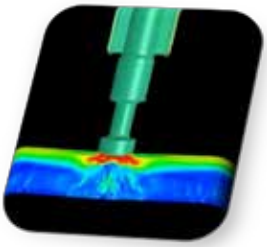
Oasys D3Plot & Newsletter

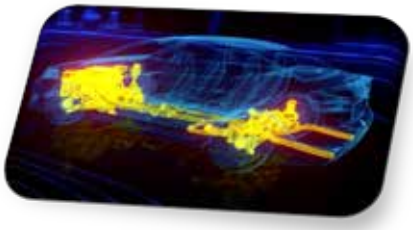
Altair AcuSolve

Shelter-In-Place for Kids Ideas

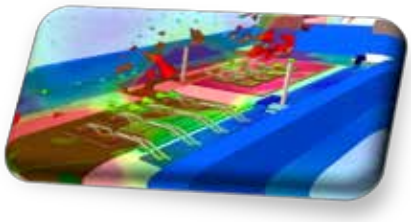
Lancemore Japan



MSC.Software



ANSYS



Forever Missed Due to Covid-19

Giuseppe Finzi
Day Hospital Parma

Önder Mutlu Yilmaz
Şehir University

FEANTM Table of Contents

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Expanding, revolutionizing, aspiring to bring a variety of FEA news, software solutions, and articles.

First, the following is strictly my own opinion (Marsha). I have commandeered this announcement page for April.

So, here we go: Marsha yelled through her megaphone, "HEY - if you think Covid-19 isn't serious then read my favorite T-SHIRT shown below."

"To those of you who have lost loved ones due to Covid-19 we will always remember this horrible time. To those on the front lines as first responders, you have my sincerest thanks, respect, and I salute your courage."

Below was shared on LinkedIn by James Harvey & by Prof. Tahsin.
Two of the many occupations and people that we have lost. Please support all first responders - Police, Fire Dept, EMT's, nurses, Doctors. Watch over your friends and family. Always tell your loved ones that you love them - NOW! Go do it now!

James Harvey • 3rd+
Project/Installation Manager
5d •

#TodaysHero Giuseppe Finzi, who was director of the Day Hospital in Parma, Italy.
He died yesterday from the #covid19 doing his Job as a doctor.

We salute you

Prof.Dr. Tahsin Engin • 2nd
Professor at The University of Sakarya
21h •

Önder Mutlu Yilmaz, the founding director general of the Technology Transfer Office at Şehir University and a manager for 8 years, unfortunately succumbed to Covid-19.

"To those of you that think Covid-19 isn't serious!"

(Yes, I know it's not politically correct and it's rude.)

Editor Note: Oasys D3Plot is the advanced 3D visualisation package for post-processing LS-DYNA analysis results. Distributor in the UK.

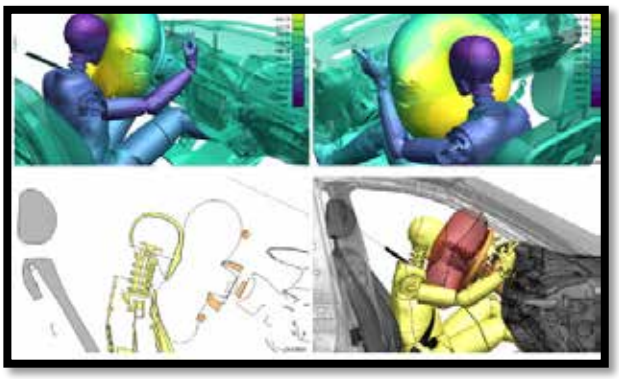
Oasys D3PLOT

Provides animation, extraction and derivation of over 100 data components, with advanced graphics (including shading, contouring, lighting and transparency).

Support for multiple models as well as an Oasys T/HIS link window results in unrivalled ease of in-depth analysis, investigation and comparison of many simulations.

Main Features

- In-depth access to LS-DYNA results, including over 100 different data components.
- Fast, high-quality graphics.
- Function keys can be programmed to execute command files.
- Cut-sections can be easily created and dragged using the mouse.
- Results data is plottable by contour, principal stress (stress flow), velocity vector, ISO surface and node cloud.
- Relative value plots available, i.e. deformation relative to axes fixed in the model or change from a given time state.
- JPEG, BMP, GIF, PDF, Postscript, AVI and MPEG output.
- Multiple windows allow viewing results from a range of different models simultaneously.
- Links with Oasys T/HIS for synchronized viewing of XY and graphical data.



Multiple Models

Use split screen windows to view the results from a range of different models simultaneously. You can overlay the results of multiple models in the same window.

Marta Kempa, MBA • 1st
Marketing Coordinator, Oasys LS-DYNA Environment

2.0 of the MPDB barrier available

OASYS LS-DYNA Newsletter - March 2020 - Now available

Editor Note: **The below article in full is located and copyright to the Altair Blog .**
Dr. Uwe Schramm is the CTO for Altair's Solvers, Optimization and Smart Multi-physics Solutions and Strategy.

Harnessing the computational capabilities of the graphics processing unit (GPU) is one of the cornerstones of Altair's mission to empower designers. In this respect, I am pleased to introduce major enhancements to two leading Altair products deployed on GPU technology:

Altair AcuSolve™, our advanced computational fluid dynamics (CFD) simulation software, and Thea Render™, a powerful 3D rendering and animation tool. These---- new enhancements specifically leverage NVIDIA GPUs to solve computational problems up to four-times faster. By utilizing GPU-based CFD solvers on NVIDIA RTX Servers, massive CFD simulations now process in hours rather than days.

The two Altair solutions validated on NVIDIA RTX Server include Altair ultraFluidX™ (external aerodynamics CFD software) and Altair nanoFluidX™ (particle-based CFD software).

External aerodynamics simulation performed with Altair ultraFluidX on the Altair CX-1 concept design, modeled in Altair Inspire Studio

Significant in their own right, these developments also form part of a bigger picture. As we enter a new decade, megatrends such as e-mobility, 5G communication, human augmentation and artificial intelligence (AI) are redefining the boundaries of engineering and creating new industries virtually overnight. Mirroring this, we're continually seeking to raise expectations of what is possible with simulation.

First and foremost, utilizing GPUs to accelerate numerical simulation delivers significant increases in speed and, therefore, throughput. That means more opportunities to explore and fine-tune designs, make decisions faster based on more accurate results, and consequently, considerably reduce time-to-market. In addition, creativity is enhanced, with more vivid, realistic and accurate rendering and visualization put within easier reach. A little less obvious, customers are free to deploy more energy-efficient computing systems, and establish a flexible, hybrid environment for design and simulation. One that is equally accessible to people using on-site infrastructures or the cloud.

Editor Note: The below article in full is located and copyright to the Altair Blog . Dr. Uwe Schramm is the CTO for Altair's Solvers, Optimization and Smart Multi-physics Solutions and Strategy.

The improvements to AcuSolve help bring these benefits into sharper focus. By implementing its algebraic solver on NVIDIA enterprise GPUs, we're realizing a six-times faster execution of the most intensive computational operations compared to an equivalent CPU configuration.

Cabin cooling simulation with Altair AcuSolve – model rendered with Thea Render

Validation on RTX Server similarly takes GPU-based CFD solvers ultraFluidX and nanoFluidX to another level. In the words of NVIDIA, "Validated systems deliver unprecedented performance at a fraction of the cost, space and power requirements of traditional CPU-based solutions."

That means large-scale CFD simulations which previously took days can now be completed overnight and can often be run on a single workstation. The entire simulation workflow can therefore be highly compressed, as shown in the vehicle design example shown below:

Video located on Altair Blog .

The vehicle design shown in the video above was created in Altair Inspire Studio, our industrial design solution that uses Thea Render as the rendering and animation engine. Used in combination with Altair ultraFluidX, it helps designers and aerodynamicists achieve more effective collaboration.

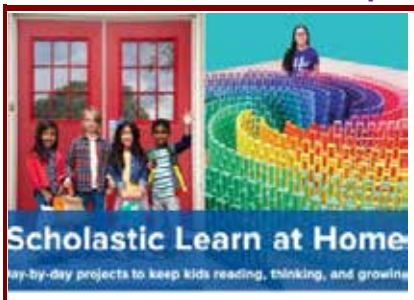
Today, it's not just design outcomes that are breaking new ground. So are the ways they are being achieved. Major advances in fields such as autonomous mobility are simply too involved to be anything other than the result of teamwork. Successful product development requires ever closer cooperation, collaboration and partnership. Altair's relationships with leaders like NVIDIA help us push the boundaries of innovation and deliver solutions that inspire our customers.

We firmly believe that an increasingly central role for simulation will help meet these challenges. It's therefore rather appropriate that our work in conjunction with NVIDIA has such an important role to play. Harnessing the latest advances in GPU technology is far from the full story in terms of enabling our customers to set new standards, but there can be little doubt that its significance will grow as we embrace a future as complex as it is exciting.

View our on-demand sessions from Altair's Milos Stanic, Yi Chen, and Avadhesh Mittal from the GPU Technology Conference online.

Editor Note: A few of the many sites to help pass the day.

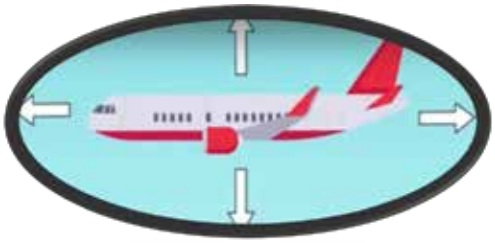
Kids That Code - A. Shapiro



03/23/2020 - Shelter-in-place - Several companies have stepped forward and offered free educational assistance including Audible and Scholastic

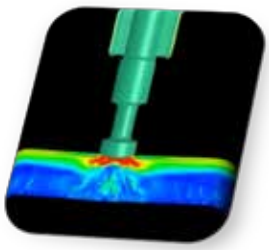
Activities To Do at Home - NASA

ANSYS STEM - Understanding Airplane Lift and Physics — for Kids!



How do airplanes fly and stay in the air? The Wright Brothers figured this out by mastering a physics force called "lift". Mostly created by the wings, lift holds an aircraft in the air. Thanks to Ansys technology, you can run airplane simulations to explore how lift is generated — directly on your computer — using the same software that even NASA scientists use! This cool video — ideal for grade schoolers (K – 7th grade) — performs fun experiments with paper airplanes and other exciting demonstrations to easily explain how lift works. Want to conduct your own lift experiment? Try building the paper airplane used in the video on the ANSYS website!

Editor Note: Lancemore located in Japan has many LS-DYNA Video Simulations

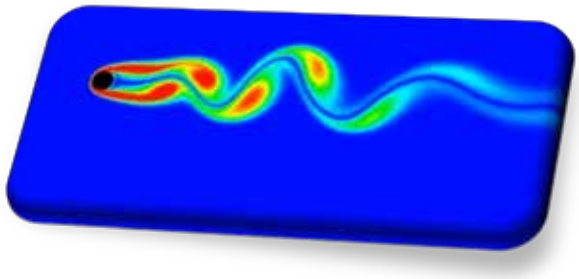


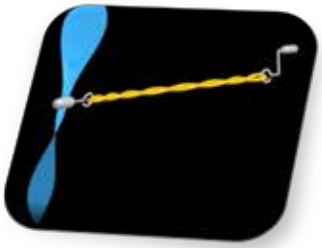
March 24 - [No.483 Impact Response of RC Beams with rectangular section]

LS-DYNA Sample model No.483 Behavior of RC Beams with rectangular section under impact loading

March 19 - [No.482 ICFD Karman Vortex Street / Unsteady flow]

LS-DYNA Sample Model No.482 ICFD Karman Vortex Street Unsteady flow condition



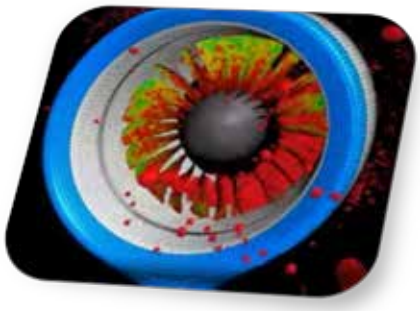


Mar 19, 2020 - [No.004 Rubber Plane Simulation / 2020 Extended version]

LS-DYNA Sample Model No.004 Rubber Plane Simulation
Ogden Rubber Model / Ogden

March 18 - [No.032 Bird Strike Analysis using SPH / 2020 remake version]

LS-DYNA Sample Model No.032 Bird Strike Analysis

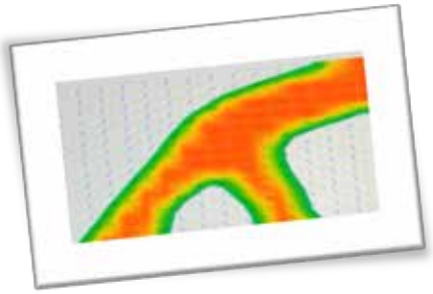


LancemoreJP YouTube Channel

Editor Note: Did you know BETA CAE has a YouTube Channel

March 18 - Topology optimization and material orientation on orthotropic materials

Find out the new tools you have in hands, and run a topology optimization on orthotropic materials with simultaneous optimization of the material orientation.



Mar 6, 2020 - Standardization of X-Attribute body assessment by coupling FEM and MKS

As presented by Ms. Emilie Debauche from Arrk P+Z Engineering. The procedure described is completely new for attributes such as Vehicle Dynamics, Vehicle NVH and RLD working with MKS. Its development was completed in co-operation with BETA CAE Systems.

Advancements in batch model preparation with the SDM-Console

As presented by Mr. Michael Tryfonidis from BETA CAE Systems at the 8th BEFORE REALITY Conference.

BETA CAE Systems YouTube Video Channel

Editor Note - Website [Hexagon - MSC.Software Simulating Reality, Delivering Certainty]

March 26, 2020 - by Hemanth Kolera-Gokula

[Adams Real Time Applications: Hardware in the Loop Testing for Controls Development]

We continue our Real Time blog series with a focus on Applications of Adams Real Time. The previous blogs in this series can be found in (Blog1, Blog2).

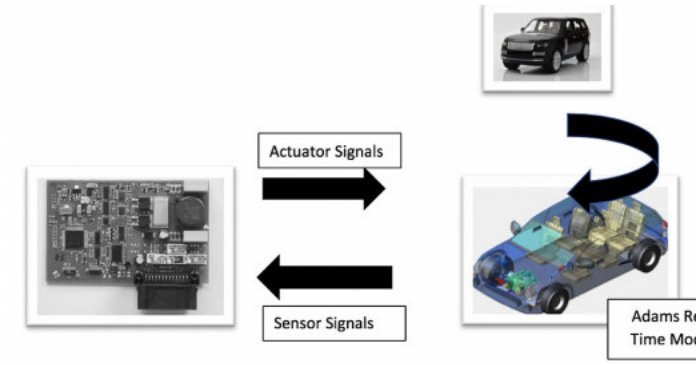
Modern engineering systems are becoming increasingly complex and multidisciplinary. Consider the automotive industry, for example, a domain that has traditionally been mechanical engineering focused. Trends related to autonomy, electrification, and connectivity have necessitated the inclusion of more electronics and software, thus fundamentally transforming the industry. This transformation imposes a fundamental challenge when it comes to verifying and validating vehicle design. Electronic Control Units (ECU's) that control, regulate and alter an automotive subsystem using embedded software have a myriad of inputs and outputs, which makes testing for standard and atypical driving scenarios a challenge. Furthermore, testing these subsystems on a fully assembled prototype is expensive and runs the risk of propagating issues far into the development cycle.

Can engineers ensure reliable, timely, and cost-effective testing practices for controls development?

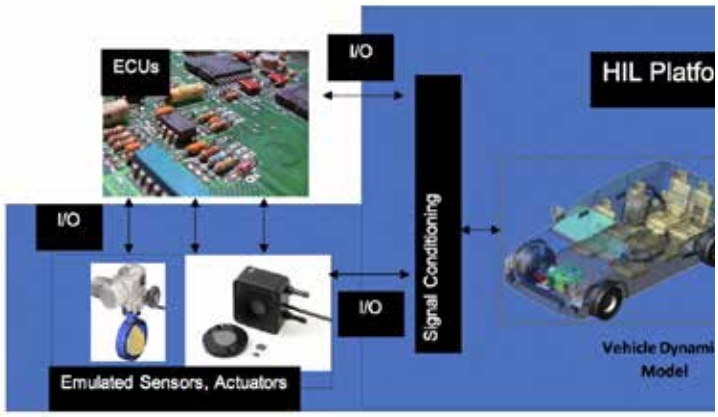
Hardware in the loop (HIL) testing technique provides a solution by connecting the real signals from an ECU with a virtual model of the system under test. HIL makes testing less dependent on prototype availability. Engineers can then test their systems as early and as often as possible, exposing potential issues upfront in the development cycle.

Since the goal is to test the ECU under realistic virtual stimuli, the model of the system needs to respond in real-time. Adams Real Time brings the time-tested benefits of Adams to applications, where a real-time model is required.

Editor Note - Website of [Hexagon - MSC.Software Simulating Reality, Delivering Certainty]



As shown in the schematic, a real time Adams model emulates the actual vehicle or vehicle subsystem and interacts with the real I/O from the ECU. The model resides on a real time platform that contains high performance processor technology and raid I/O capabilities. A more detailed representation of a HIL environment with an integrated Adams Ream Time model is shown below.



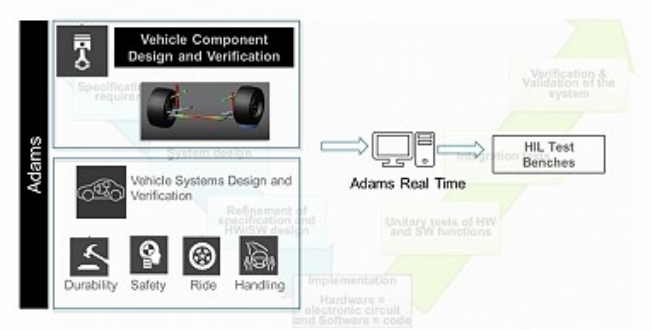
Processor boards run the Adams model in Real Time and simulate the vehicle states. The real time model is connected to the ECU via I/O interfaces and signal conditioning systems on the HIL platform. The model provides real sensor loads to the ECU, and the ECU, in turn, offers real actuator loads to the model through the I/O interfaces.

HIL provides a scale able and repeatable process for ECU testing and controls development. Since a virtual vehicle dynamics model is in the loop, engineers can test beyond the range of certain ECU parameters and safely investigate off-normal cases. Similarly, extreme events associated with failure can be investigated. For example, signal faults, e.g., open/shorted conditions, could be intentionally introduced between the model and the ECU to test for acceptable responses for these fault conditions.

How can Adams Real Time aid controls development?

The suggested usage of MBD modeling approaches, such as Adams, to simulate vehicle states in HIL is not novel. However, real-time compliant vehicle dynamics models for HIL integration have traditionally involved a low number of Degrees of Freedom (DOF), around 20. Such models are typically used to characterize the behavior of the vehicle via lookup tables. While these Reduced Order Models (ROMs) are a valid approach, with Adams Real Time compromising on the number of DOF's is no longer a requirement. Readily available high-performance computing and advances in engineering simulation techniques have now made predictive higher fidelity real-time simulations possible, providing more valuable insights for controls development.

MSC Software has designed Adams Real Time to preserve the topology and parametrics of the MBD-modelled system in real-time applications. This makes it possible to maintain elements such as hardpoints, joints, springs, dampers, and bushings and make changes to the modeled vehicle configuration without the need to calibrate a new ROM for every change. As such, the model can capture higher frequency characteristics in the system responses and replicate real-world ECU testing scenarios. Since the Adams model is parametric, the ECU can be tested against different virtual vehicle configurations rapidly. More robustness, enhanced efficiencies!

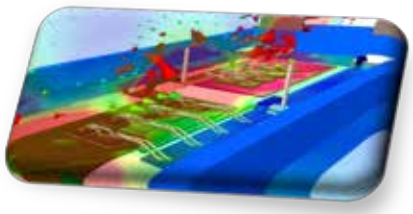


Adams is synonymous with vehicle systems optimization and is the prevailing modeling standard during the vehicle design phase. Adams Real Time now provides you the opportunity to use your existing vehicle modeling assets during the vehicle testing and calibration phases. Adopting a single modeling approach for both real-time and non-real time applications consolidates toolchains, provides consistency and eliminates error-prone model translations between different tools. This approach also makes it possible to validate control systems very efficiently and has the potential to remove weeks from a typical vehicle development program.

In upcoming blogs, we will expand on these Adams Real Time differentiators and benefits through actual vehicle applications such as stability control and anti-lock braking systems.

Editor Note - Brought to our attention on LinkedIn by B. Rozon, C. Chan, C. Jamerson

Brad J. Rozon • 1st
Continually Delivering World Leading Engineering Simulation Software
6d •



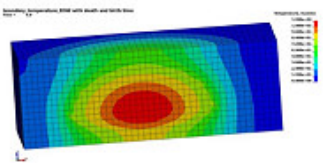
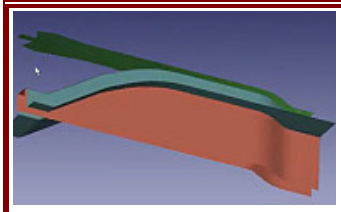
[Discover how you can design insulated gate bipolar transistors (IGBTs) with Ansys Q3D Extractor tutorials and Ansys Icepak tutorials]

Curt Chan • 1st
Inspiring innovation through the eyes of simulation
1w •

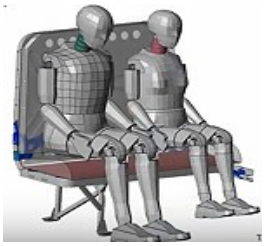
[The 3D printing revolution continues to change how we do things every day. Multiphysics simulation can help the journey every step along the way]

Christina Capasso Jamerson • 1st
Field Marketing Manager - Enterprise Accounts at Ansys, Inc.

[One Italian hospital is using 3dprinting to create a twin of a breathing system]

FEA Information Magazine	**March FEA Information News Magazine Issue**
	**D. Aggromito - Application of Impact Simulation for Protective Barrier Design**
	**T. Klöppel - LS-DYNA Developments in the Structural Conjugate Heat Transfer Solver**
	**A. Rühl, - Bolted Joint Connections of FRP-Components in Submarines Subjected to Underwater Shock**
Oasys PRIMER Bolt & Adhesive Connections	**03/30/2020 - Gavin Newlands - Oasys PRIMER_ Connections – Bolt and Adhesive Modelling**
	**03/23/2020 -Ameen Topa - Tensile Test with Solid Elements and Variable Thickness Shells**
	**03/08/2020 - Total CAE - Submit LS-DYNA to HPC Clusters and Cloud with TotalCAE**
	**03/02/2020- Jeanne He - LS-FORM**

Editor Note - Marsha, our resident coffee drinker, is Editor of the guest Section.



03/30 - I use tasting techniques to get my coffee to the correct results.

Predictive will show you projects that involve nonlinear analysis techniques to arrive at the correct result.

03/23 - Now I just need one for a tractor and I am set for the ranch.

GM's all-new modular platform and battery system (Photo by Steve Fecht for General Motors)

03/08 - I live on a ranch and I can use this to build a shed for hay, grain, saddles, tractor, COFFEE!

Kaizenat Support - Factory Shed design using Solidworks 2020

03/02 - I am SO glad my coffee machine does not give off emissions.

Keith Hanna - You can save the planet with design & engineering simulation

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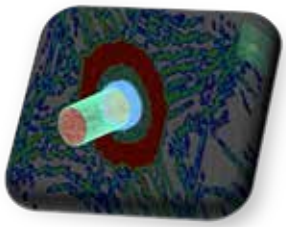
02/24 - And when we don't want a cup of coffee, how about some wine? BUT, keep in mind aeration.

Bill Kulp - Can You Aerate Wine by Pouring it From the Bottle?

02/17 Recommended by J.Racso. Personally, I (Marsha) wish I kept my Chevy S-10.

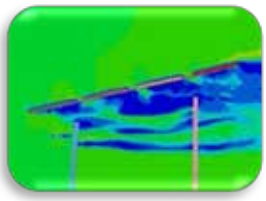
Crash Test 2019 Pickup Trucks – F150, Ram, Tundra, Titan

Editor Note - Our weekly website reviews, of course, with coffee references.



Monday 03/30/2020 - AND this week's coffee is called, Yuri with a hazlenut impact flavor! Grab that to go cup and we will head like a missle to YouTube. (oh stop groaning, I liked the missle reference)

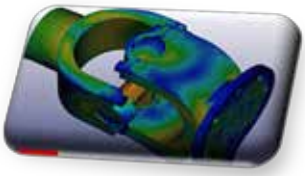
Yuri Novozilov Simulation of a soft missile impact on reinforced concrete slab - Sugano impact test



Monday 03/23/2020 - Today we have Blue Tokai Coffee AND another great video from Kaizenat Support. AND since I live in California Solar is important.

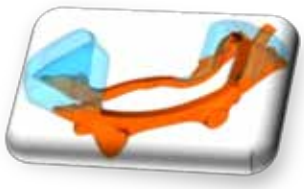
FSI(Fluid Strucuture Interaction) Simulation performed to study the Solar Panel structure Response for the Cyclone Wind load.

Monday 03/16/2020 - I apologize, but I'm exhausted and can't post. Tiki had major eye removal surgery on one eye. 03/30/2020 - He does amazing with one eye - he touches a wall, backs up and goes a different direction - Dog great, I am a nervous wreck wanting to keep guiding him.



Monday 03/08/2020 - Well, since I just replaced my transmission and driveshaft in my Ford Sport Trac, the below is crucial to me! This week we will have UJV. That stands for Universal Joint Coffee and as always with a tad of chocolate! NOW, let's get jogging to YouTube for aerobics for that chocolate calorie intake! OH like an intake manifold?

LS-DYNA - Failure simulation of a universal joint
Simu-K-Inc



Monday 03/02/2020 - I like this filling simulation because my coffee cups fill like that! It would be nice to see the coffee swirl into a cup. SO off we go to YouTube at a jog, for cardio, and then we can drink coffee and have a muffin!

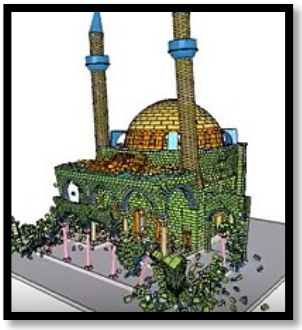
3D Mold filling in Ls-Dyna using level set

Editor Note - Our weekly website reviews, of course, with coffee references.

Monday 02/24/2020 - At times I think my coffee needs a protective screen! But it tastes so good I drink it to quickly so I guess we can just visit Simu-K Inc and their below simulation.

Simu-K Inc. - Simulation of a protective screen for tank fail

A multiphysique simulation with LS-Dyna. Liquid is modeled with SPH and the protective screen use finite element with material plasticity.



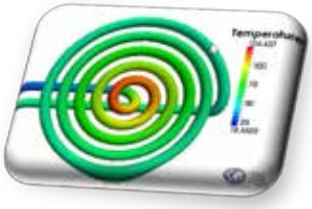
Monday 02/17/2020 - I know where I don't want to be standing drinking my coffee! The simulation below is earthquake - All I can think of is RUN! Now, that is scary!

LS-DYNA Simulation of the collapse of Takiyya al Sulaymaniyya under earthquake loads has been done in LS-DYNA.

Monday 02/10/2020 - Well, now I know what my car will look like if I run into one of the below wires. But my vehicle starts yelling at me if I go off the line it wants. It shakes the wheel; it screams - COFFEE USE BRAKE! COFFEE WATCH LANE - you would think it wants to own a coffee shop and has its flavors picked out!

Car impact into wire rope safety barrier

Simulation of an impact of a 900 kg car toa wire rope safety barrier.



Monday 02/03/2020 - Cafe Coil is our new product. It is small and will heat your coffee which is why I have the below simulation. Pop Quiz - What software rules Heat Transfer? No coffee for you if you didn't answer LS-DYNA.

LS-DYNA conjugate heat transfer in a coil heated by an electric current

Predicting the temperature of the coil to which a current is applied.

Editor Note - If you have a photo you would like included, please send it to feaanswer@aol.com

Sent in by Ed Helwig ehelwig@icloud.com

Editor Note - We had no choice. Marsha commandeered this page for more of her cloud pictures.