November 2011

Fujitsu

K computer
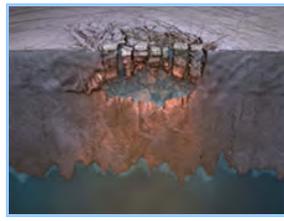
TOYOTA

THUMS

ETA
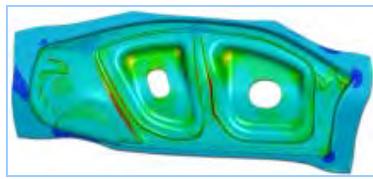
DYNAFORM 5.8.1

NASA

Icy Europa

TMC

Healthcare Robots

FORD

Boss 302

TABLE OF CONTENTS

FEA Information Inc. Announcements

Welcome Participants

Cray -

Cray supercomputers provide superior sustained performance on critical applications, scalability to handle larger problems and the reliability to run jobs to completion. This gives scientists and engineers the ability to not only get answers faster but also allows a broad spectrum of users to ask new questions.

GNS –

A German based engineering company, founded to provide high quality simulation services, as well as exceptional software products for the automobile, aeronautical and chemical industries. GNS develops and supports products such as Animator4, Generator2, Indeed, and OpenForm, each tailored to meet the needs of its most demanding clients and the industry's toughest engineering problems.

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

My Bunny Barcode

Came home from being on a trip for a week and announced "I'm home"

He raised one ear in happiness? Never expect Barcode to wake up and hop around you being happy, unless you have carrots. I duly went to the kitchen for the carrots.

Industry Announcements

RIKEN and Fujitsu have taken the No. 1 position for the "K computer" on the 38th TOP500 list announced in the US (November 14, PST)

The TOP500 list is a project that periodically ranks the 500 fastest supercomputers in the world, using LINPACK as a benchmark. The project, begun in 1993, publishes current rankings twice a year (in June and November).
http://www.top500.org/

Rank	Computer	Site	Vendor	Country	Maximal LINPACK performance achieved
1	**K computer**	**RIKEN Advanced Institute for Computational Science (AICS)**	**Fujitsu**	**Japan**	**10,510**
2	Tianhe-1A	National Supercomputing Center in Tianjin	NUDT	China	2,566
3	**Jaguar**	**DOE/SC/Oak Ridge National Laboratory**	**Cray Inc.**	**US**	**1,759**
4	Nebulae	National Supercomputing Centre in Shenzhen (NSCS)	Dawning	China	1,271
6	**Cielo**	**DOE/NNSA/LANL/SNL**	**Cray Inc.**	**US**	**1,110**
8	**Hopper**	**DOE/SC/LBNL/NERSC**	**Cray Inc.**	**US**	**1,054**

For Complete information on the K Computer:
http://www.fujitsu.com

1	K computer	RIKEN Advanced Institute for Computational Science (AICS)	Fujitsu	Japan	10,510

http://www.top500.org/

Fujitsu has been developing the K computer together with RIKEN, with the aim of commencing full-service from November 2012. This is in accordance with the High Performance Computing Infrastructure Initiative promoted by Japan's Ministry of Education, Culture, Sports, Science & Technology (MEXT).

The K computer is the nickname RIKEN has been using for the supercomputer of this project since July 2010. "K" comes from the Japanese word "Kei" which means ten peta or 10 to the 16th power. The logo for the K computer based on the Japanese character for Kei, was selected in October 2010.

The K computer, is aiming to achieve 10-petaflops computational performance. So how fast is 10-petaflops? The number, ten peta is a massive number consisting of 1 followed by 16 zeros. In Japanese this is expressed as one "Kei". That is why this supercomputer is called the K computer. For comparison one Kei worth of computations is equivalent to the world's 7 billion people each performing one computation per second, 24 hours a day for about 17 days. The K computer will be able to do all of those computations in just one second

The K computer is installed at the RIKEN Advanced Institute for Computational Science (AICS), which is located on Port Island, Kobe, in Hyogo Prefecture. The major objective of the national development project of the K computer is to seek breakthroughs in science and technology through the development and use of a world-leading supercomputer, and the enhancement of international competitive power. Another important objective is the nurture and growth of human resources able to undertake science and technology development by utilizing supercomputers.

Global Leaders

Platinum

OASYS Ltd: http://www.oasys-software.com/dyna/en/	**JSOL Corporation**: http://www.jsol.co.jp/english/cae	**CRAY** http://www.cray.com
ETA: http://www.eta.com	**DYNAmore GmbH** http://www.dynamore.de	**ESI Group**: http://www.esi-group.com
BETA CAE Systems S.A.: http://www.beta-cae.gr	**LSTC:** http://www.lstc.com	**Dalian Fukun Technology Co. Ltd.:**
MICROSOFT http://www.microsoft.com	**Panasas, Inc.** http://www.panasas.com	**Shanghai Hengstar Technology Co. Ltd** http://www.hengstar.com/
GridCore AB http://gridcore.se	**GNS** http://www.gns-mbh.com/	

Bronze Participants

Data Point Labs	APACS	Lancemore Corporation Japan
e2s Enterprise Engineering Solutions		

Total Human Model for Safety (THUMS)

Figure source: http://news.toyota.com.au/toyota-expands-crash-dummy-family
September 2011 – reprint of important news

Toyota released further body sizes of the Total Human Model for Safety (THUMS)

Toyota has added a small female and a large male to its family of digital crash test dummies.

Known as THUMS (Total HUman Model for Safety), these virtual humans deliver crash-test results in much greater detail than is achievable with conventional crash-test dummies.

The new models of a 153cm tall female and a 189cm male will join the existing 179cm average-build adult male in THUMS.

All three models come in two types - a vehicle occupant and a pedestrian - bringing the total number of models to six.

It is now possible to take into account different body sizes when conducting analyses of internal injuries caused by car accidents.

This latest software upgrade is the result of a co-operative development arrangement with Toyota Central R&D Labs, Inc, universities and other research institutes to make detailed measurements of the human body's internal structure using a high-precision CT (computed tomography) scanner.

By creating precise models of various internal organs, including their positions and how they interconnect, Toyota was able to develop a virtual human model containing approximately 14 times more information than the previous version.

This increased detail allows finer understanding of how damage is inflicted on internal organs during a collision.

As part of its vision to eliminate traffic fatalities and injuries, Toyota will apply the results of THUMS tests to develop safer vehicles.

Toyota has plans to add an elderly person and a child model to make an even more diverse range of testing possible.

THUMS allows highly detailed analysis of bone fractures, severed ligaments, etc, by simulating many characteristics of the human body - ranging from the shape of the body to its skeletal structure and skin.

Toyota began developing THUMS in 1997 in co-operation with Toyota Central R&D Labs, Inc.

.

************************** End of reprint

LS-DYNA

The models are available for commercial, educational and research purposes (not available for military use), as input file for LS-DYNA. All models are based on Version 4.0, which models the human body in great detail with approximately 2.4 million elements.

In particular, the requirements from THUMS Version 4.0 resulted in many new features in LS-DYNA related to biomechanics. According to ESQ (Part of Toyota Motor Sales, USA, Inc.) more than 30 organizations across the automotive industry, including car companies and research institutes, use the THUMS models in various applications.

For more information on THUMS and LS-DYNA contact sales@lstc.com
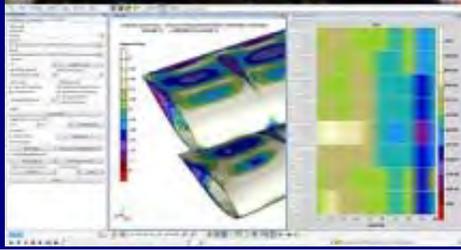
BETA CAE Systems S.A. announces the release of µETA v6.7.1

Excerpt - For Complete Information Visit:
http://www.beta-cae.gr/news/20111102_announcement_meta_v6.7.1.htm

BETA CAE Systems S.A. announces the release of µETA v6.7.1 with enhancements, new features and important code corrections

The official software release is comprised by the latest meta_post_v6.7.1 files dated November 2nd, 2011. These replace any pre-releases and files downloaded prior to this date.

New features introduced
- Improved speed of interactively selecting entities from the screen.
- New Scalar results, named Puck X and Puck Y, for the post-processing of composites.
- Groups created from Nastran SETs when geometry is read from .op2 files.
- Column for PShell thickness is now available in the lists of the Statistics, Pids and Mids tools.
- Greatly improved speed of scanning and plotting Abaqus and LS-Dyna files in the 2D Plot tool.
- One-node, MPC, MASS and BUSH connections are now supported in the FRF Assembly tool.
- New toolbar named Strain Energy Bar Chart for creating bar diagrams of Strain Energy at Parts when post-processing Eigenmode Nastran results.
- Capability to change the fill-colour of cells in the Spreadsheet Editor, according to the value in the cell and the fringebar in use.
  and many more

Known issues resolved
- Nastran composite results would not be read correctly if a model included PCOMP layers with the SOUT(i) option set to "NO".
- Certain Radioss .erf files would not be read correctly.
- It was not possible to transform ANSYS results to local coordinate systems.
- Several issues related to the Fringebar.
- Various issues related to the 2D Plot tool. - and many more

Compatibility
µETA v6.7.1 can only run with beta_lm_tools v6.0 or later. The latest beta_lm_tools version is v6.3.

The .metadb files saved by the later versions of µETA are fully compatible and can be opened by earlier versions of µETA

For Download information and release notes:
http://www.beta-cae.gr/news/20111102_announcement_meta_v6.7.1.htm

Trinity College Dublin

modeFRONTIER Used in the Design of Fatigue-Resistant Notches

Reprint from Newsletter EnginSoft

Researchers at Trinity College Dublin used modeFRONTIER in the Design of Fatigue-Resistant Notches

Researchers at Trinity College Dublin in Ireland have used modeFrontier (MF) software to reduce stress concentration effects of notches and thus significantly improve the fatigue resistance of components. Many engineering components contain features such as notches and fillets, which are usually designed with a constant radius of curvature. However it has long been known that this is not the best solution.

Variable-radius notches, in which the radius of curvature changes with position along the notch, can achieve much lower stress concentration factors with negligible change in the weight of size of the components. Nature has evolved variable-radius notches in trees, bones, etc; the German engineer Claus Mattheck showed that similiar concepts could be applied to engineering structures. Professor David Taylor at Trinity College Dublin in Ireland wondered whether the variable-radius notch could be treated as an optimization problem, and decided to use mF to solve it. Working with Matteo Toso and Professor Luca Susmel of the University of Ferrara in Italy, they considered the problem of 90degrees fillet and used mF

to seek for solutions within a design space consisting of different variable-radius fillets. They were able to find solutions better than those previously obtained using other methods, achieving reductions in the maximum stress of more than a factor of two.
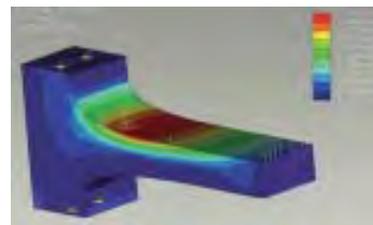
Fig. 2- Finite element analysis of a variable-radius fillet in a bracket component.

Experimental work conducted on steel samples showed that these predicted reductions translated exactly into real improvements in the fatigue strength of the components. Reductions in stress concentration factors can be highly beneficial, allowing designers to save weight, with consequent reductions in energy and material costs, without sacrificing reliability. The approach developed at Trinity College could be automated for use in industrial design, using mF in conjunction with FEM, to achieve real improvements in components of the future.

Prof. David Taylor

Prof. David Taylor M.R.I.A,
Mechanical Engineering,
Trinity College Dublin

For more information, please contact:
Prof. David Taylor DTAYLOR@tcd.ie

Dept. of Mech. and Mfg. Engineering:

The Dept. of Mechanical and Manufacturing Engineering undertakes research in a number of selected themes, including; Bioengineering, Fracture and Fatigue of Materials, Fluids, Acoustics and Vibration, Fluids and Heat Transfer, Manufacturing Technology and Systems, and Tribology and Surface Engineering.

http://www.tcd.ie/mecheng/research

Cathie Walton is preparing the 12th International LS-DYNA Conference Post Conference Training Courses. If you are interested, have questions, or suggestions, please contact Cathie, Cathie@lstc.com

Post-Conference Training June 6-7, 2012 (Wed-Thur)
 9am-5pm, University of Michigan - Dearborn
 (two days, includes light continental breakfast at 8:30am, lunch each day)
   Final course selection, will be announced May 1, 2012.
   Registration Confirmations will be sent to registered students after this date.

- Advanced ALE Applications
  - Ian Do, LSTC

- ALE/Eulerian & Fluid/Structure Interaction in LS-DYNA
  - Mhamed Souli

- Blast and Penetration Using LS-DYNA
  - Al Tabiei

- Heat Transfer with Warm Forming and Hot Stamping Applications
  - Art Shapiro, LSTC

- LS-OPT - Introduction
  - Nielen Stander, LSTC

- LS-TaSC - Introduction
  - Willem Roux, LSTC

- NVH and Frequency Domain Analysis with LS-DYNA
  - Yun Huang, LSTC

- Occupant Restraint: Dummies/Barriers
  - Sarba Guha, LSTC
  - Dilip Bhalsod, LSTC
  - Christoph Maurath, LSTC

- Polymeric Material with LS-DYNA (lecture only)
  - Paul du Bois

- Probabilistic Design Using LS-OPT and LS-DYNA
  - Anirban Basudhar, LSTC

- Smoothed Particle Hydrodynamics & Element-Free Galerkin
  - Jingxiao Xu LSTC
  - Cheng-Tang Wu, LSTC
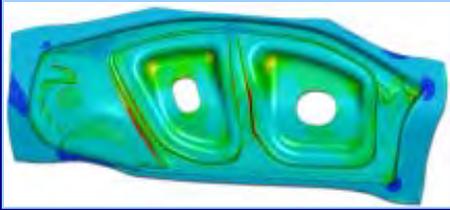
**ETA Announces
Release of DYNAFORM 5.8.1**

http://www.eta.com

Release of DYNAFORM 5.8.1

Die System Simulation Solution Offers Enhanced Die Face Engineering Capabilities

Engineering Technology Associates, Inc. (ETA) recently announced the availability of Version 5.8.1, of its complete die system simulation solution, DYNAFORM™. This latest release promises to deliver a robust environment for engineers to simulate and analyze the entire die system. The FEA software solution guides the engineer through a wide range of stages in the manufacturing process, from cost estimation and die face design to formability analysis and stamping process simulation.

Some of the most significant enhancements in this version are delivered through DYNAFORM's Die Face Engineering (DFE) module. DFE now offers the capacity to parametrically build die faces for a symmetrical part. Therefore, after the user defines the symmetry line, the program can automatically build the die faces for the other half of the symmetrical part accordingly.

Also notable, a 'new product change replacement' feature was added in 5.8.1.

It allows the user to retain the current die face design and simply drop in new product design surfaces, saving the user a great deal of time while providing greater flexibility.

A new 'Auto Mesh' option was added in DFE and allows the user to automatically mesh the CAD model immediately after it has been imported.

DYNAFORM 5.8.1 allows the user to set up a personalized 'drawbead library' which links the line bead force and the drawbead geometry shape. As a result, the user can elect to run the simulation with either the line beads or geometry beads.

The Blank Size Engineering (BSE) module was also enhanced in the latest round of development. The module was significantly improved upon by way of a streamlined guided user interface (GUI). New dialogues within the GUI contain tabbed menus for easy navigation between functions.

For a complete list of the new features available in DYNAFORM Version 5.8.1, please view the Release Notes.

DYNAFORM has been a long-time favorite among engineers in the metal stamping industry and is widely used among the automotive "Big 3".It is often hailed as the most accurate and cost-effective solution of its kind. It allows the organization to entirely bypass soft tooling, reducing overall tryout time, lowering costs, increasing productivity and providing complete confidence in die system design. It also allows evaluation of alternative and unconventional designs and materials for an optimal design solution.

ETA, Inc.
+1.248.729.3010
etainfo@eta.com
www.eta.com
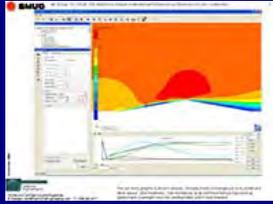
For Full download of case study with graphics:
http://www.predictiveengineering.com/consulting/projects/cfd/wind/index.html

URS / SMUD Parametric Wind Force Analysis on a Residential Roof Mounted Photovoltaic Panel

Objective: Investigate the wind generated forces via CFD on a photovoltaic (PV) panel mounted on concrete tile residential roof.

Modeling Assumptions and Details: The PV system consists of 4 modules that are aligned edge-to-edge to create an overall panel having dimensions of 130" x 62" x 2". The panel is mounted to the roof with 8 mounting brackets. The mounting brackets are 4" wide and are attached along the bottom and top edges of the PV Panel. Given this geometry, the panel was idealized as a 2-D structure.

The PV Panel was mounted mid-way up on an inclined roof (10, 18 and 30 degree slopes were investigated). Mounting details and roof geometry are provided within the body of this report.

The PV Panel height was investigated at 3.25, 4.5 and 6.0″ heights. At the lowest level (3.25"), the rear opening underneath the aluminum rails and the concrete roof was blocked. At the 4.5 and 6.0" heights, the PV Panel was open on both ends.

A total of nine conditions were investigated and their configurations are summarized in the table given on the next page.

The wind load for this simulation was a constant 100 MPH air stream.

Steady-state conditions were assumed.

CFD software used for this analysis work was CFdesign V7.0. Details on this software can be found at www.CFdesign.com.

Conclusions: The PV panel lift and drag forces under the various conditions were documented. The forces are for the complete 130x62" panel. Negative lift is pushing the panel into the roof. Positive drag is pushing the panel up the roof. In other words, lift is perpendicular to the PV panel while drag is parallel to the panel.

Worst case lift and drag conditions were noted for the 3.25" Height / 18 Degree panel at 963 and 79 lbf. In all cases, when the PV panel is blocked, high lift forces are created. In general, when air can flow unimpeded underneath the panel, the forces are roughly a third and lower.

A wind gust analysis is also included. This leeward side gust analysis indicates that PV Panel uplift from vortex shedding on the eave of the roof will not be a problem.

In conclusion, PV panel blockage should be avoided whenever possible. When air can flow underneath the panel, the greatest amount of lift found was 330 lbf as compared to 963 lbf for the blocked panel.

Question:

Carrying out full car crash simulations, a special care has to be taken on the modeling of appropriate gaps between shell and beam elements to avoid so-called initial penetrations within the contact algorithm, because contact surfaces are offset from shell mid-planes and beam centerlines. If these gaps are not considered, nodes may be found within the contact region of a contact segment at the first cycle.

The existence of such penetrations at the first cycle has several adverse effects on the quality of the simulation. Therefore, in the default treatment, if a node is suddenly found to be below the contact surface at any point during the simulation (node moves very fast and was not detected before penetration), LS-DYNA just moves the node to the master surface without applying any forces (shooting node logic).

If shooting node logic is turned off, large forces and negative contact energies suddenly appear.

If the IGNORE-Option is activated (IGNORE=1), initial penetrations are allowed to exist by tracking the initial penetrations in the AUTOMATIC contact options. The shooting node logic has no effect. If IGNORE=2, additionally, penetration warning messages are printed to the message-files with the original coordinates and the recommended coordinates of each slave node given.

Please download the file ignore.k (http://www.dynasupport.com/links/fea-information-examples/ignore.k).

1.) Why are the coordinates of some nodes modified?

2.) Check the message file for additional information
    about the modified nodes

3.) Define a birth time of t=1.0E-4 for the contact.
    What can be observed?

4.) Define IGNORE=2. Plot the z-coordinates of the nodes 101 and 201.
    What can be recognized?

Answer – Last Page of FEA News

Ford Mustang Boss 302: Back with More for 2013,
Paying Homage to a '70s Legend

- 2013 Ford Mustang Boss 302 builds on the heritage of the 1970 Boss 302 with new, reflective hockey stick graphics package – first modern application on a production car
- Also new for 2013 is heritage-inspired School Bus Yellow paint and Sterling Gray accents on Boss Laguna Seca, which delivers race-ready suspension, aerodynamic details and removed rear seat
- Ford SYNC® connectivity system becomes a standard Boss feature for 2013, adding to a specially tuned engine, quad exhaust, brakes, suspension and design that optimize weight, aerodynamics and track performance

LOS ANGELES, Nov. 15, 2011 – The Ford Mustang Boss 302 is all about performance, and a nod to heritage comes standard with new paint options and design details for 2013.

A new hockey stick graphic featuring reflective stripes is added to the new Boss, calling back the 1970 Boss 302. 2013 Boss 302 and Boss Laguna Seca models feature new School Bus Yellow paint, honoring Parnelli Jones' 1970

Trans-Am championship car prepared by Bud Moore.

"Everything we did for 2013 is consistent with and links directly back to our 1970 heritage. The reflective stripes and hockey stick graphic in particular mean something to Mustang enthusiasts," said Dave Pericak, Mustang chief engineer. "Last year, we proved the car had what it takes to perform, and this year we focused on enhancing its eye-catching looks and celebrating its history."

The reflective stripes on Boss come to life when lights hit them, similar to how they did in 1970 on the Mustang Boss 302. The new stripe follows the classic hockey stick motif by going over the fender and extending down the body panel.

Boss Laguna Seca has new Sterling Gray accents and will be available in vintage School Bus Yellow and black paint offerings, complemented by hockey stick stripes and gray interior rear cross-brace. Gray also sets off the front grille, mirror caps and rear pedestal spoiler, while Laguna Seca rear badging and unique two-tone gray and silver wheels round out the exterior accents. Unlike the previous model, the roof will not feature colored accents.

Similar to the redesigned base Mustang lineup, the front end offers a more powerful design with a more prominent

grille. A more powerful splitter and functional hood extractors add to that look. Boss Mustang has new signature lighting, with standard HID headlamps and LED-surround taillamps.

The 2013 Boss also offers a unique functional design feature in the grille with removable covers where fog lamps would be. For improved cooling on track days, the covers can be easily removed with a screwdriver.

Additionally, the rear end features a high-gloss black panel that connects the taillamps. The taillamps deliver a smoked appearance that matches up with the sinister look up front.

The new Mustang Boss includes Ford SYNC®, the voice-activated in-car connectivity system, as a standard feature. With the base SYNC package, customers enjoy the core hands-free features and services that have quickly established SYNC as a must-have technology, with more than 76 percent of current SYNC users saying they would recommend the system to others.

Some features of SYNC include:

- Hands-free, voice-activated calling via a Bluetooth®-connected mobile phone and control of a USB-connected digital music player
- 911 Assist™, the automated emergency calling service that is free for the life of the vehicle
- Vehicle Health Report, the on-demand diagnostic and maintenance information service
- Revved up and ready
- The powerful Boss engine yields 444 horsepower and 380 lb.-ft. of

torque, while still offering a smooth idle and low-end torque for comfortable around-town driving. A race-inspired clutch with upgraded friction materials transmits power, while a short-throw, close-ratio six-speed manual handles gear change duties.

Power is delivered to a 3.73-ratio rear axle using carbon fiber plates in the limited-slip differential to improve handling and longevity. For those who want even more precise control over power delivery, a torque-sensing (Torsen) limited-slip differential is available, coupled with Recaro® front seats.

In keeping with the Boss mandate to provide the best-handling Mustang ever, the already strong Mustang GT suspension system has been further refined. Higher-rate coil springs on all four corners, stiffer suspension bushings and a larger-diameter rear stabilizer bar all contribute to the road racing mission, and Boss models are lowered by 11 millimeters in front and 1 millimeter at the rear versus Mustang GT. But the real key to handling is in the adjustable shocks and struts, standard on all Boss Mustangs.

Working in concert with the suspension upgrades, Boss 302 receives unique, lightweight 19-inch black alloy racing wheels in staggered widths: 9 inches in front, 9.5 inches in the rear. The Pirelli PZero summer tires are sized specifically for each end of the car, with the front wheels receiving 255/40ZR-19 tires while the rear stays planted thanks to 285/35ZR-19 rubber.

Boss braking is also up to the challenge, using Brembo four-piston calipers acting on 14-inch vented rotors up front. In back, standard Mustang GT brakes are upgraded with a Boss-specific high-performance pad compound. The combination of vented brake shields and unique Anti-Lock Brake System (ABS) tuning gives Boss drivers maximum control and rapid, repeatable fade-free stops in road and race situations alike.

Boss 302 circa 1969-70

With styling tweaked by newly arrived Ford designer Larry Shinoda, the new-for-1969 Boss 302 sported front and rear spoilers, blacked-out hood treatment and racy side stripes for a look that screamed performance.

Beyond the bodywork, the Boss 302 didn't disappoint. Its engine combined a four-bolt main Windsor small-block with reworked heads from the then-new 351 Cleveland engine. A forged steel crankshaft, connecting rods and pistons rounded out the reciprocating assembly. The result was a free-breathing, high-revving powerplant making what Ford claimed was 290 gross horsepower —

though actual output is estimated to be significantly higher.

Ford engineers also thoroughly massaged Mustang's suspension in an effort to meet then-boss Semon "Bunkie" Knudsen's mandate "to build absolutely the best-handling street car available on the American market." Stiffer springs and shocks, special sway-bar tuning, a stiffened chassis and wide tires led to the fastest Mustang ever to lap the Ford test track up to that point.

# # #

About Ford Motor Company
Ford Motor Company, a global automotive industry leader based in Dearborn, Mich., manufactures or distributes automobiles across six continents. With about 166,000 employees and about 70 plants worldwide, the company's automotive brands include Ford and Lincoln. The company provides financial services through Ford Motor Credit Company. For more information regarding Ford's products, please visit www.ford.com.

ETA China is located in Shanghai, for sales, technical support, consulting, and training courses. Among the products are LS-DYNA and LSTC's products, as well as DYNAform and ETA's Products. A recent class organized by ETA China (Martin Ma and Grace Su) and LSTC's China Business Manager, Yanhua Zhao, was held in Beijing for LS-DYNA Training on October 24th, 2011.

The course was specifically arranged to answer questions from engineers at ETA, and customers both at the course, and through the web conference. The course was taught by Dilip Bhalsod, the Technical Support Manager, of LSTC's Michigan Office. Additionally Dilip is responsible for customers in the automotive industry, as well as LSTC's other customers and is involved with customer support, training and their requests for new features in LS-DYNA.

During the training, Mr. Bhalsod explained the behavior of MPP, for different platforms and using different number of cores and how to understand the answers. On the new hybrid technology he covered what is new, and made suggestions for MPP analysis.

Additionally he shared his experience about airbag folding and analysis tools in LS-DYNA; including control-volume method, ALE and particle method. He also explained ALE and particle method usage in detail and showed the advantages and disadvantages of each. In addition, he answered various questions about metal forming and many other functions of LS-DYNA.

We are grateful to Mr. Bhalsod's efforts for this useful training and the great technical support from LSTC.

For courses available at ETA China contact Grace Su of ETA msu@eta.com

Feel free to always contact Yanhua Zhao of LSTC yanhua@lstc.com for training courses in China

Nov. 01, 2011

TMC Shows New Nursing and Healthcare Robots in Tokyo

Four New Types of Robots Aimed for Commercialization from 2013

Tokyo, Japan, November 1, 2011—Toyota Motor Corporation (TMC) held an event today here at its vehicle display space and theme park Mega Web to display a number of new robots developed to provide support in nursing and healthcare. The robots form part of the Toyota Partner Robot series, which is being developed to assist humans in their everyday activities.

TMC considers Partner Robots to be useful in four fields: nursing and healthcare, short-distance personal transport, manufacturing and domestic duties. TMC is developing technology that cooperates with humans, including devices that assist in the loading and moving of heavy components in factories, in addition to automated technology that enables autonomous tool operation.

TMC endeavors to provide the freedom of mobility to all people, and understands from its tie-ups with the Toyota Memorial Hospital and other medical facilities that there is a strong need for robots in the field of nursing and healthcare. TMC aims to support independent living for people incapacitated through sickness or injury, while also assisting in their return to health and reducing the physical burden on caregivers.

Each robot incorporates the latest in advanced technologies developed by TMC, including high-speed, high-precision motor control technology, highly stable walking-control technology advanced through development of two-legged robots, and sensor technology that detects the user's posture as well as their grasping and holding strength.

Since the announcement of its Partner Robot development vision in 2007, TMC has pursued the development of robots that support human activities, thereby enabling new lifestyles.

Main Features of Toyota Partner Robots

Independent Walk Assist:
Developed with the aim of supporting independent walking for people whose ability to walk has been impaired by leg paralysis or other causes. Mounted onto the paralyzed leg, it helps the knee to bend to facilitate natural walking.

Walk Training Assist:
Developed as a device for walking training, this robot incorporates Independent Walk Assist technology and assists in the development of natural walking from the early training stage for people whose walking is impaired.

Balance Training Assist:
This robot was developed to support balance function training for people with impaired balance. The combination of two-wheeled self-balancing (inverted-pendulum) technology and game elements is aimed at making training enjoyable.

Patient Transfer Assist:
Developed to reduce the heavy physical burden required of caretakers when transferring patients. With the combination of weight-supporting arms and a mobile platform, this robot helps the caregiver throughout the patient transfer process from bed to toilet and back.

These nursing and healthcare Partner Robots were developed in collaboration with Fujita Health University Hospital in Aichi Prefecture, Japan, which provided TMC feedback on the needs of specialized medical facilities, to use in the design of the robots.

TMC, in cooperation with a wide range of nursing and medical facilities, will accelerate further development of the robots while taking into consideration feedback of medical staff, with an eye for commercialization from 2013.
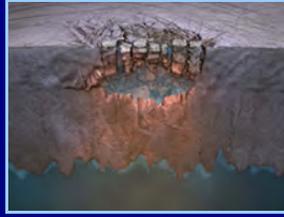
Outside the nursing and healthcare field, verification tests on short-distance personal transport assistance robots are being performed at commercial centers and active use is being made of manufacturing assistance robots in automobile production. Development in the field of domestic duty assistance is also progressing.

How Toyota Partner Robots Assist in the Nursing and Healthcare Fields

Name	Independent Walk Assist	Walk Training Assist
Main Application	Supporting independent walking for people whose ability to walk has been impaired by leg paralysis or other causes	Supporting return to natural walking from early training stages for people with impaired walking
Features	Detects the intention to walk using a thigh-position control sensor and a foot load sensor and then helps the knee swing forward as the leg is brought forward Provides reliable support when the weight of the body is supported by the knee	Employs Independent Walk Assist - Adjusts the body-weight support level according to the degree of recovery and monitors gait data such as joint angles to provide a visual interpretation of rehabilitation progress
Size	Width: 280 mm, depth: 290 mm, height: 620 mm - 770 mm	(Leg portion: Same as the Independent Walk Assist)
Weights	Leg-affixed portion: 3.5 kg	Leg-affixed portion: 4.0 kg
Photos		

How Toyota Partner Robots Assist in the Nursing and Healthcare Fields

Name	Balance Training Assist	Patient Transfer Assist
Main application	Supporting balance function training for people whose ability to maintain balance is impaired	Reducing the heavy physical burden of moving patients required in caretaking
Features	- A two-wheeled robot used in a standing position - Can be used to play three games—tennis, soccer and basketball - Provides balance training by moving the people in the game (in tandem with the movements of the training individual) according to a shift in body weight to the front, back, left and right - Facilitates enjoyable training	- A combination of weight-supporting arms and a mobile platform - The arms are shaped to easily accommodate patients, and are equipped with compact, precise control functions to provide gentle transport similar to being carried by a person - Designed for easy use by both caregivers and care recipients
Size	Width: 480 mm, depth: 700 mm, height: 1,100 mm	Width: 700 mm, depth: 995 mm, height: 900 mm
Weight	Base unit: 21.3 kg	140 kg
Photos		

NASA Probe Data Show Evidence of Liquid Water on Icy Europa

Europa's "Great Lake." Scientists speculate many more exist throughout the shallow regions of the moon's icy shell. Image Credit: Britney Schmidt/Dead Pixel FX/Univ. of Texas at Austin.

http://www.nasa.gov/topics/solarsystem/features/europa_20111116.html

Data from a NASA planetary mission have provided scientists evidence of what appears to be a body of liquid water, equal in volume to the North American Great Lakes, beneath the icy surface of Jupiter's moon, Europa.

The data suggest there is significant exchange between Europa's icy shell and the ocean beneath. This information could bolster arguments that Europa's global subsurface ocean represents a potential habitat for life elsewhere in our solar system. The findings are published in the scientific journal Nature.

"The data opens up some compelling possibilities," said Mary Voytek, director of NASA's Astrobiology Program at agency headquarters in Washington. "However, scientists worldwide will want to take a close look at this analysis and review the data before we can fully appreciate the implication of these results."

NASA's Galileo spacecraft, launched by the space shuttle Atlantis in 1989 to Jupiter, produced numerous discoveries and provided scientists decades of data to analyze. Galileo studied Jupiter, which is the most massive planet in the solar system, and some of its many moons.

One of the most significant discoveries was the inference of a global salt water ocean below the surface of Europa. This ocean is deep enough to cover the whole surface of Europa and contains more liquid water than all of Earth's oceans combined. However, being far from the sun, the ocean surface is completely frozen. Most scientists think this ice crust is tens of miles thick.

"One opinion in the scientific community has been if the ice shell is thick, that's bad for biology. That might mean the surface isn't communicating with the underlying ocean," said Britney Schmidt, lead author of the paper and postdoctoral fellow at the Institute for Geophysics, University of Texas at Austin. "Now, we see evidence that it's a thick ice shell that can mix vigorously and new evidence for giant shallow lakes. That could make Europa and its ocean more habitable."

Schmidt and her team focused on Galileo images of two roughly circular, bumpy features on Europa's surface called chaos terrains. Based on similar processes seen on Earth -- on ice shelves and under glaciers overlaying volcanoes -- they developed a four-step model to explain how the features form. The model resolves several conflicting observations.

Some seemed to suggest the ice shell is thick. Others suggest it is thin.

This recent analysis shows the chaos features on Europa's surface may be formed by mechanisms that involve significant exchange between the icy shell and the underlying lake. This provides a mechanism or model for transferring nutrients and energy between the surface and the vast global ocean already inferred to exist below the thick ice shell. This is thought to increase the potential for life there.

The study authors have good reason to believe their model is correct, based on observations of Europa from Galileo and of Earth. Still, because the inferred lakes are several miles below the surface, the only true confirmation of their presence would come from a future spacecraft mission designed to probe the ice shell. Such a mission was rated as the second highest priority flagship mission by the National Research Council's recent Planetary Science Decadal Survey and is being studied by NASA.

"This new understanding of processes on Europa would not have been possible without the foundation of the last 20 years of observations over Earth's ice sheets and floating ice shelves," said Don Blankenship, a co-author and senior research scientist at the Institute for Geophysics, where he leads airborne radar studies of the planet's ice sheets.

Galileo was the first spacecraft to directly measure Jupiter's atmosphere with a probe and conduct long-term observations of the Jovian system. The probe was the first to fly by an asteroid and discover the moon of an asteroid. NASA extended the mission three times to take advantage of Galileo's unique science capabilities, and it was put on a collision course into Jupiter's atmosphere in September 2003 to eliminate any chance of impacting Europa.

The Galileo mission was managed by NASA's Jet Propulsion Laboratory in Pasadena, Calif., for the agency's Science Mission Directorate.

For images and a video animation of the findings, visit the University of Texas at Austin.

Dwayne Brown
Headquarters, Washington
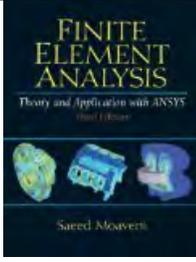202-358-1726
dwayne.c.brown@nasa.gov

Marc Airhart –
University of Texas at Austin
512-471-2241
mairhart@jsq.utexas.edu

	Finite Element Analysis Theory and Application with ANSYS (3rd Edition)		Arbitrary Langrangian-Eulerian and Fluid Structure Interaction.
	Isogeometric Analysis: Toward Integration of CAD and FEA		NURBS for Curve & Surface Design: From Projective Geometry to Practical Use
	A First Course in Finite Elements		Engineering Numerical Analysis
	Go To Book at Amazon		A first Course in The Finite Element Method
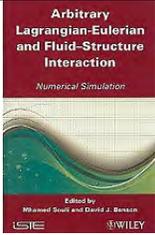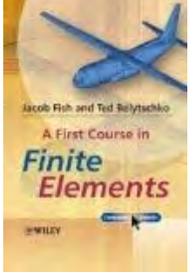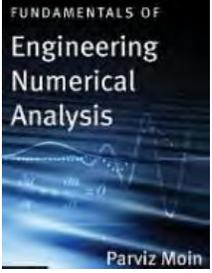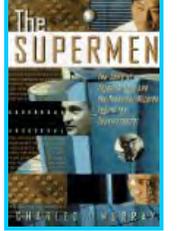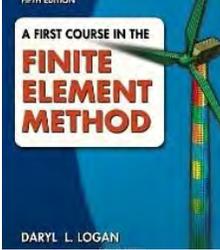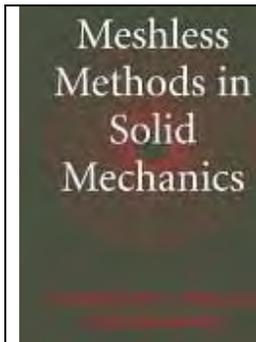
Meshless Methods in Solid Mechanics	Principles of Geotechnical Engineering	Geotechnical Earthquake Engineering
Microflows and Nanoflows	The Quantum Story: A History in 40 Moments	The Quantum World: Quantum Physics for Everyone
Introduction to Quantum Mechanics (2nd Edition	Practical Stress Analysis With Finite Elements	
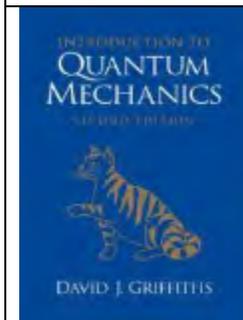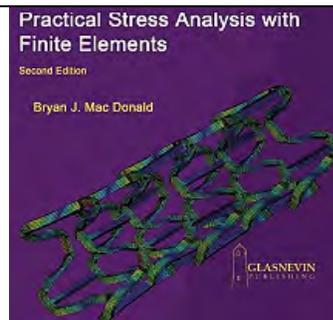
A preprocessor is a program that processes its input data to produce output. This data is then used as input to another program.

BETA CAE Systems S.A.

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

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

Engineering Technology Associates, Inc.

http://www.inventiumsuite.com

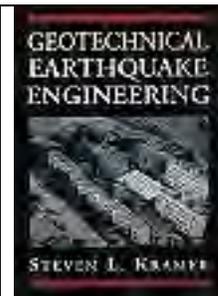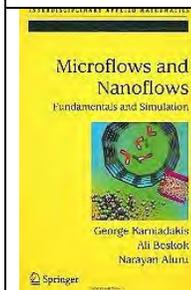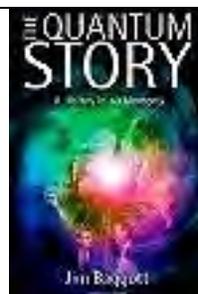PreSys is an advanced Pre/Post Processor. PreSys is a full-featured, core solution that can be used on its own or with a variety of available add-on applications.   The system offers advanced automeshing tools to provide the highest quality mesh with little CAD data preparation. It also features a scripting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

Oasys, Ltd

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

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

JSOL Corporation

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

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

Livermore Software Technology Corporation

http://www.lstc.com

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

ETA – DYNAFORM & VPG

http://www.eta.com

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

ETA – VPG

http://www.eta.com

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

OASYS software for LS-DYNA

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

Oasys software is custom-written for 100% compatibility with LS-DYNA. Oasys PRIMER offers model creation, editing and error removal, together with many specialist functions for rapid generation of error-free models. Oasys also offers post-processing software for in-depth analysis of results and automatic report generation.

ESI Group Visual-CRASH For DYNA

http://www.esi-group.com

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

BETA CAE Systems S.A.— ANSA

http://www.beta-cae.gr

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

BETA CAE Systems S.A.— µETA

http://www.beta-cae.gr

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

Gompute on demand®

A Cloud HPC service oriented to Technical and Scientific users.

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) a 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.

Website: www.gompute.com
Website: www.gridcore.se

The Complete Courses Offered Can Be Found At: http://www.cadfem.de
Please check the site for accuracy and changes.
Among the many course offering are the following:

Introduction to simulation with ANSYS Workbench
>December 13, 2011
>January 10, 2012
>February 21, 2012
>March 13, 2012

Introduction to explicit structural mechanics with ANSYS-LS-DYNA and LSTC's LS-DYNA
>February 08, 2012
>May 09, 2012

Material Modeling with LS-DYNA
>March 06, 2012

Modeling joints with LS-DYNA
>March 02, 2012

Introduction to simulation of joint and muscle forces with AnyBody
>April 25, 2012

Efficient coupling of AnyBody with ANSYS workbench
>April 27, 2012

Additional Courses are offered — please check the website for upcoming dates for:

- FTI Forming Suite
- DIGIMAT
- DIFFPACK

Individual Training:

Take advantage of the expertise of our specialists and get to know how simulation processes in your company can be arranged in an optimal way.

Let us combine your expert knowledge in your particular company questions with our experience in handling with ANSYS and ANSYS Workbench. In an individual training we can develop efficient solution approaches hand in hand and we help you to use our software effectively.

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

Please check the site for accuracy and changes.
Among the many course offering are the following:

Composites
            December 01, 2011

Support Occupant
            December 05, 2011

Crash Analysis – Paul DuBois
            December 06, 2011

DYNAstart
            December 15, 2011

Free Info Day Support LS-DYNA
            December 16, 2011

Penetration Paul Du Bois, Dr. Len Schwer
            December 19, 2011

Blast Modeling Paul Du Bois, Dr. Len Schwer
            December 21, 2011

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

Please check the site for accuracy and changes.
Among the many course offering are the following:

Advanced Options in LS-DYNA
 MI
            December 8-9, 2011

Introduction to LS-PrePost (no charge)
MI
            December 12, 2011

Introduction to LS-DYNA
MI
            December 13-16, 2011

Implicit Analysis with LS-DYNA
MI
            January 16-17, 2012

Introduction to LS-PrePost (no charge)
CA
            January 30, 2012

Introduction to LS-DYNA
CA
            January 31 - February 3, 2012

NVH and Frequency Domain Analysis
with LS-DYNA
CA
            February 7-8, 2012

ALE/Eulerian & Fluid/Structure
Interaction in LS-DYNA
 CA
            February 20-22, 2012

Smoothed Particle Hydrodynamics (SPH)
in LS-DYNA and Element-Free Galerkin
(EFG)
CA
            February 23-24, 2012

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

Please check the site for accuracy and changes.
Among the many course offering are the following:

LS-PrePost 3, introduction
  March 12, 2012
  Anders Jernberg Fars Hatt,
  Kungälv

LS-DYNA, introductory course
  March 13, 2012
  Dr. Jimmy Forsberg Fars Hatt,
  Kungälv

ANSA & Metapost, Introductory course
  March 20, 2012
  David Karlsson
  Linköping

ANSA CFD Meshing
  March 22, 2012
  David Karlsson
  Linköping

LS-DYNA, implicit analysis
  March 27, 2012
  Dr. Thomas Borrvall
  Linköping

LS-DYNA, Simulation of sheet metal forming processes
  April 17, 2012
  Dr. Mikael Schill
  Linköping

LS-DYNA, Material modelling
  April 24, 2012
  Dr. Thomas Borrvall
  Linköping

The complete Training Courses offered can be found at
   http://www.asplus.fr/ls-dyna

Please check the site for accuracy and changes.
Among the many course offerings are the following:

Other regular courses (in Paris) ...

Switch from LS-PrePost 2.X to 3.X
      December 14

LS-PrePost 3.0 – Advanced meshing capabilities
   December 15

LS-DYNA User Options
      to be announced

LS-DYNA – Polymeric materials – By Paul DU BOIS
      December 12-13

Email: info@hengstar.com
Phone: +86-021-61630122

2011	5	6	7	8	9	10	11	12
An Introduction to LS-DYNA(High Level)								
Crashworthiness Simulation with LS-DYNA								
Passive Safety and Restraint Systems Design								■
LS-Prepost, LS-DYNA MPP, Airbag Simulation with LS-DYNA	■							
Pedestrian Safety and Passive Safety Simulation with LS-DYNA				■				
Crashworthiness Theory and Technology, Introduction of LS-OPT which is based on LS-DYNA			■					
Concrete & Geomaterial Modeling, Blast Modeling with LS-DYNA								
Frontal Restraint Systems according to FMVSS 208 and Euro NCAP				■	■			
Crashworthy Car Body disinterested, Simulation, Optimization						■	■	
Hot stamping with LS-DYNA		■	■					

Global Courses

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

Please check the site for accuracy and changes.
Among the many course offering are the following:

Introduction to DYNAFORM
      December 06-07, 2011
      January   03-04, 2012
      February   07-08, 2012

Introduction to PreSys
      December 13, 2011
      January   10, 2012
      February   14, 2012

Introduction to LS-DYNA
      December 20-21, 2011
      January   17-18, 2012
      February   21-22, 2012

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

Please check the site for accuracy and changes.
Among the many course offering are the following:

CAE Associates
  ANSYS Training, CFD and FEA Consultants Serving CT, NJ, NY, MA, NH , VT
  1579 Straits Turnpike / Suite 2B / Middlebury, CT 06762 / Phone: 203.758.2914

Feb 28, 2012 2 days
> Introduction to Fatigue & Fracture
> Analysis
> Middlebury, CT

Mar 05, 2012 1 day
> ANSYS DesignModeler
> Middlebury, CT

Mar 06, 2012 2 days
> Introduction to ANSYS Mechanical
> (Workbench)
> Middlebury, CT

Apr 12, 2012 2 days
> Introduction to CivilFEM
> Middlebury, CT

Apr 16, 2012 3 days
> Introduction to ANSYS Mechanical
> APDL Part I (Traditional GUI
> Middlebury, CT

Apr 19, 2012 2 days
> Introduction to ANSYS Mechanical
> APDL Part II (Traditional GUI)
> Middlebury, CT

May 14, 2012 1 day
> ANSYS Workbench Meshing for
> CFD
> Middlebury, CT

May 15, 2012 2 days
> Introduction to CFX
> Middlebury, CT

Jun 11, 2012 1 day
> ANSYS DesignModeler
> Middlebury, CT

Jun 16, 2012 2 days
> Introduction to ANSYS Mechanical
> (Workbench)
> Middlebury, CT

The ninth in a series of update meetings for Oasys LS-DYNA Users will be held at our office in Solihull on Wednesday 25th January 2012.

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 the Oasys team at Arup and other invited guests yet to be confirmed. Full agenda will be avialable online soon.

The event will be followed by a complimentary meal at The Boot Inn in Lapworth kindly sponsored by OCSL. Please ensure you register in advance 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 Katherine Groves. Please also 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.

Training Courses

The following training courses are provisionally scheduled around the time of the Oasys LS-DYNA UK Users' Meeting:

Mon 23rd - Tues 24th Jan
    Blast Modelling with LS-DYNA
    (with Paul Du Bois and Len Schwer)
    £1,000

Thur 26th Jan
    Penetration Modelling with LS-DYNA
    (with Paul Du Bois and Len Schwer)
    £600

Fri 27th Jan
    Oasys PRIMER & D-3PLOT - An Introduction to Javascripting
    FREE

The course costs listed above are per attendee and do not include VAT or any travel / accommodation expenses. For more information on all our courses see our training pages.

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; please click here for a PDF map. Details for public transport to the Blythe Valley Park can be found here (links to the Blythe Valley Park website).

Meal after the event: The meal following the event will be held at The Boot Inn, Old Warwick Road, Lapworth, B94 6JU. As in previous years the meal is kindly sponsored by OCSL. 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.

Contact Details
If you would like more information on this event please contact:
Katherine Groves
Oasys LS-DYNA Project Administrator, Arup
T +44 (0) 121 213 3291
E Katherine Groves

**12th International LS-DYNA®
Users conference**

The 12th International LS-DYNA® Users conference will be held in Dearborn, Michigan, USA, June 3-5, 2012.

Acceptances for paper summary are being sent, and there is still time to send in your summary for December 9th. For details visit http://www.ls-dynaconferences.com

Application areas being accepted for submission:
- Aerospace
- Automotive Crashworthiness
- Ballistic/Penetraion
- Bimechanics
- Civil Engineering
- Compressible Fluid Dynamics
- Electro Magnetics
- Heat Transfer
- Impact/Drop Testing
- Manufacturing Processes
- Metal Forming
- Modeling Techniques
- Nuclear Applications
- Occupant Safety
- Seismic Engineering
- Ship Building
- Transportation
- Virtual Proving Ground

Exhibitor Booths and Sponsorships information – vic@lstc.com
.

Canada	Metal Forming Analysis Corporation - MFAC -
	Contact: galb@mfac.com

USA	Engineering Technology Associates, Inc
	Contact: sales@eta.com

USA	SE&CS
	Contact: len@schwer.net

USA	Predictive Engineering
	Contact: george.laird@predictiveengineering.com

USA	CAE Associates
	Contact: info@caeai.com

USA	AEG Product Engineering Services
	Contact: support@engineering-group.com

USA	APACS Services Inc.
	Contact: apacs@comcast.net

DENMARK   FaurConAps
               Contact: faurholdt@faurcon.com

FRANCE   ALYOTECH TECHNOLOGIES
               Contact: nima.edjtemai@alyotech.fr

FRANCE   ALLIANCE SERVICES PLUS
               Contact: v.lapoujade@asplus.fr

Germany   CADFEM GmbH
               Contact: ls-dyna@cadfem.de

Germany   DYNAmore
               Contact: uli.franz@dynamore.de

ITALY   EnginSoft SpA
               Contact: info@enginsoft.it

Netherlands Infinite Simulation Systems, B.V
                Contact: j.mathijssen@infinite.nl

Sweden   DYNAmore Nordic

               Contact   marcus.redhe@dynamore.se

UK   OVE ARUP & PARTNERS
               Contact: brian.walker@arup.com

China	Ove Arup & Partners
	Contact: stephen.zhao@arup.com
China	ETA China
	Contact: lma@eta.com.cn
China	Shanghai Hengstar Technology Corp.
	http://www.hengstar.com
INDIA	nHance Engineering Solutions Pvt Ltd
	Contact: lavendra.singh@arup.com
INDIA	EASi Engineering
	Contact: rvenkate@easi.com
JAPAN	JSOL Corporation
	Contact: cae-info@sci.jsol.co.jp
JAPAN	Itochu Techo-Solutions Corp.
	Contact: ls-dyna@ctc-g.co.jp
JAPAN	LANCEMORE
	Contact: info@lancemore.jp
KOREA	THEME Engineering
	Contact: wschung@kornet.net
KOREA	KOREAN SIMULATION TECHNOLOGIES
	Contact: young@kostech.co.kr

Alpha Order by Country

Canada	Metal Forming Analysis Corp - MFAC http://www.mfac.com/ galb@mfac.com
China	ETA China http://www.eta.com.cn/ lma@eta.com.cn
China	OASYS Ltd. (software house of Arup) http://www.oasys-software.com/dyna/en stephen.zhao@arup.com
China	Shanghai Hengstar Technology Corp. http://www.hengstar.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
Greece	PhilonNet Engineering Solutions http://www.philonnet.gr stavroula.stefanatou@philonnet.gr

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
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\

Korea	Theme Engineering
	http://www.lsdyna.co.kr/ wschung@kornet.net

Korea	Korea Simulation Technologies
	http://www.kostech.co.kr young@kostech.co.kr

Netherlands	Infinite Simulation Systems, BV
	http://www.infinite.nl/ j.mathijssen@infinite.nl

Sweden	DYNAmore Nordic
	http://www.dynamore.se marcus.redhe@dynamore.se

Taiwan	Flotrend Corporation
	http://www.flotrend.com.tw/ gary@flotrend.tw

Russia	State Unitary Enterprise –STRELA
	info@ls-dynarussia.com

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

http://investors.cray.com/phoenix.zhtml?c=98390&p=irol-newsArticle&ID=1630950&highlight=

NCSA, Cray Partner on Sustained-Petascale Blue Waters Supercomputer

SEATTLE, WA, Nov 14, 2011 -- The University of Illinois' National Center for Supercomputing Applications (NCSA) has finalized a contract with Cray Inc. (NASDAQ: CRAY), to provide the supercomputer for the National Science Foundation's Blue Waters project.

This new Cray supercomputer will support significant research advances in a broad range of science and engineering domains, meeting the needs of the most compute-intensive, memory-intensive, and data-intensive applications. Blue Waters is expected to deliver sustained performance, on average, of more than one petaflops on a set of benchmark codes that represent those applications and domains.

More than 25 teams, from a dozen research fields, are preparing to achieve breakthroughs by using Blue Waters to model a broad range of phenomena, including: nanotechnology's minute molecular assemblies, the evolution of the universe since the Big Bang, the damage caused by earthquakes and the formation of tornadoes, the mechanism by which viruses enter cells, and improved climate change predictions.

Blue Waters will be composed of more than 235 Cray XE6 cabinets based on the recently announced AMD Opteron(TM) 6200 Series processor (formerly code-named "Interlagos") and more than 30 cabinets of a future version of the recently announced Cray XK6 supercomputer with NVIDIA(R) Tesla(TM) GPU computing capability

incorporated into a single, powerful hybrid supercomputer. These Cray XK nodes will further increase the measured sustained performance on real science problems.

"We are extremely pleased to have forged a strong partnership with Cray. This configuration will be the most balanced, powerful, and useable system available when it comes online. By incorporating a future version of the XK6 system, Blue Waters will also provide a bridge to the future of scientific computing," said NCSA Director Thom Dunning.

"The project is an incredible undertaking, requiring commitment and dedication not only from NSF, NCSA, the University of Illinois, and the science teams, but also from our computing systems partner -- Cray. This strong partnership further establishes our place at the forefront of high-performance computing," said University of Illinois President Michael Hogan.

"The Blue Waters team has the technological capability and the commitment to make this important resource a reality -- a resource that will help scientists and engineers solve their

most challenging problems," said Phyllis Wise, chancellor of the University of Illinois at Urbana-Champaign.

The Cray Blue Waters system will employ:

- Cray's scalable Gemini high-performance interconnect, providing a major improvement in message throughput and latency.
- 16-core AMD (NYSE: AMD) Opteron(TM) 6200 Series processors, selected by the editors of HPCwire as one of the top five new technologies to watch in 2011.
- Cray XK6 blades with NVIDIA(R) Tesla(TM) GPUs, based on NVIDIA (NASDAQ: NVDA) next-generation 'Kepler' architecture, which is expected to more than double the performance of the Fermi GPU on double-precision arithmetic.
- 1.5 petabytes of total memory (or four gigabytes per AMD Opteron 6200 Series processor core).
- Cray's scalable Linux Environment (CLE) and HPC-focused GPU/CPU Programming Environment (CPE). A Cray integrated Lustre parallel file system with more than one terabyte-per-second of aggregate storage bandwidth and more than 25 petabytes of user accessible storage.
- Up to 500 petabytes of near-line storage and up to 300 gigabits per second of wide area connections.

"We are extremely proud to have been selected to deliver the Blue Waters system through this important partnership with the NSF, the University of Illinois, and NCSA," said Peter Ungaro, president and CEO of Cray. "It's a honor to be able provide the NSF's vast user community with a Cray supercomputer specifically designed for delivering real,

sustained petascale performance across a broad range of breakthrough science and engineering applications. It's a passion that drives all the members of this partnership, and we are pleased to be a part of it."

Consisting of products and services, the multi-year and multi-phase contract is valued at more than $188 million. Cray will begin installing hardware in the University of Illinois' National Petascale Computing Facility soon, with an early science system expected to be available in early 2012. Blue Waters is expected to be fully deployed by the end of 2012.

As supercomputers continue to grow in scale and complexity, it becomes more challenging to effectively harness their power. Since the Blue Waters project was launched in 2008, NCSA has helped researchers prepare their codes for the massive scale of this and other extreme-scale systems. NCSA also initiated a broad range of R&D projects designed to improve the performance of the existing HPC software stack and facilitate the development and use of applications on Blue Waters and other petascale computers.

The Blue Waters project is now prepared to mount a major, community-based effort to move the state of computational science into the petascale era. The center will work with the computational and computer science and engineering communities to help them take full advantage of Blue Waters as well as future supercomputers. The effort will focus on scalability and resilience of algorithms and applications, the use of accelerators to improve time to solution for science and engineering problems, and enabling applications to simultaneously use computational components with different characteristics.

For more information about the Blue Waters project, see:
http://www.ncsa.illinois.edu/BlueWaters/.

For a Cray press release with more information regarding the financial details of the contract and its expected impact on Cray's 2012 outlook, see:
http://www.cray.com/rd/nov2011.html

About Cray Inc.

As a global leader in supercomputing, Cray provides highly advanced supercomputers and world-class services and support to government, industry and academia. Cray technology is designed to enable scientists and engineers to achieve remarkable breakthroughs by accelerating performance, improving efficiency and extending the capabilities of their most demanding applications. Cray's Adaptive Supercomputing vision is focused on delivering innovative next-generation products that integrate diverse processing technologies into a unified architecture, allowing customers to surpass today's limitations and meeting the market's continued demand for realized performance. Go to www.cray.com for more information.

About the National Center for Supercomputing Applications : The National Center for Supercomputing Applications (NCSA), located at the University of Illinois at Urbana-Champaign, provides powerful computers and expert support that help thousands of scientists and engineers across the country improve our world. Established in 1986 as one of the original sites of the National Science Foundation's Supercomputer Centers Program, NCSA is supported by the state of Illinois, the University of Illinois, the National Science Foundation, and grants from other federal agencies.

Safe Harbor Statement: This press release contains forward-looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934 and Section 27A of the Securities Act of 1933, including, but not limited to, statements related to Cray's ability to deliver the Cray supercomputer to NCSA when expected, Cray's ability to deliver a Cray supercomputer that meets NCSA's needs and the expected timing of the system being available and fully deployed. These statements involve current expectations, forecasts of future events and other statements that are not historical facts. Inaccurate assumptions and known and unknown risks and uncertainties can affect the accuracy of forward-looking statements and cause actual results to differ materially from those anticipated by these forward-looking statements. Factors that could affect actual future events or results include, but are not limited to, the risk that the Cray supercomputer required by NCSA is not delivered and/or accepted in a timely fashion or does not perform as expected, the risk that NVIDIA's Tesla GPUs based on the next-generation 'Kepler' architecture is not available with the performance expected or when expected and such other risks as identified in the Company's quarterly report on Form 10-Q for the quarter ended September 30, 2011, and from time to time in other reports filed by Cray with the U.S. Securities and Exchange Commission. In addition, more information regarding the expected impact of the contract on Cray's 2012 financial results and the risks associated with that impact can be found in Cray's press release announcing 2012 outlook referenced above. You should not rely unduly on these forward-looking statements, which apply only as of the date of this release. Cray undertakes no duty to publicly announce or report revisions to these statements as new information becomes available that may change the Company's expectations.

Cray is a registered trademark of Cray Inc. in the United States and other countries, and Cray XE6, Cray XK6, Cray XK, Gemini and Cray Linux Environment are trademarks of Cray Inc. Other product and service names mentioned herein are the trademarks of their respective owners.

Cray Media: Nick Davis 206/701-2123
  nickd@cray.com
NCSA Media: Bill Bell 217/265-5102
  jbell@ncsa.illinois.edu

Answers:

1.) Because of the, by default activated, shooting node logic.

2.) Information about the penetrating nodes and the modified coordinates can be found.

3.) Shooting node logic works not only during the initialization of the LS-DYNA input deck.   No information is reported in the message file. Information about penetrating nodes are only reported,   if the penetration is found during initialization.

4.) Penetrating nodes are not moved. Contact forces will resist further penetration, whereas the contact thickness is adjusted locally. If the penetration node leaves the contact region,   the contact thickness is adjusted again to the original contact thickness.