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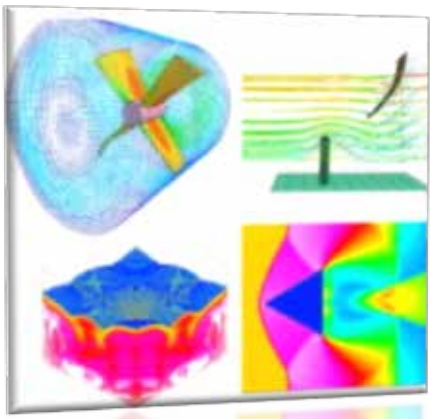
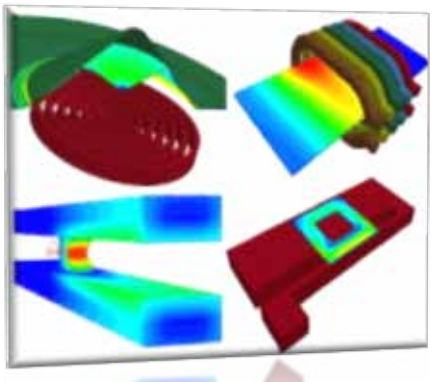
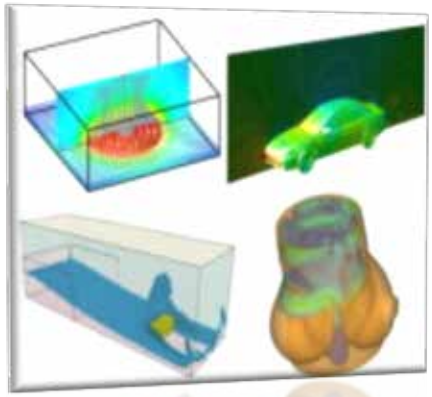
FEA Information Engineering Solutions

Volume 2, Issue 08, August 2013







New Multiphysics Solvers
R7

FEA Information Inc. is a publishing company founded April 2000, incorporated in the State of California July 2000, and first published October 2000. The initial publication, FEA Information News continues today as FEA Information Engineering Solutions. The publication's aim and scope is to continue publishing technical solutions and information, for the engineering community.

FEA Information Inc. Publishes:

FEA Information Engineering Solutions

FEA Information Engineering Journal

FEA Information China Engineering Solutions

FEA Information Engineering Solutions:

A monthly publication in pdf format sent via e-mail, additionally archived on the website FEA Publications. www.feapublications.com

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
To sign up for the Traditional, or Simplified edition write to yanhua@feainformation.com

FEA Information Engineering Journal: ISSN #2167-1273, first published February, 2012

Available on www.feaiej.com

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Comet
The performance engineering workspace
www.cometsolutions.com

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Announcements and/or articles not to miss reading:

FEAIEJ

FEA Information Engineering Journal

FEAIEJ, ISSN 2167-1273, Volume 2, Issue 8, August 2013

www.feaiej.com

Chosen papers highlight R7 LS-DYNA

LSTC

Sponsorships and Exhibitor Booths are now available/
Contact vic@lstc.com for Sponsorship brochure

Comet Solutions

Comet Workspace

Fujitsu

Receives Order for New Supercomputer System from Canon

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

We permitted a wedding photo shoot on our ranch.

Bride – Groom
and
Our Kubota Tractor!

Kubota Tractors Rule!

August 2013 FEA Information Engineering Solutions

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August chosen papers to showcase in FEAIEJ are © to:

The 2013 9th European LS-DYNA Users Conference - ARUP

www.feaiej.com FEA Information Engineering Journal

LS-DYNA® R7: Conjugate heat transfer problems and coupling between the Incompressible CFD (ICFD) solver and the thermal solver, applications, results and examples.

Iñaki Çaldichoury
Facundo Del Pin

LS-DYNA® R7: Coupled Multiphysics analysis involving Electromagnetism (EM), Incompressible CFD (ICFD) and solid mechanics thermal solver for conjugate heat transfer problem solving

Iñaki Çaldichoury
Pierre L'Eplattenier
Facundo del Pin
Miro Duhovic

LS-DYNA® R7: Strong Fluid Structure Interaction (FSI) capabilities and associated meshing tools for the incompressible CFD solver (ICFD), applications and examples.

Facundo Del Pin
Iñaki Çaldichoury

LS-DYNA® R7: Recent developments, application areas and validation results of the compressible fluid solver (CESE) specialized in high speed flows.

Zeng-Chan Zhang

LS-DYNA® R7: Update On The Electromagnetism Module (EM)

Pierre L'Eplattenier
Iñaki Çaldichour

http://www.feaiej.com/2013/feaiej_august2013.pdf Large file

Papers: The full suite of papers from the conference are now available to download from www.dynalook.com

LSTC Site - http://www.lstc.com/applications/new_multiphysics
For Complete information on: For Features - Test Cases - Gallery and Documentation

LS-DYNA R7 includes three new solvers for multiphysic purposes :

- •Incompressible CFD (ICFD)
- •Electromagnetics (EM)
- •CESE/ Compressible CFD and Chemistry

Pursuing LSTC's objective of offering a unified simulation environment for an always wider range of applications, three new solvers are automatically included and available for any registered DYNA user (R7 version, double precision executables only).

Incompressible CFD

Sales: US - LSTC - DYNAMAX - ETA
Canada - MFAC

The incompressible flow solver is based on state of the art Finite Element technology applied to fluid mechanics. It is fully coupled with the solid mechanics solver. This coupling permits robust FSI analysis via either an explicit technique when the FSI is weak, or using an implicit coupling when the FSI coupling is strong. In addition to being able to handle free surface flows, there is also a bi-phasic flow capability that involves modeling using a conservative level-set interface tracking technique. Basic turbulence models are also supported. This solver is the first in LS-DYNA to make use of a new volume mesher that takes nice surface meshes bounding the fluid domain as input. In addition, during the time advancement of the incompressible flow, the solution is adaptively re-meshed as an automatic feature of the solver. Another important feature of the mesher is the ability to create boundary layer meshes. These anisotropic meshes become a crucial part of the model when shear stresses are to be calculated near fluid walls. For more details, please refer to the associated menu links.

Electromagnetics

Sales: US - LSTC - DYNAMAX - ETA
Canada - MFAC

The Electromagnetism solver solves the Maxwell equations in the Eddy current (induction--diffusion) approximation. This is suitable for cases where the propagation of electromagnetic waves in air (or vacuum) can be considered as instantaneous. Therefore, the wave propagation is not solved. The main applications are magnetic metal forming or welding, induced heating, and so forth. The EM module allows the introduction of a source of electrical current into solid conductors and the computation of the associated magnetic field, electric field, as well as induced currents. The EM solver is coupled with the structural mechanics solver (the Lorentz forces are added to the mechanics equations of motion), and with the structural thermal solver (the ohmic heating is added to the thermal solver as an extra source of heat). The EM fields are solved using a Finite Element Method (FEM) for the conductors and a Boundary Element Method (BEM) for the surrounding air/insulators. Thus no air mesh is necessary. For more details, please refer to the associated menu links.

LSTC Site - http://www.lstc.com/applications/new_multiphysics
For Complete information on: For Features - Test Cases - Gallery and Documentation

CESE/ Compressible CFD

Sales: US - LSTC - DYNAMAX - ETA
Canada - MFAC

The CESE solver is a compressible flow solver based upon the Conservation Element/Solution Element (CE/SE) method, originally proposed by Dr. Chang in NASA Glenn Research Center. This method is a novel numerical framework for conservation laws. It has many non-traditional features, including a unified treatment of space and time, the introduction of conservation element (CE) and solution element (SE), and a novel shock capturing strategy without using a Riemann solver. To date, this method has been used to solve many different types of flow problems, such as detonation waves, shock/acoustic wave interaction, cavitating flows, and chemical reaction flows. In LS-DYNA, it has been extended to also solve fluid-structure interaction problems with the embedded (or immersed) boundary approach or moving (or fitting) mesh approach. For more details, please refer to the associated menu links.

Programs conducted & sponsored by Kaizenat Technologies Pvt. Ltd.

www.kaizenat.com

NIT-Trichirapalli

- One week short term course on "Quantitative Research Techniques and Tools for Engineers and Researchers" (10.06.2013 to 14.06.2013)
- Researchers, Faculties, students, Engineers from various Industries
- Kaizenat Sponsored this event & educated attendees on capabilities of LSTC suite of products

Advance LS-DYNA training by Dr. Al Tabiei, USA

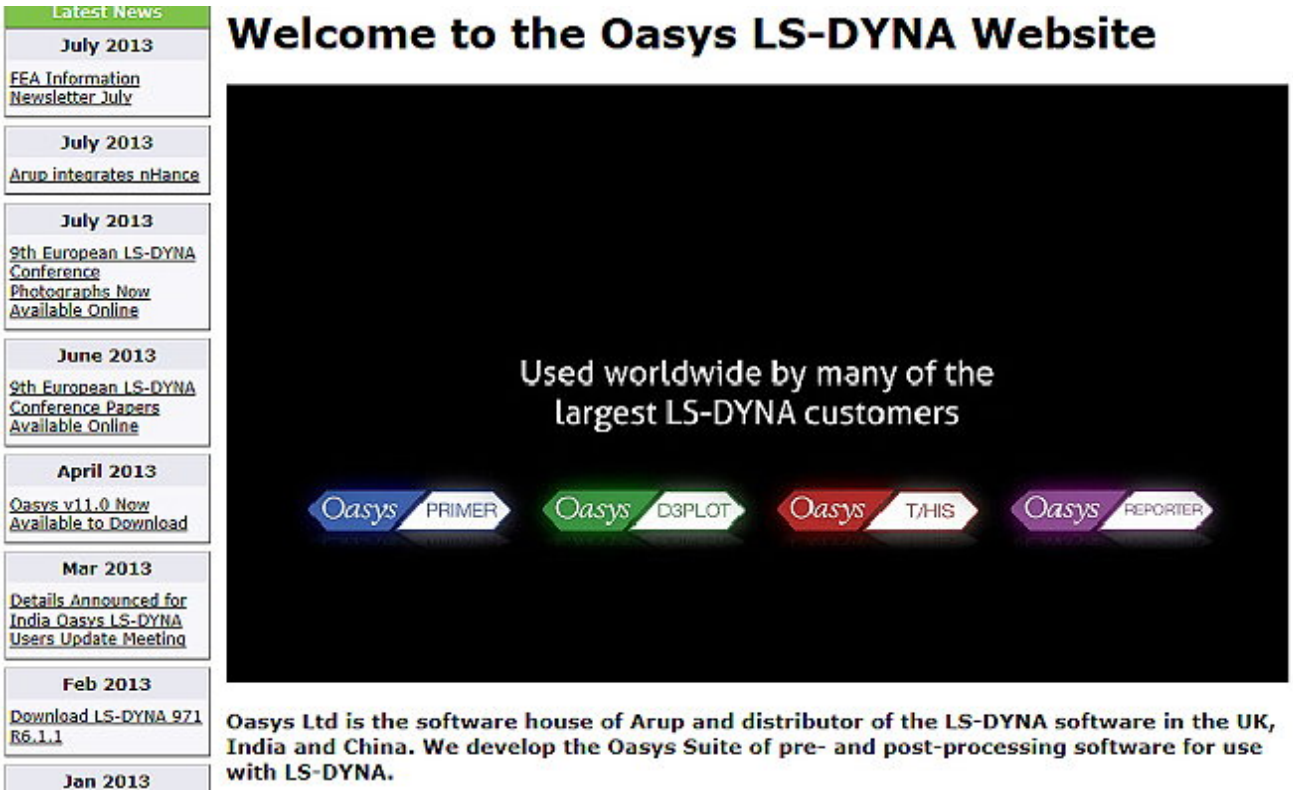
- Conducted series of event at Bangalore & Pune with ARAI
- Close to 100 attendees both event put together
- Participants appreciated on this different kind of initiative of 2 days of LS-DYNA focussed technical event by such international expert from Kaizenat which was not in the history of Indian LS-DYNA community

International workshop on Rubber Product Design & Failure Analysis at ANNA University-MIT Campus

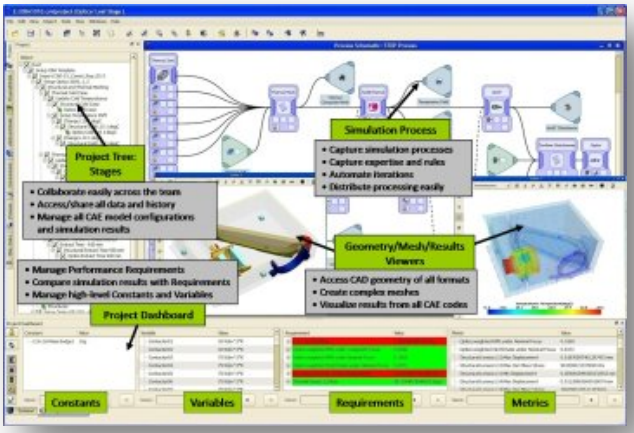
- Benefits of LSTC suite of tools for Elastomers was presented
- Close to 80 participants were there.
- Kaizenat supported this event and educated Rubber & Plastics industries about potential benefits that LSTC suite of tools can add for them
- Very well received due to the width of capabilities (like mold flow) our tools

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

LS-DYNA Distributor in the UK, China and India – for other locations and offered software please visit the website.



http://cometsolutions.com/



Comet is a collaborative, model-based engineering workspace that captures your current simulation best practices and enhances associated design and engineering software tools (both COTS and in-house). Comet Intelligent Templates enable geometry-independent, multi-physics modeling and simulation process automation for standard as well as complex design analysis activities.

Comet enables individual engineers as well as cross-functional product engineering teams to rapidly develop more innovative and reliable products: starting from early concept design exploration through detailed design validation. The key is linking product simulation activities to key product performance requirements via Comet Intelligent Templates.

Benefits of using the Comet Workspace

•Capture and reuse engineering IP/best practices with Comet Intelligent Templates

- ◦Increased effectiveness of limited CAE expert analyst resources
- ◦Enable non-CAE experts to safely perform standard calculations

•Enable design innovation via multi-disciplinary concept trade studies

- ◦Robust multi-fidelity, multi-physics performance simulation

•Ensure Accuracy & Consistency of Simulation Results

- ◦All analysis disciplines work off the same “master model” data
- ◦Reduce manual data translation, analysis model re-work and errors

•Complete Audit Trail of Project Models, Processes Used & Results vs Requirements

- ◦Work-in-progress engineering data is captured at each stage of project

•Collaborate Across the Project Team via the Project Dashboard

- ◦Systems engineers, CAE analysts, design engineers & even program managers
- ◦Increase Speed and Effectiveness of Design Trade-off Decisions

What Makes Comet Different: In contrast to other "file-based" process integration and design optimization (PIDO) tools available in the market today that rely on having an existing data file for each tool to be chained together in a "black box" process, a Comet "intelligent process template" actually recreates the complete underlying product design data and product simulation models every time the process is executed within Comet. This means that a Comet process is not limited to merely making relatively small "tweaks" to parameters contained in the baseline files/models. A Comet process template can instead explore a much wider range of changes to the design topology and alternative configurations/variants because the underlying design models are actually regenerated "on the fly" using the new design parameters which can be modified interactively from within the Comet Project Dashboard.

This "hub and spoke" integration model utilizes Comet "adaptors" to regenerate the inputs for the underlying design and simulation tools in a Comet process, run the tools and capture the results back into the Comet "master model" of the product design. Comet also captures and archives all of the native input and output files for each of the external software tools executed within a process for every unique variation of the model captured within the Comet project "stages". As opposed to the way that templates are typically created in other software tools today via script-based programming for each tool-to-tool connection required to execute a process, creating design simulations processes within Comet is a graphical, drag and drop based interaction model working directly within the Comet user interface. As such, the engineers that "author" a Comet process template do not have to be experts in C++ programming or other advanced scripting languages such as Python.

Also, because the Comet data model is built around a highly extensible XML-based data schema, it is very easy to extend and enhance the scope of the Comet application without requiring C++ programming expertise. The Comet Abstract Engineering Model™ readily allows for extensions beyond what is currently supported by Comet and it's COTS adaptors such as:

- new functional component types/abstract component libraries
- new physics & design domains
- new simulation and analysis codes
- new process procedures
- new environments (loading and boundary conditions)

Importantly, the Comet AEM™ can support an evolving design and analysis process that can easily progress throughout a design project's lifecycle. It allows analyses where models are at mixed levels of fidelity(0D-3D), as well as evaluations with complex cross-domain effects and interdisciplinary interactions (e.g., structural, thermal, optics, durability, mechanical/3-D MCAD, costing, controls, etc.).

.August 6, 2013 - Fujitsu Limited

Fujitsu Receives Order for New Supercomputer System from Canon

http://www.fujitsu.com/global/news/pr/archives/month/2013/20130806-01.html

PRIMEHPC FX10 configuration handles large-scale, complex analyses, enabling product development with minimal need to make prototypes

Tokyo, August 6, 2013 -

Fujitsu today announced that it has received an order for a new supercomputer system from Canon Inc.

Fujitsu will also provide Canon with LS-DYNA(2) non-linear dynamic structural analysis software.

Fujitsu Supercomputer
PRIMEHPC FX10

The system will be a 96-node configuration of the Fujitsu Supercomputer PRIMEHPC FX10, and will have a theoretical peak performance of 20.2 teraflops.

The system will contribute to more sophisticated analytical simulations in Canon's product development processes. The system is expected to begin operations in October 2013.

Background to the New System

Canon has been utilizing HPC(1) for virtual prototyping and various analytical simulations in its product development activities. However, as products are becoming increasingly sophisticated while getting progressively smaller, the company began to consider deploying a more sophisticated supercomputer system that would enable it to perform complex, large-scale analytical calculations.

Canon selected the PRIMEHPC FX10 as its new supercomputer system for its combination of high performance, low power consumption, and high reliability.

Overview of the New System

The PRIMEHPC FX10 is a supercomputer with superior scalability, reliability, and energy-saving features that represent further improvements in the Fujitsu technologies employed in the K computer. The new system will be a 96-node configuration of the PRIMEHPC FX10, and have a theoretical peak performance of 20.2 teraflops. In addition, Fujitsu will deliver a high-capacity, highly reliable, high-performance storage environment by using a Fujitsu Storage ETERNUS disk array and FEFS (Fujitsu Exabyte File System) software. **Fujitsu will also provide Canon with LS-DYNA(2) non-linear dynamic structural analysis software.**

With the new system, Canon will now be able to perform complex, large-scale simulations, which had previously been difficult to perform due to the processing resources required, thereby enabling the achievement of Canon's goal of "prototype-free" product development(3).

Through the provision of its PRIMEHPC FX10 and other technical computing solutions, Fujitsu seeks to help customers reduce their product development timeframes and costs while contributing to improvements in the performance, features, and quality of their products.

Glossary and Notes

1 High performance computing: Used for processing massive scientific calculations at high speeds. For example, it can be applied to weather analysis of the entire planet and car crash analysis

.2 LS-DYNA: Software developed by Livermore Software Technology Corporation and sold by Fujitsu for simulating large deformations of structures using finite element method with explicit time integration. This highly reliable program is the world's leading software for use in the simulations of car crashworthiness, drop testing, metal/plastics forming, perforations, crack propagation, and failure, among other applications.

3 Prototype-free product development: The use of simulations and other techniques in product development work to minimize the creation of physical prototypes in order to reduce product development timeframes and costs.

About Fujitsu: Fujitsu is the leading Japanese information and communication technology (ICT) company offering a full range of technology products, solutions and services. Approximately 170,000 Fujitsu people support customers in more than 100 countries. We use our experience and the power of ICT to shape the future of society with our customers. Fujitsu Limited (TSE: 6702) reported consolidated revenues of 4.4 trillion yen (US$47 billion) for the fiscal year ended March 31, 2013. For more information, please see http://www.fujitsu.com.

24 – 25 September 2013

Filderstadt (Stuttgart), Germany

www.dynamore.de/forum13-e

DYNAmore invites you to attend the 12th LS-DYNA Forum (free of charge), which will take place in Stuttgart-Filderstadt, Germany.

The event consists of two parts, i.e., the "Developer Forum" focusing on background information and new developments in LS-DYNA and LS-OPT and the "LS-DYNA User Forum" where renowned speakers are invited to present their applications. Seminars and workshops will also be held before and after the event.

LS-DYNA Developer Forum on 24 September 2013

During this afternoon, participants have the chance to obtain first-hand information from program developers of LSTC and DYNAmore on the latest innovations and future developments in LS-DYNA and LS-OPT. It will be well worth visiting the event to find out more about new features, their scientific basis as well as their application. Additionally, your ideas and wishes are welcome and we encourage you to engage in open exchanges.

LS-DYNA User Forum on 25 September 2013

Exciting contributions from the companies Basell, BASF, BMW, Daimler, Hyundai, Johnson Controls, Magna Steyr, Opel, Porsche, Toyota, ViF and Volkswagen as well as from the universities TU Dortmund and TH Mittelhessen will give an excellent overview of current and future simulation requirements concerning vehicle safety and process simulation. The main focus will be on modeling plastics, composites and ultrahigh-strength steels as well as on the joining techniques of bonding and welding. This year, the program developer Dr. Brian Wainscott from LSTC will be giving a summary on recent developments in LS-DYNA.

Hardware and Software Exhibition

A hard- and software exhibition will be running parallel to the LS-DYNA Forum.

Workshop on Dynamic Material Characterization

The determination of material cards is discussed and an introduction to the associated material models is given besides a live demonstration of the pendulum test rig 4a impetus.
Date: Morning of 24 September; Registration:
www.dynamore.de/ws-kunststoffe-reg-e

Seminars held by LSTC Developers on Advanced Modeling Techniques in LS-DYNA

- **EFG/SPH – Meshless Methods in LS-DYNA**
  Seminar, 12-13 September,
  www.dynamore.de/meshless13e
  Lecturer: Dr. C.-T. Wu (LSTC developer for EFG and SPH)
- **Acoustics with FEM and BEM in LS-DYNA**
  Information day (free of charge), 23 September, www.dynamore.de/2013-info-aku-e
  Lecturer: Dr. Y. Huang (LSTC developer for acoustics)
- **ALE and Fluid-Structure Interaction in LS-DYNA**
  Seminar, 26-27 September,
  www.dynamore.de/ALE13e
  Lecturer: Prof. Dr. M. Souli (LSTC/Univ. Lille, developer for ALE/FSI)

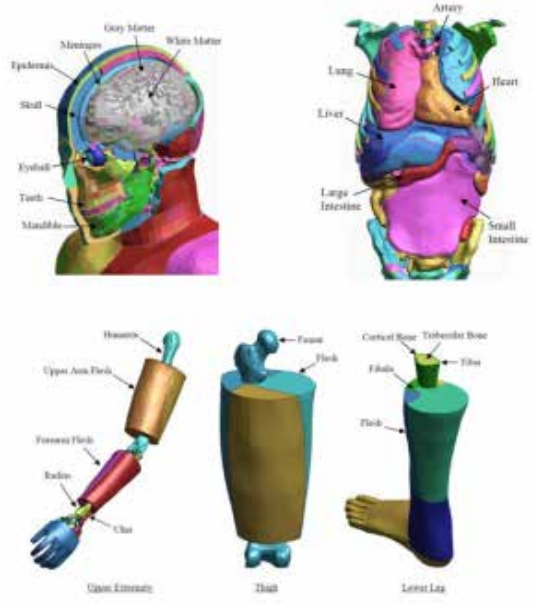
DYNAmore is looking forward to seeing you in Filderstadt.

Webinar	**Date**	**Location**
Springback compensation, LS-DYNA	27 August, 10-12	WEB
Blanksize optimization, LS-DYNA	12 September, 13-15	WEB
Sheet metal forming, DYNAform/LS-DYNA	15 October, 13-15	WEB
Sheet metal forming, FTI Software	22 October, 10-12	WEB
Composite modeling in LS-DYNA, #1	TBD – more info later	WEB
Composite modeling in LS-DYNA, #2	TBD – more info later	WEB
Composite modeling in LS-DYNA, #3	TBD – more info later	WEB
ANSA #1, basic geometry handling	5 November, 10-12	WEB
ANSA #2, Model set-up in LS-DYNA	20 November, 13-15	WEB
mETApost #1, basic post processing	5 December, 10-12	WEB
Courses	**Date**	**Location**
LS-OPT - Optimization & Robustness	3 September	Linköping
Introduction to LS-PrePost	9 September	Linköping
Introduction to LS-DYNA	10 September	Linköping
Meshless Methods	12 September	Stuttgart
ALE and FSI	26 September	Stuttgart
LS-DYNA Implicit Analysis	1 October	Göteborg
LS-DYNA, Simulation of sheet metal forming processes	8 October	Linköping
Contacts in LS-DYNA,	15 October	Göteborg
Introduction to ANSA & mETA	22 October	Linköping
Crash Analysis	5 November	Linköping
Introduction to Composite Modeling	12 November	Linköping
Material Failure	19 November	Linköping
Introduction to LS-PrePost	25 November	Linköping
Introduction to LS-DYNA	26 November	Linköping
Concrete and Geomaterial Modeling	5 December	Ulm
Explosives Modeling for Engineers	9 December	Stuttgart
Blast Modeling	10 December	Stuttgart
Penetration Modeling	12 December	Stuttgart
Crash Analysis	17 December	Stuttgart

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.

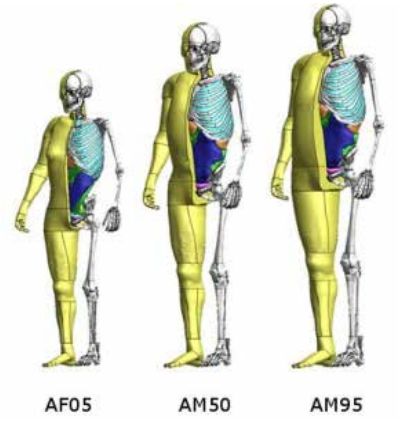


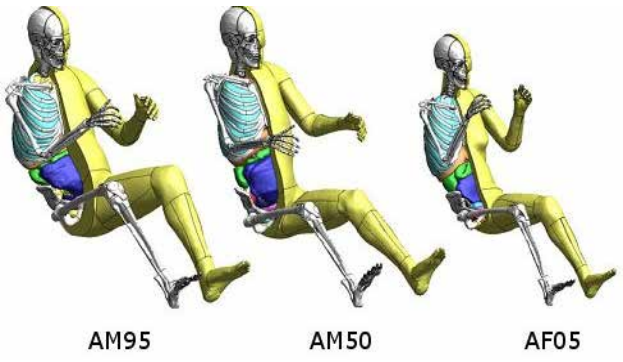
THUMS is limited to civilian use and may under no circumstances be used in military applications.

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 .





THUMS®, is a registered trademark of Toyota Central R&D Labs.

Antoine Reymond Antoine.Reymond@amd.com - Sr. Strategic Alliances Manager

AMD Accelerated Parallel Processing Math Libraries (APPML) is now available as open source as clMath.

I am extremely pleased to have the opportunity to announce that the APPML BLAS & FFT projects are now available as open source projects on the popular GitHub social coding website. A blog post about our introduction of clMath is now publicly available to read.

AMD team today announced the creation of "clMath" – an open source library from the AMD APPML BLAS & FFT projects.

http://developer.amd.com/community/blog/amd-releases-appml-source-code-creates-clmath-library/

Links to the new project and user API level documentation is available online here:

https://github.com/clMathLibraries
http://clmathlibraries.github.io/clFFT
http://clmathlibraries.github.io/clBLAS/

AMD worked closely with Accelereyes to open source the project. Read the Accelereyes announcement here:

http://blog.accelereyes.com/blog/2013/08/13/clmath-an-open-source-blas-and-fft-library-for-opencl/

https://twitter.com/accelereyes/

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

http://www.cray.com/Products/Products.aspx

The Cray XK6

The Cray XK6 supercomputer combines Cray's proven Gemini interconnect, AMD's leading multi-core scalar processors and NVIDIA's powerful many-core GPU processors to create a true, productive, hybrid supercomputer

Cray XE6™ and Cray XE6m™ Supercomputers

The Cray XE6 scalable supercomputer is engineered to meet the demanding needs of capability-class HPC applications. The Cray XE6m is optimized to support scalable workloads in the midrange market.

Cray XMT™ System YarcData uRiKA™ Graph Appliance

The YarcData uRiKA graph appliance is a purpose built solution for Big Data relationship analytics. uRiKA enables enterprises to discover unknown and hidden relationships in Big Data, perform real-time analytics on Big Data graph problems, and realize rapid time to value on Big Data solutions.

The uRiKA graph appliance complements an existing data warehouse or Hadoop cluster.

Cray Sonexion 1300™ Storage System

The Cray Sonexion 1300 system is an integrated, high performance storage system that features next-generation modular technology to maximize the performance and capacity scaling capabilities of the Lustre file system.

Cray also offers custom and third-party storage and data management solutions

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

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

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

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

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

etainfo@eta.com

Inventium Suite™

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

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

PreSys

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

VPG

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

DYNAFORM

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

ESI Group www.esi-group.com

Visual-Environment: 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 command file while the postprocessor provides output such as approximation accuracy, optimization convergence, tradeoff curves, anthill plots and the relative importance of design variables.

LS-TaSC

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

LSTC Dummy Models

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

LSTC Barrier Models

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

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. Hongsheng 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** galb@mfac.com www.mfac.com			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	
	eta/DYNAFORM	INVENTIUM/PreSys		
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			
	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	
	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			
	ANSA	µETA	LS-DYNA	LS-OPT
	LS-PrePost	LS-TaSC	FastFORM	DYNAform
	FormingSuite		LSTC Dummy Models	
			LSTC Barrier Models	
Sweden	**GRIDCORE**		info@gridcore.com	
	www.gridcore.se			
	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			
	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	optiSLang	ESAComp	DIGIMAT
	LS-DYNA		LS-OPT	LSTC Dummy Models	LS-PrePost
	FTI FormingSuite		AnyBody	LSTC Barrier Models	LS-TaSC

India	**Kaizenat Technologies Pvt. Ltd**			support@kaizenat.com	
	http://kaizenat.com /				
	LS-DYNA		LS-OPT	LSTC Dummy Models	LS-PrePost
	Dedicated to LSTC Software			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			
	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.**	info@terrabyte.co.jp		
	http://www.terrabyte.co.jp			
	Consulting LS-DYNA			

Korea	**THEME**	wschung@kornet.com		
	www.lsdyna.co.kr			
	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

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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

 **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

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ESI Group
http://twitter.com/ESIgroup

ETA
http://twitter.com/ETA_Inc

GNS
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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

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

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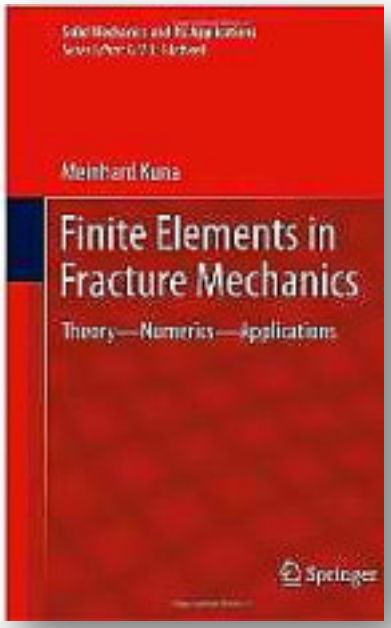

Editorial Reviews - From the Back Cover

Finite Elements in Fracture Mechanics **Prof. Dr. Meinhard Kuna**

Fracture mechanics has established itself as an important discipline of growing interest to those working to assess the safety, reliability and service life of engineering structures and materials. In order to calculate the loading situation at cracks and defects, nowadays numerical techniques like finite element method (FEM) have become indispensable tools for a broad range of applications. The present monograph provides an introduction to the essential concepts of fracture mechanics, its main goal being to procure the special techniques for FEM analysis of crack problems, which have to date only been mastered by experts. All kinds of static, dynamic and fatigue fracture problems are treated in two- and three-dimensional elastic and plastic structural components. The usage of the various solution techniques is demonstrated by means of sample problems selected from practical engineering case studies. The primary target group includes graduate students, researchers in academia and engineers in practice.

About the Author

After studying physics at the University of Magdeburg, Prof. Dr. Meinhard Kuna worked as researcher and group leader at the Academy of Sciences of GDR (Institute of Solid State Physics and Electron Microscopy) in Halle. At the university of Halle he graduated with PhD Thesis (1978) and habilitation (1991) in the field of numerical methods in fracture mechanics. After German reunification, he became head of department at Fraunhofer institute for Mechanics of Materials Freiburg/Halle and later at MPA Stuttgart. Since 1997 he is full Professor for Applied Mechanics and Solid Mechanics at TU Bergakademie Freiberg.

Prof. Kuna established an internationally recognized research group dealing with computational methods in fracture mechanics, damage mechanics and modelling of materials. His projects are devoted both to fundamental research and industrial applications, ranging from nuclear waste casks, piezoelectric materials to microelectronic devices.

Prof. Kuna published about 240 papers and one monograph. He organized several national and international scientific conferences on fracture mechanics and is member of Editorial Boards in international journals.

Product Details
Series: Solid Mechanics and Its Applications (Book 201)
Hardcover: 490 pages Publisher: Springer; 2013 edition (July 30, 2013)
Language: English ISBN-10: 9400766793 ISBN-13: 978-9400766792

Time-Domain Finite Element Methods for Maxwell's Equations in Metamaterials (Springer Series in Computational Mathematics	*Jichun Li*
Finite Element Analysis: A Primer (Engineering)	*Anand V. Kulkarni - V.K. Havanur*
Finite Element Methods for Engineers	Roger T. Fenner
July 2013 Finite Element Mesh Generation	*Daniel Lo*
January 2013 The Finite Element Method: Theory, Implementation, and Applications (Texts in Computational Science and Engineering)	*Mats G. Larson -, Fredrik Bengzon*
January 2013 Finite and Boundary Element Tearing and Interconnecting Solvers for Multiscale Problems (Lecture Notes in Computational Science and Engineering)	*Clemens Pechstein*
January 2013 Structural Analysis with the Finite Element Method. Linear Statics: Volume 2: Beams, Plates and Shells (Lecture Notes on Numerical Methods in Engineering and Sciences)	*Eugenio Oñate*
Elementary Continuum Mechanics for Everyone: With Applications to Structural Mechanics (Solid Mechanics and Its Applications)	*Esben Byskov*

Finite Element Analysis Theory and Application with ANSYS (3rd Edition)	Practical Stress Analysis with Finite Element	A First Course in the Finite Element Method
Saeed Moaveni	**Bryan J Mac Donald**	**Daryl L. Logan**
Finite Element Modelling Techniques in MSC.NASTRAN and LS/DYNA	Finite Element Analysis/formulation & verification	Introduction to Theoretical and Computational Fluid Dynamics
Sreejit Raghu	**B. A. Szabo**	**C. Pozrikidis**

		CAE design and sheet metal forming… **Li Fei Zhou Deng**	**Applied Metal Forming**

Micro Metal Forming (Lecture Notes in Production Engineering)	**The Finite Element Method: Theory, Implementation, and Applications (Texts in Computational Science and Engineering) [Hardcover]**	

Viskoplastische Stoffgesetze für Thermoplaste in LS-DYNA: Theorie und Aspekte der Programmierung **Matthias Vogler**	Meshless Methods in Solid Mechanics **Youping Chen**	Geotechnical Earthquake Engineering **Steven Lawrence Kramer**
Fundamentals of Earthquake Engineering **Amr S. Elnashai**	Computational Fluid Dynamics **John David Anderson**	Computational Fluid Dynamics: A Practical Approach [Paperback] **Guan Heng Yeoh**
Biomechanical Systems Technology: Computational Methods **Cornelius T. Leondes**	Numerical response of steel reinforced concrete slab subjected to blast and pressure loadings in LS-DYNA. **Vivek Reddy**	Formulas for Mechanical and Structural Shock and Impact **Gregory Szuladziniski**

The Finite Element Method **Thomas J. R. Hughes**	Computational Fluid Dynamics **T. J. Chung**	

Conference Schedule**: Oct.16th – 18th**

Oct. 16Th	Evening	Registration, Reception party
Oct. 17th	Morning Main Session	Keynote Speakers speech **Dr. John O. Hallquist** **Dr. Lin Zhongqin** **Dr. Zhou Qing** **Dr. Wu Shenrong** **Dr. Li Genguo**
	Afternoon Session	1. Automotive crashworthiness(1) 2. MPP 3. Simulation Technogloy 4. EFG, NVH, Multi-Physics 2
	Evening	Banquet
10月18日	Morning Session	1. Automotive crashworthiness(2) 2. Metal Forming 3. Airbag, Ale, CMP, SPH 4. Pre,Post processing and Optimization
	Afternoon Main Session	Latest LSTC products updates LSTC expert will introduce Latest LSTC products updates

Training Classes: Oct. 15th - 16th

No	Class Title	Date	Language	Instructor
C1	ALE/FSI	15th -16th	Chinese	Hao Chen
C2	LS-OPT Introduction	15th -16th	English	Nielen Stander
C3	LS-DYNA(R) in Sheet Metal Forming Simulation	15th -16th	Chinese	Xinhai Zhu
C4	MPP and Particle Airbags	15th -16th	Chinese	Jason Wang
C5	Passive Safety	15th -16th	English	Dilip Bhalsod
C6	LS-PrePost	19th -20th	Chinese	Zhan Ding, Wang Kai

ALE/FSI

This course is to provide an understanding of ALE method implemented in LS-DYNA package and its fluid structure interaction mechanism. LS-DYNA employs multi-material ALE formulation to model fluids. Together with its own tightly-coupled fluid structure interaction method, it excels in simulating a series of engineering problems that involve fluids carrying large momentum or high energy density impacting, penetrating Lagrange structures. For examples, explosions, tank sloshing, container dropping, bird strike, projectile-hitting-target, etc.

This course expects audiences to have an understanding of finite element method and a basic knowledge of LS-DYNA package (be able to construct, execute and analyze a simple Lagrange structure model). Advanced knowledge in finite element method and computational fluid dynamics is helpful but not necessary.

ALE/FSI

This course will start with a brief introduction to finite element method and cover certain key concepts in element technology such as reproducing condition, locking, hourglassing, etc. Next the advection process will be introduced in the description of single-material ALE method. Then interface reconstruction algorithm used to model inter-element fluid interfaces is going to be discussed in the multi-material Eulerian method section. Mesh motion is covered to wrap up the ALE part and the first day of the class.

The second day we will concentrate on the fluid structure interaction part. We start with a simple contact case as it is more familiarized with LS-DYNA users. By comparing the contact and coupling algorithms, we smooth our entrances to the ALE FSI concepts. Next we cover several aspects of the coupling method, such as construction of fluid interface and structure interface, penalty spring, leakage, etc. Key points of performing a successful FSI analysis are then discussed. We conclude the class by briefly discussing different types of applications and their modeling techniques.

LS-OPT Introduction

Over the duration of the class, students work in groups of two (sometimes individually) to work/solve the exercises. The exercises are simple, so that they take a short time to run, but contain enough complexity to give insight into the optimization process. Most of the problems are nonlinear (large deformation) dynamic and will be solved using LS-DYNA simulation. The following topics are discussed.

- **Optimization Theory.** Fundamentals, Experimental Design, Metamodeling, Optimization, Examples.
- **Running LS-OPT and using the post-processor.** Run LS-OPT and do post-processing using the Viewer (graphical post-processor).
- **Simple Optimization with LS-DYNA.** Learn how to set up a simple optimization problem from the start. Make design revisions such as adding simulations or changing the design formulation. Run an automated optimization.
- **Import Analysis Results table.** Import existing analysis results and conduct an optimization run without new simulations.
- **Direct Optimization.** Direct Optimization using the genetic algorithm with LS-DYNA as solver.
- **Multi-Objective Optimization.** Learn how to set up a simple LS-DYNA example with multiple objectives. Both direct and metamodel-based examples.
- **User-defined example.** Learn the setup for optimization using user-defined (i.e. non-DYNA) simulations. Neural net applications.
- **Modal Analysis and Tracking.** Learn how to set up an optimization problem with frequency constraints and mode tracking, using the LS-DYNA implicit analysis. Select the most important variables using design sensitivities.
- **Multi-disciplinary optimization.** Learn how to set up an optimization problem with more than one case or discipline. Combines crashworthiness with frequency criteria in a single design using the explicit and implicit versions of LS-DYNA. (If time allows).
- **System Identification.** A problem to identify material parameters from experimental results. Set up a multi-case problem. Confidence intervals. Methods include both the classical ordinate-based method as well as the Curve Mapping approach, designed for material calibration using general response history curves or crossplots.

CHINA & Int'l LS-DYNA® Users Conference – 1st October 16, 2013

LSTC US & Dalian Fukun Technology, Ltd. China
The 1st China & International LS-DYNA® Users Conference
Oct. 16 at Dalian, China.

The 1st China & US LS-DYNA® Users Conference
Dalian Fukun China & LSTC US
Oct. 16th-18th, 2013 - Dalian, China

Dalian Inn Fine Hotel, Dalian China.

Join us to meet LSTC Developers, Dalian Developers, Professors, Engineers all dedicated to the growth of LS-DYNA and alliance partners products in the China market. Expected are attendees from Taiwan, Thailand, Korea, US, and other countries.

Learn new LS-DYNA features, share your LS-DYNA experience with developers, professors, and engineers from industry experts, end users and LSTC/Dalian developers.

China was chosen due to the rapid growth in CAE technology. LS-DYNA, as the leading finite element software in the industry, has been well acknowledged and widely adopted in China and worldwide, in various industries such as Automotive, Aerospace and Aeronautics, and Electrical & Electronics.

Headquartered in Livermore, California, Livermore Software Technology Corporation (LSTC) develops LS-DYNA and a suite of related and supporting engineering software products: LS-PrePost, LS-OPT, LS-TaSC and LSTC's ATD and Barrier Models.

The conference will be held regularly and be China's main LS-DYNA Conference platform for researchers and engineers to exchange ideas, new developments and to encourage communications between software developers, users, and others in industry and academia

We welcome all LS-DYNA users to share their knowledge by submitting papers.

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Site: www.dalianfukun.com/conference
Contact us: chinaconf@lstc.com

LSTC US & DYNAmore Germany

The 13th US & International LS-DYNA® Users Conference
June 08-10, 2014 Dearborn, MI

Welcome and Call For Papers

Livermore Software Technology Corporation (LSTC) is pleased to bring engineers, professors, students, consultants, industry leaders and interested parties together at the 13th International LS-DYNA® Users Conference to be held at the Adoba Hotel (formerly the Hyatt Regency) Dearborn, MI.

Abstract Deadline: 11/11/2013	**email your abstract to:** papers@lstc.com	**Notification:** No later than 12/15/2013
Paper Deadline: March 05, 2014	The presenter of each accepted paper will receive free admission to the conference, provided that the presenter registers for a room at the Adoba Hotel under LSTC Conference registration.	

Application Areas Being Accepted for Paper Submission:

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

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

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