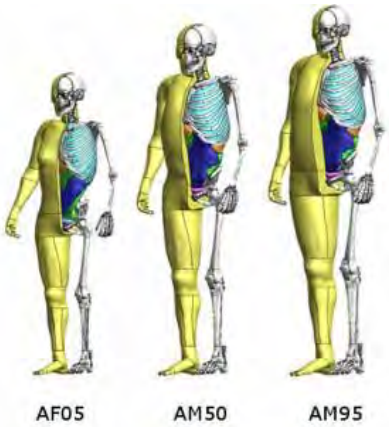


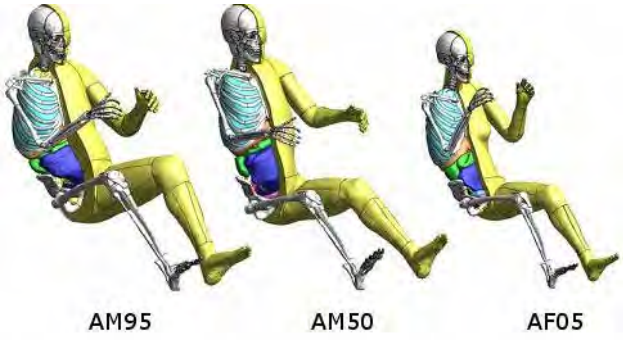
THUMS is limited to civilian use and may under no circumstances be used in military applications.

Model Details: Each of the different sized models is available as sitting model to represent vehicle occupants and as standing model to represent pedestrians.

The internal organs were modeled based on high resolution CT-scans.

LSTC is the US distributor for THUMS. Commercial and academic licenses are available.
For more information please contact us at THUMS@lstc.com .





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AUTHORS
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The Finite Element Method for Fluid Dynamics, Seventh Edition

Book Description
Publication Date: November 28, 2013 | ISBN-10: 1856176355 | ISBN-13: 978-1856176354 | Edition: 7

The seventh edition of these seminal books delivers the most up t o date and comprehensive reference yet on the finite element method for engineers and mathematicians. Renowned for their scope, range and authority, the new editions have been significantly revised and developed. Each book is now complete in its own right and provides self-contained reference, while together they provide a formidable resource covering the theory and the application of the universally used FEM.

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The Finite Element Method for Solid and Structural Mechanics, Seventh Edition

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The Finite Element Method for Solid and Structural Mechanics is the key text and reference for engineers, researchers and senior students dealing with the analysis and modeling of structures, from large civil engineering projects such as dams to aircraft structures and small engineered components.

The Finite Element Method: Its Basis and Fundamentals, Seventh Edition

Book Description
Publication Date: September 5, 2013 | ISBN-10: 1856176339 | ISBN-13: 978-1856176330 | Edition: 7
The Finite Element Method: Its Basis and Fundamentals offers a complete introduction to the basis of the finite element method, covering fundamental theory and worked examples in the detail required for readers to apply the knowledge to their own engineering problems and understand more advanced applications.

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Owned and Operated by Dr. Al Tabiei

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- DummiesAdvance Impact Simulations Using LS-DYNA
- Material Modeling Using User Defined Material
- Intro LS-PREPOST
- Advance LS-PREPOST
- Multi-Physics LS-DYNA

Dr. Al Tabiei has been a consultant on the use of LS-DYNA for more than 20 years to more than 60 companies.

He has been teaching different courses on LS-DYNA for more than 18 years nationally and internationally.

His primary work focus is in the area of multi-physics simulations, crash simulation, impact simulation, and material model development for isotropic and composite materials..

Len Schwer

http://www.duboisschwertraining.com/future

Paul Du Bois and I are pleased to announce or 2014 schedule of classes to be presented in Troy Michigan and hosted by our ETA partners (www.eta.com)

A registration form with the class price list is available on our web page.
http://www.duboisschwertraining.com/classes/Registration%20Details%20Troy%20MI

Completed registration forms are required prior to 13 May 2014 to establish class size. Class size minimum is four attendees. Once a class is confirmed, an invoice with payment instructions will be emailed.

2014 Schedule of Classes

ETA, Troy, Michigan

Hosted by our ETA Partners www.eta.com

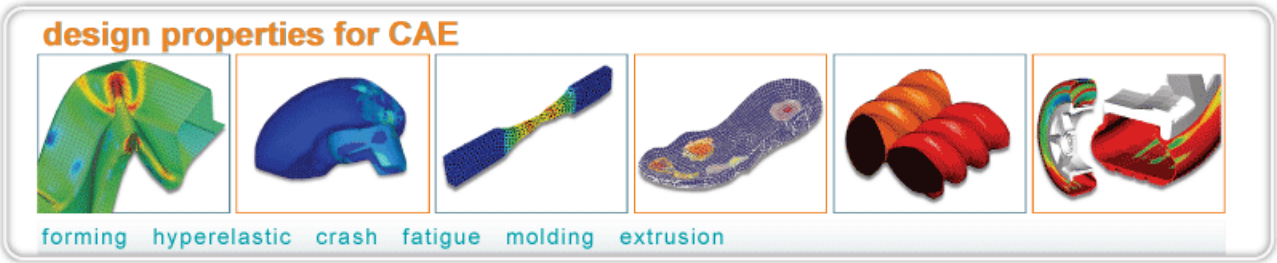
27-28 May 2014 - Concrete and Geomaterial Modeling with LS-DYNA
29-30 May 2014 - Methods and Modeling Techniques: Prerequsite for Blast and Penetration
2-3 June 2014 - Penetration Modeling with LS-DYNA
4-5 June 2014 - Blast Modeling with LS-DYNA
6 June 2014 - Explosives Modeling for Engineers

DYNAmore, Stuttgart, Germany

9-10 October 2014 - Concrete and Geomaterial Modeling (Len)
13-14 October 2014 - Blast Modeling with LS-DYNA
15-16 October 2014 - Penetration Modeling with LS-DYNA

ARUP, Solihull, United Kingdom

20-21 October 2014 - Concrete and Geomaterial Modeling (Len)
20-21 October 2014 - Polymer Modeling (Paul)
22 October 2014 - Explosives Modeling for Engineers



See you at the following events:

- International LS-DYNA Users' Conference: June 8-10, 2014; Dearborn, MI, USA
- ANSYS Conf. & CADFEM Users' Mtg: June 4-6, 2014; Nuremburg, Germany
- SIMULIA Community Conference: May 19-22, 2014; Providence, RI, USA
- CARHS Automotive CAE Grand Challenge: April 15-16, 2014; Hanau, Germany

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With widespread use of modern materials there is the growing need to understand material behavior for the proper utilization of virtual product development tools. testpaks.com is the first web site to feed the "material" needs of the CAE (computer aided engineering) user. It seeks to concentrate the current knowledge base of materials modeling for virtual product design, drawing from the extensive experience of DatapointLabs materials specialists, CAE vendors, and expert users. testpaks.com is important in view of the widespread difficulty experienced by the CAE community and the subsequent limitations it places upon the use of CAE products.

As CAE use has evolved in the past decade, DatapointLabs products for CAE, TestPaks®, have offered CAE users with the most convenient way to get material data inputs specific to their material and simulation programs. For good material models, it is important that the testing and modeling be done by people who understand material behavior, as well as CAE programs. To better understand the needs of CAE, DatapointLabs maintains an active and extensive Alliance Program with all major CAE vendors, and has been serving its client base with not just material data, but "ready-to-load" models that can be exported in digital format as CAE-input decks via MaterealityDDS.

testpaks.com is info-mercial in nature. While it serves as a co nvenient online catalog for purchase of material testing for CAE, it a lso serves as a place for CAE community to submit content, opinions and experiences on t he modeling of materials. We actively solicit this input and post it subject to review. We have in-house facilities to take relevant papers, presentations, web-links and movies and make them ready for the web. These facilities are at your disposal and you can work interactively with our team to get the desired interconnectivity and results.\

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Language: Lectures can be held in English or German.
Documents for presentation should be – if at all possible – in English.
Please submit the title of your lecture in the language in which you will hold it.

Lecture submission and deadlines: Duration of lecture should be 25 minutes.
Please submit by January 31st, 2014:

- Title of lecture
- Short summary stating subject and contents and the software used (at least 2000 signs)
- technical information
- The field/industry you are working in
- By February 14th, 2014: you will receive information about acceptance.
- by March 14th, 2014: you will receive information about session/time of your lecture.
- by May 16st, 2014: please provide us with your lecture and a short CV.

For templates and further information on lecture submission please refer to: ACUM2014-Presenters [1.5 MB].
Submissions can be sent in:

- using the fax form: Registration - online at: Registration - email to: acum2014@cadfem.de

.

Remuneration: Please visit the website for information.

Publication: By submitting your lecture you agree toyour presentation being published in the conference media and used by CADFEM and ANSYS for marketing purposes after the conference.
If you do not agree to this, please let us know.

Registration for lecturers: You must register for the conference even if you are a lecturer.
If you have chosen a free day of participation as remuneration for your user report, the respective day (presumably Thursday, June 5th, 2014) will not be charged.

ACUM Best Paper Award: A committee is going to award in each discipline (Structural Mechanics, Fluid Dynamics, Electronic-Mechanics and Systems & Multi-physics) the best presentation. Only papers submitted on time can be considered. Winners will receive a terrific surprise.

The main language is German. However, lectures in English are welcome! If you plan to attend, please note that selected sessions and workshops will be held entirely in English and the slides in all sessions will mostly be in English

Pre- Conference Seminar
Using LS-DYNA for Heat Transfer Analysis & Coupled Thermal-Stress
Sunday, June 8, 2014 9am - 5pm
Location: Adoba Hotel

Instructor: Dr. Arthur Shapiro

LSTC 1 Day Seminar **Registration: $ 50.00 Students $ 30.00**

Contact: vic@lstc.com

Hot Stamping Process

fringes of temperature

Description: This class provides guidelines in using the heat transfer capabilities in LS-DYNA to model coupled thermal-stress problems with a focus on hot stamping manufacturing operations. It is intended for people with a background in using LS-DYNA for computational mechanics, but who are not familiar with modeling heat transfer or coupled thermal-stress.

Class Material: Class notes will be provided. Although the class presentation is all lecture without workshops, a 30-day demo LS-DYNA license will be authorized for practice in solving the problem set provided in the notes. You can request a demo license starting May 25th. demo@lstc.com subject pre conference seminar

Sections covered during the course

- Getting Started – Learn to create a KEYWORD input file to solve for the thermal expansion of an aluminum block. Learn how to interpret LS-PrePost temperature fringe plots to gain knowledge of the physical process.
- Equation Solvers & Nonlinear Solution Method - Learn the advantages and disadvantages between the Gauss direct solvers & conjugate gradient iterative solvers in LS-DYNA. Learn the nonlinear heat transfer keyword parameters and how Newton's nonlinear method works.
- Time Step Control – Learn how to select a thermal and mechanical time step size, and understand the difference between explicit and implicit solution methods.
- Initial and Boundary Conditions – Learn how to define temperature, flux, convection, and radiation boundary conditions. Learn how to hand calculate a convection heat transfer coefficient, which is the parameter with the greatest uncertainty in your model.
- Thermal-Mechanical Contact – Learn thermal-mechanical contact modeling issues with sheet metal forming applications.
- Thermal-stress coupling – An introduction to coupled thermal stress modeling. Topics include conversion of plastic work to heat, conversion of sliding friction to heat, and calculation of thermal expansion. Thermal-mechanical material constitutive models are also presented.
- Modeling Hot Stamping - The Numisheet 2008 B-pillar hot stamping benchmark problem BM03 is presented and solved.

The new online job market is designed for CAE-engineers from industry, research & development and education. The portal has been initially developed in cooperation with the German NAFEMS Online-Magazine, the magazine for numerical simulation methods and related fields (FEM, CFD, MBS, VR, etc.).

In order to provide this service also to the international engineering community we now offer this service in English language.

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