



FEA Not To Miss+ Town

Software & Engineering Solutions

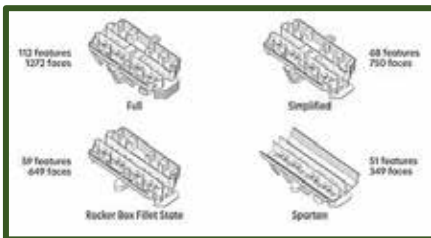
Town Hall Meeting, Blog & Gossip

We have bulldozed and started a new town

AEROSPACE – Raytheon



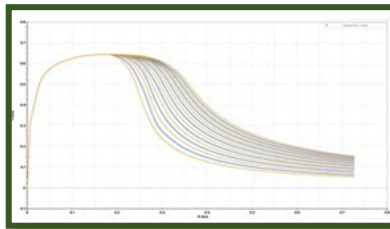
CATI



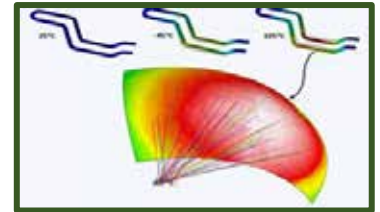
AUTOMOTIVE - BMW -



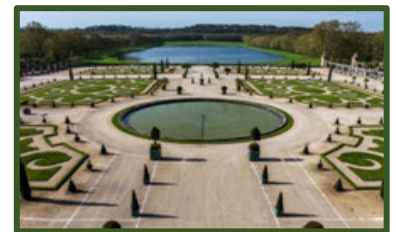
D3VIEW



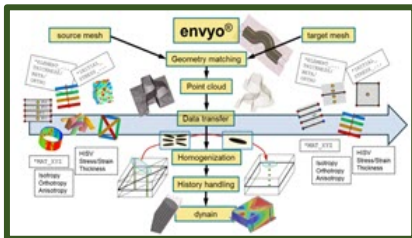
CADFEM



DYNAmore France



DYNAmore Germany



MSC - Hexagon

DYNAmore Nordic



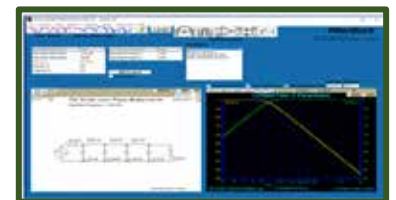
OASYS



Enginsoft



OZEN



CONVENTION CTR. CONFERENCE ROOM – 20 Year anniversary of DYNAmore - How it all began



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Editors: (alpha order) Anthony, Art, Marnie, Marsha, Yanhua

Town Pretend to be Editors

The Old Rancher - No one in town knows his name. You yell "Hey, Old Rancher."

The Old Pilot - No one in town knows his name. You yell "Hey, Old Pilot."

The Old Racer - No one in town knows his name. You yell "Hey, Old Racer."

They are all brothers - strange family

Contact us at feaanswer@aol.com

[Map Vector & town graphics in our magazine are courtesy of vecteezy](#)

Table of contents All postings and or articles are copyright to the respective person/company

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05 Town Hall Meeting & Announcements

06 Town Map

07	V. Daroz	ANSYS	Ansys Rocky's 200-Million Particle Simulation on Oracle Cloud Pushes DEM Analysis to a New Height
09		CADFEM	L.E.S.S. SA shapes automotive lightings
10	A. Sandri	CATI	Maximizing Save Performance in SOLIDWORKS
12	S. Bala	D3VIEW	Curve reconstruction procedure for use in Machine Learning
15		DYNAMORE	Envyo is a multi-purpose mapping tool dedicated to LS-DYNA
16	R. Schützer	DYNAmore Nordic	Diffcrash is a tool for analyzing huge datasets and identifying non-robust design regions.
17	N. Edjtemai	DYNAmore France	2nd LS-DYNA France User Day
18		ENGINSOFT	Filling and compression analysis of metallic powders composed of spherical particles
20	R. Baldwin	Hexagon	New release Simufact Welding 2022 - Enormous improvements
21	A. M Stark	LLNL	A deep dive into the interior of red dwarfs
22	M. KEMP	OASYS	Webinar, Pedestrian Safety - YouTube - Oasys GSA!
23	M. Ozen	OZEN Eng.	by: A. Benalla, Nuhertz FilterSolutions: ...Now Fully Integrated in Ansys AEDT

Automotive and/or Racing Information

24	BMW	MINI Concept Aceman: Digital, full electric, responsible.
----	------------	-----------------------------------------------------------

Airport - Aerospace

25	Raytheon	Government-industry team demonstrates first-of-its kind Air Base Air Defense capability
26	O.R Pilot	Quiz
27	News & Air Force	USAF - Pictures of the month

Thanks to [Vecteezy](#) for our **Map Vector/town** and many of the graphics in our magazine

Table of contents All postings are copyright to the respective person or company

Research Hospital

28	DYNAmore Nordic	Analyses of orthopedic fixation devices with LS-DYNA
31	T. Klekiel	Numerical Analyses of Fracture Mechanism of the Pelvic Ring during Side-Impact Load

Town Library – papers & DYNAmore Reference Desk

32	D. Liu	Numerical Simulation and Experimental Study on Single Point Blasting of Ice Jam of Heilongjiang River Based on ANSYS/LS-DYNA
33	S. Pathy	Numerical Simulation of Aircraft Seat Compliance Test using LS-DYNA® Implicit Solver

Cattle Rancher – Whatever he wants

34	J. Robinson	Pull Up Nets
----	--------------------	--------------

Secretary – Virtual Tours

35	Museum	Italy - ALFA ROMEO
----	---------------	--------------------

Supervisor – Anything, never sure what will show up!

36	Gossip	Marsha's Coffee & Gossip (and ranting and raving)
----	---------------	---------------------------------------------------

Convention Center Booths

37	Poster Board	OmniQuest, Applus+ IDIADA, DYNAmore France, ETA, YSA22	
38	YouTube	Exhibitors	This month YouTube Exhibitors
39	Convention Center Conference Room - Kathleen Fritz - DYNAmore GmbH Rasmus Schutzer - DYNAmore Nordic AB 20 Year anniversary of DYNAmore - How it all began		
43	BIAS Engineering		Oasys Software Turkey Representative
44	Jenson	DFETECH	DFETECH Product Offerings
45	Jitesh	Kaizenat	Concrete Mixer simulation using Rocky DEM
46	Kambiz	Hexagon	HxGN Live Smart Simulation Summit
47	Kit	CATI	YouTube what you missed
48	Madhukar	CADFEM India	Create bolt joints easily and check them with certainty
49	T. Miyachi	JSOL	JSOL CAE Forum
51	Tarik	FIGES	MATLAB

Goodbye, AND answers to the Old Pilot Quiz

This blog/magazine is a positive venue, for editorial purposes, and not revenue derived



Serving coffee & chocolate cupcakes!

Our town comprises individuals interested in solutions for the future and, of course, animals and children.

Gossip is at the local coffee shop.

Pets are welcome. (Small pets, horses stay outside)
(Pet goats or pigs also stay outside)

TOWN NOTICE- We held DEMOLITION TOWN DAY!!!

Why? Companies stopped their blogs, wondering if a resident had moved on, congested, too much traffic, and smog.

We used equipment, horses, and demolished buildings – see town map - YEEHAW!

As presiding town Supervisor, I call this meeting to order:

1. Why did the secretary order 500 books "Learn to be smarter" AND 500 telescopes?
2. Last weekend, she read books to tractors, combines, and computers.
3. She was seen on the Town Hall roof using a telescope to view planets?
4. Explain to her that we didn't mean space alien robots by Artificial Intelligence.
5. Explain that Machine Learning isn't her reading "Learn To be smarter" books to machines.
6. Why is everyone grabbing a telescope and heading to the roof?

SEE D3View - Curve reconstruction procedure for use in Machine Learning

The secretary purchased my birthday cake for October 13th (73rd - yes, that is old)

1. WHY DOES MY CAKE SAY HAPPY 20th Anniversary, DYNAmore!!!!
2. Why is everyone cutting the cake yelling, "Who cares – it's good cake – get a slice."

SEE convention conference room - 20th anniversary of DYNAmore - How it all began



1. Analyses of orthopedic fixation devices with LS-DYNA
2. Numerical Analyses of Fracture Mechanism of the Pelvic Ring during Side-Impact Load



1. Numerical Simulation and Experimental Study on Single Point Blasting of Ice Jam of Heilongjiang River Based on ANSYS/LS-DYNA
2. Numerical Simulation of Aircraft Seat Compliance Test - LS-DYNA® Implicit Solver

Keynote Speaker

Jean-Daniel Beley PhD
Senior Director Software
Development, Mechanical
Business Unit Ansys



DYNA
MORE NORDIC

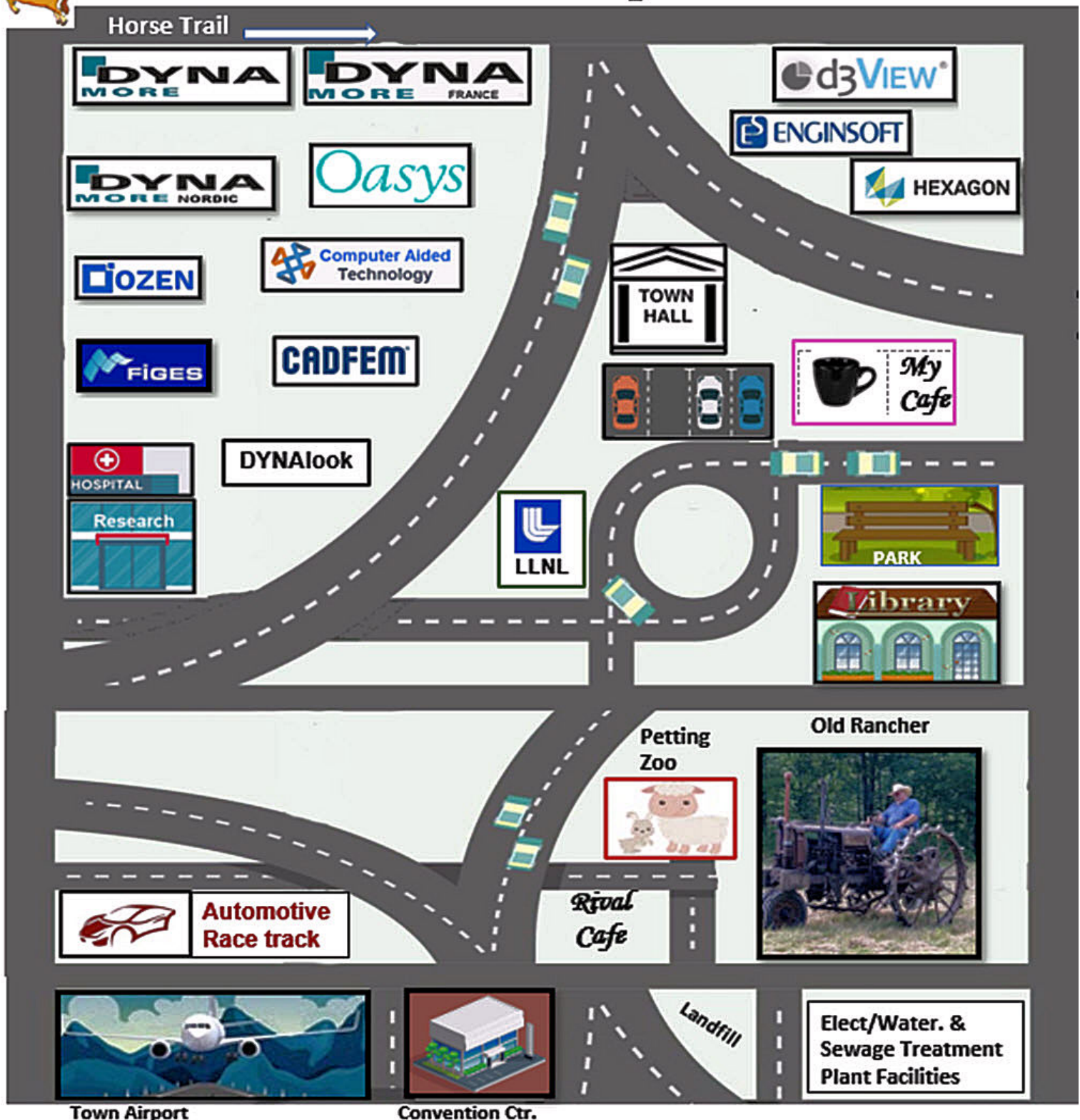
Nordic LS-DYNA Users' Conference
2022 October 18-19 Gothenburg

Don't miss the DYNAmore Nordic Conference **Jean-Daniel Beley, Ph.D. / Senior Director, Software Development, Mechanical Business Unit**

What will change for LS-DYNA users now that LSTC is part of ANSYS? LS-DYNA will continue on the current development trajectory, ANSYS will work with LSTC partners and continue direct customer engagement. Joint projects with our other flagship solver technologies will open new doors.



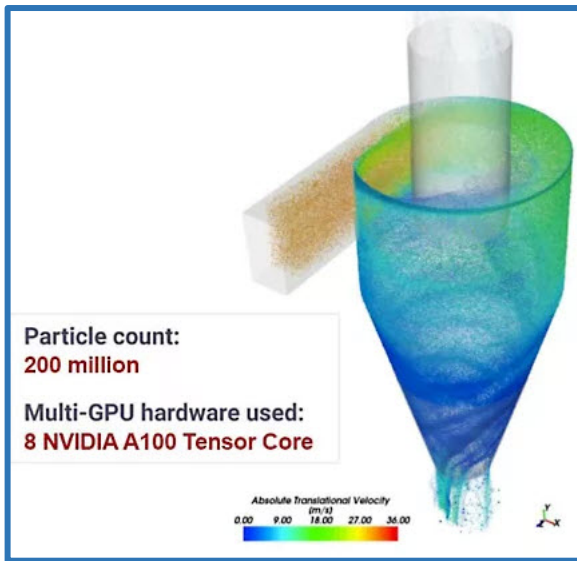
Town Map



- * The logos displayed, of content in our magazine, do not represent their endorsement.
- * To be removed, please notify feaanswer@aol.com with the request.
- * Your town lot will be auctioned, with the Town applying all proceeds to the coffee budget.
- * The town map changes pending information, and rotational building rentals.



Excerpt



[Ansyes Rocky's 200-Million Particle Simulation on Oracle Cloud Pushes DEM Analysis to a New Height](#)

Author - Vinicius Daroz

CFD-DEM Applications Engineer, ESSS

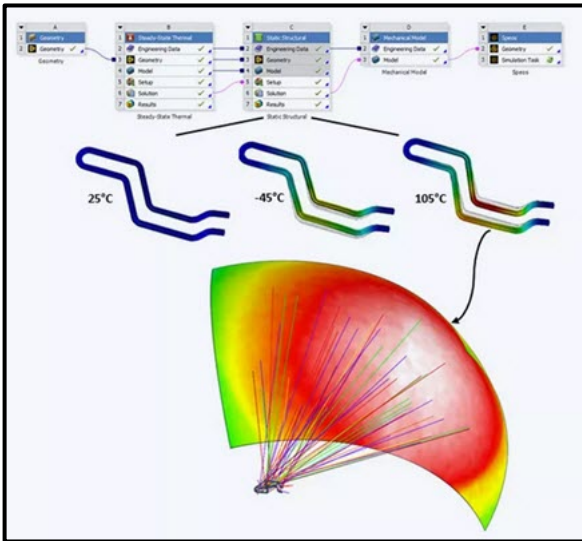
Oracle Cloud Infrastructure (OCI) and NVIDIA have elevated discrete element modeling (DEM) technology via the first-of-its-kind simulation of a 200-million particle analysis using Ansyes Rocky DEM software on OCI's bare-metal graphical processing unit (GPU) shape.

The latest NVIDIA data center solution, the NVIDIA A100 Tensor Core GPU, was one of the key components in this simulation. It allowed GPU-accelerated software codes such as Rocky DEM to use its full capacity, handling tens of millions of particles deployed in a DEM simulation model. Enabled by Rocky's multi-GPU parallel processing capabilities and the power of OCI's bare-metal GPU systems, we can dramatically expand the range of applications and apply DEM simulations to analyze problems that include hundreds of millions of particles. In addition, in the most recent release of Rocky, a powerful parallel load balancing algorithm enables more efficient GPU resource utilization than previous versions.

With the computing hardware taken care of, there was still one concern: storage of the results. Huge simulation cases tend to generate a large amount of data, which uses a lot of disk space. To avoid moving such a large amount of data between the processing server BM.GPU4.8 and the post-processing server VM.GPU3.1, a more efficient storage solution was developed. A third virtual machine was launched to serve as a network file system (NFS) server with terabyte-level block storage mounted to it. This storage solution made intermediate output data available for post-processing on the fly. It also allowed the bare-metal BM.GPU4.8 server to be deleted when the simulation work was finished, creating a more cost-effective solution. Similarly, the post-processing virtual machine could be deleted while waiting for new intermediate output data.

Recently, OCI and Ansyes designed a study for a gas cyclone separator, a device commonly used to separate and remove particles from an airflow stream. Such a device can be found in our home vacuum cleaners and has many industrial uses, including separating abrasives, pollutants, dust particles, and various production plant exhausts.

In this study, particle-laden air was injected into a centimeter-sized cyclone. While the air swirled inside the cyclone, dust particles of different diameters bumped into each other, bouncing off the interior walls of the cyclone. The rapid swirling motion allowed the heavier particles to move toward the cyclone walls and make their way out through the bottom outlet while some finer particles and a cleaner air stream were released from the top outlet.



L.E.S.S. SA shapes automotive lightings - Design of automotive lightings compliant to demanding regulations

Sector: Precision mechanics and optics

Specialist field: Optic

Automotive lighting design requires interdisciplinary understanding to create high-performing products. The Advanced Product and Technology Development team at L.E.S.S SA performs Multiphysics simulations including flow, thermal, mechanical, and optical calculations, to design products that meet physical expected performances and ECE regulation R87 requirements.

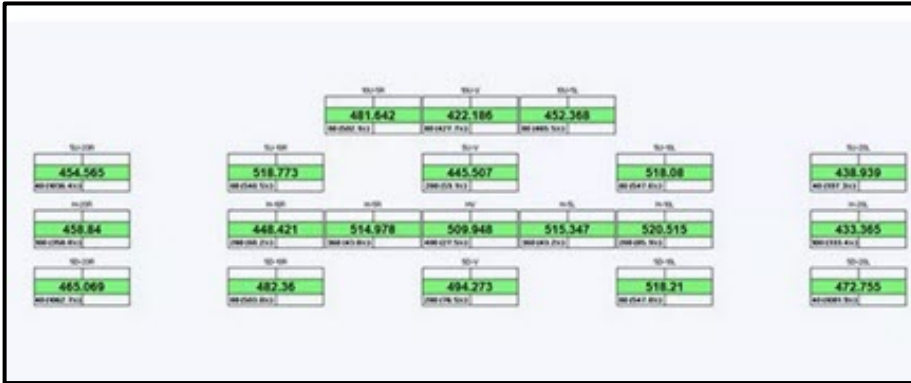
Workflow in Ansys workbench, thermal deformation contours at different temperatures, and optical simulation with the deformed shape for compliance with ECE regulation.

Task	Solution	Customer benefits
Automotive lighting design requires interdisciplinary understanding to create high-performing products in a design environment with a low thermal budget and limited space.	Due to the nature of the problem, a Multiphysics approach is needed to analyze the thermal and mechanical effects on optical performance.	L.E.S.S. SA can anticipate the delivery of innovative automotive lighting through the use of Ansys multiphysics software and the support CADFEM

TASK - Automotive lighting design requires interdisciplinary understanding to create high-performing products in a design environment with a low thermal budget and limited space. Tight tolerances of optics and the demanding requirement of the automotive industry together create a challenge for engineers in this field.

The Advanced Product and Technology Development team at L.E.S.S SA constantly work on developing reliable products that enable flexible designs under the harsh conditions of the automotive industry ensuring high-performance and compatibility with international automotive standards. ANSYS products are utilized in the R&D process to ensure product safety by performing Multiphysics simulations including flow, thermal, mechanical, and optical calculations.

The working conditions in a vehicle can change drastically due to outside temperatures and heat dissipated from the vehicle. Therefore, the products must endure environments with temperatures from sub-zero levels (typ. -45°C) to elevated temperatures (typ. 105°C) while satisfying the optical specifications of international automotive standards. The thermal dilatation due to temperature change must be considered to ensure that the optical performance is not affected over the full range of environmental conditions.



Simulation table of light distribution for the homologation of daytime running light

Solution - Due to the nature of the problem, a Multiphysics approach is needed to analyze the thermal and mechanical effects on optical performance. Ansys Workbench was used to first perform a thermal analysis to determine the temperature gradient on a daytime running lamp module (DRL). The thermal field is then posed as loading in a mechanical simulation to estimate the thermal deformation of the part at temperatures ranging between -45°C to 105°C. Finally, the resulting deformed body is transferred to an optical simulation in Ansys SPEOS to check the illumination performance against the requirements of ECE regulation R87 concerning the daytime running lamps. This analysis setup provides a complete tool that helps evaluate the products, select materials, and ensure compliance with international standards from the beginning of the design iterations.

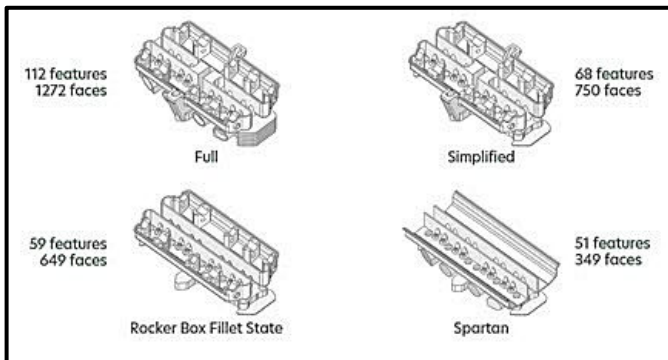
Customer Benefit - Appropriate simulations give L.E.S.S a strong advantage in terms of product performances and responsiveness to a demanding market before testing. These lightings are compliant with the ECE regulations and take account of thermal deformations and their effects on the optical performance. These benefits were accomplished by:

- Using optimization tools in different stages of design to provide the best possible products in the shortest time.
- Consideration of various working conditions with simulations to make sure the products will serve as expected through the product life cycle.
- Decreasing the number of physical prototypes/tests to reduce design iterations with customers to save time
- Analyzing the capabilities of products in a large range of working conditions and power requirements to better communicate to customers the product capabilities and ensure that customer-specific requirements (CSR) are fulfilled.



EXCERPT – Maximizing Save Performance in SOLIDWORKS

Anthony Sandri - Nobody wants to sit around and wait for their files to save. It's a waste of time and we can probably speed it up with some tweaks. But what should we do to make this better? Well, you've probably used configurations or heard of them in the past, so we can clean those up. Additionally, we should look at our display settings in SOLIDWORKS. Ideally, the files are fine enough detail that we can easily know what we're looking at but not so detailed that it bloats the file. With those as our backdrop, let's look at a few best practices to help you maximize your save performance with SOLIDWORKS.

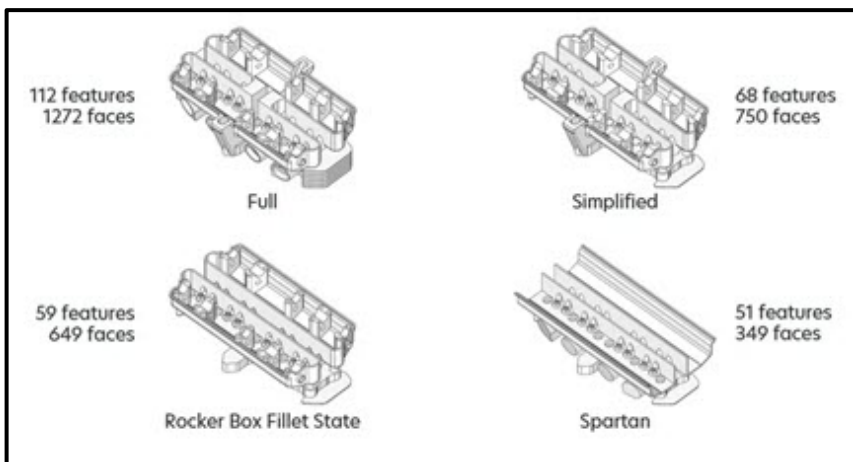


Maximizing Save Performance in SOLIDWORKS

Anthony Sandri - Application Engineer

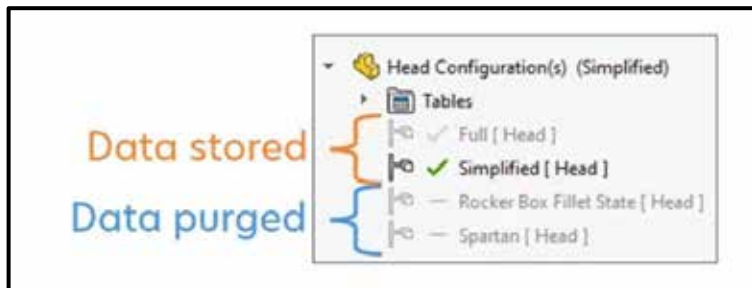
How Configurations Impact Save Performance - Configurations in SOLIDWORKS allow you to depict multiple versions of a model in a single file. They're especially useful as simplifications with non-critical features or components removed. You can also use them as representations of distinct model states (e.g., extended vs. collapsed, pre- vs. post-machining). If you're not careful, though, adding configurations to your model can worsen performance, particularly when saving the file.

When you save a model, SOLIDWORKS stores information related to the active configuration at a minimum. (It's often more than just the active configuration, but I'll get to that later.) Though there are other contributing factors, the size of the file tends to be driven by that active configuration's feature data (the calculations required to build its feature tree) and display data (its graphical representation). So, the more complex the active configuration is, the larger the file will be and the longer it will take to save.



To prove this point—and to show some easy tricks to keep things running smoothly—let's look at this engine head model. It has four configurations, differentiated only by the number of active features. To get a general sense of the complexity of each configuration, I've listed their feature and face counts below:

- Full: 112 features, 1272 faces
- Simplified: 68 features, 750 faces
- Rocker Box Fillet State: 59 features, 649 faces
- Spartan: 51 features, 349 faces



Influence of the Active Configuration on Save Performance

In order to see how the active configuration affects performance, I saved the engine head model in each configuration and recorded the resulting file size. When saving the model with the Full configuration active, the file size was around 3300 KB. This value jumps around as I save, but it was usually in that 3300 KB area. With the Simplified configuration active, the file size was close to 2000 KB. With Rocker Box Fillet State, it's about 1750 KB. And finally, with Spartan, the size is only around 1250 KB.

Clearly, the active configuration impacts the file size. However, I had to be kind of careful to measure this correctly. Notice in each scenario that only one configuration—the active one—has a checkmark. The rest have dashes. Dashes indicate that SOLIDWORKS isn't caching the feature data for those model configurations.

Any configurations with checkmarks, whether green or grey, are being remembered by the model, so to speak. The difference in color is just to differentiate the active (green) configuration from the inactive (grey). If you're looking at your ConfigurationManager and see a bunch of checkmarks, you're likely storing a lot more data in your file than you need.

Visit our website to continue with the following:

- *Feature Data
- *Unload a Cached Configuration
- *How Display Data Helps Maximize Save Performance
- *Performance
- *Minimize Triangles to Maximize Save Performance

Conclusion... So, configuration feature data and display data both have a significant effect on maximizing save performance...

...Of course, if you are having persistent performance issues and want more in-depth analysis, give us a call. Anthony Sandri, Application Engineer, Computer Aided Technology



Suri Bala
Founder and CEO at d3VIEW, Inc

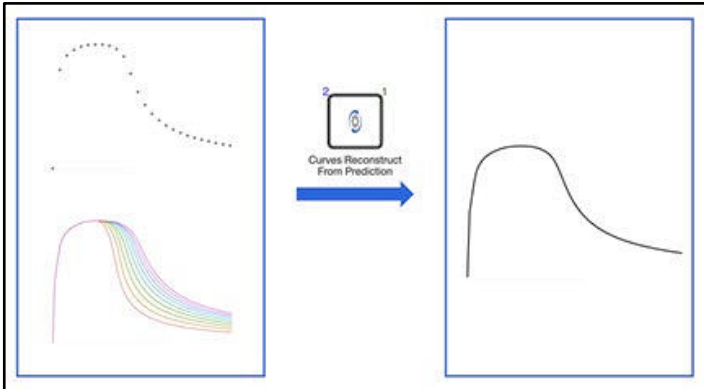
"Did you know that d3VIEW Workflow has a **curves_reconstruct_from_prediction** worker. Instead of a simple interpolation, it is a weighted average of the points from the input curves. As a result, it has the capability to capture the patterns from the input curves."

Curve reconstruction procedure for use in Machine Learning – by Bing

Introduction - Given a set of points, we want to construct a curve that shares some specific patterns described by a group of curves. From the description of the problem, there are two pieces of information available to us. First, the points available (Prediction Points) are part of an unknown curve we want to reconstruct. Second, this unknown curve (Prediction Curve) shares the same characteristic patterns defined by a group of known curves (Input curves). The information determines that a simple interpolation will not fulfill the goal of integrating the characteristic patterns to the reconstructed curve.

Curve reconstruction with d3VIEW Workflow

d3VIEW Workflow has a `curves_reconstruct_from_prediction` worker to perform the task. It takes two inputs, the group of input curves and prediction points.



And the output is the constructed curve that passes the given prediction points and shares the characteristic patterns. Instead of a simple interpolation, it is a weighted average of the points from the input curves. As a result, it has the capability to capture the patterns from the input curves.

Fig. The `curves_reconstruct_from_prediction` worker takes two inputs, input curves and prediction points and generates the reconstructed curve as an output

Examples - It is intuitive that more prediction points will generate a more accurate reconstructed curve. Meanwhile, we are interested in knowing if there is a number of prediction points that is small but also large enough so that the error between the reconstructed curve and the prediction curve is acceptable.

To find it out, we generate some simulation curves by varying the parameter and digitize them so that each curve has 100 points. These will be our input curves. We take a different number of points, say all 100 points, 34 points, 21 points and 11 points, from each of these input curves as the prediction points and use them for the curve reconstruction. The output will show us how many points are necessary to get a good result.

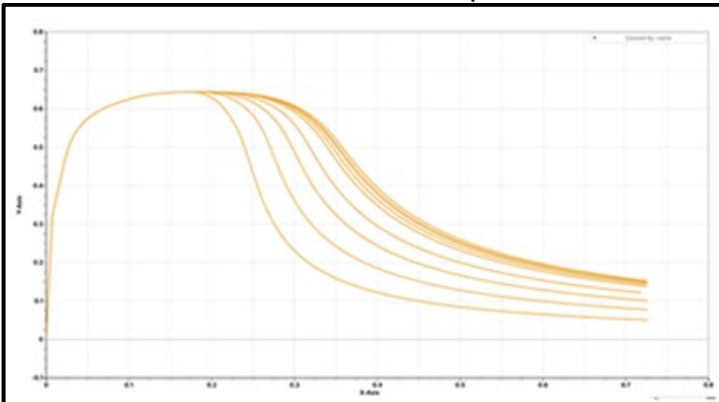


Fig. Simulation curves generated by varying some parameter and are used as input curves.



The figure below shows how the reconstructed curves compare to the input curves. It is clear that 11 points will miss some patterns from the input curves and reconstructed curves with around 30 points are fairly close to the input curves.

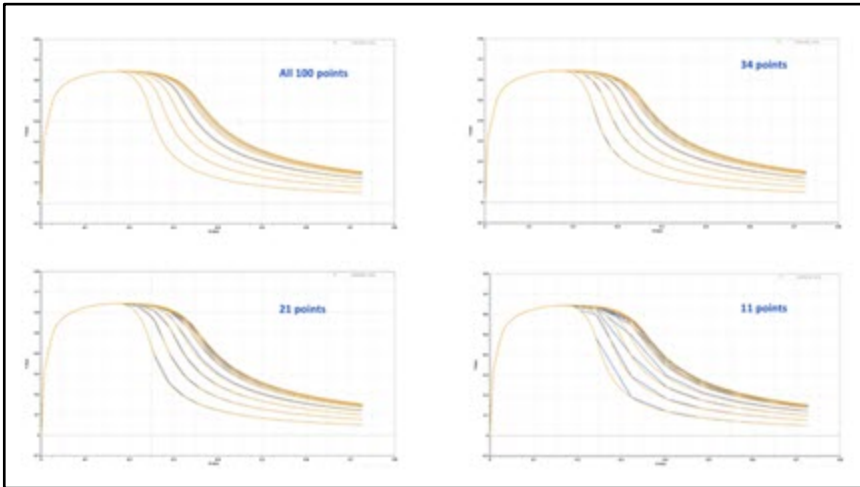


Fig Overlays of input curves (orange) and reconstructed curves (blue) with a different number of prediction points taken from the input curves

In the case above, we are taking prediction points from the input curves and thus the input curves are also the prediction curves. Now let's take the prediction curves from a different set of curves (but with the same patterns).

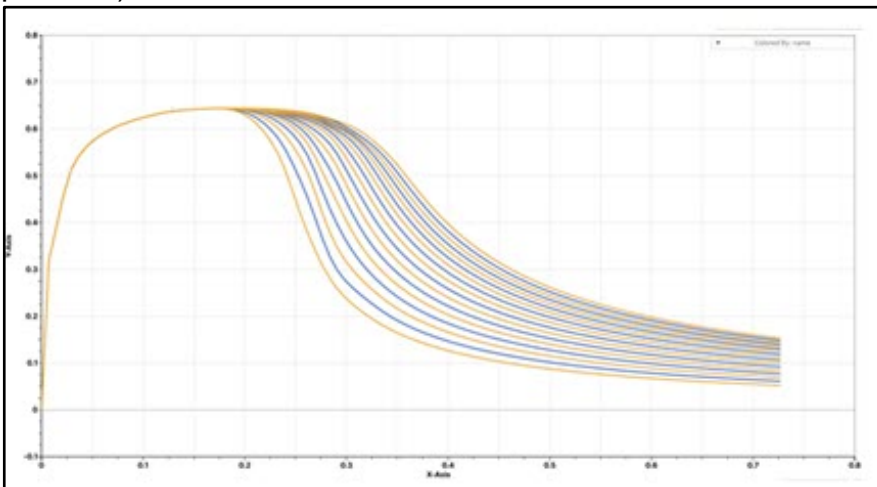


Fig. Input curves (orange) and prediction curves (blue)

We take 26 points from each curve and use them as prediction points. The reconstructed curves are shown below. We can see that the reconstructed curves are very close to the prediction curves.

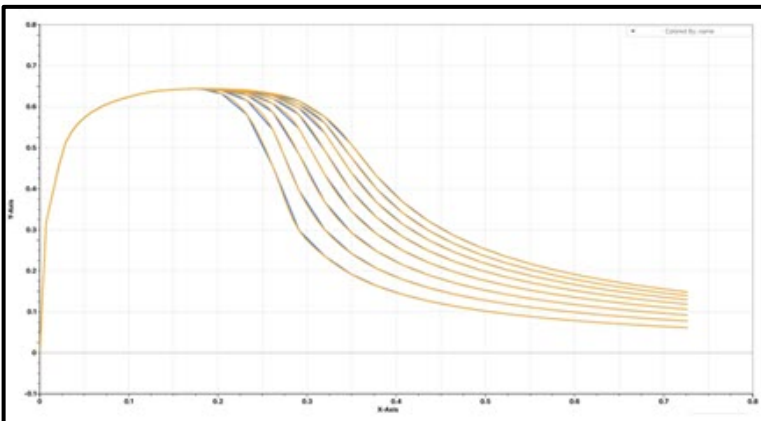


Fig. Prediction curves (orange) and reconstructed curves (blue)



Prediction Points - Prediction points is a critical input for the worker `curves_reconstruct_from_prediction` to perform its computation accurately. Prediction points includes only y values. The requirements for the prediction points input are

- The x values of the selected points are symmetric. In another word, they are equally distanced.
- The first prediction point is the y value of the first point of the prediction curve and the last prediction point is the y value of the final point of the prediction curve.

Basically, the prediction points are y values of a subset of points from the prediction curve, the curve we want to reconstruct. And these points must spread out equally on the whole range of the time domain where we want to reconstruct our curve. If these requirements are not met, the reconstructed curves will either be purely not accurate or show an offset from the prediction curve.

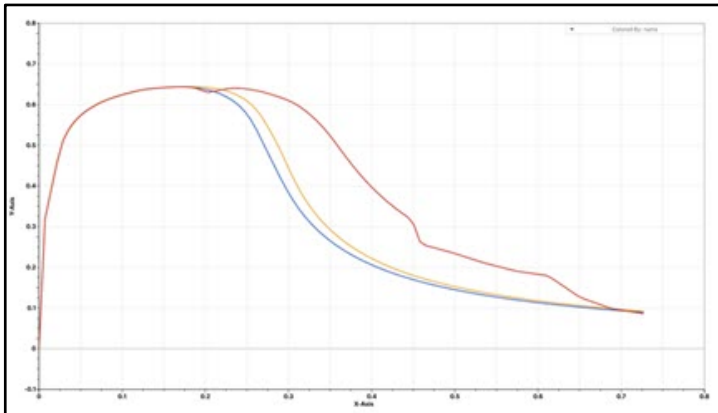


Fig. Prediction curve (orange), reconstructed curve if prediction points are not equally distanced (red), reconstructed curve if prediction points don't start with the first point and/or don't end with the last point (blue)

This is the reason why one of the reconstructed curve in the previous example shows an offset even when we were using all 100 points as prediction points.

If we look closely to the end, that specific curve is shorter than the other input curves and thus the provided prediction points for that curve will not be equally distributed on the whole time domain, which is slightly longer than that for that specific curve.

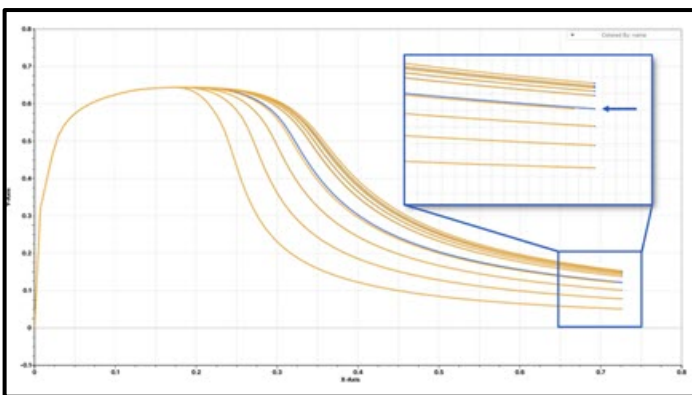
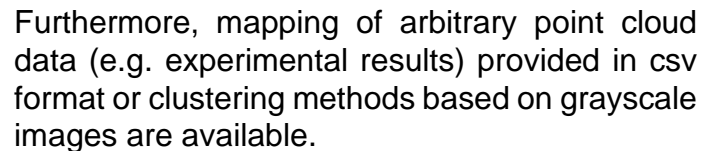


Fig. Failing to meet the second requirement for the prediction points input leads to an offset of the reconstructed curve.

Summary - The `curves_reconstruct_from_prediction` worker provides a great tool to reconstruct a curve from a subset of its points. Not only it reconstructs the curve, it also captures the patterns defined by a group of curves. It is a very useful tool when we want to restore a simplified curve to its original resolution at the cost of a small compromise of its accuracy. Meanwhile, we want to be cautious when we are providing the prediction points input. Both requirements must be met in order to get a good results.



Some standard and more automatized transformation options allow for the consideration of different length scales and coordinate systems.



(target constitutive model: *MAT_157 or *MAT_215):

- ## Metal Forming:

- ### Bake Hardening (target constitutive model: with *MAT_251):

- ### Mapping of Micro- and Mesoscopic Models (orientation initialization):

- ### Mapping of axisymmetric simulation results:

- ### Considering experimental data:

- General Information** - Envyo is developed by DYNAmore GmbH and is licensed separately from LS-DYNA. Test licenses can be requested following the provided link to the right – preferably with a small description of the use case. It is available for both, Windows and Linux operating systems.

15



Diffcrash is a tool for analyzing huge datasets and identifying non-robust design regions. With its help, you can suggest design changes that ultimately lead to a more robust model and/or product.

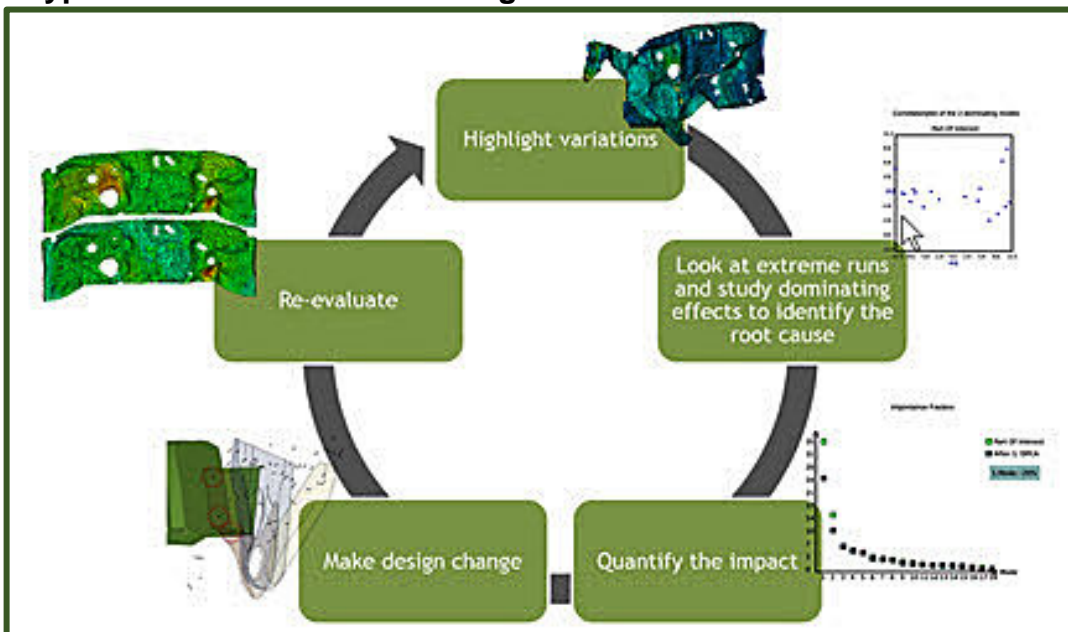
For the design and optimization of car models it is very helpful to deal with a simulation model, which generates similar results even if slight changes of the model are performed. The keyword here is predictability.

Predictability in simulation results

Even very small changes applied to a simulation model may cause a large variation in the calculated results. This is particularly true for numerically challenging problems like, e.g., car crash simulations that include many buckling bifurcation points. The reasons for result dispersions occurring within a simulation model could be physical and/or numerical, but how do we know which one it is?

The way forward - Independent of model size, Diffcrash can analyze a set of simulations and highlight the areas with a large scatter of the simulation results in the model. With its advanced data reduction tools, it is possible to correlate the behavior between different regions in the model, i.e., to find the root cause of the observed variations. With this information, it becomes much easier to come up with an appropriate design change that would increase the overall robustness of the model and/or product.

A typical flow chart when working with Diffcrash is illustrated below.



You can also visit [SIDACT's web page to read more about Diffcrash.](#)

... Both physical instabilities in automotive design and numerical instabilities in simulation packages often cause extremely sensitive dependencies of simulation results.

Solution - DIFFCRASH therefore was developed to encounter these problems and deliver a CAE tool which makes it possible to find the critical/sensitive regions, derive design suggestions and thus lead to a more robust model...



2nd LS-DYNA User Day in France

Our 2nd LS-DYNA User Day in France will take place on November 17, 2022.

Participation in this day is free



It is with great pleasure that we, DYNAmore France, are once again organizing our LS-DYNA User Day in France User Day.

Registration and Information:

Don't hesitate to register now: [registration](#).

This day will be an opportunity to attend technical presentations and to exchange with other LS-DYNA users as well as members of the DYNAmore team.



The event will take place on November 17, 2022 at our Versailles premises.

DYNAmore France SAS
21 avenue de Paris
78000, Versailles

Participation in this day is free.

We hope to see many of you at this event.



You can also register for our seminars of Q4 2022:

- October 4: Introduction to LS-PrePost
- October 18: Parameter identification with LS-OPT
- October 19-21: Introduction to LS-DYNA (Compact)
- November 21-22: LS-DYNA Implicit
- December 5-7: Introduction to LS-DYNA

Our full seminar brochure can be downloaded at:

<https://www.dynamore.eu/en/homepage-news/eu/brochure-2022>



Filling and compression analysis of metallic powders composed of spherical particles

The efficiency of material design can be greatly improved by using FEM-based virtual material testing analysis

This article presents an example of the analysis of a powder composed of spherical particles. Since powders have a very fine heterogeneous structure, a multi-scale approach based on homogenization analysis is proposed.

ABSTRACT - The macroscopic material behavior of the powder is obtained through virtual compression tests using a unit cell model representative of the microstructure. The microstructure is further homogenized by curve-fitting its material response according to the constitutive law of the macro material. **The analysis was performed using Ansys® Mechanical™ and its add-on tool Multiscale.Sim.**

Metallic powders are used to create new materials for many industrial manufacturing processes. Any number of metals can be used in the mixture to change the characteristics of the final product, in terms of strength, flexibility, durability, etc.

For a material with a large number of particles, particle densification is very important because there is a correlation between density and the material properties. For example, the electrodes used in rechargeable batteries consist of densely packed particles (also called as active materials). The electrons inside the individual particles are charged. This means that the electrical properties, such as battery capacity and charging efficiency, are closely related to the particle density. However, the mechanical properties also have an influence, so it is equally important to understand the mechanical properties of the product in order to improve its reliability and durability, and so on.

There are many conditions involved in creating a material full of particles, such as the shape and size distribution of the particles, and the type of material. Therefore, the material properties are not easily optimized using only actual testing; rather, it should be combined with simulation.

Many researchers have analyzed the process of particle filling. Most of them used the discrete element method (DEM)[1],[2]. The DEM was considered highly compatible with these analyses because it can efficiently calculate the motion of individual particles, which are assumed to be rigid. The inelastic behavior that occurs during the compression process is then represented by the interaction between the particles. However, since these parameters are not directly related to real phenomena, it is necessary to calibrate them using actual tests. The finite element method (FEM), on the other hand, can directly express the deformation behavior of particles, which allows us to analyze phenomena that are closer to the real problem.

This article presents an example of analyzing the particle packing problem using the finite element method. First, I will discuss the issue of particle packing to establish the initial state before compression. Multiscale.Sim™ [3], an add-on tool for Ansys® Workbench™ for multiscale analysis, was used to create the model. Next, an example of the analysis is shown whereby a rigid wall is placed around the micromodel created and then densified by compression.



Here, we will observe the change in the microstructure during compression and the relationship between the compression force and the fill rate. Finally, the resulting macroscopic material behavior is adapted using the macrostructural constitutive law. With the equivalent material properties obtained in this way, you can perform the analysis of the macrostructure using the homogenized microstructure.

EXCERPTS - Please visit the website for the complete paragraphs on:

- **Particle filling analysis** - Before presenting an example of the analysis of the compression process, we will consider the initial composition of the particles in the powder. The initial placement of the particles is very important because, if there are multiple bullet gaps or bites between particles in the microstructure from the beginning, it can compromise the accuracy of the compression process analysis. The particles should be packed with as few gaps and bites as possible. By observing the initial packing state of various distributions of particle sizes before compression analysis, it is also possible to predict trends in the maximum particle packing rate after compression... -
- **Compression analysis** - The compression process analysis for densification is performed using the particle-filled microstructure model created in the previous section. The microstructures analyzed in this study are the result of extracting only a small portion of the actual structure. In order to evaluate the apparent behavior of the material based on such a partial model, the homogenization method is generally used. In this analysis, the extracted microstructure is used as a unit cell, and conditions of periodic symmetry are defined in all directions on its outer surface. However, if the particle-free region is not filled with other materials, such as resin, it is inevitable that small particles will escape from the unit cell during compression. Therefore, an alternative is to create a rigid wall that touches each of the six outer surfaces of the unit cell. One of these rigid walls is then loaded by forced displacement and the unit cell is compressed...
- **Curve fit analysis** - Up to this point, we have analyzed the material behavior during the compression process using a microstructure model composed of particles. However, this approach is computationally expensive and can only focus on extremely limited areas for analysis. Modeling for heterogeneity is not appropriate for actual productlevel objects. Therefore, at the end of this article, we attempt to replace the heterogeneous microstructure with a homogeneous body.,...

Conclusion

The results of the analysis showed that the material behavior during compression, and the degree of densification that can be achieved by compression, can vary greatly depending on the size distribution of the particles. Because of the wide range of parameters that determine the material behavior of powders, it is not realistic to design materials based on actual measurements alone. It is expected that the efficiency of material design will be greatly improved by using the virtual material testing analysis introduced here.



EXCERPT – Visit the link [New Release](#) for complete videos and information



New release Simufact Welding 2022 - Enormous improvements

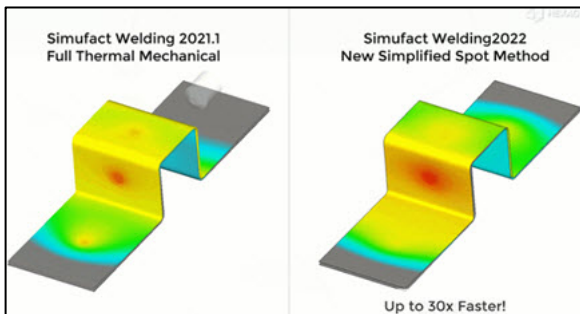
by Richard Baldwin

New mode for RSW simulation for up to 30x speed – In Simufact Welding 2022, a new purely mechanical solution called 'Simplified Spot' has been implemented.

It runs completely on 2D shell elements. The new mode speeds up your resistance spot welding simulation up to 30x speed with consistent quality of results.

4 modes are available depending on your requirements:.

- Temperature field and distortions are required:
 1. Full transient simulation, or
 2. Thermal cycle mode
- Only the distortions are required:
 1. Electrodes mode, or
 2. New simplified spot mode



For example, up to 30x faster RSW simulations can be achieved if the temperature is not required and you use the new "Simplified Spot" mode

Simulation of asymmetric weld nuggets – In the latest version of Simufact Welding 2022 it is possible to consider asymmetric weld nuggets in a resistance spot weld simulation. Just shift the centre line or define the ratio of the upper and lower weld nugget to the centre line.

The asymmetric weld nuggets can be easily considered and defined via a dedicated dialog. With the new feature you can easily create asymmetric weld nuggets to simulate even more realistic Resistance Spot Welding (RSW) simulation results.

New refinement technique for RSW Simulation – In general, there is a dependency between the number of Finite Elements and the calculation time. Also a dependency between the accuracy and the number of FE elements occurs. In order to achieve a high accuracy, you need many elements, which leads to high computation times.

In our Simufact products, so-called "refinement boxes" help you to create a fine mesh, where high accuracy is required. For the rest of the model you benefit from a coarser mesh.

Thanks to the new refinement technique for resistance spot welding simulation, it is now possible to remesh an imported shell mesh and perform local refinements on the welding spots. It gives you a high resolution at the welding points. You save remarkable computing time and there is no need to mesh the entire model very finely.

Continued on the website - Extension of the model check - New Restart function - About Simufact Welding



A deep dive into the interior of red dwarfs - Anne M Stark

-Red dwarfs are the most abundant stars in the Milky Way, making up 70% of all stars.

This illustration shows a red dwarf star orbited by a hypothetical exoplanet. Red dwarfs tend to be magnetically active, displaying gigantic arcing prominences and a wealth of dark sunspots. Red dwarfs also erupt with intense flares that could strip a nearby planet's atmosphere over time or make the surface inhospitable to life as we know it. Image courtesy NASA, ESA and D. Player (STScI).

But the physics of their interiors is not well understood. Heat is generated in the core and travels outward to the surface, but it is not clear whether that process occurs via radiation, convection or a combination of the two. The key factor determining whether red dwarfs are radiation- or convection-dominated is the opacity of the internal hydrogen.

Lawrence Livermore National Laboratory (LLNL) researchers using the National Ignition Facility, the world's largest and most energetic laser, are exploring the opacity of hydrogen under the extreme pressures and relatively low temperatures found in the interior of red dwarfs. The research appears in the journal, *Physics of Plasmas* – [<https://aip.scitation.org/doi/10.1063/5.0094579>]

Red dwarfs are very low-mass stars. As a result, they have relatively low pressures, a low fusion rate and low temperature. The energy generated is the product of nuclear fusion of hydrogen into helium by way of the proton–proton (PP) chain mechanism. These stars emit relatively little light.

In their paper, LLNL scientists and collaborators propose a novel implosion experiment at NIF to measure the opacity of dense hydrogen due to free-free absorption, thought to be the dominant absorption mechanism for that environment. To accomplish this, the implosion velocity is significantly reduced to achieve colder plasma temperatures than required for self-sustaining inertial confinement fusion reactions, and the high-density hydrogen is probed by X-ray radiography.

The smallest red dwarfs are thought to be fully convective. In this case, the fusion reactions in the core are permanently re-fueled by hydrogen from the outer layers. Combined with the low fusion rates due to the relatively low core temperatures, convection possibly allows some red dwarfs to last trillions of years until all hydrogen fuel is spent.

The internal structure of a star has a major impact on the activity of its surface. The boundary between a radiative core and a convective layer can lead to strong magnetic fields and a turbulent atmosphere, including radiative and plasma outbursts that may threaten life on nearby planets.

“But even a small radiative core can strongly change behavior and its existence crucially depends on the effectiveness of radiation transport in highly compressed matter,” said LLNL co-author Tilo Doeppner. “Understanding the radiative properties of the complex plasmas within a host star is crucial when judging the possibility of an exoplanet to host life — especially for red dwarfs where the habitable zone is thought to be found relatively close to the star itself due to the low surface temperature.”

For the complete list of authors and institutions please visit the website.

The project is part of the NIF Discovery Science program and the LLNL portion of the work is funded by the Department of Energy.



Marta Kempa, MBA - Marketing Coordinator & Seppi
Oasys LS-DYNA
Oasys Software, Tutorials & Classes Not To Miss



Webinar - October 26th - [Pedestrian Safety Tools Series: #3 HIC Area Calculator and Pedestrian Run Builder](#)

Katie Lampl - Katie is an Engineer at Arup's Advanced Digital Engineering group with around 3 years' experience using LS-DYNA and the Oasys software. She has used LS-DYNA on a wide variety of projects, including civil, seismic and automotive.

This webinar covers the Oasys tools available for interrogating pedestrian head impact results. It will include the HIC Area Calculator, which is used for understanding results and the pedestrian run builder which can be used to set up new sweeps of head impacts.

The webinar will be suitable for anyone involved in pedestrian head impact analysis.

[Not To Miss on our YouTube Channel](#)

 1:33:57	 44:24	 1:31
Pedestrian Safety Tools Series #1 Pedestrian marku...	LS DYNA for Civil Structural Applications	Ease of use and performance - MAT_Glass history variables



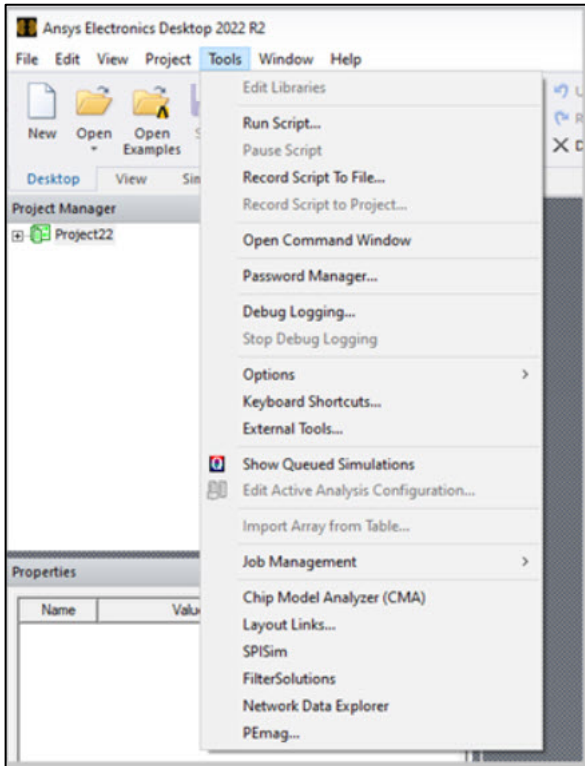
[Residential building built with the elements in mind using Oasys GSA](#) (Excerpt)

Project Overview - In Amstelkwartier, Amsterdam, a 70-meter-tall hybrid timber-concrete residential building was designed using Oasys GSA by Arup engineers with specific design considerations of all the elements – the optimisation of daylight, water collection, wind and fresh air, green spaces, energy generation and the response to the urban envelope.

With a total gross floor area of 14,800 m², the building includes 70 medium-sized properties, 74 owner-occupied properties, commercial facilities, a green roof garden, and photovoltaic panels built into the building's exterior.

**Metin Ozen**

Principal & CEO at Ozen Engineering, Inc. and Mallett Technology, Inc.

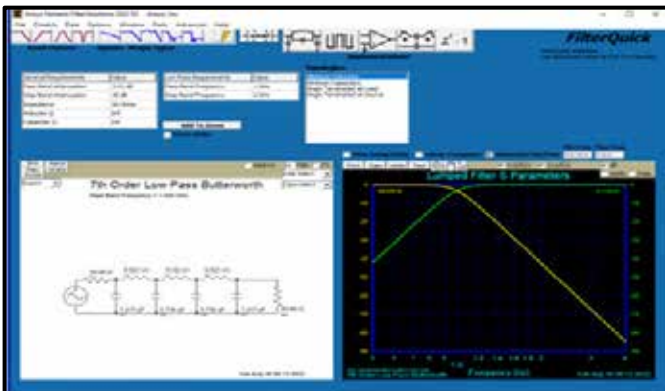


EXCERPT – please visit the website for the complete article with high resolution graphics

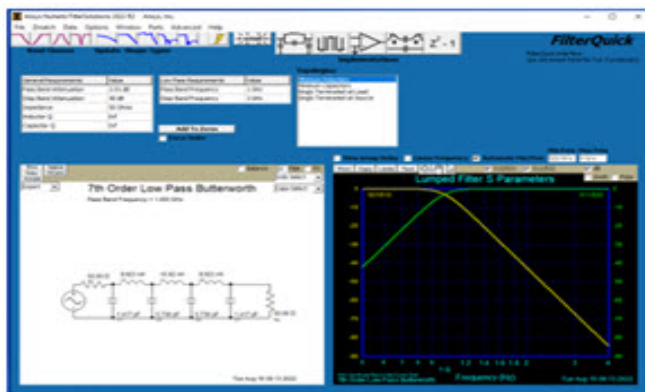
Nuhertz FilterSolutions: The Best in Filter Design Is Now Fully Integrated in Ansys AEDT
by: Aziz Benalla

Ansys has recently added the Nuhertz FilterSolutions product to its portfolio, enabling the customer to design RF/Microwave filters very quickly and accurately. The new product assists engineers in the design, synthesis and optimization of RF, microwave, and digital filters, lowering the development cost, reducing the time to market, and optimizing the product performance. “Today, it is difficult to find RF designers who are acquainted with and have the expertise for filter design”, said Shawn Carpenter, Product Manager for the Nuhertz FilterSolutions product at Ansys.

Starting with AEDT 2022R2, FilterSolutions has been Integrated with HFSS, the gold-standard for accuracy, for 3D EM analysis and optimization. The software is launched from Tools, as shown in Figure1.



Particularly useful for new users is the FilterQuick interface (Figure 2) which allows users to synthesize and design a filter quickly and accurately.



The advanced option (shown in Figure 3) is the preferred option by seasoned filter guru to use all the tweaks of synthesis to achieve optimal results.



Excerpt - [MINI Concept Aceman: Digital, full electric, responsible.](#)

MINI is showcasing a very special concept car: the MINI Concept Aceman heralds a completely new model that will enrich the brand's portfolio from 2024 onwards. **Stefanie Wurst, Head of MINI, and MINI Chief Designer Oliver Heilmer talk about the philosophy behind the first all-electric, urban MINI crossover in this interview.**

Ms Wurst, a lot is changing at MINI in the next few years. What does the future strategy of the brand look like?

Stefanie Wurst: MINI will become fully electric at the start of the 2030s. The Chinese market is becoming increasingly important, but the MINI plant in Oxford remains the heart of our production. We are expanding our vehicle portfolio with an urban crossover model, the MINI Aceman – a vehicle that stands for a new generation and perfectly covers all social metatrend bases – and with it the future needs of urban target groups.

The MINI Concept Aceman provides a tangible glimpse of this future. What will its place be in the future MINI portfolio?

The MINI Concept Aceman opens a perspective to a completely new vehicle, bridging the space between the MINI Cooper and the MINI Countryman in the future of the model family. The concept car reflects how MINI is reinventing itself for its all-electric future and what the brand stands for: an electrified go-kart feel, an immersive digital experience for our community and a strong focus on a minimal environmental footprint.

Mr Heilmer, what is the purpose of concept cars like the MINI Concept Aceman?

Oliver Heilmer: We use a concept car to communicate a vehicle that will go into series production in the coming years. We emphasise, amplify and heighten the highlights in technology and design.

What special characteristics do you see in the MINI Concept Aceman?

It is young, cool and urban. Self-confident, yet sustainable. A crossover in the best sense; always on the move, powered in the city. We started by giving it the name "Urban Prodigy" internally. We demonstrate this character by exaggerating certain elements on the vehicle. And in this case, exaggeration can also mean reduction. Less can often be more – sometimes generating a much stronger impact. A very typical, almost classic idea at MINI. We focus on three points that will shape the future design understanding of the MINI brand with the MINI Concept Aceman: a modern and iconic design language, an immersive user experience, and all this based on a fundamental principle of sustainability...



Raytheon Missiles & Defense



Government-industry team demonstrates first-of-its kind Air Base Air Defense capability

NASAMS fires AIM-9X, AMRAAM, and AMRAAM-ER in layered cruise missile defense experiment

ANDØYA, Norway, (Sept. 7, 2022) — Raytheon Missiles & Defense, a Raytheon Technologies business, and Kongsberg Defence & Aerospace, in partnership with the Air Force Research Laboratory Strategic Development Planning and Experimentation (SDPE) office, conducted a first-of-its kind Air Base Air Defense experiment.

During the demonstration, the National Advanced Surface-to-Air Missile System, known as NASAMS™, fired AIM-9X®, AMRAAM®, and AMRAAM-Extended Range missiles, engaging cruise missile targets at various distances.

“We demonstrated how integrated defense solutions enable the warfighter to deploy the right effector at the right time and at the right target,” said Wes Kremer, president of Raytheon Missiles & Defense. “Using fielded systems, our goal is to provide customers the quickest, most effective way to protect their people and critical infrastructure with layered cruise missile defense.”

This complex experiment assessed NASAMS’ operational ability to fire the three missile variants when integrated with U.S. Army radars and U.S. Air Force’s operationally fielded command and control capability, the Battle Space Command and Control Center, or BC3, developed by Raytheon Solipsys. During the demonstration, the radar first passed targeting information to BC3, then BC3 relayed key data to the KDA Fire Distribution Center for threat evaluation and weapon assignment. The operator in the FDC used that information to close the kill chain by selecting and firing the most effective missile from the NASAMS multi-missile canister launcher.

“Our intent was to inform strategic investment decisions through the evaluation of low-cost, high technology readiness level capabilities that could provide near term air base air defense capability,” said Jim Simonds, SDPE experiment program manager, U.S. Air Force. “This layered defense solution can provide immediate defensive capability at a fraction of the price of currently fielded systems.”

NASAMS, a highly adaptable medium-range air defense solution, is jointly developed and produced by RMD and Norway’s Kongsberg Defence & Aerospace.

“This experiment demonstrates NASAMS’ flexibility, providing the operator with enhanced firing alternatives to successfully execute complex threat scenarios employing a range of missiles,” said Eirik Lie, president of Kongsberg Defence & Aerospace.

For questions or about the company information please visit the website.



Town Airport Quiz

October

The quiz was left in the suggestion box by The Old Retired Pilot. We are sending it out to the residents and guests. No one in town knows his name. You yell, "HEY, Old Pilot."

The Old Pilot and the Town Secretary are arguing which is rather a common occurrence

One yelled, "I said to purchase an attack Helicopter, not an attack dog."

(We're not saying who wanted the Helicopter and who wanted a dog)

(We're also not explaining why a poodle puppy was purchased as an attack dog)

(Although it was named Helicopter, it has only attacked shoes, pillows, and nips your chin)

Quiz - can guess the names?

(The answers are at the bottom of the Goodbye page)



A _____



B _____



C _____



D _____



US Airforce Week in Pictures



An A-10 Thunderbolt II, from Idaho National Guard's 124th Fighter Wing, performs a strafing run during the Hawgsmoke 2022 gunnery competition at the Saylor Creek Bombing Range, south of Mountain Home, Idaho, Sept. 8, 2022. The competition traces its heritage back to 1949 and the Gunsmoke gunnery competition.

(U.S. Air National Guard photo by Senior Master Sgt. Joshua C. Allmaras)



Off we go into the wild blue yonder

Lt. Col. Jim Sluder, 10th Air Force personnel recovery division combat rescue officer and jumpmaster, faces Maj. Gen. Bryan Radliff, 10th Air Force commander, and Master Sgt. Rob Hutchison, 306th Rescue Squadron pararescueman, as they jump from an HC-130J Combat King II over Patrick Space Force Base, Fla., Sept. 10, 2022. Radliff jumped tandem with Hutchison as part of his 920th Operations Group immersion over the weekend, when he recognized three Airmen for their outstanding performance and presided over the wing's change of command ceremony.

(U.S. Air Force photo by Master Sgt. Kelly Goonan)



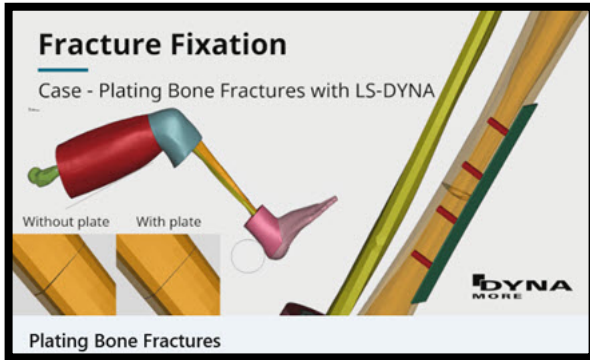
LC-130 elephant walk

Nine LC-130 Hercules' with the 109th Airlift Wing conducted the unit's first-ever elephant walk at Stratton Air National Guard Base, N.Y., on Sept. 10th, 2022. An elephant walk is a United States Air Force term for taxiing military aircraft in close formation, often employed to project air power through the rapid deployment of multiple aircraft at once.

(U.S. Air Force photo by Tech. Sgt. Jamie Spaulding))



DYNAmore Nordic Team, “We hope that you never have to experience the below fracture, unless it’s virtual like in this case study - **The performance of the fixation plate is evaluated using LS-DYNA** and a leg model obtained from a Human Body Model.

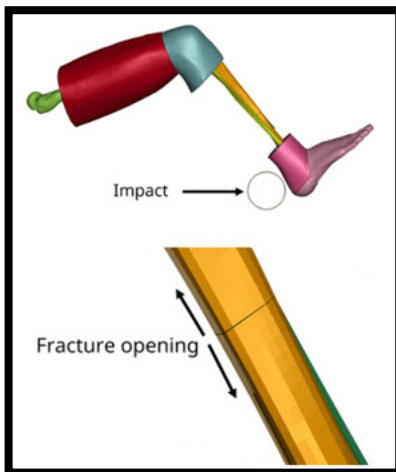


A complete fracture is assumed in the tibia shaft! The fracture is immobilized with a steel plate attached to the bone with screws.

Case study: [Analyses of orthopedic fixation devices with LS-DYNA](#) - In order to aid the healing process of bone fractures, the bone segments can be immobilized by external or internal fixation. The design and material choices for such fixation devices can differ significantly. In some cases, the fixation device is customized to the patient at hand.

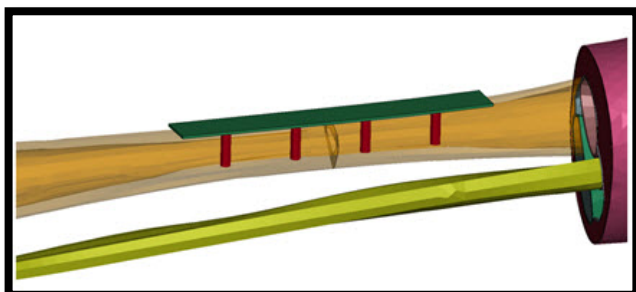
In this case study, a complete fracture is assumed in the tibia shaft. The fracture is immobilized with a steel plate, which is attached to the bone with screws. The performance of the fixation plate is evaluated using LS-DYNA and a leg model obtained from a Human Body Model.

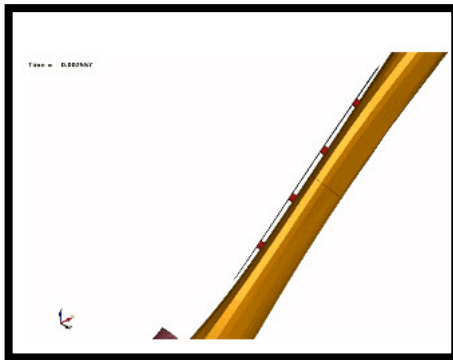
(Excerpt) The THUMS model - The present case study is based on THUMS AM50 (v6.1), which represents an average adult male. The Total Human Model for Safety (THUMS) is a human body FE-model developed by Toyota. The model is capable of simulating human body injuries, such as bone fracture and damage to the brain and internal organs in e.g. a vehicle crash. The material models and geometry of the THUMS are intended to represent the tissue, bones and muscles of a real physical person. THUMS is available without a license cost, under some conditions. Contact your local LS-DYNA distributor.



Method - A basic model of a steel fixation plate (shell elements) with screws (beam elements) was developed. The material properties were assumed elastic. The screws were attached to the bone using nodal constraints. The plate was clamped to the bone during dynamic relaxation by prestressing the screws. The leg model was obtained from THUMS AM50 (v6.1). All active muscles were removed to simplify the model further since they were deemed not relevant for the case. The load condition was an impact on the heel. The objective was to minimize the opening between the fractured surfaces when subjected to the dynamic load.

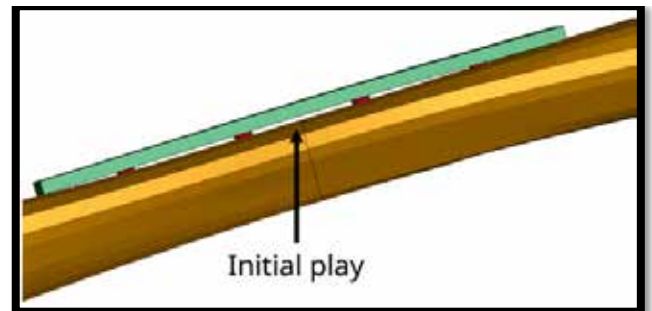
The analyses were performed using the explicit mechanical solver of LS-DYNA (mpp s R12.1). The problem time was 0.05 s, and the solution time was about 40 minutes on 20 cores.



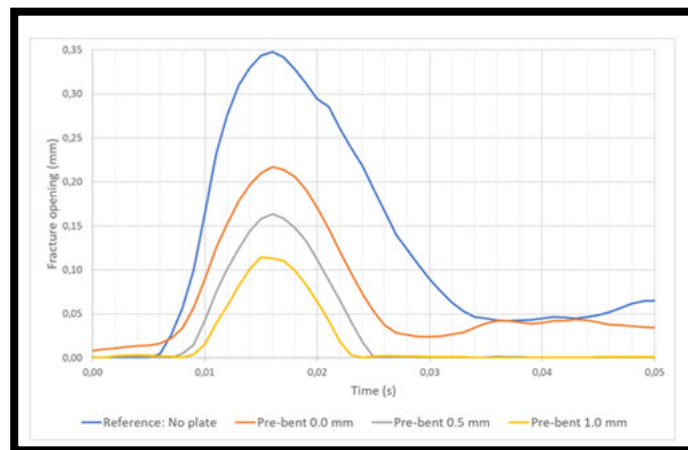
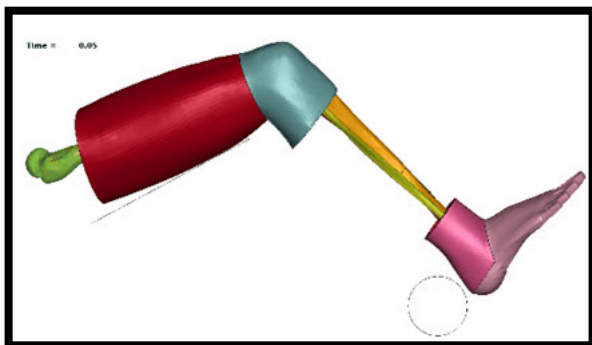


Method – prestress - For reference, an initial simulation was performed without a fixation plate included. Then three simulations were performed with the plate included. The plate was attached with four screws in all simulations; however, the geometry of the plates differed slightly. The plate variants were a straight plate (pre-bent 0.0 mm), a plate that was pre-bent 0.5 mm, and a plate that was pre-bent 1.0 mm. The pre-bent plate had an initial play between plate and bone. This play was reduced to zero when prestressing the screws. The compression forces that were built up through this manner may be beneficial for the performance of the fixation. Let's find out!

Simulation	Description
1	Open fracture (no plate)
2	Plate with 4 screws, pre-bent 0.0 mm
3	Plate with 4 screws, pre-bent 0.5 mm
4	Plate with 4 screws, pre-bent 1.0 mm



Results - The maximum fracture opening was reduced from 0.35 mm to 0.11 mm by the use of a fixation plate. A pre-bent plate was shown to be beneficial, both in terms of reducing the maximum fracture opening, but also note that the fracture opening before and after the impact is zero.





In conclusion

The development of HBMs, based on geometry and material data from physical humans, opens for new analysis possibilities within biomechanics. In the present case study, the highly advanced THUMS model, originally developed for injury assessment of the human body in vehicle collisions, was used in a study of orthopedic fixation devices.

In this case only the leg of the HBM was used. The model was further simplified by removing all active muscles. The end results was a fast model that allow quick turn-around times for evaluation and optimization.

A similar approach as demonstrated in this case study can probably be used for evaluation and optimization of a variety of design parameters , such as for instance:

Screws

Numbers, quality, length, positioning, pretension etc.

Plate

Geometry, material, pre-bend, positioning etc.

Bone

Size and strength etc.

To learn more

Simulations have time and again proven to be a cost-effective product development tool that avoids costly tooling redesign. We have the software and knowledge required so that you may learn to perform these simulations yourself. We will guide you all the way, including training and support. To learn more, please contact one of our technical experts listed below:



Klas Engstrand
LS-DYNA
FE-Models
Crash
@ Klas Engstrand



Anders Jonsson
LS-DYNA
Implicit
mETA
ANSA
@ Anders Jonsson

For numerical analyses carried out in the LS-Dyna environment, a Hybrid ES-2RE dummy model was used, seated on a stiff chair, which was then subjected to the impact of an impactor.

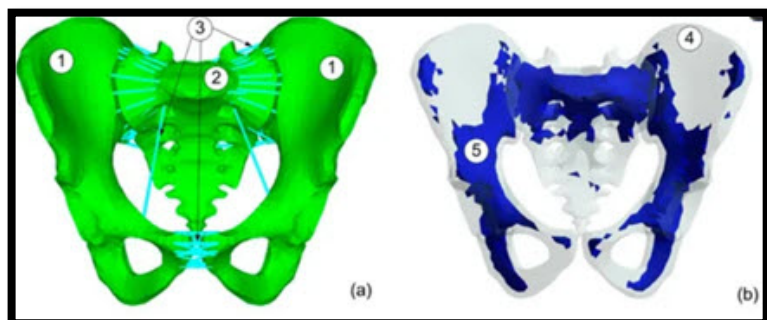


Figure 1. Model of pelvic ring with ligaments.

- (a) Pelvis model: 1—Pelvic bones, 2—Sacrum, 3—Ligaments,
 (b) Trabecular bone map: 4—cortical bone, 5—trabecular bone.

Numerical Analyses of Fracture Mechanism of the Pelvic Ring during Side-Impact Load

By:

Tomasz Klekiel, Katarzyna Arkusz, & Romuald Będziński

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 University of Zielona Góra, Poland

Piotr Malesa & Grzegorz Sławiński

Faculty of Mechanical Engineering,
 Military University of Technology, Poland

Academic Editors:

Enrique Casarejos & René de Borst

Abstract - The aim of this study is the analysis of the multiple pelvis fracture mechanism in side-impact dynamic load cases. The elaborated numerical model of a pelvis complex includes pelvic and sacral bones as well as soft tissues such as ligaments and cartilages. The bone has been modelled as a viscoelasticity material based on the Johnson–Cook model. The model parameters have been chosen based on the experimental data. The uniqueness of a presented approach refers to the selection of crack criteria for the bone. Thus, it was allowed to analyse the process of multiple fractures inside the pelvic bones. The analysis was evaluated for the model in which the deformation rate influences the bone material properties. As a result, the stress distributions inside particular bones were changed. It has been estimated that the results can vary by 50% or even more depending on the type of boundary conditions adopted. The second step of work was a numerical analysis of military vehicle subjected to an IED. An analysis of the impactor's impact on the pelvis of the Hybrid ES-2RE mannequin was conducted. It was shown that the force in the pelvis exceeds the critical value by a factor of 10. The results of the numerical analysis were then used to validate the model of a military vehicle with a soldier. It was shown that for the adopted loading conditions, the critical value of the force in the pelvis was not exceeded.

Excerpt - Introduction - The validated model made possible an analysis of various load variants. The explicit algorithm for finite element method (FEM) is useful in model preparation. The models, among others, are used to model a fracture mechanism in the body, but the analysis quality depends on the material behaviour under impact load. As a result of a side impact, the passengers of a vehicle are usually injured in the body segment, such as the abdomen, chest, and head due to the high energy. Fractures are also associated with the pelvis. Using a numerical method, a better understanding of the bone fracture mechanism is possible. The body model with appropriate boundary conditions should be prepared and validated based on experimental data [1]. The energy transfer to passengers through the vehicle's elements under a side-impact crash is typically analysed using FEM [2]. According to previous studies, the influence of the impulse loads acting on a passenger's body during a traffic accident depends on the vehicle's velocity during a collision [3]. The distribution of passengers in a vehicle, the type of a vehicle, as well as age, growth, and weight of passengers influence the type of injuries [4,5]. Similar factors also have an influence on soldiers travelling in a military vehicle...

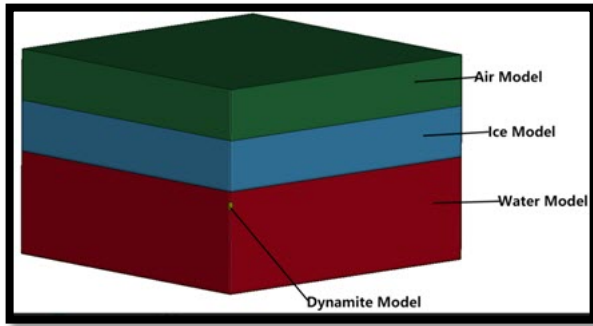


Fig. - numerical model of ice blast

Numerical Simulation and Experimental Study on Single Point Blasting of Ice Jam of Heilongjiang River Based on ANSYS/LSDYNA

Dong Liu, Changlei Dai, Yaodong Ma

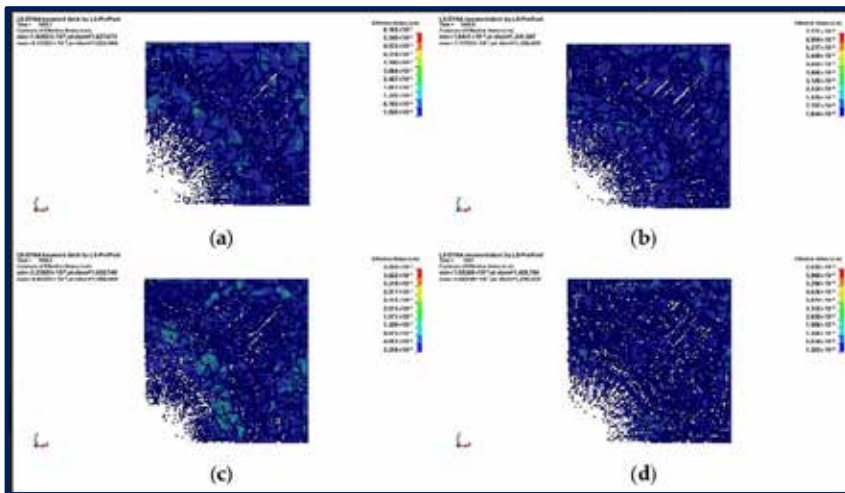
Inst. Groundwater in Cold Region, Heilongjiang Univ.,
Harbin, China

School of Hydraulic & Electric Power, Heilongjiang Univ.,
Harbin, China

China & Russian Cold Region Hydrology and Water
Conservancy Engineering Joint Laboratory,
Heilongjiang Univ. Harbin, China

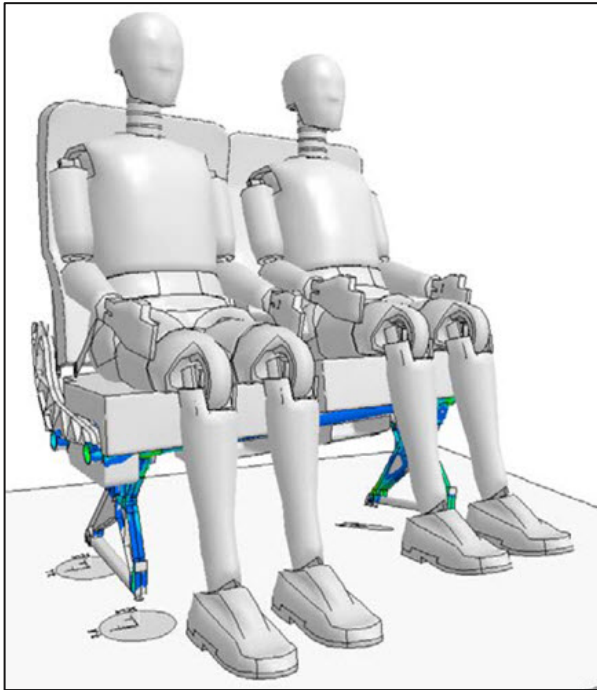
Chenggang Yu

Daxing'anling Hydrology Bureau, Daxing'anling, China



- a. Blasting with 3.2 kg TNT
- b, Blasting with 4.8 kg TNT
- c. Blasting with 6.4 kg TNT
- d. Blasting with 8.0 kg TNT

Abstract - Based on the thickness of the common ice layer in the Heilongjiang Basin, explosions featuring different methods of firing, different thicknesses of the common ice layer, and different distances between the explosive and the ice are hereby simulated using ANSYS/LSDYNA software. The most suitable blasting scheme after field test verification is obtained, and it is concluded through the field blasting test comparison and verification that the central ignition produces the best blasting effect and the largest blasting volume and radius when the explosion is fired under the ice. A larger ice thickness indicates a worse explosive blasting effect, and the number of explosive packs should be used reasonably to achieve the best blasting effect. An ice blast does not finish at once, but experiences energy transfer in the form of waves. The blasting effect is the best in the case of a distance between the explosive and the ice of about $L = 150$ cm. The shallower the depth of the river is, the more powerful the blast becomes and the more obvious the blast volume becomes. The ice layer is blasted when the maximum temperature on the day of blasting is stable and positive, which is when the texture of the ice sheet maintains its hardness and high efficiency.



Dummies on pre-loaded aircraft seat



Burns Seat developed by NIAR

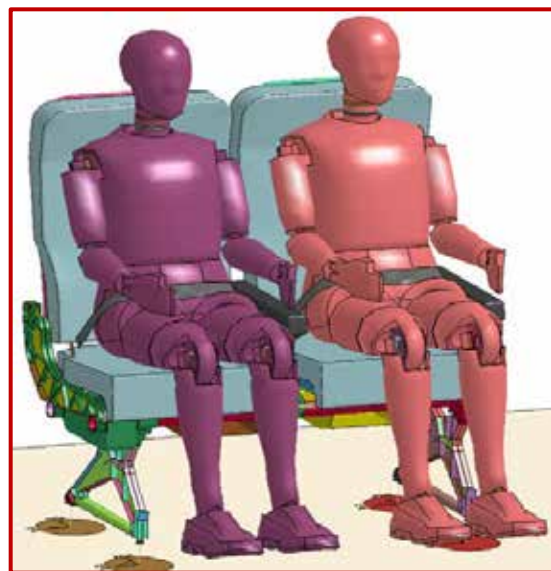
Numerical Simulation of Aircraft Seat Compliance Test using LS-DYNA® Implicit Solver

Satish Pathy, LST/ANSYS

Thomas Borrvall, DYNAmore Nordic AB

With the possibility of using numerical simulation results in place of dynamic tests for aircraft seat compliance, use of LS-DYNA for this purpose is gaining traction and visibility. This test is done in two parts – In the first part which is quasi-static, the seat undergoes “roll” and “pitch” at the attachment mounts, which preloads the seat structure, and, in the second part an acceleration pulse of 16g’s is applied to the seat system and dummies. If the seat integrity is maintained, the test is considered a pass and the seat gets certified.

The challenge is, the first part of the simulation is quasi-static and currently explicit solver is used, which means the solution has to be time-scaled. Since the seat components are discretized with fine mesh, mass-scaling is used to an extent the regulation allows. Time-scaling and mass-scaling is necessary to achieve a decent turn-around. This paper explores the possibility of using LS-DYNA’s Implicit solver to reduce the computation time for the quasi-static part of the simulation – by improving the solver and developing FE dummies that are implicit-ready.



Dummies positioned on Burns aircraft seat

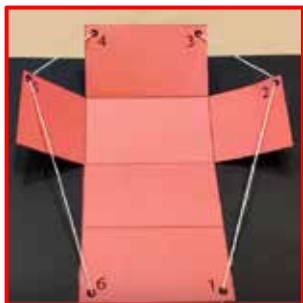


The Old Cattle Rancher's Ranch
No one knows his name. You yell, "HEY, old rancher."
Agriculture, Soil, Equipment, Cattle, and whatever he wants.

October



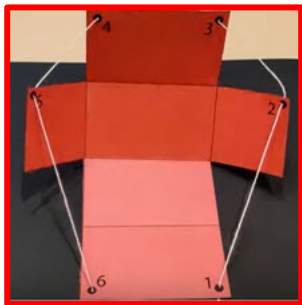
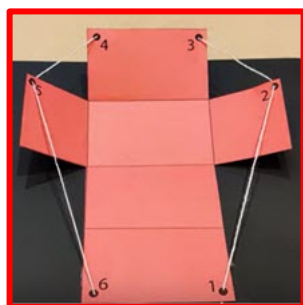
Pull up nets is a fantastic, fun way to learn how a net forms a polyhedron. In this time of distance learning I encourage students to craft with their parents and experience the wow moment when the net becomes a solid.



How to Create Pull Up Nets (templates are available on the website)

- Pull Up Cube
- Pull Up Cuboid
- Pull Up Tetrahedron
- Pull Up Octahedron
- Pull Up Dodecagon

1. Cut out the net for your pull-up polyhedron.
2. Fold along the edges of each face using a ruler.
3. Use a hole puncher to make holes at the small circles numbered 1, 2, 3, ...
4. Thread string through the holds in ascending order.
Make sure the string goes up through hole 1 and down through the last hole.
5. Use glue to stick the face of the cube with the number 1 hole on to a surface.
6. Pull the string gently to pull up your net into a 3D shape.



My name is **Jonathan Robinson** and I'm passionate about teaching mathematics. I am currently Head of Maths in the South East of England and have been teaching for over 15 years. I am proud to have helped teachers all over the world to continue to engage and inspire their students with my lessons.



Town secretary My Virtual Travel Outing

October

Thank you for joining me on my visit to this month's museum. I visit a museum every month.



LA MACCHINA DEL TEMPO WELCOME TO MUSEO STORICO ALFA ROMEO

The Museo Alfa Romeo tells the legendary story of the brand, via a project and an installation designed to reflect its values: historical presence, beauty and speed, an essential part of the Alfa Romeo Dna. As the visitors admire car after car, they travel through the company's glorious history and also discover stories and curious facts with the help of videos, images and interactive access points, in a crescendo of emotions.



The legend of the Quadrifoglio



**World Championships of the Alfetta
Nino Farina and Juan Manuel Fangio.**



Dream cars by the greatest Italian designers.



Kyle is a cross between a dog and a coyote. It's illegal to feed or water any wild animal. SO, he obviously is not a coyote!!

Kyle shall now only be called Kyle and not what he is, or isn't. Kyle is now designated a ranch worker. I also talk to Kyle and he listens and tilts his head one way, then the other. He offers no solutions – He is also Kyle the Therapist.

He is patiently waiting while I feed and water the horses. I put a water bowl outside by the pasture, in case a horse gets loose and needs water? That sounds believable.

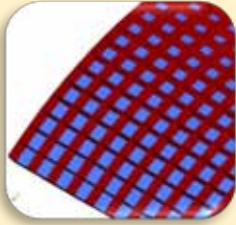
I have proven I'm never satisfied - I hate when it snows, and then I hate when it is 98 degrees!

I apparently complain all year!





Town Residents Poster Board of news, events, gossip not to miss.



OMNIQUEST [Topology Optimization for Rib Design](#) to Improve Stiffness and/or Mass - Adding ribs to stiffen structures or to reduce their mass is quite common. We will show an example of how to use topology optimization to design ribs using the GENESIS software.



Applus+ IDIADA - [video of our new connected mobility test facility at IDIADA's headquarters near Barcelona.](#)

With the opening on 18th July of this new set of test tracks to perform complex CAV and ADAS testing and validation programmes, IDIADA becomes Europe's most comprehensive site for connected and automated vehicle development.

For further information please contact us at: info@idiada.com



DYNAnore France - 2nd LS-DYNA User Day in France

Registration Site

Our 2nd LS-DYNA User Day in France will take place on November 17th,
Participation in this day is free



Blog by Curtis Hsiung, Technical Sales Representative, ETA

[Maximizing Material Utilization, Minimize Scrap & Cost](#)



[YSA22 - Young Stress Analyst Competition](#)

**Sponsored by
AIRBUS**



[Nov.16 – 17 Human Modeling and Simulation in automotive engineering](#)



CONVENTION CENTER YouTube Booths

October

Welcome to our Convention Center exhibit hall & Coffee Cafe. Coffee, of course vanilla, hazelnut, and other flavors are courtesy of our favorite coffee shop (not the rival coffee shop).

Current videos
from our booth visits:
On Sept 26th



Free Coffee for
visiting our exhibitors

[Computer
Aided
Technolog](#)



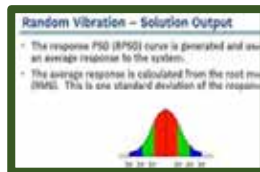
[Rbf
Morph](#)

[AM
General](#)



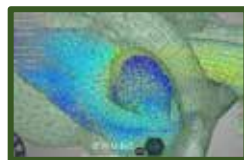
[Oasys
LS-DYNA](#)

[Ozen
Engineering](#)



[ANSYS](#)

[Expert
FEA](#)



[Hexagon](#)

MEETING
ROOM



[DYNAmore](#)

If you have a YouTube Channel, send us the URL feaanswer@aol.com



CONVENTION CONFERENCE ROOM

Kathleen Fritz – Rasmus Schutzer

October



Kathleen Fritz - DYNAmore GmbH
Rasmus Schutzer - DYNAmore Nordic AB



20 Year anniversary of DYNAmore - How it all began -
In 1987 Dr. John O. Hallquist founded LSTC in Livermore, California. At the same time the founders of DYNAmore started as freelancer to sell and co-develop LS-DYNA in Germany.

Excerpts - Please visit the link for the complete history with pictures and information of our journey

1987 Dr. John O. Hallquist founded LSTC in Livermore, California.



1993 Karl Schweizerhof is promoted as Head of Institute of Mechanics of the University of Karlsruhe (KIT)



2001 - By the end of 2001, Prof. Karl Schweizerhof founded DYNAmore GmbH with the initial Name DYNAelless GmbH.



2002 - Let's go! The first employees start work at the beginning of 2002. Stress and hectic do not deter the team and the mood is excellent.



2002 - Young and dynamic - The first orders are landed in the new offices in a relaxed and casual manner.



2002 - In April, the move into the offices is officially celebrated. Already at this party you can see that DYNAmore also has the best qualities when it comes to celebrating.





CONVENTION CONFERENCE ROOM

Kathleen Fritz – Rasmus Schutzer

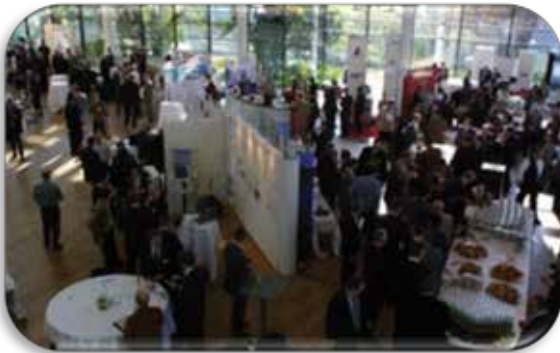
October

2004 - Continuous growth & International partnerships.
New year - new employees. We are happy about everyone who walks the journey together with us. International partnerships

The DYNAmore network is growing: With the signing of the distribution agreement with Arup for primers and barrier models, the company now also has excellent contacts in the United Kingdom. We are delighted!



2006 - The events grow from year to year. This is due on the one hand to the top-class technical presentations and on the other hand to the keynotes, which are as always first class.



2008 - New subsidiary - On April 14, DYNAmore opens its branch office in Ingolstadt. In addition to providing direct support to Audi AG in the area of optimization in crash and occupant simulation, the main focus there is on the topics of data organization and integration of the workflows of crash simulation projects into the development processes.



2009 - In December, DYNAmore opens the location in the Saxon metropolis of Dresden. Over the years, this will develop into the sister company SCALE, which covers the area of simulation data management in the group of companies.



2011 DYNAmore welcomes the colleagues from Engineering Research Nordic AB, the LS-DYNA distributor for the Nordic countries and the Baltic States. Everything remains as it is. The only thing the employees have to get used to is the new name "DYNAmore Nordic".





CONVENTION CONFERENCE ROOM

Kathleen Fritz – Rasmus Schutzer

October

2014 - When DYNAmore invites you to an excursion, partners and children are always welcome. The offer is gladly accepted - because the culinary well-being is always well taken care of.



2015 - With DYNAmore France, DYNAmore is now also available for the French automotive manufacturers and suppliers.



2016 - LS-DYNA in the Cloud for the first time. Together with LSTC, DYNAmore provides cloud-based computing resources for all LS-DYNA customers worldwide.



2017 - New country - In 2017, DYNAmore ventures across the Atlantic and founds DYNAmore Corporation in Dublin, Ohio.

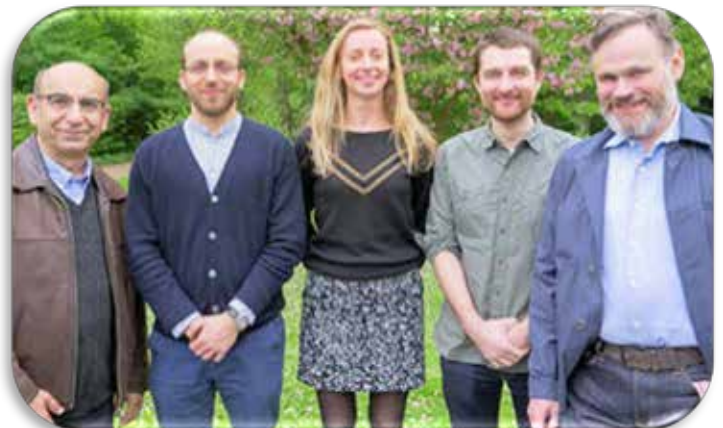


2017 CASCATE is another of the DYNAmore family. The company is focused on flow simulations and distributes the software Simcenter STAR-CCM+ in Germany.



2019 - DYNAmore France has moved to a new location in the heart of Versailles

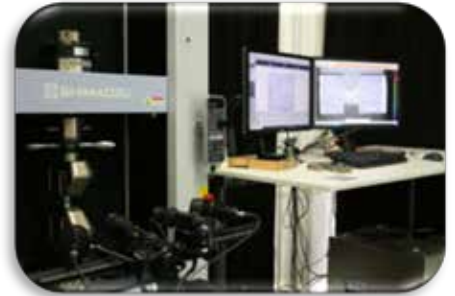
The new premises offer the best conditions for further growth as well as the expansion and improvement of the service offering.





Kathleen Fritz – Rasmus Schutzer

2019 - The DYNAmore Material Competence Center sets the course for the future by moving into the new premises. The location offers the best conditions to meet the growing demand for high-quality material data, if necessary even into the failure and fracture range.



2021 - New office - DYNAmore GmbH has opened a new office in the Bavarian capital Munich. The main activities of the team at the new location are the cooperation with automotive manufacturers, the customers in the Munich area as well as with the Technical University.

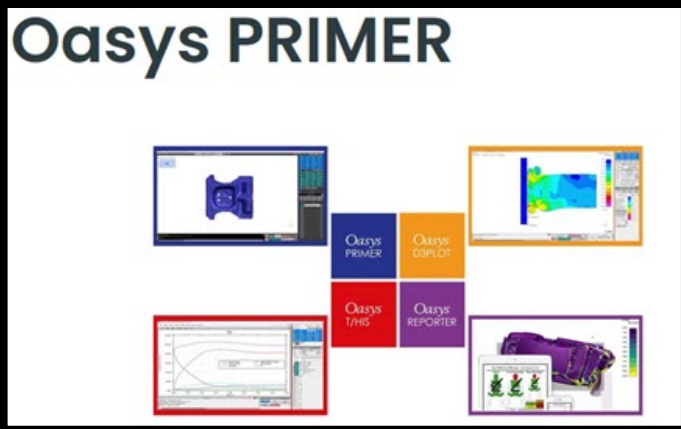


Our journey continues with software development, training, consulting, conferences and our partnerships and alliances.

**Thank you for joining us celebrating
our 20th year.
The DYNAmore Global Team**



The representative of Oasys PRIMER Turkey, the preprocessor designed for the fastest preparation of LS-DYNA models. BIAS Engineering supports the latest LS-DYNA features.



Oasys Software Turkey Representative
BIAS Engineering

Oasys PRIMER is the pre-processor designed to make preparation and modification of LS-DYNA models as quick and as simple as possible.

With support for every LS-DYNA keyword, you can read and write models with the confidence that no data will be lost or corrupted.

The Oasys PRIMER user interface is designed specifically for LS-DYNA – with no compromises – giving you convenient access to a range of powerful pre-processing tools.

EXCERPT – Visit our page for complete information on OASYS PRIMER Features

Model Setup

- Create and edit LS-DYNA entities using custom menus and a powerful keyword editing tool.
- Extensive connection tools including support for solid spotwelds, adhesive and bolted connections.
- Occupant modelling: simulation-based dummy positioning, seatbelt fitting, seat foam compression.
- Contact penetration detection and removal.
- Full support for INCLUDE and INCLUDE_TRANSFORM files with label range management and visualisation.

Model Manipulation

- Quick access to part properties such as thickness and material.
- Mass balancing and assignment tools as well as mass calculation with mass-scaling effects.
- Part/assembly replace to update a model for design changes.
- Intelligent entity deletion with consideration for other dependent entities.
- Intelligent model merging with label clash resolution.

Model Validation

- Viewing of most LS-DYNA entity types allowing visual checking.
- Viewing of connections and relationships between entities (Cross-References and Attached).
- Contouring of material properties, timestep, mass scaling, etc.
- More than 7000 LS-DYNA specific checks with error tree view for easy identification and fixing of multiple instances of similar errors.
- Intelligent model comparison detailing differences and changes.



CONVENTION CENTER

Jenson Chen

October



Jenson Chen - Dyna Forming Engineering & Technology [DFETECH](#)

We are an engineering firm established since 2005 to provide advanced engineering solutions to industries ranging from automotive and aerospace to electronics, consumer products, civil engineering and defense.

We offer a wide range of products, training and consulting.

Our expertise includes CAE, modern stamping engineering, dimensional engineering and variation prediction.



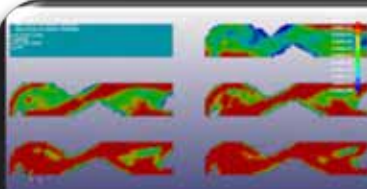
CAE



Manufacturing



Dimensional
Engineering



Optimization



Remote Desktop &
HPC Portal



Statistical Process
Control



Bioinformatics



We the Technical team of Simulation engineers at Kaizenat Technologies Private Limited support and train engineers for FEA, DEM, CFD, Electronic simulations using tools like ANSYS, LS DYNA, etc.

For any technical assistance, please reach us at support@kaizenat.com



[Concrete Mixer simulation using Rocky DEM | Rocky - Fluent Coupling | Particle Dynamic Simulation](#)

In the below Simulation – a 2-way FSI of particles and fluid is performed using ANSYS Rocky and Fluent to identify how the concrete particles are raised up with fluid's temperature.

A concrete mixer is a device that homogeneously combines cement, aggregate such as sand or gravel, and water to form concrete. A typical concrete mixer uses a revolving drum to mix the components.

Concrete Mixer Simulation

Tool Used: ANSYS Rocky



- A concrete mixer (often colloquially called a cement mixer) is a device that homogeneously combines cement, aggregate such as sand or gravel, and water to form concrete.
- A typical concrete mixer uses a revolving drum to mix the components.



KAIZENAT



CONVENTION CENTER Kambiz Kayvantash

October



Are you ready to shift to zero prototypes? Join us in Troy, MI on November 09-10. Our combination of proven software and engineering expertise gives our customers the confidence to rely on virtual simulation and eliminate full prototype iterations. Don't take our word for it - come and hear about it from our customers at HxGN LIVE Smart Simulation Summit 2022!

Excerpt – Visit the website for Keynotes, New Technology Overview, User Paper Presentations



[HxGN Live Smart Simulation Summit](#)

Vehicle manufacturers are under pressure to compress program duration, or to accomplish more within a prescribed timeframe. Rapidly evolving technology has led to the wide adoption of new subsystems.

Traditional requirements of light-weighting, noise and durability are being supplemented with new performance criteria such as range (automotive) or certification (eVTOL).

Achieving drastic reductions in development times will not happen using unidirectional, waterfall processes, but rather through adopting agile methods that can shift more CAE to the left of the product development. By changing how design tools are used and how groups collaborate, and by leveraging technologies like Artificial Intelligence (AI) to facilitate more efficient development, we can move towards digital prototyping and reduced development cycles; we can shift to zero.

This event will be a platform to share ways to revolutionize development processes through:

- Convergence of tools, workflows, methods, and solutions
- Interoperable, open, cloud-ready, and performance-enabled simulation technology
- Systems thinking and cross-attributing workflows
- Fast, yet accurate, solutions with no-compromise - AI and intelligent ROMs

Why Attend & Workshops

- Be part of our community meeting & find out how our technologies are driving change within the industry
- Get hands-on with our latest technology, alongside our product experts
- Be inspired by thought leaders in our keynote sessions
- Network with peers, partners and top engineering talent
- It's free! All attendees register at zero cost
- Workshop 1: Non-linear FEA using MSC Apex(4 hrs)+
- Workshop 2: Introduction to virtual manufacturing solutions(4 hrs)+
- Workshop 3: Systems engineering simulation - leveraging multi-physics software to validate controls and hardware systems performance(4 hrs) +
- Workshop 4: Addressing the challenges of composite EV parts with simulation(4 hrs) +
- Workshop 5: Meeting NVH targets with simulation(4 hrs) +
- Workshop 6: Reduced order modelling and machine learning with ODYSSEE(4 hrs)



CONVENTION CENTER Kit MacDonald

October



Kit MacDonald, Application Engineer at Computer Aided Technology,

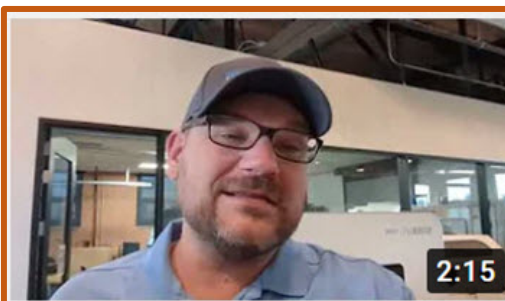
Here they are – [Our latest videos on our YouTube Channel](#)



CATI 3DEXPERIENCE User
Group: September 2022



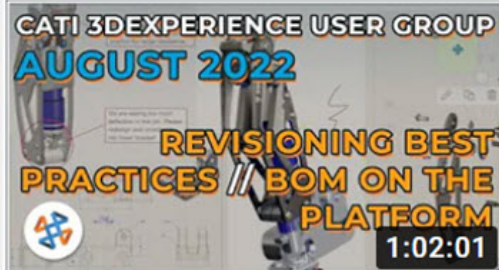
CST Studio Suite for
Electronic Design: Signal an...



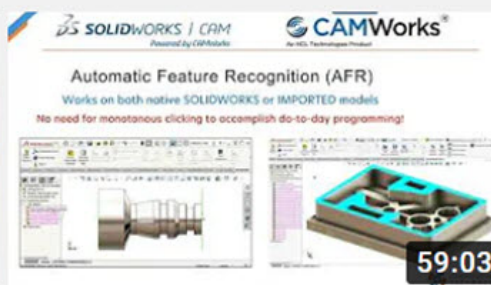
#LearningWithLuke:
Construction Project Update



Opera: Electric Motor Design
in Record Time



CATI 3DEXPERIENCE User
Group: August 2022

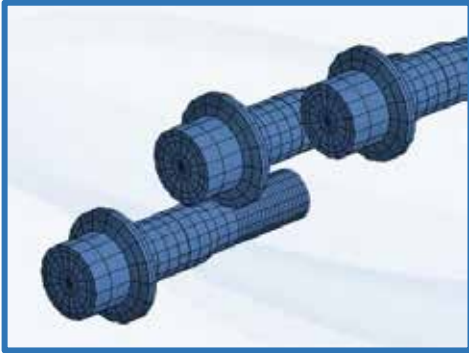


Lightning-Fast NC
Programming: The Easy...



Madhukar Chatiri, CEO at CADFEM India, Simulating to Engineer a better World

“Are you looking for the right simulation tool for evaluating bolted joints? We have the perfect #Ansys tool for your needs.”



Create bolt joints easily and check them with certainty

Reliable simulation tools for optimal creation and fast evaluation of bolted joints according to Eurocode 3 or VDI 2230.

Bolt Assessment - Verification of bolts according to Eurocode 3 or VDI 2230

Bolt Assessment - Verification of bolts according to Eurocode 3 or VDI 2230

Stable connections determine the quality and reliability of structures and components. Bolts make an important contribution to safety and durability under different load combinations. The exact requirements for safety and load specifications and the test methods to be applied are specified in national and international regulations. Our simulation software supports you in complying with these regulations.

Reliable simulation tools for optimal creation and fast evaluation of bolted joints according to Eurocode 3 or VDI 2230.

Bolts are one of the most important parts of any structure or component—they connect two structures, they hold together a structure, they provide safety in your structure, and they make it possible for your structure to do its job. The right bolt will strengthen your project while also helping it stay strong under pressure.

But when it comes to creating a bolt joint, there's only one way to go: with our simulation software!

We've been working on this software for years and we know how much it can help you on any project. You can use it to solve complex tasks with simple workflows in Ansys—and we'll even show you how!

Highlights at a glance

- The right tool for the evaluation of bolted joints for every guideline
- Solve complex tasks with simple workflows in Ansys
- Reduce development time and costs through automated workflows



CONVENTION CENTER Takahiko Miyachi

October



Takahiko Miyachi, Division Director at JSOL Corporation

Join us at the "JSOL CAE Forum," an event to introduce the latest technologies of various CAE packages provided by JSOL's Engineering Technology Division. This year the forum will, again, be held online.

JSOL CAE Forum 2022

Technical Conference

28th engineering simulation virtual event in Japan

[JSOL CAE Forum](#)

8 days

December 13th (Tuesday) to 20th (Tuesday)

All the staff will prepare to satisfy you. Please look forward to it.

We sincerely look forward to your participation.

Engineering Technology Division
JSOL Corporation

Dates	Tuesday, December 13 - Tuesday, 20, 2022 (UTC+9)
Organizer:	JSOL Corporation
Venue:	Online
Expected number of participants:	Approximately 1000
Contents:	Conference / Partner exhibition
Registration Fee:	Users, or Considerere of software introduction : Free
Non-subscribed users:	50,000.-JPY (exc.tax)

Users Meeting Secretariat
JSOL Corporation, Engineering Technology Division
E-mail : event@sci.jsol.co.jp



CONVENTION CENTER

Tarık ÖĞÜT

October



Deep learning is a sub-set of a machine learning in which the algorithms inspired by neural networks and human brain learn from the data.



[MATLAB information and view the video on our website.](#)

Johanna Pingel – MathWorks - Reasons to use MATLAB

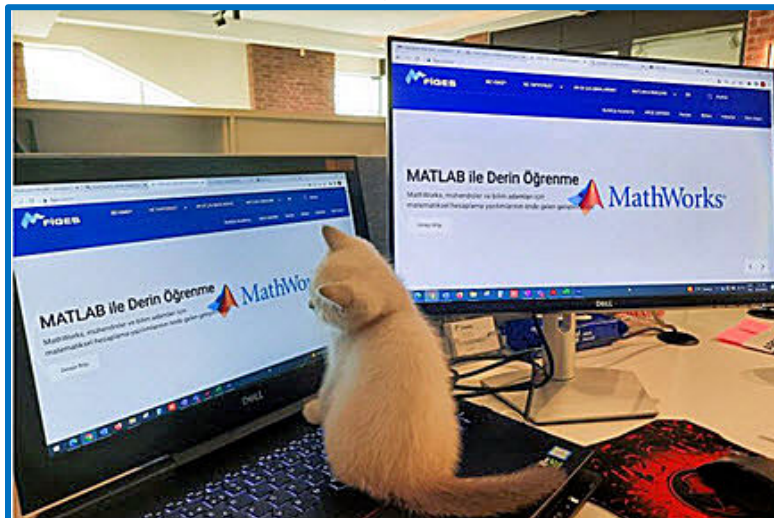
With just a few lines of MATLAB code, you can apply deep learning techniques to your work whether you're designing algorithms, preparing and labeling data, or generating code and deploying to embedded systems

With MATLAB, you can:

- Create, modify, and analyze deep learning architectures using apps and visualization tools.
- Preprocess data and automate ground-truth labeling of image, video, and audio data using apps.
- Accelerate algorithms on NVIDIA GPUs, cloud, and datacenter resources without specialized programming.
- Collaborate with peers using frameworks like TensorFlow, PyTorch, and MxNet
- Simulate and train dynamic system behavior with reinforcement learning
- Generate simulation-based training and test data from MATLAB and Simulink models of physical systems.

We will show you three approaches to train a deep learning network:

- Training a network from the scratch
- Using the transmission learning to train an available network
- Training an available network for semantic segmentation





Goodbye and Come Back Soon



QUIZ ANSWERS

- A. AH-64 Apache
- B. Eurocopter Tiger
- C. Agusta A129 Mangusta
- D. Poodle – named Helicopter



Our Town Salutes our US military, NATO and Friends of the US and NATO. We salute Freedom.