FEA Information

Engineering Journal and Website Resource

LS-DYNA
Engineering Analyst III

LENOVO

NASA Expedition

Intel® Atom™ N450
('Pinetrail') processor die

Roadside Safety Program
Texas Transportation Institute

Akram Abu-Odeh   **Nauman Mansoor Sheikh**

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Announcements closing out 2009

Immediate Notice:

    January 27th, 2010 – OASYS LS-DYNA UK Users' Meeting

LSTC News:

    Conference Abstract deadline is January 14th, 2010

    LSTC's sponsorship/booth brochure is available:

        Contact: vic@lstc.com or wlm@lstc.com .

    Lavendra Singh and Brian Walker visited LSTC.

China:

    Lenovo – benchmark news

LSTC Barrier Models and the Update on the Development will be featured in our January 2010 issue.

Wishing Everyone A Happy New Year from FEA Information Inc.

As we close 2009, I'd like to wish everyone, on behalf of FEA Information Inc. a very Happy New Year

Sincerely, *Marsha J. Victory*, President, FEA Information Inc
mv@feainformation.com

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Global Leaders

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

Oasys LS-DYNA UK Users' Meeting

January 27, 2010
Wednesday

The seventh in a series of update meetings for Oasys LS-DYNA Users will be held at our office in Solihull on Wednesday 27th January 2010.

As in previous years, this event will bring together around 70 users of the Oasys and LS-DYNA software to provide information on upcoming features of Oasys and LS-DYNA and to learn more about current and new applications, as well as other related software products.

We are looking forward to talks from Paul Du Bois, Len Schwer, Heiner Müllerschön (DYNAmore GmbH), M'hamed Souli (LSTC) and the Oasys team at Arup.

The event will be followed by a complimentary meal at The Boot Inn in Lapworth (please ensure you let us know in advance if you plan to attend this evening meal).

Registration: This event is free of charge. To register for the event and the evening meal simply send an email with your company/affiliation and contact details to Hazel Partridge. Please let us know if you have any particular dietary requirements when you register.

Please note: in line with our company sustainability policy we do not plan to provide printed copies of the presentations for each attendee at the event; the presentations will be made available to download after the event. If you particularly require a printed copy on the day please let us know when you register.

Venue: The event will be held at The Arup Campus, Blythe Valley Park, Solihull, B90 8AE. Blythe Valley Park is located at junction 4 of the M42;

Meal after the event: The meal following the event will be held at The Boot Inn, Old Warwick Road, Lapworth, B94 6JU. The size of the restaurant is limited so please ensure you confirm to us that you plan to attend to avoid disappointment on the night.

For additional information:

Hazel Partridge, Oasys LS-DYNA Project Administrator, Arup

+44 (0) 121 213 3324

hazel.partridge@arup.com

Provisional Agenda

09:30 - 10:00	Registration with tea & coffee	
10:00 - 10:10	Introduction	
10:10 - 11:00	Session 1 – LS-DYNA	Brian Walker, ARUP
11:00 - 11:30	Morning Break/Networking	
11:30- 12:45	Session 2 – Oasys PRIMER and JavaScripting	Richard Sturt, ARUP
12:45- 14:00	Lunch/Networking	
14:00- 15:30	Session 3 presentation by M'hamed Souli (title TBC) Oasys Post-Processing: D3PLOT, T/HIS & REPORTER presentation by Heiner Müllerschön Medina Mesher	M'hamed Souli, LSTC Roger Hollamby, Arup Heiner Müllerschön, DYNAmore GmbH Martin Gambling, GRM Engineering Ltd
15:30-16:00	Afternoon break & networking	
16:00–17:20	Session 4 Other software (DIGIMAT, FEMZIP, HYCRASH) presentation by Paul Dubois & Len schwer (title TBC) Electric Vehicles presentation	Ian Bruce, Arup Paul Dubois/Len Schwer Neil Butcher/Dick Stimpson, Arup
17:20-18:00	Wrap-up/Networking	
18:00	Dinner at The Boot Inn	

Complete Details can be located at:

http://www.oasys-software.com/dyna/en/events/users_jan-10/users_jan-10.shtml

Training Courses

The following training courses are provisionally scheduled around the time of the Oasys please visit website for complete details:

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

LS-DYNA UK Users' Meeting:

- Thurs 21st -Fri 22nd Jan:
  LS-DYNA Introductory Training Course

- Mon   25th -Tues 26th Jan
  Optimization with LS-OPT,
  (this may be merged with a shortened version of the Stochastic Analysis course)

- Thurs 28th -Fri 29th Jan
  Blast Modelling with LS-DYNA , (with Paul Dubois and Len Schwer)

Intel Announces

Next-Generation Atom Platform

Santa Clara, Calif., Dec 21, 2009

http://www.intel.com/pressroom/archive/releases/2009/20091221comp_sm.htm

Intel Corporation announced new Intel Atom processors today that feature integrated graphics built directly into the CPU, enabling improved performance and smaller, more energy-efficient designs in a new generation of netbooks and Atom-based entry level desktop PCs. Major OEMs have committed to having systems on the new Intel® Atom™ processors and a new companion chipset available within the next few weeks.

The newest Intel Atom platform for netbooks consists of a new Intel® Atom™ processor, the N450, and a new low-power Intel® NM10 Express Chipset. For entry level desktop PCs, it consists of either the Intel® Atom™ processor D410 or the dual core D510, also paired with the Intel® NM10 Express Chipset. The Intel Atom processor was designed from the ground up for small devices and low power, and remains Intel's smallest chip, built on the company's 45nm high-k metal gate manufacturing process. The overall package, including chipset, just got smaller due to the increasing integration and 45nm manufacturing, which means smaller, more compact system designs, lower costs for OEMs and improved performance.

Broad Industry Momentum: Intel continues to see broad industry support

for the Atom platform as netbooks in particular have been hot sellers during a recessionary year due to their affordability, function and small size (7-10.2" screens). Additionally, Intel is expecting to see broad channel adoption for Atom in a variety of small form factor entry-level desktop PCs at low price points, including ultra-small designs (less than 1-litre chassis), fanless designs, and low-cost all-in-one designs.

Since Intel announced the first Atom processors for netbooks and entry-level desktop PCs in June 2008, the market has expanded rapidly. Since introduction, Intel has shipped over 40 million Atom chips for netbooks to every major OEM around the world. In the same timeframe, netbooks ramped faster and sold more units than Apple's iPhone or the Nintendo Wii.* According to ABI Research, total Atom shipments for all segments are expected to continue to grow into the 100s of millions by 2011.* Intel is not letting up, offering the next-generation platform for OEMs to continue to innovate around.

"The Intel Atom processor has fueled an entirely new category of computing over the last year and a half and we think the growth will continue for devices like netbooks and entry-level PCs built around basic computing and Internet usage

models," said Mooly Eden, Intel corporate vice president and general manager of Intel's PC Client Group. "We're excited to be delivering the next-generation Atom platform and working across the industry as we head into a second phase of growth, powering innovative new system designs with better performance, smaller footprints and better battery life."

Intel has over 80 design wins to-date for the new Atom platform from such leading OEMs as ASUS, Acer, Lenovo, Dell, MSI, Toshiba, Samsung and Fujitsu. While the bulk of the systems will feature the new Windows 7* Starter or Home Basic operating system, consumers will have a choice when it comes to selecting an operating system, with some OEMs offering MoblinTM Linux v2 as an alternative for customers who desire a customizable and differentiated user interface.

Worldwide netbook shipments by telecommunications companies such as T-Mobile, Vodafone, Orange and others are also growing and expected to fuel another round of expansion. Intel has been working closely with mobile operators and modem vendors to advance 3G capabilities in netbooks in established and emerging markets. To-date approximately a dozen service providers offer netbooks in various markets, and the numbers are expected to grow with the newest platform. Improved processor and graphics performance

One of the most significant features of the new platform is the integration of memory controller and graphics into the CPU, a first in the industry on x-86 chips. That means two chips (CPU+chipset) instead of the previous three (CPU, chipset, I/O controller hub), a lower TDP, and substantial reductions in cost, overall footprint and power. The netbook platform features a 20 percent improvement in average power and a smaller package size over the previous Atom platform. This translates into smaller and more compact system designs and longer battery life. Because of the integration, the total footprint for the netbook platform has decreased by approximately 60 percent. For entry level desktop PCs, it's a nearly 70 percent reduction in footprint and about 50 percent lower TDP than the previous generation.

About the platform: The N450 is a single core Atom processor with 512k of L2 cache and a 7 watt total kit TDP including chipset. The D410 for entry-level desktop PCs is a single-core Atom processor with 512k of L2 cache and a 12-watt total kit TDP including chipset, and the D510 for entry-level desktop PCs is a dual core Atom processor with 1meg L2 cache and a 15-watt total kit TDP including chipset. The new chips all run at 1.66GHz. Pricing and availability will be announced in January as systems become available from OEMs.

About Intel

University In The News

Roadside Safety Program

Texas Transportation Institute

Akram Abu-Odeh **Nauman Mansoor Sheikh**

The Roadside Safety Program is part of the Roadside Safety & Physical Security Division of TTI. Research in the Roadside Safety Program involves identifying, analyzing, and developing solutions for roadside safety problems with the goal of reducing the tremendous loss of life that occurs on our nation's highways each year as a result of roadside accidents. Specific research activities include the design, analysis, testing, and evaluation roadside safety structures, and the development of guidelines for the use, selection, and placement of these structures. Innovative safety devices designed by TTI researchers are in use worldwide and are saving lives on a daily basis. Roadside safety structures addressed by the Program include guardrails, bridge rails, median barriers, transitions, end treatments, crash cushions, breakaway support structures, and work zone traffic control devices.

Crash tests are often conducted in support of the development and evaluation of these safety devices. Such tests are conducted with the support of the TTI Proving Grounds located at Texas A&M University's Riverside Campus. The Proving Ground Program is staffed by highly skilled personnel who fabricate and construct test articles, conduct crash tests, and process, analyze, and report crash test data. These crash tests are used to demonstrate design viability and safe impact performance before a system is implemented on the roadside.

Today's simulation technology now permits accurate modeling of vehicle interactions with roadside safety devices on the computer. The Roadside Safety Program works closely with the Center for Transportation Computational Mechanics at TTI in applying state-of-the-art analytical tools such as LS-DYNA to roadside safety problems. Researchers have access to a vast array of high-speed computing facilities which enable large, detailed simulations to be run in a short time period. Sophisticated finite element models of vehicles and roadside safety hardware are used to simulate crash tests to evaluate impact performance, assess design alternatives, and perform design optimization in a predictive manner. Use of these sophisticated analysis tools provides an enhanced understanding of crash dynamics that enables researchers to design better, more cost-effective safety hardware at a lower cost to the sponsor.

Research within the Roadside Safety Program also addresses the influence of roadside geometric features such as driveways, slopes, ditches, shoulders, and

medians on the safety of vehicles encroaching into the roadside environment. Researchers perform clinical analysis of real-world crash data and use sophisticated computer simulation codes to better understand the nature and severity of roadside crashes, evaluate countermeasures, and develop design guidelines. Researchers have drafted or are currently developing safety guidelines for roads in such areas as median barrier warrants, clear zones, slope rounding, and driveway slopes and spacing. Benefit/cost analysis is used to evaluate the cost effectiveness of safety alternatives with consideration given to various traffic, roadway, roadside, and vehicle characteristics.

Researchers in the Roadside Safety Program partner with federal and state agencies, other universities and research institutes, and industry on research and development projects. These agencies include the Federal Highway Administration (FHWA), American Association of State Highway and Transportation Officials (AASHTO), National Cooperative Highway Research Program (NCHRP), Texas Department of Transportation (TxDOT), and other state departments of transportation. The Roadside Safety Program is also the designated research partner for the Roadside Safety Pooled Fund Program. This program, which is led by Washington State DOT and has six other member states, pools limited resources to address common roadside safety research problems in a cost-effective and timely manner.

In addition, the Roadside Safety Program's researchers have affiliations with a number of national and international organizations. These affiliations have enabled the researchers to develop strong working relationships and provides for the exchange of ideas and information with professionals throughout the world

Publications can be located at http://www.dynalook.com

Dr. Abu-Odeh is an associate research scientist in the Highway Safety Structures program
http://tti.tamu.edu/people/resume.htm?pid=742

Modeling and Simulation of Bogie Impacts on Concrete Bridge Rails using LS-DYNA
http://www.dynalook.com/international-conf-2008/SimulationTechnology%281%29-2.pdf

Application of New Concrete Model to Roadside Safety Barriers
http://www.dynalook.com/international-conf-2006/11CrashSafety.pdf

Mr. Nauman Mansoor Sheikh is an Assistant Transportation Researcher in the Roadside Safety Program at the Texas Transportation Institute
http://tti.tamu.edu/people/resume.htm?pid=1818

Development of a Hybrid Energy Absorbing Reusable Terminal (HEART) Using Finite Element Modeling in LS-DYNA for Roadside Safety Applications
http://www.dynalook.com/international-conf-2004/01-4.pdf

Development of an Energy Absorbing End Terminal for Open Box Beam Guardrail
http://www.dynalook.com/international-conf-2006/15CrashSafety.pdf

Validation of a W-beam guardrail model against full-scale crash test.
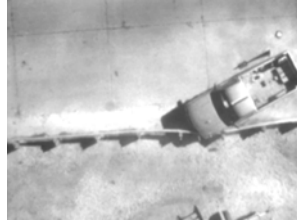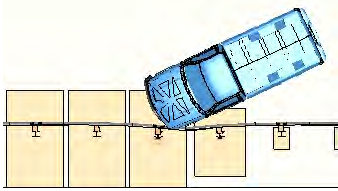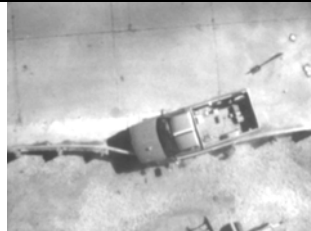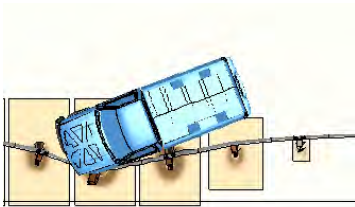
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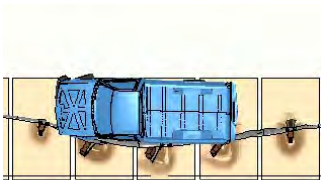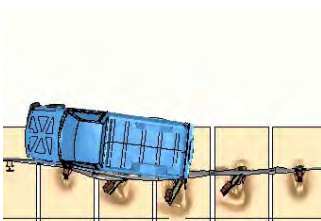
Lenovo Beijing Innovation Center

Livermore Software Technology Corp.

Shanghai HengStar Technology

LS-DYNA® BENCHMARK

The LS-DYNA® benchmark, Lenovo ThinkStation D20 System, now uploaded to TopCrunch.org was accomplished with the help of engineers from the US and China.

Jun Hu, and engineers from
Lenovo Beijing Innovation Center
Beijing China

Jason Wang, and engineers from
Livermore Software Technology Corp.
Livermore, CA

Honsheng Lu, and engineers from
Shanghai HengStar Technology Corp.
Shanghai China

A joint press release will be issued in January.

LS-DYNA Benchmark on Lenovo ThinkStation D20 System Cluster overview.

- 4 nodes × 2 processors/nodes x 8 cores/processor.
- 48 Gb memory total.
- Cisco catalyst 3750 interconnnect.
- Hyperthreading is turned off.

Compute node overview.
- Lenovo ThinkStation D20 System
- Dual Intel W5580 3.2GHz, 8 cores total per machine, hyper-threading is turned off
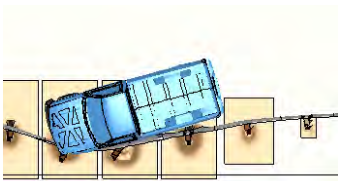- DDR3-1333 2G x 6 (12 G per machine)

Summary of benchmarks can be viewed on http://www.topcrunch.org.

Benchmark	Cores	Time (seconds)
Neon (refined & revised)	8	731
	16	446
	32	339
3 Vehicle Collision	8	9985
	16	6103
	32	4298
2 Vehicle Collision	8	100850
	16	53527
	32	29427

Description of benchmark run:.

Neon (refined & revised).

Frontal crash with initial speed at 31.5 miles/hour Model size 535k elements Simulation length: 150 ms Model created by National Crash Analysis Center (NCAC) at George Washington University One of the few publicly available model for vehicle crash analysis based on 1996 Plymouth Neon. This is a revised version of the neon_revised problem from LSTC. The heading of the file documents the revisions. This revised version is preferred over the previous version for future benchmarks. The previous file will continue to be available so that people may confirm that they run in the same time.

3 Vehicle Collision.

A van crashes into the rear of a compact car, which, in turn, crashes into a midsize car. Vehicle models created by NCAC, and assembled into the input file by Mike Burger, consultant to LSTC.

2 Vehicle Collision.

This model is based on NCAC minivan model and created by Dr. Makino. Supplied by Dr. Chen Tsay, LSTC, on Feb. 13, 2006 Termination time modified per John Hallquist to .120 on March 7, 2006

Modelling of Ductile Failure in Metal Forming

H. Wisselink, J. Huetink (university Twente)

Damage and fracture are important criteria in the design of products and processes. Damage mod- els can be used to predict ductile failure in metal forming processes. Nonlocal models avoid the mesh dependency problems of local damage models.

A nonlocal damage model has been implemented in LS- DYNA using the user-subroutines UMAT and UCTRL1. The implemented model will be compared with results obtained with the available option in LS-DYNA to combine *MAT PLASTICITY WITH DAMAGE with *MAT NONLOCAL. Advantages and disadvantages of the different implementations will be discussed. The user nonlocal damage model has been applied to a bending and a blanking process. Results of these simulations will be shown..

Keyword: Ductile Failure, Nonlocal damage, Bending, Blanking

http://www.dynalook.com/european-conf-2009/C-IV-01.pdf

B. Walker, M. Victory, L. Singh

**LSTC Welcomed ARUP
Brian Walker, UK Office
Lavendra Singh, India Office**

As part of Arup's regular interactions with LSTC, Dr Brian Walker from the Arup Birmingham, UK office and Lavendra Singh, from the Hyderabad, India office spent the first week of December at the LSTC Headquarter Offices in Livermore, CA.

Although Brian Walker has been a long standing visitor and associate, this was the first visit for Lavendra Singh, Leader of the Engineering Solutions Group, for the Indian region. Mr. Singh supports Commercial, Educational, Government and Consulting LS-DYNA clients in India.

Among the discussions, with Dr. John Hallquist and Ms. Marsha Victory, were LS-DYNA as the emerging FEA code in the Indian market, pricing, 2010 training courses and events to be held in India.

Special discussions were held regarding the upcoming 3rd Oasys LS-DYNA Update meeting and standard and specialist training programs. Among the training/discussions planned for 2010 are the latest developments in LS-DYNA, Crash Analysis, Optimization, LSTC's Dummy and Barrier Models, and other courses, lectures and symposiums.

It was an extremely useful meeting and the Arup team got the latest updates on LS-DYNA 980, LSTC Models, LS-PrePost and LS-OPT.

Lavendra Singh observed, "The previously developed features and new features, that I observed, of the new 980 version of LS-DYNA, for Electromagnetism, Acoustics, compressible and Incompressible Fluids, will make it a complete solution for multistage simulations in the Automotive crashworthiness, Manufacturing industries and Aerospace industries."

Mr. Singh added, "Many of the new features expand the scope of LS-DYNA to new industries. For example, the addition of incompressible FSI capability will be very useful in such fields as BioMedical field applications. Similarly, new capabilities to model unbounded domains using perfectly matched layers for wave propagation and to model earthquake excitation into the soil-structure system using the effective seismic input method are highly relevant to the Civil Engineering industry."

Please contact Lavendra Singh at india.support@arup.com if you would like to know more about the new features and improvements to LS-DYNA, LS-PrePost and LS-OPT.

China News

Training Courses Presented by Shanghai Hengstar Technology Corp
By: Hongsheng Lu

January 2010 – Training Class

A three days training class "LS-DYNA MPP, Airbag simulation with LS-DYNA, and LS-Prepost", taught by LSTC's Dr. Jason Wang, and Philip Ho, will be held at Shanghai from Jan. 25 to Jan. 27, 2010 by Hengstar Technology Corp. (www.hengstar.com).

Day one (Jan. 25):
   LS-PrePost

Day two (Jan. 26):
   MPP LS-DYNA

Day three(Jan. 27):
   Airbag simulation with LS-DYNA

This course is in response to users wanting to effectively use LS-DYNA MPP in their complex simulations such as crashworthiness, airbag deployment, stamping etc.

New developments and features in LS-DYNA MPP and LS-PrePost will be covered. CAE engineers and professor from OEM, research center and university are very welcome to attend this course.

LS-PrePost, LS-OPT, LSTC's Barrier and Dummy Models are included with your LS-DYNA license at no additional fees. LS-PrePost training is given by the lead developer of LS-PrePost who leads a team of developers in the US and in China. LS-PrePost is fast becoming utilized in China and this course being taught by Philip Ho is an excellent way to learn. 30-day demonstration licenses are available to class attendees to practice what they have learned.

For the course 30-day demonstration license, for course practice contact hongsheng@hengstar.com

Dr. Hongsheng Lu prior to returning to China worked as a senior scientist in LSTC to develop and implement EFG in LS-DYNA. Dr. Lu also worked on several projects with automobile companies to improve automobile design by using and implementing the new features of LS-DYNA. From July 2009, Dr. Lu worked as a general manager in Shanghai Hengstar Technology Co. Ltd. (www.hengstar.com). He tries to help LS-DYNA users in China to effectively use LS-DYNA to improve automobile design, especially in crashworthiness simulation and passive safety.

Position Description

LS-DYNA
Engineering Analyst III

Must be a U.S. Citizen.

The following employment opportunity is listed by Tom Myers

Tom Myers - ELECTRONIC CAREERS - 310-317-6113

http://www.electroniccareers.com   SEND RESUME TO Myers@electroniccareers.com

Summary: Conducts analyses on designs of experimental, prototype, or production parachutes and deployment systems and related components.

Supervisory Responsibilities: This position has no supervisory responsibilities with the exception of coaching and mentoring of Analyst I & II – Engineering staff.

Major Responsibilities and Duties:

- Leads engineering analysis activities in support of development and design of parachute systems programs.

- Prepares technical solutions and designs to meet customer specifications during bid process.

- Formulates or devises methods of computer analysis or simulation to assist in analysis.

- Leads development and advancement of the company's modeling capabilities and techniques.

- Leads the identification and preparation of risk assessment information during all phases of a program.

- Interfaces with program managers, customers, and vendors.

- Defines test instrumentation needed to gather data for subsequent analysis.

- Oversees test data reduction and the interpretation of test results.

- Follows general company policies and procedures and develops / implements companies polices and procedures as they relate to analysis activities.

Physical Demands: The position requires that the employee is frequently required to stand, walk, sit, and use hands to grasp objects, reach with hands and arms, talk or hear. The employee is frequently required to lift and/or move up to 10 pounds, occasionally lift and/ or move up to 25 pounds, and infrequently lift and/or move up to 50 pounds. The

employee is required to have close, distance, and color vision and the ability to adjust focus.

Work Environment: Environment is general moderate office where the employee may be exposed to toxic and caustic chemicals (toner) and airborne particles (common paper dust). While in the plant or offsite, the employee may be exposed to wet humid conditions, fumes or airborne particles, toxic or caustic chemicals, work near moving mechanical parts, outdoor weather conditions, extreme hot or cold, and risk of electrical shock.

Skills & Knowledge:

- Detailed knowledge of aeronautical, mechanical or electrical engineering design principles, practices, and procedures.

- Working knowledge of office machines and PC computers.

- Extensive experience, with specialist analysis software, including LS-DYNA, Optistruct, Hypermesh, DCLDYN, and test equipment software.

- Working knowledge of at least one scientific programming language, e.g. FORTRAN.

- Applies advanced mathematical concepts such as plane and solid geometry and trigonometry. Utilizes fractions, percentages, ratios and proportions.

- Reads, analyzes, and interprets periodicals, professional journals, and technical procedures. Writes reports, correspondence, and procedures in English.

- Effectively presents information and responds to questions from customers and managers.

- Writes reports, business correspondence, and procedures/ effectively presents information and responds to questions from managers, vendors, and customers.

- Utilizes office software applications such as Word, Excel, Outlook and PowerPoint.

- A working knowledge of AutoCad and Solid Works is desired.

Education: Bachelor's degree in Engineering or Scientific field from four year college. A graduate degree is desirable.

Experience: A minimum of four years of related experience.

Must be a U.S. Citizen.

E-mail resume to

myers@electronicareers.com

http://www.nasa.gov/mission_pages/station/main/index.html

Wearing festive holiday hats, the Expedition 22 crew speaks with officials from Russia, Japan and the United States. In the front row are Flight Engineer Maxim Suraev (left) and Commander Jeff Williams. Behind them, left to right, are newly-arrived Flight Engineers Oleg Kotov, T.J. Creamer and Soichi Noguchi. Credit: NASA

Following the arrival of the three new Expedition 22 crew members Tuesday, the crew aboard the International Space Station had an off-duty day Wednesday.

The crew members spent most of the day sleeping due to the late finish of the docking activities.

NASA astronaut T.J. Creamer, Russian cosmonaut Oleg Kotov and Japan Aerospace Exploration Agency astronaut Soichi Noguchi docked with their new home at 5:48 p.m. EST Tuesday. The trio launched aboard the Soyuz TMA-17 spacecraft at 4:52 p.m. Sunday from the Baikonur Cosmodrome in Kazakhstan.

From inside the station, Commander Jeff Williams and Flight Engineer Maxim Suraev monitored the approach of the Russian spacecraft as it docked to the Earth-facing port of the Zarya module.

After completion of leak checks, the hatches between the two vehicles were opened at 7:30 p.m. Williams and Suraev, who arrived at the station Oct. 2 aboard the Soyuz TMA-16, welcomed the new Expedition 22 flight engineers aboard their orbital home for the next five months.

Creamer, 50, is making his first flight into space. Selected as an astronaut in 1998, Creamer was a support astronaut for the Expedition 3 crew and worked with hardware integration and robotics.

Kotov, 44, is making his second spaceflight, having previously served six months aboard the station as an Expedition 15 flight engineer in 2007. Kotov will be a flight engineer for Expedition 22 and assume the duties of Expedition 23 commander when Williams and Suraev depart in March 2010.

Noguchi is making his second spaceflight. He flew on the STS-114 return-to-flight mission of Discovery in 2005 and conducted three spacewalks totaling more than 20 hours..
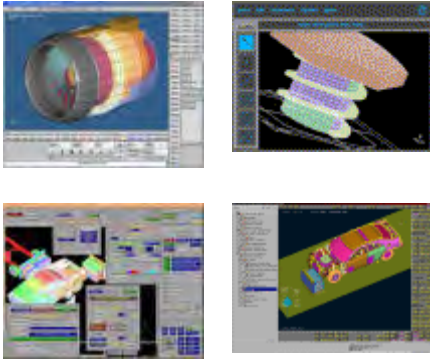
Pre Processing

Post Processing

Model Editing

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

BETA CAE Systems S.A.

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

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

Engineering Technology Associates, Inc.

http://www.eta.com

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

Oasys, Ltd

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

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

JSOL Corporation

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

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

Livermore Software Technology Corporation

http://www.lstc.com

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

Educational Community

Global Connections

China

    Tsinghua University
    Dr. Qing Zhou

India

    Indian Institute of Science
    Dr. Anindya Deb

Italy

    Prode – Elasis & Univ. of Napoli, Frederico II
    Prof. Gennaro Monacelli

Russia

    St. Petersburg State Tech. University
    Dr. Alexey I. Borovkov

Turkey

    Bogazici University
    Dr. Sami Kilic

USA

    Northwestern University
    Dr. Ted Belytschko

    Univ. of California – San Diego
    Dr. David Benson

    Ohio University
    Dr. Bhavin V. Mehta

The Ohio State U – ERC/NSM
    Dr. Taylan Altan

University of Cincinnati
    Dr. Ala Tabiei

University of Nebraska
    Prof. John D. Reid

Connecticut State University
    Prof. Thomas Vasko

LS-DYNA Distributors

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

Alpha order by Country

Australia	Leading Eng. Analysis Providers - LEAP http://www.leapaust.com.au/ info@leapaust.com.au
CANADA	Corp. – MFAC http://www.mfac.com/ galb@mfac.com
CHINA	OASYS Ltd. (software house of Arup) http://www.oasys-software.com/dyna/en stephen.zhao@arup.com
FRANCE	ALYOTECH TECH. http://www.alyotech.fr nima.edjtemai@alyotech.fr
FRANCE	ALLIANCE SVCE. PLUS - AS+ http://www.asplus.fr/ls-dyna v.lapoujade@asplus.fr
GERMANY	CADFEM http://www.cadfem.de/en lsdyna@cadfem.de
GERMANY	DYNAmore http://www.dynamore.de/ uli.franz@dynamore.de

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Alpha order by Country I – J

INDIA	OASYS Ltd. (software house of Arup) http://www.oasys-software.com/dyna/en lavendra.singh@arup.com
INDIA	EASi Engineering http://www.easi.com/ rvenkate@easi.com
INDIA	CADFEM Eng. Svce India http://www.cadfem.in/ info@cadfem.in
Italy	EnginSoft SpA http://www.enginsoft.it/ info@enginsoft.it
Italy	DYNAmore http://www.dynamore.de/ uli.franz@dynamore.de
JAPAN	JSOL Corporation http://www.jsol.co.jp/english/cae cae-info@sci.jsol.co.jp
JAPAN	ITOCHU Techno-Solutions Corp. http://www.engineering-eye.com/ ls-dyna@ctc-g.co.jp
JAPAN	FUJITSU http://jp.fujitsu.com\solutions\hpc\app\lsdyna\

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Alpha order by Country

KOREA	Theme Engineering http://www.lsdyna.co.kr/ wschung@kornet.com
KOREA	Korean Simulation Tech. http://www.kostech.co.kr young@kostech.co.kr
Netherlands	Infinite Simulation Systems, BV http://www.infinite.nl/ j.mathjissen@infinite.nl
SWEDEN	Engineering Research AB http://www.erab.se/ sales@erab.se
TAIWAN	Flotrend Corporation http://www.flotrend.com.tw/ gary@flotrend.tw
RUSSIA	State Unitary Enterprise –STRELA info@ls-dynarussia.com

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Alpha order by Country

United Kingdom	OVE ARUP & PARTNERS http://www.oasys-software.com/dyna/en/ dyna.sales@arup.com
USA	Livermore Software Tech. Corp. - LSTC http://www.lstc.com/ sales@lstc.com
USA	Engineering Tech. Assc. Inc. – ETA http://www.eta.com/ sales@eta.com
USA	DYNAMAX http://www.dynamax-inc.com/ sales@dynamax-inc.com

Finite Element Analysis
(FEA) Consulting
&
Engineering Service

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

North America

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

EU – Pacific Rim

AU **LEAP** http://www.leapaust.com Greg Horner 02 8966 7888	**UK** **ARUP** http://www.oasys-software.com/dyna/en/ Brian Walker 44 (0) 1212 133317	**UK** **Dutton Simulation** http://www.duttonsimulation.com Trevor Dutton 44 (0) 1926 732147

Software & Hardware Alliances

Software Solutions

SMP/MPP Hardware & OS

MPP & Interconnect MPI

ETA – DYNAFORM

http://www.eta.com

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

ETA – VPG

http://www.eta.com

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

OASYS software for LS-DYNA

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

Oasys software is custom-written for 100% compatibility with LS-DYNA. Oasys

PRIMER offers model creation, editing and error removal, together with many specialist functions for rapid generation of error-free models. Oasys also offers post-processing software for in-depth analysis of results and automatic report generation.

ESI Group Visual-CRASH For DYNA

http://www.esi-group.com

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

Software & Hardware Alliances

Software Solutions

SMP/MPP Hardware & OS

MPP & Interconnect MPI

APTEK

http://www.aptek.com

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

BETA CAE Systems S.A.— ANSA

http://www.beta-cae.gr

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

BETA CAE Systems S.A.— μETA

http://www.beta-cae.gr

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

SMP & MPP Hardware and OS

FUJITSU

Prime Power

SUN OS 5.8

NEC
SX6

Super-UX

SGI
Linux

Windows

INTEL	**INTEL**	**INTEL**
IA32	IA64	Xeon EMT64
Linux, Windows	Linux	Linux, Windows 64

HP	**HP**	**HP**	**HP**
	IA-64	Opteron	Alpha
PA-8X00			
	HP-UX 11.22	Linux	True 64
HP-UX 11.11. and above	and above		

MPP and Interconnect MPI

Company	O/S	HPC Interconnect	MPI Software
CRAY			
CX1	Linux Windows HPC Server 2008,	InfiniBand	MSMPI, HP MPI, INTEL MPI
XT5	Linux	SeaStar2	Cray MPI
XT5M	Linux	SeaStar1	Cray MPI
FUJITSU			
Prime Power	SUN OS 5.8		
HP			
PA8000	HPUX		
IA64	HPUX		
NEC			
SX6	Super-UX		

Continued on next Page

Participant Listing

For S-DYNA®

MPP and Interconnect MPI

INTEL			
IA32	Linux, Windows	InfiniBand (Voltaire), MyriCom	MPICH, HP MPI, OpenMPI
IA64	Linux		MPICH, HP MPI, OpenMPI
Xeon EMT 64	Linux	InfiniBand (Voltaire), MyriCom, PathScale InfiniPath	MPICH, HP MPI, OpenMPI, INTEL MPI

SGI			
Altix 4700, 450	Linux	NUMAlink 4	SGI MPT, OpenMPI, Intel MPI, MPICH, Platform MPI 7 (HP-MPI)
Altix UV	Linux	NUMAlink 5	SGI MPT, OpenMPI, Intel MPI, MPICH, Platform MPI 5.6 (Scali MPI), 7 (HP-MPI)
Altix ICE	Linux	GigE QDR Mellanox Infiniband	SGI MPT, OpenMPI, Intel MPI, MPICH, Platform MPI 5.6 (Scali MPI), 7 (HP-MPI)
Altix XE	Linux & Windows	GigE QDR Mellanox Infiniband	SGI MPT, OpenMPI, Intel MPI, MPICH, Platform MPI 5.6 (Scali MPI), 7 (HP-MPI), MSMPI
CloudRack X2	Linux & Windows	GigE	SGI MPT, OpenMPI, Intel MPI, MPICH, Platform MPI 5.6 (Scali MPI), 7 (HP-MPI), MSMPI
Octane III	Linux & Windows	GigE QDR Mellanox Infiniband	SGI MPT, OpenMPI, Intel MPI, MPICH, Platform MPI 5.6 (Scali MPI), 7 (HP-MPI), MSMPI

Training Courses

LSTC CA & MI

Send listings to agiac99@aol.com

Advanced - Impact Analysis	CA July 12-15, 2010 CA Sept 28 - Oct 01, 2010
Advanced Options	CA Dec 09-10, 2010
ALE/Eulerian & Fluid/Structure_Interaction	CA Feb 17-19, 2010
Blast Modeling	CA Sept 20-21, 2010
Penetration Modeling	CA Sept 22-23, 2010
Modeling & Simulation	CA Sept 16-17, 2010
Composite Materials	CA June 24-25, 2010
Concrete and Geomaterial Modeling (min 3 students)	CA Sept 14-15, 2010
Contact	CA June 22-23, 2010 MI Sept 20-21 2010
Implicit	MI March 25-26, 2010 CA June 30-July 01, 2010
Introduction to LS-DYNA LS-PrePost is no fee and the day prior to start date	CA Feb 02-05, 2010 CA May 04-07, 2010 CA Aug 03-06, 2010 CA Nov 09-12, 2010
Introduction to LS-DYNA LS-PrePost is no fee and the day prior to start date	MI March 16-19, 2010 MI June 15-18, 2010 MI Sept 14-17, 2010 MI Dec 14-17, 2010
Material Modeling Using User Defined Options	CA June 28-29, 2010

Training Classes

Training Course

Blast Modeling

Penetration Modeling

Modeling & Simulation

Courses taught jointly by Paul A. Du Bois and Len Schwer

The LS-DYNA Blast & Penetration course has been updated and revised. Material has been continually added over the years and for 2010 the course has been divided into two complete separate classes. This allows time for each class to be covered comprehensively.

1. (2) two days on blast - Blast Modeling with LS-DYNA Applications to Protective Structures, Vehicles and Homeland Security

2. (2) two days on penetration - PENETRATION MODELING WITH LS-DYNA®: APPLICATIONS TO PROTECTIVE STRUCTURES, VEHICLES AND HOMELAND SECURITY THREATS

Additionally, a third class is being introduced in 2010:

MODELING & SIMULATION WITH LS-DYNA®: INSIGHTS INTO MODELING WITH A GOAL OF PROVIDING CREDIBLE PREDICTIVE SIMULATIONS

Compete descriptions of the courses can be found on the LSTC website

Training Classes

Training Courses

Date is Class Start Date

**Visit the company sites
for updated information**

ETA
US
[http://www.eta.com]

Introduction to DYNAFORM
     January 05
     February 02
     March 02
     April 06

Introduction to LS-DYNA
     January 14

Intro to Modeling with VPG/PrePost
     January 12
     May 04

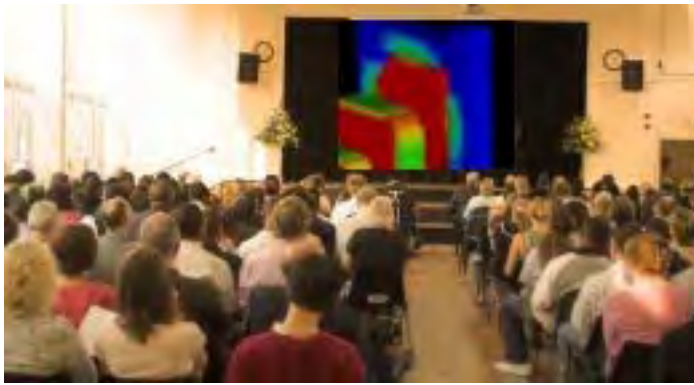**Metal Forming Analysis Corporation
Canada
[http://www.mfac.com]**

SHEET METAL FORMING SIMULATION
USING LS-DYNA

Short Course by Chris Galbraith
galb@mfac.com
Location: Kingston, Ontario, Canada
June 15-18, 2010.
class 9:00 a.m. - 5:00 p.m

Conferences

Events

Symposiums

2010

Start	Country	
Feb 24	UK	9th International Symposium Computer Methods in Biomechanics and Biomedical Engineering http://www.cmbe2010.cf.ac.uk
May 16	France	"Generalized/extended FEM, meshless and related approaches" http://www.eccm2010.org
June 06	US	11th LS-DYNA International Users Conference http://www.ls-dynaconferences.com
June 23	US	"Predictive Science and Technology in Mechanics and Materials." http://www.cavs.msstate.edu/symposium
July 19	AU	Minisymposium on Meshfree and Generalized/Extended Finite Element Methods http://www.wccm2010.com/dates.htm
Oct 14	UK	Modeling of Elastomeric Materials and Products http://www.iom3.org/events/modelling-elastomeric-materials-and-products?c=2822

A conference on Modeling of Elastomeric Materials and Products
 October 14-15, 2010 — UK

This two day conference is organized by the Rubber in Engineering Committee of the Polymer Society, part of the Institute of Materials, Mining and Minerals, and will be held at 1, Carlton House Terrace, London, UK on 14th-15th October 2010.

Paper abstracts are now invited for consideration by the committee. The final closing date for this call is the 26th February 2010. Abstracts of less than 200 words should be sent to Alan Muhr (amuhr@tarrc.co.uk) and should include details of all the authors and their affiliations.

This conference is aimed at sharing advances and opportunities in practical design methodology for elastomeric engineering products. Abstracts are invited that illustrate theory in practical action, explore the experimental foundations of design methodology, or present advances in modelling materials or components relevant to engineering design, for example in the following aspects:

  * Development of new models - in areas such as swelling, leaching or stress-strain behaviour.
  * New approaches in data collection, analysis and model validation.
  * Resolution of outstanding problems in finite element and other numerical modelling methods and their application.
  * Modelling of life prediction.
  * Modelling of macro-composites.
  * Modelling of elastomeric materials as microcomposites.
  * Fast approximate methods.

Further details are available at: http://www.iom3.org/events/modelling-elastomeric-materials-and-products?c=2822

9th International Symposium
Computer Methods in Biomechanics and Biomedical Engineering

February 24-27, 2010

www.cmbbe2010.cf.ac.uk

Scope and objectives:

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

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

Symposium Organisers:

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

Christopher Jacobs (Columbia University, New York, USA)

Brian Walker (Arup, Birmingham, UK)

Carlos Atienza (IBV, Valencia, Spain)

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

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

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

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

**The 11th International,
LS-DYNA® Users Conference**

June 06-08, 2010

**Hosted by Livermore
SoftwareTechnology Corp.**

To be held at The Hyatt Regency
Dearborn, MI

Abstract Due: January 14, 2010	email abstract to: papers@lstc.com subject line for e-mail – Abstract LS-DYNA Conference 2010	Notification: January 25, 2010
Paper Deadline: March 05, 2010	Conference Papers: The presenter of each accepted paper will receive free admission to the conference, provided that the presenter registers for a room at the Hyatt Regency Dearborn under LSTC Conference registration	

Application Areas Being Accepted for Paper Submission:

- Aerospace
- Automotive Crashworthiness
- Ballistic and Penetration
- Biomechanics
- Civil Engineering
- Compressible Fluid Dynamics
- Electro Magnetics

- Heat Transfer
- Impact and Drop Testing
- Manufacturing Processes
- Metal Forming
- Modeling Techniques
- Nuclear Applications
- Occupant Safety

- Seismic Engineering
- Ship Building
- Transportation
- Virtual Proving Ground

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

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

| **Invitation from J. S. Chen, University of California, Los Angeles, USA, jschen@seas.ucla.edu** | **Minisymposium on Meshfree and Generalized/Extended Finite Element Methods** |

You are cordially invited to participate in the "Minisymposium on Meshfree and Generalized/Extended Finite Element Methods" to be held at the 9th World Congress on Computational Mechanics and 4th Asian Pacific Congress on Computational Mechanics (WCCM/PCOM 2010) to be held in Sydney, Australia – July 19-23, 2010

Minisymposium on Meshfree and Generalized/Extended Finite Element Methods

Meshfree and Generalized/Extended Finite Element methods have undergone substantial development and have received much attention since mid 1990's. The two workshops of this subject have been held at University of Maryland in 2005 and 2009, and new and emerging issues of Meshfree and Generalized/Extended Finite Element methods have been identified. This symposium aims to promote collaboration among engineers, mathematicians, computer scientists, and national laboratory and industrial researchers to address development, mathematical analysis, and application of Meshfree and Generalized/Extended Finite Element methods. While contributions in all aspects of meshfree methods are invited, topics with particular interests are:

- Identification of classes of problems for which Meshfree Methods or Generalized /Extended Finite Element Methods are clearly superior to classical methods;

- Problems of higher dimensionality (four or greater), e.g., truly ab initio solutions of the Schroedinger equations for many particle systems, Fokker-Planck equations and other stochastic problems;
- Problems with many discontinuities and singularities, e.g., fracture mechanics and fragmentation, modeling of phase changes and motion of phase boundaries, dislocation modeling for anisotropic, nonlinear and problems with complex geometry;
- Qaudrature issues: accuracy, stability, effects of numerical integration for stiffness/force/source terms, numerical integration for enrichment functions, integration of error norms, a posteriori error estimation including the effects of numerical qaudrature;
- Error analysis for Meshfree Methods or Generalized /Extended Finite Element Methods with enrichment;
- Non Galerkin type approach: strong form with collocation, Petrov-Galerkin, mixed formulation;
- Local (such as moving least-squares, reproducing kernel) approximations vs. nonlocal (such as radial basis functions) approximation, new approximation functions;
- Benchmark problems for comparison of different numerical

methods in terms of solvability, accuracy, and efficiency;

- Mathematical analysis of stability and consistency (and thus convergence) of meshfree methods in hyperbolic problems;
- Coupling of different numerical method

Minisymposium Organizers

Uday Banerjee,

Syracuse University, USA, banerjee@syr.edu

Ted Belytschko,

Northwestern University, USA, tedbelytschko@northwestern.edu

J. S. Chen,

University of California, Los Angeles, USA, jschen@seas.ucla.edu

Hsin-Yun Hu,

Tunghai University, Taiwan, huhy@math.thu.edu.tw

John Osborn,

University of Maryland, USA, jeo@math.umd.edu

Marc Alexander Schweitzer,

Universitaet Bonn, Germany, schweitzer@ins.uni-bonn.de

Press Releases

Alpha Order

HP
http://www.hp.com/hpinfo/newsroom/press/2009/091216xa.html
HP Accelerates Cloud Computing Adoption for Businesses and Service Providers, HAMBURG, Germany, Dec. 16, 2009

HP today announced three new offerings to help businesses and telecommunication service providers realize the benefits of cloud computing while optimizing costs and mitigating the risk of adoption.

SGI
http://www.sgi.com/company_info/newsroom/press_releases/2009/december/onera.html

Onera, France's Leading Aerospace and Defense Research Center, Chooses SGI® Altix® Supercomputers

Altix and Altix® ICE Enhance Computing Power; Accelerate Scientific Research

FREMONT, Calif. — December 14, 2009 — SGI (NASDAQ: SGI), a global leader in HPC and data center solutions, announced that Onera (Centre Français de Recherches Aérospatiales), the French aerospace research center, chose SGI® Altix® to significantly boost its computing power. Its new supercomputer will be used to enhance the precision of Onera's computer simulation models, accelerate its digital simulation processes and adapt its computing resources for massively parallel processing (MPP) technology. More than 3,000 processing nodes, versus its predecessor's 512 nodes, offer twice the power to significantly boost computation speed.

SUPPORT SITES FOR LS-DYNA

The Official LS-OPT Support site

[http://www.lsoptsupport.com]

The Official LS-OPT Support site [http://www.lsoptsupport.com] is jointly monitored by DYNAmore GmbH (Germany) and LSTC (US)

The LS-OPT support site was jointly developed to keep you updated with current information. During January 2010 the site will be updated with

"Getting Started"
A first place to stop for new users to view the LS-OPTui and the basic procedures of optimization with LS-OPT.

How To's
A collection of information and examples for several tasks with LS-OPT

Documents
A collection of documents related to LS-OPT, Optimization and Stochastics

Examples
This Section demonstrates LS-OPT capabilities by means of a series of examples

Glossary
Alpha order to view definitions such as Anova, Bias error, Iteration and other technical terms.

Downloads
Downloads specific to LS-OPT

FAQ's
Questions related to Optimization, Robustness and Reliability Analysis
        Answers are posted on the LS-OPT Support Site
        http://www.lsoptsupport.com/faqs
News
Latest news relation to, or about LS-OPT

Crash Test Dummy Models

Anthropomorphic Test Devices

Websites/Information

FEA Information

http://www.ls-dynadummymodels.com

LSTC's Models

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

Arup Cellbond Barrier Models

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

Arup Pedestrian Impactor Models
http://www.oasys-software.com/dyna/en/fe-models/pedestrian.shtml

Arup RCAR Barrier Model

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

DYNAMore Models for

http://www.dummymodels.com

LS-DYNA Dummy Mailing List

sarba@lstc.com