FEA Not To Miss April 2023 **ISSN 2694-4707**

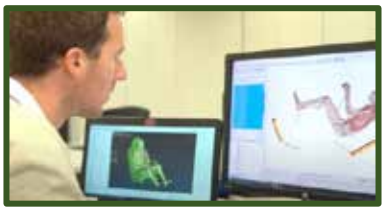
Engineering, AI, Machine Learning, Data Science and more

Monthly Town Hall Meeting
Engineering, Blog, Gossip & News
www.feantm.com

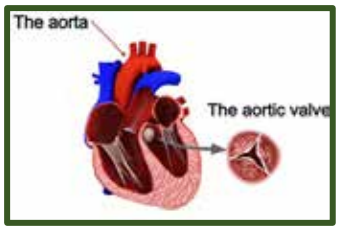
Airport

Airport

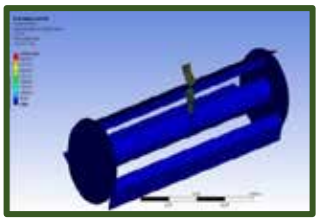
Automotive



Research Hospital



Rancher



Museum

Charlotte

Curt

Kathleen

Marco

Markus

Marta & Seppi

Rasmus

Shweta

Tarik

FEA not to miss a/k/a (FEANTM) comprises a group of interested parties sharing information. Information is presented on the website www.feantm.com and this publication ISSN # 2694-4707.

Goal

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Editors: **(alpha order) Anthony, Art, Marnie, Marsha, Shweta, 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

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- **The websites noted will have the complete articles, and higher resolution graphics/videos.**
- **We reference and link to the source of information.**
- **This blog/magazine/town is a positive venue for informational purposes.**

April 2023 - Name of the person the town thanks

Town Hall Meeting Rooms (A)

07	**Charlotte**	Our next half-day of information will be in June 15.
08	**Curt**	Put Designs in Motion with Tinkercad Sim Lab
09	**Jitesh**	Office Chair Simulation Using Ansys Static Structural:
10	**Kambiz**	Hexagon's Multiphysics suite
11	**Kathleen**	Slides of the info-day Automotive and Aerospace Applications are now available.
12	**Marco**	Ansys RBF Morph Structures Getting Started (Self-paced Learning Available)
13	**Markus**	Dynamic study of the passive safety of an active vehicle with Ansys LS-DYNA
14	**Marta**	Among our May on-line webinars Intro to Oasys PRIMER & Intro to Oasys POST.
15	**Metin**	OZEN March blogs & YouTube
16	**Nicola**	FE modeling of a composite sandwich laminate w/LS-DYNA for Aerospace…
17	**Rasmus**	Case study: Simulation of Hot Forming of an aluminum car body... & Seminars
18	**Shweta**	d3View resource documentation page
19	**Stefan**	Xflow
20	**Tarik**	Advanced Engineering Services - Computational Fluid Dynamics

Town Hall Meeting Rooms (B)

21	**Poster Board**	**ANSYS – Carhs – SCALE – LLNL – SSTL - Luri**	
22	**YouTube**	Exhibitors	This month: ANSYS LLNL OZEN OASYS

Automotive and/or Racing Information

23	**Applus+ IDIADA**	Develops a set of procedures to understand occupant behavior in pre-crash scenarios

Thanks to Vecteezy for our **Map Vector/town and many of the graphics in our magazine**

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First named person the town thanks

Airport – Aerospace - Military

Research Hospital

AI – ML – Data Science Building

Town Library – papers (first author)

Cattle Rancher – Whatever he wants

Secretary – Virtual Tours

Supervisor – Town Coffee Shop & Anything, never sure what will show up!

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

TOWN HALL MEETING
FREE COFFEE

Park Cars behind building

Tie horses to hitching rails

Serving coffee & home baked Rhubarb Pie

Our town comprises individuals interested in solutions 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)

Apology for the many errors last month. It will take a few months, but our resident is doing great. He had a Stroke/Sub Arachnoid Hemorrhage. The brain is now is apparently re-wiring itself/re-absorbing a bleed. Who taught the brain how to re-wire itself? I find that amazing!

ER had a device that showed arm veins! (The picture is on last page.) - We may add a wing on the Research Hospital for medical devices. The latest ER devices? Amazing!!!

Welcome to our town hall meeting for April. Our Town Secretary has a new section: Her world of crossword puzzles. Why do we have her crossword puzzles? I have yet to find out who voted. The document on my desk says 100% of voters approved this ballot. The ballot is on a restaurant paper napkin. It was written using a red crayon. It states 100% of voters

Announcements from our residents

Poster Board	LLNL,	Computational Engineering is key to ignition success
Airport	General Atomics	MQ-9 Reaper
Airport	Turkish Aerospace	TF-X

Educational:

Tinkercad Sim Lab - This new workspace allows teachers and students to start learning about simulation

Safety:

Dynamic study of the passive safety of an active vehicle with Ansys LS-DYNA

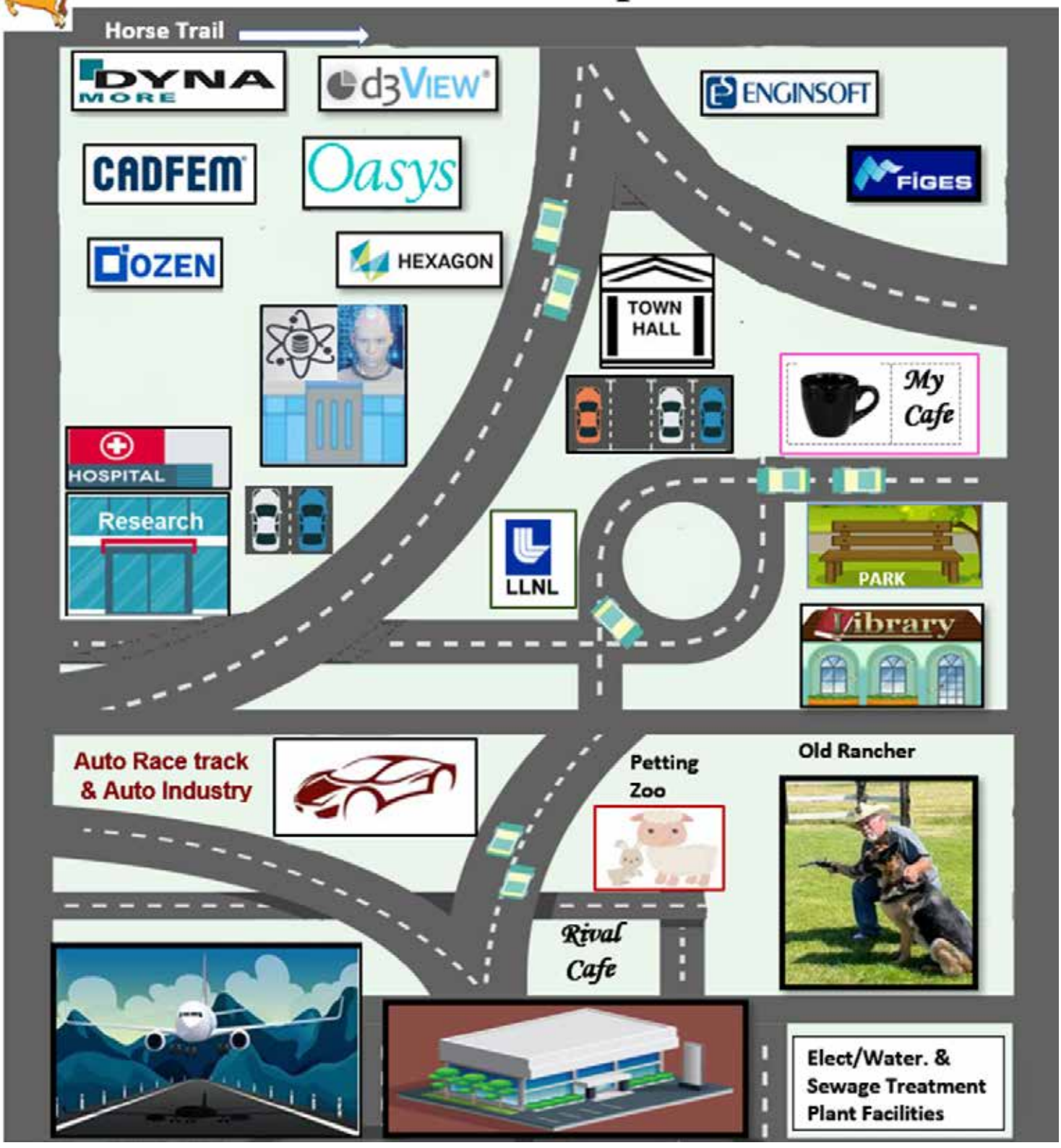
Informative:

d3View has a resource page. Information covers educational analysis including how to videos.

Medical:

Diagnosing Aneurysms in a Heartbeat with Ansys - We consider aneurysm research to be really important and really difficult, involving academia and the medical industry working together for a common objective.

Town Map



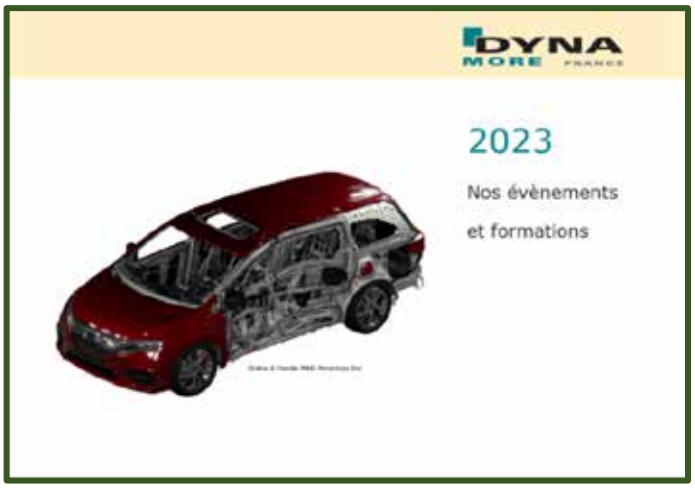
* **The logos displayed, of content in our magazine, do not represent their endorsement.**
* **To be removed, please notify** feaanswer@aol.com **with the request.**
* **Your town lot will be auctioned, with the Town applying all proceeds to the coffee budget.**
* **The town map changes pending information,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

DYNAmore - **Thank you all for attending our half-day of information on Mechanical Connections.**

We were happy to have that many participants!

Our next half-day of information will be in June 15.

A poll to select the topic is on its way…



DYNAmore France

The 2023 French events and courses are available on our website.

You will find all our French training courses. Online webinars as well as on site courses in our premises in Versailles are proposed.

Free information webinars are also offered on specific topics related to customer needs.

Our 3rd French LS-DYNA User Day will occur.

Our full seminar brochure -download at: https://www.dynamore.eu/en/homepage-news/eu/brochure-2023

Evènement / Formation	Avril	Mai	Juin	Juillet
Introduction à LS-DYNA		10-12		*03-05 (compacte*)*
Introduction à LS-PrePost				
Introduction aux technologies de la simulation		23		
L'analyse implicite avec LS-DYNA			*12-13 (compacte*)*	
Contacts dans LS-DYNA				
Mise en forme à froid avec LS-DYNA	12-14			
Modélisation des matériaux métalliques				
Introduction et optimisation avec LS-OPT			21-23	
Introduction et identification de paramètres avec LS-OPT	04			
La méthode ALE et le couplage fluide-structure dans LS-DYNA			26-27	
La méthode SPH (Smoothed Particle Hydrodynamics) dans LS-DYNA			28-29	
Demi-journée d'Information			15	
3ème Journée Utilisateurs LS-DYNA France				

Toutes les formations ont lieu dans nos bureaux à Versailles.

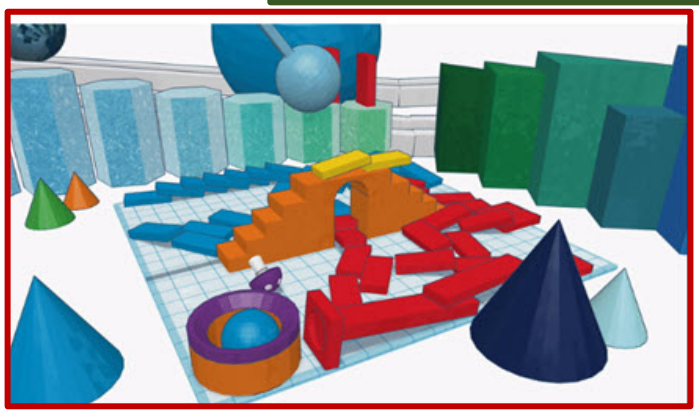
**Formation en ligne*

Sim Lab - 60 Million Users. 6-0 Million. 60,000,000. Sixty Million Users. Let that 'marinate' for a moment.

Bravo to Guillermo Melantoni and the tinkercad team for making a FREE product more powerful with the release of Sim Lab.

This new workspace allows teachers and students to start learning about simulation.

As a father, this enables my kids to start understanding physics as simple as their ABCD's (Always Be Closing Deals 😉)

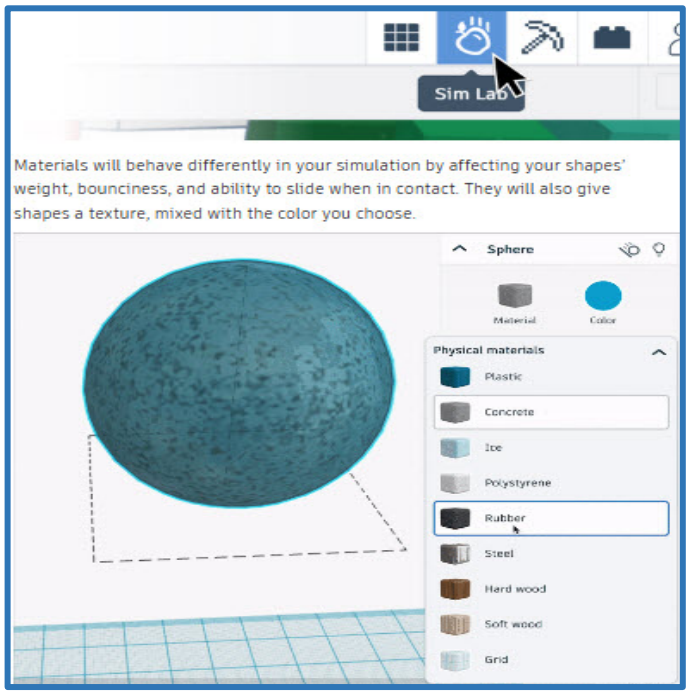


Sim Lab

[Put Designs in Motion with Tinkercad Sim Lab]
By: Team Tinkercad

Welcome to Tinkercad Sim Lab, a new feature that will help your students build momentum with their 3D designs. It is a place to have fun while learning STEAM concepts.

Any 3D design can be used in the Sim Lab by clicking on the falling apple icon. By default, all shapes will be dynamic but you can update any shape you don't want to move by making it static. Once a shape is static, other shapes can run into it, but it will never move.



Materials will behave differently in your simulation by affecting your shapes' weight, bounciness, and ability to slide when in contact. They will also give shapes a texture, mixed with the color you choose.

There are many things you can do with Sim Lab and more things planned for the future. Check out the examples on our website to see what it has to offer your designs!

Ready to dive in, but want a little more information?

Visit our website for complete Information and additional designs

KAIZENAT

Scope: The scope for the office chair simulation using Ansys software is broad. It can benefit designers, manufacturers, occupational health and safety experts. Additionally, end-users by optimizing design, production, and safety.

Physical Test Result

Simulation Result

Simulation [Office Chair Simulation Using Ansys Static Structural]

Specification: To simulate an office chair using Ansys software, it is important to accurately specify the material properties, define the boundary conditions, ensure a quality mesh, validate the simulation results, and optimize the design.

Approach: The approach for office chair simulation using Ansys software includes defining the problem and requirements, creating a 3D model, Mesh generation, assigning appropriate material properties, defining loads and boundary conditions. A reclining load is applied on the seat with all of fixed at the bottom rollers. The plastic parts are defined with non-linear material properties.

Summary: **We could replicate the failure zone precisely in Ansys Mechanical software**. At the same location of failure Ansys Mechanical software showed high v-m stress. As a next step the rib design of the recliner foam support will redesigned to an optimum geometry so that the failure can be avoided.

About Kaizenat Technologies: KAIZENAT Technologies Private Limited is founded to sell & support innovative simulation solutions for Indian Industry.

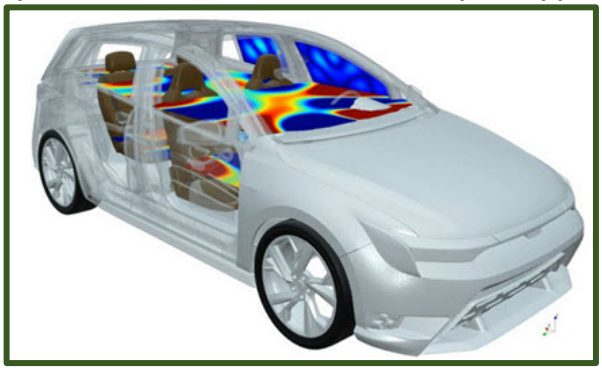
The Kaizenat team has a blend of vast technical and commercial experience from top Indian OEMs & leading CAE software/service providers. KAIZENAT is an authorized distributor of LS-DYNA and ANSYS for India.

For More Details - Web: www.kaizenat.com |
Email: info@kaizenat.com Phone: +91 080 41500008

Hexagon's Multiphysics suite brings focus to end-to-end solutions for specific industry challenges, such as NVH.

Noise, vibration and harshness in vehicles, especially with the move towards electrification, requires engineers to evaluate the different parts at a component and system level, examining interactions and defining solutions to meet targets before a single prototype is built..

EXCERPTS Optimal NVH designs for lighter and more comfortable vehicles - Shorten the development cycle and reduce the number of prototypes with end-to-end NVH simulation



Hexagon's Multiphysics suite, provides an end-to-end solution for NVH to help engineers optimise the structural behavior and interior cabin comfort while keeping weight and costs low, across the full frequency spectrum.

With easy-to-use and powerful solutions such as Virtual SEA and a damping treatment positioning workflow, evaluating NVH performance and creating solutions becomes a breeze. High-accuracy noise, vibration and harshness (NVH) analysis is crucial for meeting NVH targets and shortening the development and verification cycle. Balancing powertrain performance with quietness of the cabin interior, masking tire and wind noise to provide a superior quality of the ride are just a few examples of the challenges that eMobility brings.

The wide frequency spectrum where the vehicle must showcase excellent NVH performance requires engineers to adopt a variety of solutions and materials, each designed for a specific frequency range and noise source.

Hexagon offers an end-to-end solution for NVH with industry-standard tools that allow engineers to optimise the structural behaviour (vibrations), encapsulate noise sources (acoustic materials) and reduce the emission levels of the powertrain (gears and bearings).

ePowertrain NVH - electrification brings several new challenges for the powertrain NVH, including a shift from low-frequency to high-frequency noise, new designs, more lightweight, stiff chassis and a greater need to balance NVH performance with efficiency. At the same time, automakers want to reduce development time, prototyping and testing, as well as understand powertrain sound quality from the end-user's perspective.

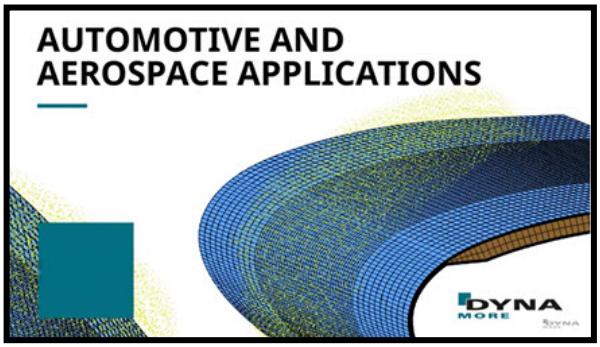
Providing fast, accurate solutions for engineering insight and optimisation, Hexagon's advanced simulation capabilities are proven to work in the real world. Combining advanced capabilities with interfaces to the rest of your CAE ecosystem, Hexagon enables a "right first time" CAE-led solution for powertrain NVH design.

Article continued on website

Full vehicle NVH - Partner ecosystem - Technology

DYNAMORE **- The slides of the info day Automotive and Aerospace Applications are now available.**

- **Additionally, we are very happy to organize the European LS-DYNA Conference**
- **Learn about DYNAMore's experience with Quantum Computing**



Infoday Automotive and Aerospace Applications

On December 1, 2022 we organized the info day on Automotive and Aerospace Applications.

The slides of the event are now ready for download.

(pdf format is available on the website for below listings.

- Welcome
  (**M. Merten**, DYNAmore)
- Digital. Efficient. Sustainable. Simulation possibilities in the innovative aerospace supply industry
  (**Dr. Meyer**, Heggemann)
- DYNAmore GmbH - Your partner for innovative FEM calculation
  (**M. Merten**, DYNAmore)
- Isothermal Hot Forming of Titanium Blanks - From Characteristic Determination to the Component
  (**Mr. Kaiser**, Heggemann)
- Examples for AM-Simulations in LS-DYNA
  (**Dr. Buhl**, BTU Cottbus)
- Simulation of resistive heating of titanium blanks
  (**M. Merten**, DYNAmore)
- GISSMO for Damage and Failure Prediction (Dr. Koch, DYNAmore MCC)
- A new material model for continuous fiber reinforced plastics in crashworthiness analysis
  (**Dr. Klöppel**, DYNAmore)
- Closed process chain for the simulation of fiber reinforced composites in LS-DYNA using ENVYO
  (**T. Usta**, DYNAmore)
- Multiphysics Modeling of Batteries with LS-DYNA
  (**Dr. Karajan**, DYNAmore)

14th European LS-DYNA Conference will be held in Baden-Baden, Germany on October 18 and 19, 2023.

We are very happy to organize the European LS-DYNA Conference - On October 18-19 the LS-DYNA user community meets in Baden-Baden, Germany. The call for papers is open. We are looking forward to receive numerous abstracts.

Image courtesy of: Baden-Baden Kur & Tourism GmbH

RBF Morph - We are really excited that we have been included in the Ansys Learning Hub. **This new course on how to leverage radial basis function and our tool RBF Morph Structures in your simulations is definitely not to be missed.**

Complete a class on your own schedule at your own pace. Scope is equivalent to Instructor led classes. Includes video lecture, workshops and input files. All our Self-Paced video courses are only available with an Ansys Learning Hub subscription.

Excerpt

Ansys RBF Morph Structures Getting Started (Self-paced Learning Available)

Course Overview - In this introductory course, you will understand what radial basis function (RBF) mesh morphing is and learn how to install and use Ansys RBF Morph Structures. The course is organized into 7 lessons, and you will be guided step by step in discovering tools and functionalities of the software. Supporting material is provided to clarify and deepen certain key concepts about mesh morphing.

Prerequisites

- Basic knowledge of Ansys Mechanical is required.
- Target Audience
- Mechanical, Aerospace, Thermal, Telecommunication, Biomedical, Civil Engineers.
- Teaching Method
- Lectures and computer practical sessions to validate acquired knowledge.

Learning Outcome - Following completion of this course, you will be able to:

- Install and independently use RBF Morph Structures.
- Move through the RBF Morph material.
- understand and use the basic tools of RBF Morph Structures.
- Set up a mesh morphing cases independently on a new computational grid.
- Perform parameter-based shape optimization using RBF mesh morphing and generate Response Surfaces based on shape parameters.
- Use mesh morphing to project the computational grid onto CAD.
- Use the shape parameters created by RBF morph in Ansys optiSLang.
- Perform parameter-free shape optimization using RBF mesh morphing through the Biological Growth Method (BGM).
- Perform mesh morphing of a model available in Mechanical APDL.
- Create shape parameters to build a static ROM using Ansys Static ROM Builder.

Agenda - This course is divided into 7 Self-Paced lessons.

- Introduction (1.5-hours)
- what if Analysis (1.5-hours)
- CAD Projection Methods (1-hour)
- optiSLang Interfacing (1-hour)
- Biological Growth Method (BGM) (1.25-hour)
- RBF Morph & APDL (.75-hour)
- Static ROM Builder Integration (1-hour)

CADFEM -**The development of an active mobility solution, such as the Vigoz offered by the start-up CIXI, requires rapid development based on various physical methods and tools, ranging from static linear analysis with Ansys Mechanical to normative crash validations with Ansys LS-DYNA and thermal analysis.** The start-up program from which they benefited enabled them to meet regulation requirements as well as comfort and optimization requirements. From a passive safety perspective, the Vigoz aims to validate crash tests for M category vehicles.

Crash test simulation of an active vehicle - To ensure the required level of safety for the driver, this active vehicle has been subjected to numerous crash tests and its design has been re-adapted.

Dynamic study of the passive safety of an active vehicle with Ansys LS-DYNA

Sector: Automotive (motor vehicles/trucks), Automotive supplier, Consumer goods/durable goods
Specialist field: Biomechanics, Concept design phase simulations, Structural mechanics
Images: © CIXI

Summary by Lucas Guilié, Structural analysis engineer, CIXI, "We used the LS-DYNA tool to model the seat and the belt as well as to study the biomechanical criteria for the driver to ensure that it would be truly safe while driving. The CADFEM support was exceptional, giving us quick feedback. Thanks to these exchanges, we've managed to develop digital tools together that are now very effective and help us every day in our developments."

Task - CIXI is a start-up whose ambition is to make active mobility intelligent and environmentally friendly. To do so, it aims to reintegrate physical activity into daily commute. In order to build a more sustainable future, CIXI's mobility solutions reduce the impact on the environment and improve the mental and physical health of users. The Vigoz is a vehicle that allows active travel with a low carbon footprint and the comfort of a car. Users can travel fast, safely, and in a weatherproof manner, while pedaling (up to 120 km/h) on roads previously reserved for cars. The Vigoz also offers a unique driving experience thanks to CIXI's pedaling and rolling technologies.

Solution - The meshing and data setting of the model are initially performed with the Ansys Mechanical tool. The integration of the dummy and the modeling of the belts are performed with the Ls-Prepost tool. Front and rear crash tests are performed. They allow the measurement of the vehicle's performance both from a structural point of view, such as intrusions, as well as from a biomechanical point of view, such as the measurement of the HIC…

Customer Benefit - By using Ansys LS-DYNA, CIXI was able to quickly obtain valuable information on the performance of its products with respect to the normative framework to be complied with. The use of numerical simulation has also allowed for detailed optimization of parameters or shapes that would not have been possible if the development had been based solely on physical tests…

Oasys - **My colleague Simon Hart will be presenting "The Role of LS-DYNA in the Design of the New London Electric Taxi"** on the 27th April at 16:25 - the first day of the Ansys UK Innovation Conference in Coventry.

Our registration for our UK Oasys LS-DYNA conference is now open

The registration for the UK Oasys LS-DYNA conference is now open.

Register here.

Introduction to Oasys PRIMER pre-processing software. Recommended for those who have not previously used Oasys PRIMER. Oasys PRIMER is an LS-DYNA pre-processor developed to help users build robust models and solve the problems engineers face in their daily lives.

- Title: Introduction to Oasys PRIMER Date: 2 May, 2023
- Duration: 3 days sessions from 09:30 - 12:30 BST
- Location: Online - Price: FREE - Attendees must attend all 3 sessions to complete the course.

Session #1: 02 May 9:30– 2:30 BST - #2: 03 May 9:30–12:30 BST # 3: 04 May 9:30– 2:30 BST

This course provides an overview of using PRIMER for setting up and navigating LS-DYNA models. The menu system will be explained, and mouse and keyboard controls and shortcuts explained. As most core functionality will be covered, after the course users will be able to confidently use PRIMER to produce quality LS-DYNA models. Workshop examples are used to demonstrate how to work around the software together with a PowerPoint presentation. **Course Content:**

- How to read and write models - How to navigate around the software
- How to investigate model contents - Core Oasys PRIMER tools, such as model checking
- Introduction to more advanced features, such as mass balancing and connections.
- Top tips

Introduction to Oasys POST (online) provides a thorough overview of the Oasys post-processing software including D3PLOT, T/HIS and REPORTER. Attendees must attend all three sessions to complete the course. The Oasys LS-DYNA environment can be used from setting up a FEA model to advanced post-processing of the results. It is essential for an engineer to know how to efficiently use and navigate around post-processing software. This course provides a thorough overview of the Oasys post-processing software including D3PLOT, T/HIS and REPORTER. After the course, the attendees should be able to navigate and feel comfortable using the Oasys post-processing software and be aware of the advanced capabilities of the software.

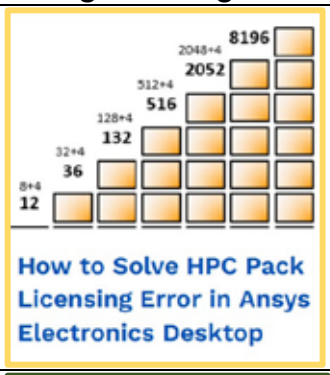
Recommended for those who have not previously used the Oasys post-processing software.

- Title: Introduction to Oasys POST (online) - Date: 16 May, 2023

OZEN Engineering **-Thanks to our engineers who are uploading videos to our Youtube channel!** There are many different topics: How to set arbitrary back drill depth on PCB's in HFSS; UDF to define temperature dependent properties in Fluent; Using Q3D to calculate die leads' resistance; Control panel lighting simulation in Speos; Electromigration; Photonic modulator design and simulation using Lumerical; etc...

Additionally on our website are informational blogs:

Among the Blogs on our website:



How to Solve HPC Pack Licensing Error in Ansys Electronics Desktop

Author - Mark Jones

This blog post will show how to resolve an error message related to HPC license settings in the Ansys Electronics Desktop. HPC stands for high performance computing which is an important part of performing larger engineering simulations, and Ansys offers HPC licenses in several configurations to enable additional CPU cores above the 4 cores included with the base solver license. These additional cores can be used to solve a single design even faster or to solve multiple parametric variations, frequencies, or time steps in parallel.

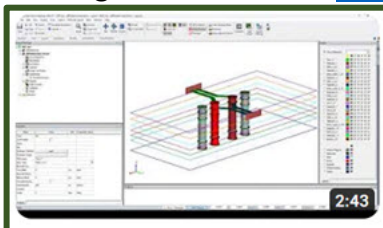
Calculating Die Leads' AC and DC R and L using Q3D

Author - Daniel Esmaili

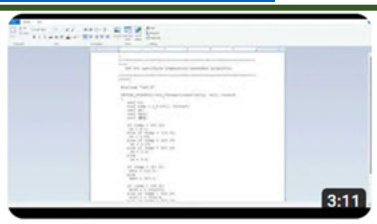
Dies are very often used in electronics industries. Understanding the parasitic characteristic of its leads are important for designers. Q3D is the prefect tool to calculate RLCG. It can be used in high speed boards or low frequency power electronics.

In video on the OZEN website, we showed how to modify geometry, set up the model, and check the results.

Among the videos on our YouTube Channel:

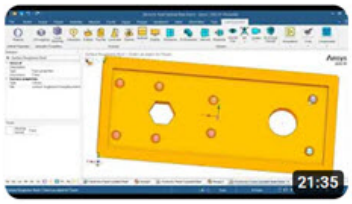


How to set arbitrary backdrill depth in HFSS 3D Layout

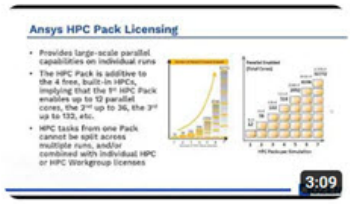


UDF to define temperature-dependent properties - Ansys Fluent

ImportingCADtoCFDPost



Control panel lighting simulation - Ansys Speos Demo



How to solve HPC Pack / Pool licensing error in Ansys Electronics...

Electromigration: Theory and Simulation

EnginSoft wishes to acknowledge Benecorinc., Wichita (KS), for providing samples of sandwich laminates for the experimental tests. (Newsletter EnginSoft Year 12 n°2)

Alessandro Tazzini | ITACAe Srl - Dario D'Agostino | EnginSoft
Marco Di Sciuva, Massimiliano Mattone | Politecnico di Torino

The force-displacement curve from the FE model set with LS-DYNA shows a good agreement with experimental data (See figure 11 below)

Excerpt - FE modeling of a composite sandwich laminate with LS-DYNA for Aerospace applications

ABSTRACT - Laminated composite materials such as sandwich structures are widely used in the transportation industry due to their high stiffness and strength to weight ratio. Significant efforts have been made in improving the structural theories and prediction methods to give engineers a reliable tool to develop new structural concepts (i.e. vehicle front and rear end components, automotive and aeronautical seats). The complete mechanical behavior of a composite material is very difficult to be predicted without first calibrating the model to some test data. This is especially important when damage and rupture are considered for impact and crash analyses.

This project investigates how best to correctly predict the energy absorption of these non-isotropic and non-homogeneous materials, whose lamina thickness is typically of the order of 0.2 mm or less and consists of tiny fibers or particles dispersed in a matrix material. This makes it impossible to model details in the micro scale when considering a whole component or vehicle. The typical FE element size for metal structures is 5mm and needs to be similar for composite structures to ensure manageable simulation times.

Therefore, in order to achieve computational efficiency relevant models and theories need to be understood. This article examines some modelling techniques to simulate a sandwich composite laminate, paying particular attention to its non-linear behavior and correlated energy absorption features. The numerical results have been compared with experimental tests.

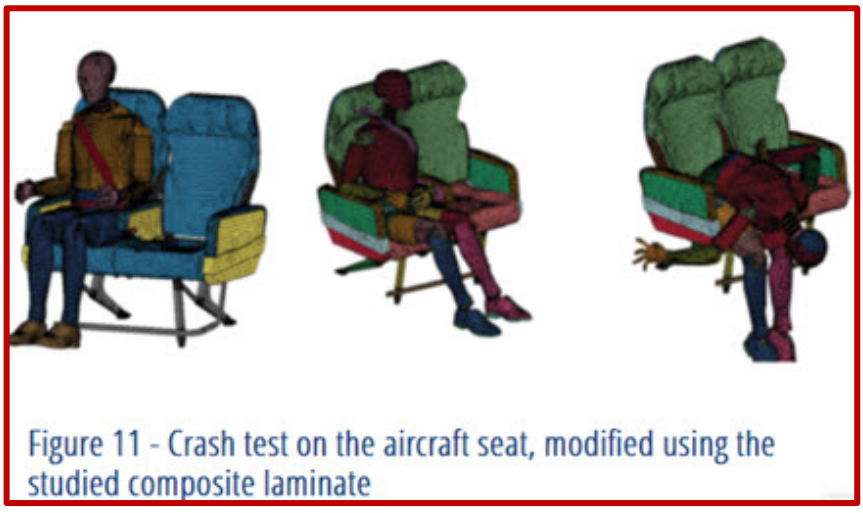


Figure 11 - Crash test on the aircraft seat, modified using the studied composite laminate

Information and graphics for the below categories are on the website:

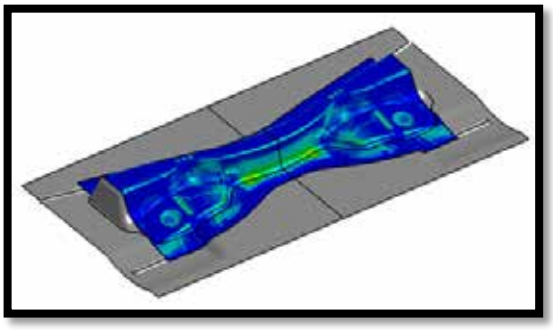
- The composite sandwich laminate
- Mathematical modeling strategy
- The model for the skins
- The model for the core, with virtual testing
- Experimental tests
- Evaluation of the mathematical model and recalibration

…

Please continue to read the article on the EnginSoft Expertise Website

DYNAMORE **- On our website don't miss our case study on Hotforming and seminars**

When simulating a forming process, the main task is to follow how the part is changing through the various forming steps.



Case study: Simulation of Hot Forming of an aluminum car body crossmember with springback compensation

When simulating a forming process, the main task is to follow how the part is changing through the various forming steps. One needs to mimic the physical process as accurately as possible in every step. To accommodate this, the user should have the possibility to choose the most appropriate solver and method required for the present forming step.

AMONG OUR MAY SEMINARS

May 02 - Contacts in LS-DYNA (2 days)

LS-DYNA is a leading finite element (FE) program in large deformation mechanics, vehicle collision and crashworthiness design. To solve e.g. a vehicle collision, the problem requires the use of robust and accurate treatment of the interaction between different parts and assemblies. Contacts have, and will continue to be, one of the most difficult topics in many types of simulations. Therefore it is necessary to acquire knowledge of how the contacts in LS-DYNA behave.

May 02 NVH & Frequency Domain Analysis in LS-DYNA

The objective of the training course is to introduce the frequency domain vibration and acoustic features of LS-DYNA to users, and give a detailed look at the application of these features in vehicle NVH simulation.

May 16 Introduction to ANSA & mETA

ANSA is the leading multidisciplinary pre-processor for FE and CFD applications, with extremely powerful geometry handling and meshing capabilities. This course will give a hands on introduction to ANSA (through exercises with ANSA), focusing on FE applications.

May 24 - Human Body Models and Injury Prediction

Development of numerical human body models (HBMs) was initiated in several parts of the world with the introduction of advanced automotive safety systems, in response to the need of a repetitive tool with increased biofidelity and anatomical detail compared to the crash test dummies. Today, HBMs are suited to study human biomechanics in applications in varying fields, including but not limited to automotive, aeronautics, sport injuries, and medical applications.

May 30 Introduction to LS-DYNA

The introductory seminar gives a quick, comprehensive introduction to the applications of LS-DYNA and is recommended for simulation engineers who want to use LS-DYNA as an FE code to simulate general nonlinear problems. Prior knowledge is not required.

d3View - **Did you know that d3View has a resource documentation page? The documentation will assist you with educational and analysis information.**

Additionally, you will find Learning Videos.

We continually add to our library of how-to videos.

d3VIEW Documentation	Worker Cheat Sheets	Material Specimen Generator Types Cheat Sheets	Tutorial Videos	d3VIEW Platform Blog Posts

d3VIEW Documentation	Zion R2022
· Main Documentation · Simlytiks Documentation · Workflows Documentation · Lucy Documentation	· Main Documentation · Simlytiks Documentation · Workflows Documentation

Release Notes	Worker Cheat Sheets
· Release Notes - Zion R2022.002 · Release Notes - Zion R2022.003 · Release-notes MASTER	· Important Worker Names, Illustrations and Descriptions · Curve Worker Names and Illustrations · Curves and Complex Curves Worker Names and Illustrations

Material Specimen Generator Types Cheat Sheets	Among the Tutorial Videos
Uniaxial Types · Shear Types · Notch Types · Punch Types · KS-II Types · Spotweld Types	· how filters work in Databases · how to add color picker input and how to specify colors · steps to extract binout response · how to apply a curve transformation for the response · how to add conditions in Template · how to extract a response via transformation · how to extract responses by applying template

Among The Tutorial Videos

· how to submit a job · how to change Physical Test Data table view type to Pivot Table · how to customize the physical tests data table · how to view part details of a model using right-click · how to import and viw Assembly groups · introduces you to brief overview of Peacock	· how progressive loading works for models · how to turn on fringes and view them for a model · options to change the view of a model · how to move a model · how to edit settings and customize a model · how to view uploaded model · how to hide BOM material parts and rest visibility

Caelynx Europe **- XFlow offers particle-based Lattice-Boltzmann technology for high fidelity Computational Fluid Dynamics (CFD) applications.**

XFLOW is a part of SIMULIA's Fluids Simulation portfolio.

XFlow - In the modern competitive world of product innovation, industries demand the complex simulation of their product's real-world behavior under extreme conditions; such as vehicles wading, powertrain lubrication and critical flight maneuvers.

The state-of-the-art technology of XFlow enables users to address complex CFD workflows involving high frequency transient simulations with real moving geometries, complex multiphase flows, free surface flows and fluid-structure interactions.

Its automatic lattice generation and adaptive refinement capabilities minimize user inputs thereby reducing time and effort in the meshing and pre-processing phase. This enables engineers to focus the majority of their efforts on design iteration and optimization.

With XFlow's discretization approach, surface complexity is also not a limiting factor. The underlying lattice can be controlled with a small set of parameters; the lattice is tolerant to the quality of the input geometry and adapts to the presence of moving parts.

Advanced rendering capabilities provide realistic visualization to gain deeper insight into flow and thermal performance. XFlow's unique capabilities enable companies to reduce physical testing while making to make better design decisions faster.

SIMULIA Fluids Simulation is driven by three complimentary technologies that provide customers with scalable fluids simulation to address broad range of real-world applications. Dassault Systèmes SIMULIA brand is committed to enhancing and expanding our Fluids Simulation portfolio to provide end-to-end solutions for broad range of Industry Processes on the 3DEXPERIENCE platform.

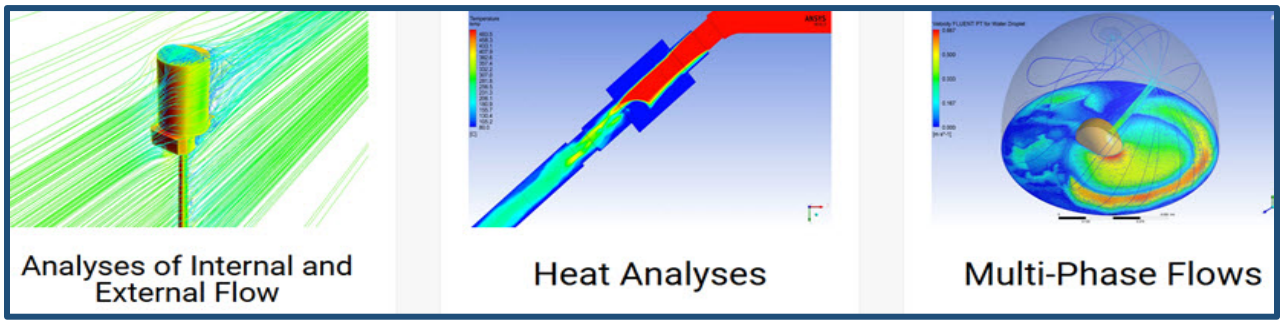
Among the key capabilities are:

• Single phase flow model - • Free-surface flow model • Multiphase flow models: Particle-based tracking, Phase Field and VoF • Acoustics analysis • Thermal analysis • Conjugate Heat Transfer (CHT) boundary condition • Vibroacoustics analysis with Wave6	• Radiation Montecarlo model • Scalar transport • Discrete Phase Model (DPM) • Non-Newtonian flows • Advance boundary conditions, including porous media and fan model • Moving parts with enforced behavior • Moving parts with rigid body dynamics up to 6 degrees of freedom

FIGES AS - **FİGES offers simulation-based project, engineering, and consultation services for multi-disciplinary industrial applications.**

Below find a few of our examples for Computation Fluid Dynamics

Advanced Engineering Services - Computational Fluid Dynamics

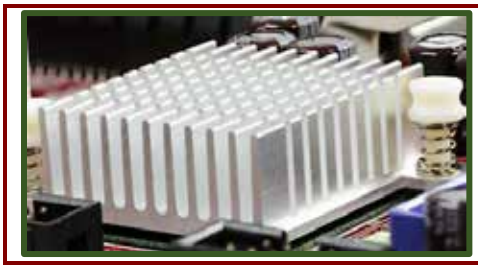


In the field of Computational Fluid Dynamics, the company provides almost every sector, including but not limited to, the industries of defense, automotive, maritime, aviation, energy, domestic appliances, construction, turbomachinery, and chemistry, with analysis services.

Hydrodynamics is the science of fluid motion. The behavior of fluid flow can be examined under three separate categories, namely experimental, theoretical, and numerical. Recently, a computational approach, through which equations of mass, momentum, and energy conservation are solved numerically, have been adopted because of the high-costs and time associated with conducting experiments. Computational fluid dynamics (CFD) is the science of forecasting the fluid flow (laminar or turbulence), heat exchanges, mass transfers, and chemical reactions by using a numerical process, while simultaneously managing these processes by solving them with mathematical equations. Typically, by using the engineering data dealing with CFD, it is possible to conduct studies on the existing system behaviors, create new conceptual designs, develop detailed products, and perform troubleshooting or improvements.

Powered with the industry leading ANSYS software, the company develops the most suitable understanding and produces the most accurate and fast solutions for its clients by taking the requirements of engineering and limitations of real life into account. In the field of Computational Fluid Dynamics, the company provides almost every sector, including but not limited to, the industries of defense, automotive, maritime, aviation, energy, domestic appliances, construction, turbomachinery, and chemistry, with analysis services. Along with its experienced staff of engineers, the company offers services in the areas such as single and multi-phased flows, heat exchanges, turbulence modelling, phase exchanges, chemical reaction flows, flow-induced noise (acoustics), free surface flows, optimization, and fluid-structure interaction.

Article continued on the FIGES website



ANSYS - by Nick Stefani, David Mercier – Thermal Analysis

Case Study - **How Ansys Discovery can be used to perform thermal analysis of a heat sink placed above two CPUs generating heat during intense computational tasks.**

Carhs training **-** Online-Seminar May 02 - **Early Increase of Design Maturity of Restraint System Components in the Reduced Prototype Vehicle Development Process**

Course Objectives - The course provides thoughts and ideas for a successful approach in the development of restraint systems within vehicle development processes in which only a small number of prototypes are available for verification and optimization of the systems. **Instructor** - Sandro Hübner, EDAG Engineering GmbH

SCALE Announcement SCALEsdm **India Private Limited** - Beginning 2023, SCALE has a new office in Jaipur, India. SCALE's vision is to establish a development center and hire experts from India's rich software development ecosystem and talent pool.

Their first colleagues Yogendra Bairagi and Karan Mangla! Together with General Manager Harsh Sharma, will ensure a successful launch at the Jaipur location.

LLNL - **Computational Engineering is key to ignition success** - Jeremy Thomas - In a room illuminated by blinking lights and glowing monitors, more than 2,000 synchronized computers are triggered to run 5 million lines of code. The intricate code language is responsible for aligning and firing 192 laser beams — and carrying some 800 channels of target diagnostic data — efficiently and reliably several times a day. This isn't a scene from a science fiction movie: it's the control room of LLNL's National Ignition Facility (NIF)….

SSTL - BUILDING WORLD-LEADING SMALL SATELLITES - Surrey Satellite Technology Ltd (SSTL) is at the forefront of space innovation and is the world's leading small satellite company, delivering customizable complete space mission solutions for Earth observation, science, communications, navigation, in-orbit debris removal and servicing and exploration beyond Earth infrastructure.

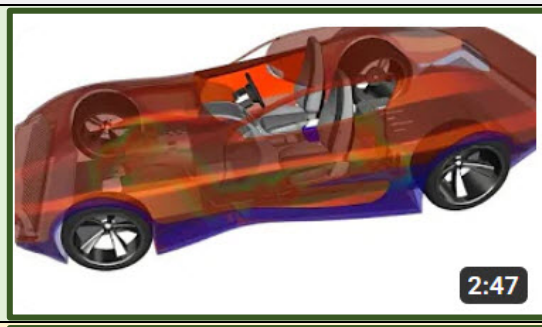
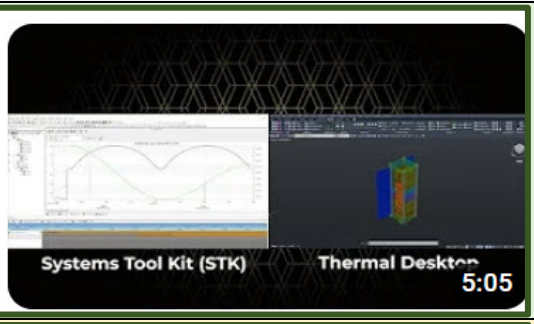
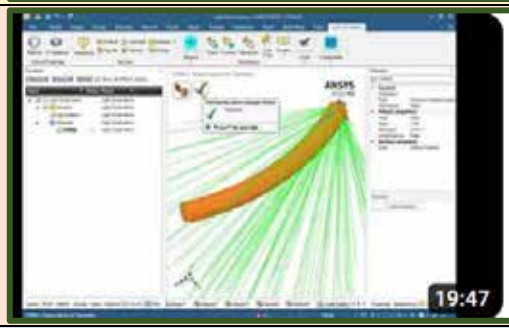
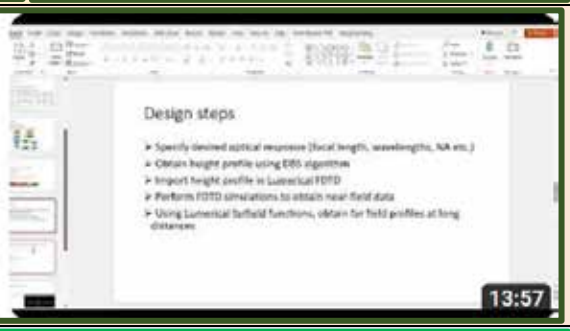
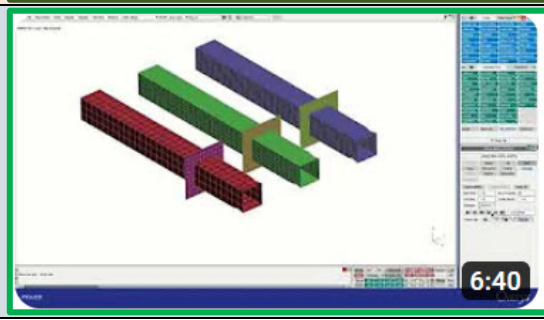
LURI Engineering - YouTube Channel with simulations.

LURI Engineering Official ANSYS-LSDYNA- DYNAFORM – GENESIS distributor. Solutions that cover Structural Engineering, Automotive, Energy, Transportation, Development & Optimization of Products and/or Structures using the tools of CAE Finite Element Analysis, CAD Computer Aided Modeling, Manufacturing Processes and PLM.

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

Today we visited the booths listed below on YouTube Current Content:

Free Coffee for visiting

ANSYS	 
LLNL	 
OZEN Engineering	 
OASYS	 

The new methodology is the result of the combination of Human Body Model simulations with pre-crash testing on a driving simulator, correlated with real data obtained in proving ground tests.

APPLUS+ IDIADA **develops a set of procedures to understand occupant behaviour in pre-crash scenarios -** Applus+ IDIADA has developed a validated set of procedures to better understand pre-crash occupant behaviour in order to assess the impact of ADAS functionalities on occupant protection. This new methodology combines pre-crash testing, on both driving simulator and proving ground, and Human Body Model (HBM) simulations.

These new procedures expand the work in the pre-crash and in-crash phases with HBM simulations using active muscle response, which have been correlated with data gathered from a wide variety of occupants in real testing at our own test track facilities. The reason for including a wide variety of users in the study is to properly assess possible differences in occupant behaviour and the extent to which these differences interfere with the overall performance of restraint systems in a pre-crash scenario.

Cutting-edge technology has been key in collecting a large amount of data to assess the response of the vehicle occupants and to measure instinctive human reactions in a potentially harmful situation.

Combining different areas of expertise with Human Body Models - This new service has been made possible by connecting the expertise of Applus+ IDIADA's professionals from the fields of Passive Safety, Human Factors, Body Development, and the use of HBM simulations with active musculature.

Data from occupant behaviour, kinematics, and seating positions in pre-crash scenarios has been analysed by Applus+ IDIADA's Passive Safety team to understand the effect on restraint system performance by combining the know-how from various safety engineering fields.
The Human Factors team has developed a test methodology capable of observing occupants' kinematics and muscular response just before the collision takes place. This methodology has been validated through tests with real participants both in the driving simulator and with real vehicles in a controlled environment at Applus+ IDIADA's Proving Ground in Spain.

From a Body Development perspective, the integrated safety of the restraint systems has been analysed using HBM simulations. Pre-crash scenarios were simulated based on data gathered with real participants, followed by an in-crash safety assessment. The result was a holistic safety assessment of the vehicle's restraint system. The development of this methodology will certainly be key to better understanding the influence of Active Safety systems on restraint system performance for occupant protection in the event of a crash, and to elaborate effective countermeasures that can be applied to support the development of safer vehicles.

MQ-9A Reaper Objective - Perform multi-mission Intelligence, Surveillance and Reconnaissance (ISR) missions over land or sea.

General Atomics MQ-9 Reaper

MQ-9A "Reaper”

The General Atomics MQ-9 Reaper (sometimes called Predator B) is an unmanned aerial vehicle (UAV) capable of remotely controlled or autonomous flight operations, developed by General Atomics Aeronautical Systems

The turboprop-powered, multi-mission MQ-9A Remotely Piloted Aircraft (RPA) was developed with GA-ASI funding and first flown in 2001. MQ-9A "Reaper" is a highly sophisticated development built on the experience gained with the company's battle-proven Predator RPA and is a major evolutionary leap forward in overall performance and reliability. MQ-9A was designated "Reaper" by the U.S. and Royal Air Force, but has become the widely used name for any Predator B equipped with weapons.

Featuring unmatched operational flexibility, MQ-9A has an endurance of over 27 hours, speeds of 240 KTAS, can operate up to 50,000 feet, and has a 3,850 pound (1746 kilogram) payload capacity that includes 3,000 pounds (1361 kilograms) of external stores. The aircraft carries 500% more payload and has nine times the horsepower. It provides a long-endurance, persistent surveillance/strike capability for the war fighter.

An extremely reliable aircraft, MQ-9A is equipped with a fault-tolerant flight control system and triple redundant avionics system architecture. It is engineered to meet and exceed manned aircraft reliability standards.

MQ-9A is powered by the flight-certified and proven Honeywell TPE331-10 turboprop engine, integrated with Digital Electronic Engine Control (DEEC), which significantly improves engine performance and fuel efficiency, particularly at low altitudes.

The aircraft is highly modular and is configured easily with a variety of payloads to meet mission requirements. MQ-9A is capable of carrying multiple mission payloads to include: Electro-optical/Infrared (EO/IR), Lynx® Multi-mode Radar, multi-mode maritime surveillance radar, Electronic Support Measures (ESM), laser designators, and various weapons and payload packages.

MQ-9A continues to improve and evolve, making it more relevant for its customers' emerging needs. The MQ-9A Extended Range (ER) was designed with field-retrofittable capabilities such as wing-borne fuel pods and a new reinforced landing gear that extends the aircraft's already impressive endurance from 27 hours to 34 hours, while further increasing its operational flexibility. To date, the MQ-9A has been acquired by the U.S. Air Force, U.S. Department of Homeland Security, NASA, the Royal Air Force, the Italian Air Force, the French Air Force and the Spanish Air Force… Additional information on the website

Social Media and Using Social Media Translation –

Temel Kotil President & CEO at Turkish Aerospace

"I would like to express my gratitude to Mr. President who has never withheld his support from us, and I would like to express my gratitude to all my Türk Havacılık ve Uzay Sanayii colleagues who have contributed to us to reach this point in projects that are of great importance for our country. We will continue to serve our nation."

Turkish Aerospace TF-X

The TAI TF-X is a stealth twin-engine all-weather air superiority fighter completed its Key Taxi Tests

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."

Jets – in or not in service: They were, and are, an integral part of our country's security and the safety of our military ground troops. The beauty of a jet in flight can't be matched!
Answers are on the last page – name that jet.

1._____

2._____

3._____

4. _____

Courtesy of and Copyright to USAF Photo

US Airforce Week in Pictures

Seeing double

The **U.S. Air Force Air Demonstration Squadron "Thunderbirds"** perform at Nellis Air Force Base, Nev., March 9, 2023. Following the demonstration, the Thunderbirds received final certification for 2023, which officially kicked off the air show season**.**

U.S. Air Force photo by Senior Airman Dakota Carter)

Airman's best friend

Military working dog Fanny receives praise during training at Tyndall Air Force Base, Fla., March 10, 2023. Tyndall AFB is currently home to four MWDs trained in a variety of skills, including the detection of explosives and drug paraphernalia, tracking down suspects and patrolling the installation.

U.S. Air Force photo by Senior Airman Anabel Del Valle

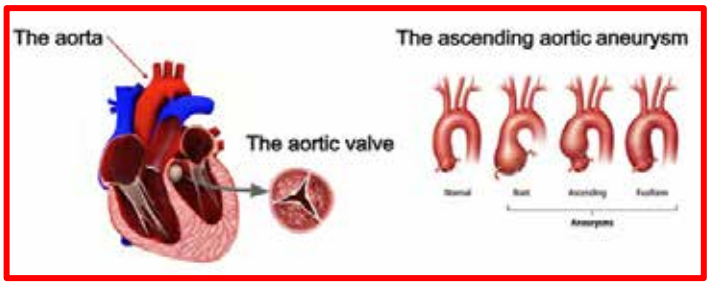
Soaring Eagle

A **U.S. Air Force F-15E** Strike Eagle assigned to the 389th Expeditionary Fighter Squadron flies within the U.S. Central Command area of responsibility Feb. 5, 2023. The 389th EFS's mission is to deliver dominant combat airpower and fortify the U.S. commitment to deterrence and regional stability.

U.S. Air Force photo by Tech. Sgt. Daniel Asselta

Marco Evangelos Biancolini
RBF Morph CTO & Founder - Associate Professor of Machine Design

Diagnosing Aneurysms - "Coming into MeDiTATe we already have activities around this topic," says Dr. Marco Evangelos Biancolini, RBF Morph CTO and Founder, and Associate Professor of Machine Design at the University of Rome Tor Vergata. "We consider aneurysm research to be really important and really difficult, involving academia and the medical industry working together for a common objective. We have a $4 million budget for this project with many partners including Ansys, plus 14 researchers that are 100% committed to this effort, which amounts to a medical digital twin task force of almost 100 people."



Diagnosing Aneurysms in a Heartbeat with Ansys

Excerpt from the blog by Graziella Alves

Heart conditions remain a leading cause of death in the world according to the World Health Organization (WHO).

Among them, ascending aorta aneurysms (AsAAs) are very common, life-threatening cardiovascular diseases characterized by an abnormal bulging or a weak spot in the aorta, the main artery in the human body. Most of us are familiar with aneurysms, as they have a scary reputation for causing a blood vessel to burst suddenly — and, too often, fatally…

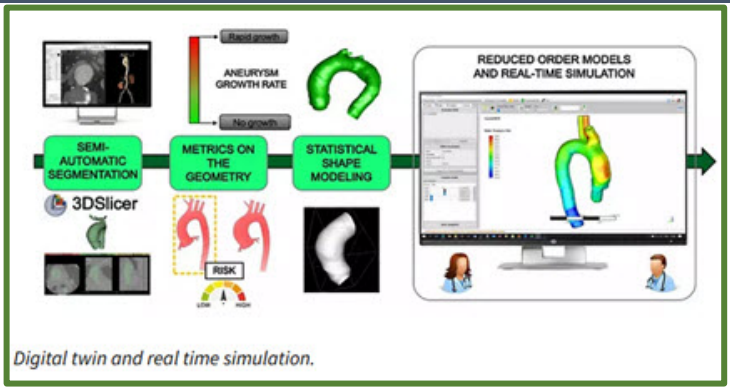
...

A Twinning Strategy for the Future of Aneurysm Prevention and Treatment - Thanks to MeDiTATe — the medical digital twin for aneurysm prevention and treatment — simulation may become an important factor in the diagnosis and treatment of aneurysms. MeDiTATe research is supported by a longstanding partnership between Ansys and software company RBF Morph.

There are currently three MeDiTATe research projects focused on using digital twins that are interconnected with some participant overlap. RBF Morph is enabling the use of mesh morphing with Ansys computer-aided engineering (CAE) solutions and Ansys Twin Builder in all three projects to develop a better understanding of AsAAs and other medical conditions.

"Coming into MeDiTATe we already have activities around this topic," says Dr. Marco Evangelos Biancolini, RBF Morph CTO and Founder, and Associate Professor of Machine Design at the University of Rome Tor Vergata. "We consider aneurysm research to be really important and really difficult, involving academia and the medical industry working together for a common objective. We have a $4 million budget for this project with many partners including Ansys, plus 14 researchers that are 100% committed to this effort, which amounts to a medical digital twin task force of almost 100 people."

MeDiTATe's large consortium of researchers are working together with Ansys using medical imaging segmentation software. Researchers compare the images of a patient with the reduced-order model (ROM) generated in Twin Builder to see, in real time, the evolution of the pathology. Using this medical digital twin model, they can then augment the images with simulation results, enabling them to extract indexes/biomarkers and further understand what's going on medically.



Digital twin and real time simulation.

Ultimately, the creation of a medical digital twin in Twin Builder could enable a high-fidelity simulation of the patient for a patient-specific geometry. The goal is to provide additional information to the surgeon and reduce the mortality rate of an aneurysm event.

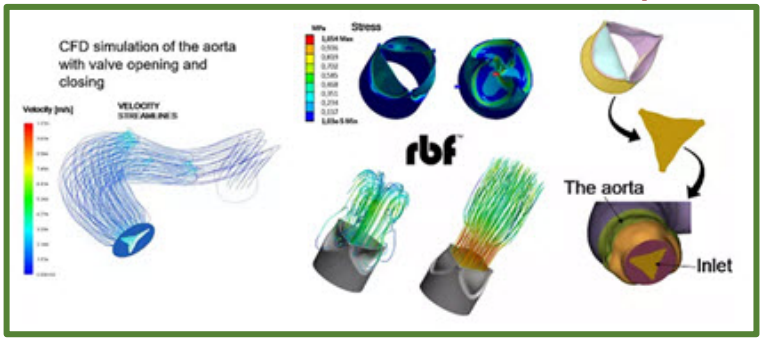
Using a medical digital twin introduces greater certainty in the medical decision-making process, supported by additional evidence and knowledge.

"Obviously, if I'm a patient and I have this condition, and you provide one more perspective or additional information to help me make this decision, that's always better," says Biancolini. "Introducing simulation gives you more authoritative, well-defined information based on additional technology. In the future, it's also possible that a digital twin may become an important component or part of a medical device, such as a digital twin onboard of an ultrasound."

Ansys Software Enables New Pathways to Recovery - In the face of many unknowns, the extensive use of simulation comes with several benefits for the MeDiTATe team in the deployment of Ansys-based medical digital twins. It's reflected first in the collective experience using high fidelity simulation software including Ansys Fluent, Ansys Mechanical, and Ansys LS-Dyna. All three are integral in the study of fluids, structures, and electrophysiology fluid-structural interactions that are a big part of the team's work. MeDiTATe researchers are also deploying solutions with Twin Builder that make ROM generation effective and user friendly in the process.

Working with very well-established tools in support of new technologies for digital twin development enables researchers to approach their work with more clarity knowing where they are headed, and the challenges they can expect along the way.

"To deploy effective medical digital twins you need the state-of-the-art data coming out of our research, yet this is not enough," says Biancolini. "You also need two different things — one is reduced-order model data compression, which can be obtained by high-performance computing, and a model to run it on. Twin Builder enables us to extract a large amount of data then use it to create a model that, instead of running many hours of calculations, can run in real time. The ability of advanced visualization makes translation possible so this data can be used in the medical world."



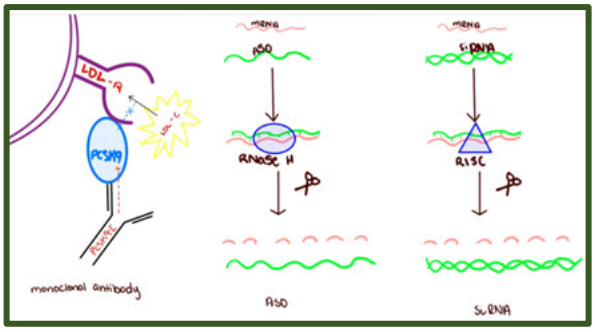
Mesh Morphing and Twin Building into Three Dimensions - RBF Morph mesh morphing technology is a key enabler of parametric shapes and forms — shapes that have a curving nature.

The software is not only useful in defining shape parameters — for instance, the positioning of a prosthetic part — but is also needed for statistical shape modeling (i.e. to extract common shape features of a patient cohort)

Article continues on website

Hyperlipidemia is a significant risk factor for atherosclerotic cardiovascular disease. Undertreatment of elevated lipids persists despite existing therapies.

Figure 1. Mechanism of action of monoclonal antibodies and gene silencing techniques



MDPI - **Monoclonal Antibodies, Gene Silencing and Gene Editing (CRISPR) Therapies for the Treatment of Hyperlipidemia—The Future Is Here**

Authors listed:

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Leandro Slipczuk - Cardiology Div., Montefiore Med. Ctr., Albert Einstein College of Medicine, Bronx, NY,

Salim S. Virani - Health Policy, Quality & Informatics Program, Michael E. DeBakey VA Medical Ctr. Health Svcs. Res. & Dev. Ctr., Houston, TX, USA - Section of Cardiology, Michael E. DeBakey Veterans Affairs Medical Ctr., Houston, TX, USA

Abstract - **Hyperlipidemia is a significant risk factor for atherosclerotic cardiovascular disease.** Undertreatment of elevated lipids persists despite existing therapies. Here, we provide an update on monoclonal antibodies, gene silencing therapies, and gene editing techniques for the management of hyperlipidemia. The current era of cutting-edge pharmaceuticals targeting low density lipoprotein cholesterol, PCSK9, lipoprotein (a), angiopoietin-like 3, and apolipoprotein C3 are reviewed. We outline what is known, studies in progress, and futuristic goals. This review of available and upcoming biotechnological lipid therapies is presented for clinicians managing patients with familial hyperlipidemia, statin intolerance, hypertriglyceridemia, or elevated lipoprotein (a) levels.

An Area of Unmet Need - Hyperlipidemia remains of critical importance as a causal risk factor for atherosclerotic cardiovascular disease (ASCVD). Despite extensive research related to causes and treatments, hyperlipidemia remains underdiagnosed and undertreated [1,2]. Low density lipoprotein (LDL) is one of the main apolipoprotein B (Apo B) containing lipoproteins. Low density lipoprotein cholesterol (LDL-C), a component of the lipid profile, represents the total concentration of cholesterol within LDL, intermediate density lipoprotein (IDL) cholesterol and lipoprotein (a) particles, and has a particular importance for ASCVD, with the magnitude and duration of exposure increasing the risk [3]. Reducing LDL-C lowers cardiovascular (CV) risk, with estimates being a one fifth reduction in the annual rate of heart attack, revascularization, and ischemic stroke for each 1.0 mmol/L (approximately 39 mg/dL) reduction in LDL-C [4]. Moreover, LDL-C is one of the main risk factors to target for ASCVD disease prevention. LDL-C lowering therapies are widely available, yet the rates of hyperlipidemia are climbing. Indeed, global registry data have detected an exponential increase in the burden of elevated LDL-C over the past 25 years [5]…

We thank one of our town nurses, Rosanna, for bringing this to our attention

What are HeLa Cells? An immortalized cell line reproduces indefinitely under specific conditions, and the HeLa cell line continues to be a source of invaluable medical data to the present day.

The part many don't know is it stands for Henrietta Lacks. She may have saved your life or someone you know! A Not To Forget Henrietta Lacks

Wikipedia HeLa Cells

Henrietta Lacks was an African-American woman whose cancer cells are the source of the HeLa cell line, the first immortalized human cell line and one of the most important cell lines in medical research

From Wikipedia (for references please visit Wikipedia) - Henrietta Lacks (born Loretta Pleasant; August 1, 1920 – October 4, 1951) was an African-American woman whose cancer cells are the source of the HeLa cell line, the first immortalized human cell line and one of the most important cell lines in medical research. **An immortalized cell line reproduces indefinitely under specific conditions, and the HeLa cell line continues to be a source of invaluable medical data to the present day.**

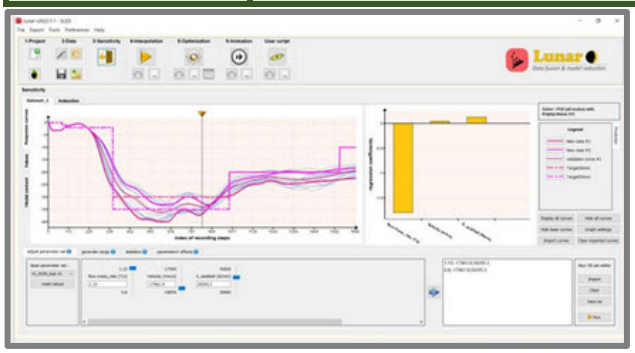
HeLa (/ˈhiːlɑː/; also Hela or hela) is an immortalized cell line used in scientific research. It is the oldest and most commonly used human cell line. The line is derived from cervical cancer cells taken on February 8, 1951, from Henrietta Lacks, a 31-year-old African-American mother of five, who died of cancer on October 4, 1951, and after whom they are named.[3] The cell line was found to be remarkably durable and prolific, which allows it to be used extensively in scientific study.

The cells from Lacks's cancerous cervical tumor were taken without her knowledge or consent, which was common practice in the United States at the time. Cell biologist George Otto Gey found that they could be kept alive, and developed a cell line. Previously, cells cultured from other human cells would only survive for a few days. Cells from Lacks's tumor behaved differently.

HeLa cells, like other cell lines, are termed "immortal" in that they can divide an unlimited number of times in a laboratory cell culture plate as long as fundamental cell survival conditions are met (i.e. being maintained and sustained in a suitable environment). There are many strains of HeLa cells as they continue to mutate in cell cultures, but all HeLa cells are descended from the same tumor cells removed from Lacks.

HEXAGON - Nothing is completely the end of something else, but only a continuation or an evolution of it. The relevant question is whether it is useful or not, and if yes, what is the gain and at which cost. We know today that the cost of FEM and HPC solutions are overwhelming and can be compared to the greatest industries' energy consumption. AI/ML allow us to revise the cost and investigate new frontiers in innovation.

Is AI/ML the end of traditional PDE based simulation techniques?



HEXAGON ODYSSEE

There is another gain which is of importance: the level of expertise needed for making industry standard predicting models of physical realities. For the moment, AI/ML based modeling and simulation is heavily based on the PDE simulations (FEM) themselves.

Once these are enhanced by real field data, we expect even more predictive potential as well as efficiency at a lower level of expertise.

ODYSSEE is a contribution in this sense, replacing a considerable amount of FEM simulations with much simpler, faster and cheaper simulation models. We also speak of ROMs (reduced order models referring to the complexity of the PDE's). In its latest release, ODYSSEE 2023.1 extends its domain of application to Adaptive and LOO sampling, health monitoring, fault detection, physics based AI/ML such as MINN(Mechanics Informed Neural Networks), LSTM (Long-short Term Memory for battery life simulation) and various image based prediction and segmentation techniques (CNN, SVM, etc.)

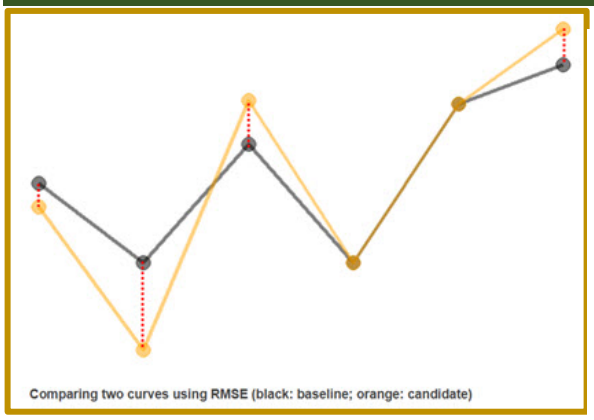
ODYSSEE CAE is a unique and powerful CAE-centric innovation platform that allows engineers to apply Machine Learning, Artificial Intelligence, Reduced Order Modelling (ROM) and Design Optimization to workflows. It allows you to benefit from modern data science technology by creating cost efficient digital twins through real-time predictive modeling and optimization for both CAE simulation data and physical test data.

ODYSSEE A-Eye is a unique and powerful image-based machine learning solution that accelerates product design and development via real-time parametric simulation and optimization using machine learning and artificial intelligence (AI) solutions. ODYSSEE A-Eye allows you to create your own AI application based on image data, sensor data, scalars, labels, curves, and CAD data as inputs and then predicts responses using the known data of your system.

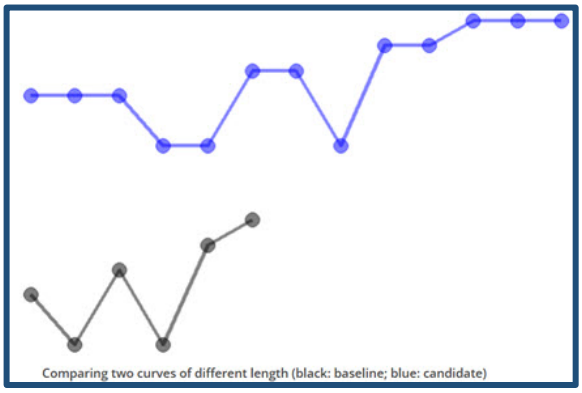
This insight enables designers and production technicians to explore the design space more extensively and interactively and improve next-generation products without prohibitive computing cost or time.

D3View - A blog by Bing discusses comparing curves with Dynamic Time Warping

Given two curves, a baseline and a candidate curve, how do we know how similar they are to each other?s In machine learning, it is common to compare the predicted values (candidate curve) of a testing set to the true values (baseline curve) by RMSE (Root Mean Square Error). By comparing RMSE values of different candidate curves, we can learn which one is more similar to the baseline curve and thus identify the machine learning model that performs the best.



Comparing two curves using RMSE (black: baseline; orange: candidate)



Comparing two curves of different length (black: baseline; blue: candidate)

Excerpt - Compare curves with Dynamic Time Warping -

What if the two curves have different number of points on a different range (where it starts and ends)? Considering different people speaking the same sentence, different people speak in different speed (range), pitches (values) and so on, however, they make very similar sound (as it is the same sentence). This leads to two temporal sequences (curves) with different number of points and values at each point. If we continue to use RMSE metric to measure the difference between the two curves, we will not be able to calculate a point-wise value difference. An algorithm to compare curves like these is Dynamic Time Warping (DTW). It associates points from candidate curve to the baseline curve so that the total distance of the formed path (warping path) is minimal. The distance is a measure of their similarity and can be used to compare similarities of different candidate curves to the baseline curve.

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LS-DYNA finite element predictions of the global and local deformation/inversion of the panel/connectors compared reasonably well with the experimental observations.

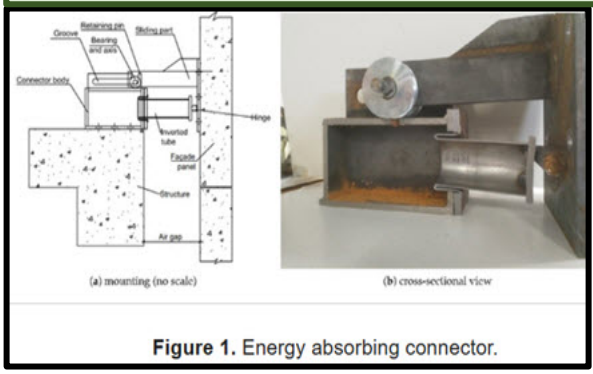

Figure 1. Energy absorbing connector.

Experimental Validation and Numerical Analysis of a High-Performance Blast Energy-Absorbing System for Building Structures

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CINAMIL & Military Academy, Lisbon, Portugal
Valter José da Guia Lúcio, Corneliu Cismaşiu
CERIS NOVA and Dept.of Civil Engineering of NOVA School of Science & Tech., Caparica, Portugal
José Luis Mingote
NATO Counter Improvised Explosive Devices Centre of Excellence, Madrid, Spain

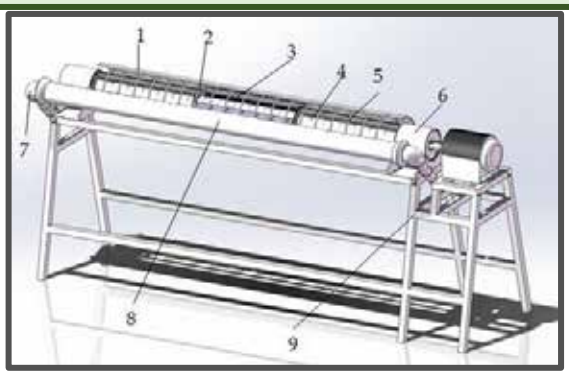
Abstract - The paper presents a full-scale blast testing experimental campaign conducted on an energyabsorbing connector comprising thin-walled inversion tubes as kernel elements mounted in a façade protective panel. LS-DYNA finite element predictions of the global and local deformation/inversion of the panel/connectors compared reasonably well with the experimental observations. After validation, the numerical model was used to analyze the response of a simple idealized reinforced concrete structure under three blast-loading scenarios: the first two scenarios produce, approximately, the same impulse but are significantly different in terms of load duration and overpressures, and represent a far-field and a near-field scenario (1600 kg TNT at 20 m (i) and 150 kg TNT at 5 m (ii), respectively); the third scenario is more demanding, and consists in a half standoff distance of the second (150 kg TNT at 2.5 m (iii)). These numerical simulations allow to assess the effect of standoff distance and blast loading on the effectiveness of the protective system. One may conclude that the introduction of EACs strongly limits the forces imparted to the protected structure, reducing significantly the corresponding energy absorption demand. Comparing the energy absorbed by the structure in different scenarios, with and without the protective system (8 × ϕ64 × 2 mm), one can see that these reductions can reach, respectively 67%, 72% and 68% in the far-field, near-field and very near-field explosions.

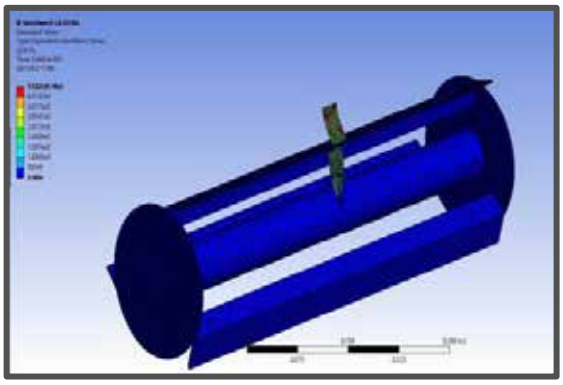
EXCERPT - 1. Introduction - Research on the effects of explosions in infrastructures is significant, particularly in the fields of military operations in high threat environments and hazard prevention in industrial facilities where explosion risks exist, such as oil, mining and chemical industries, but also as a response to the need for nations to protect citizens against terrorist threats. In expeditionary military missions, the limitations and logistical problems faced by the first military forces entering a new theater of operations are also known, namely, the lack of adequate infrastructure for the settle down of these forces, which sometimes leads to the re-use of existing buildings where important activities are run (e.g., command and staff) or have a considerable human presence (billeting, food areas, etc.). Therefore, taking into account a plausible threat and the need to protect civilians, workers and/or troops are of utmost importance to assess the extent of the potential damage and, consequently, to design adequate protection measures and systems.

No one knows his name.
You yell, "HEY, old rancher."

Agriculture, Soil, Equipment, Cattle,
and whatever he wants.

To solve the problems of low net harvesting rate, high loss rate, and uneven stubble height during the harvest of laver, the laver (Porphyra yezoensis) was selected as the research object, the analysis of the cultivation mode, biomechanical characteristics, harvesting trajectory and force of laver were carried out.





An ANSYS/LS-DYNA Simulation and Experimental Study of Sectional Hob Type Laver Harvesting Device

Jiahong Tang , Wei Lu, Haidong Li, Shang Ni, Zhenyin Sun, Cheng Zhao,

- College of Mechanical and Power Engineering, Dalian Ocean University, Dalian, China

Xiuchen Li, Guochen Zhang, Hanbing Zhang, Qian Zhang and Gang Mu

- College of Mechanical and Power Engineering, Dalian Ocean University, Dalian, China
- Marine Fishery Equipment Professional Technology Innovation Center of Liaoning Province, Dalian, China
- Key Laboratory of Environment Controlled Aquaculture, Ministry of Education, Dalian, China

Abstract - A sectional hob type harvesting device was designed. A rigid-flexible coupling model related to the interaction between the cutting mechanism and the laver was constructed based on ANSYS/LS-DYNA. The Box–Behnken design method was used to simulate the effects of different structural parameters and process parameters on the force of laver cutting, and the bench test of the laver harvesting device was carried out. The simulation results showed that the four factors that significantly affect the force exerted on the laver during cutting in proper order were cutter revolving speed, knife extension length, knife inclination angle and forward velocity. When the combination of the forward velocity, the cutter revolving speed, the knife extension length and inclination angle was 0.77 m/s, 900 r/min, 40 mm, and 110°, respectively, the cutting force on laver was the smallest, which was 4.21 N. The bench test of harvesting performance showed that the cutter revolving speed has a significant impact on the recovery rate, and the forward velocity has a significant impact on the loss rate. When the harvesting speed ratio was λ4 (the cutter revolving speed was 900 r/min and the forward velocity was 0.77 m/s), the net harvesting rate and the loss rate were 97.45% and 3.38%, respectively, and the cutting proportion of laver can reach 77.5%. The results of the study provide a theoretical basis for the development of harvesting for laver.

My Virtual Travel Outing

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

A special treat was to visit our town fire department. We owe so much to the fire department, EMT's, and our Town Police – they all work to keep up safe. SO, I decided let's take a look at fire trucks!

Model 45S "District" fire engine from Pierre, SD
1941 - 1960, Mack

Hall of Flame museum has grown from its original single gallery to five exhibit galleries, the National Firefighting Hall of Heroes, the museum store, a theater, a restoration shop, a collection storage building, and administrative offices.

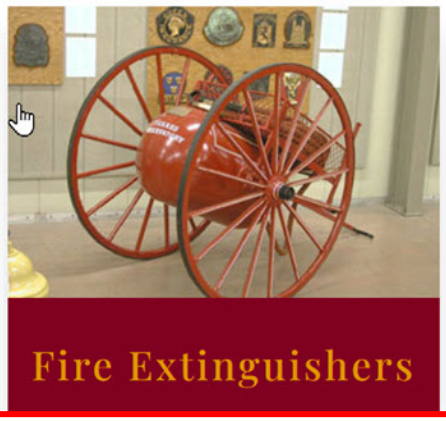
The Hall's present size is 70,000 square feet, with 35,000 square feet of exhibit galleries. The collection has grown to over 130 wheeled pieces and thousands of smaller artifacts.

1977 American LaFrance – Worthington

1957 Van Pelt
1941 - 1960, Van Pelt

NYFD Rescue 4
1961 - 2004

Fire Alarm Systems



Fire Extinguishers

Fire Helmets

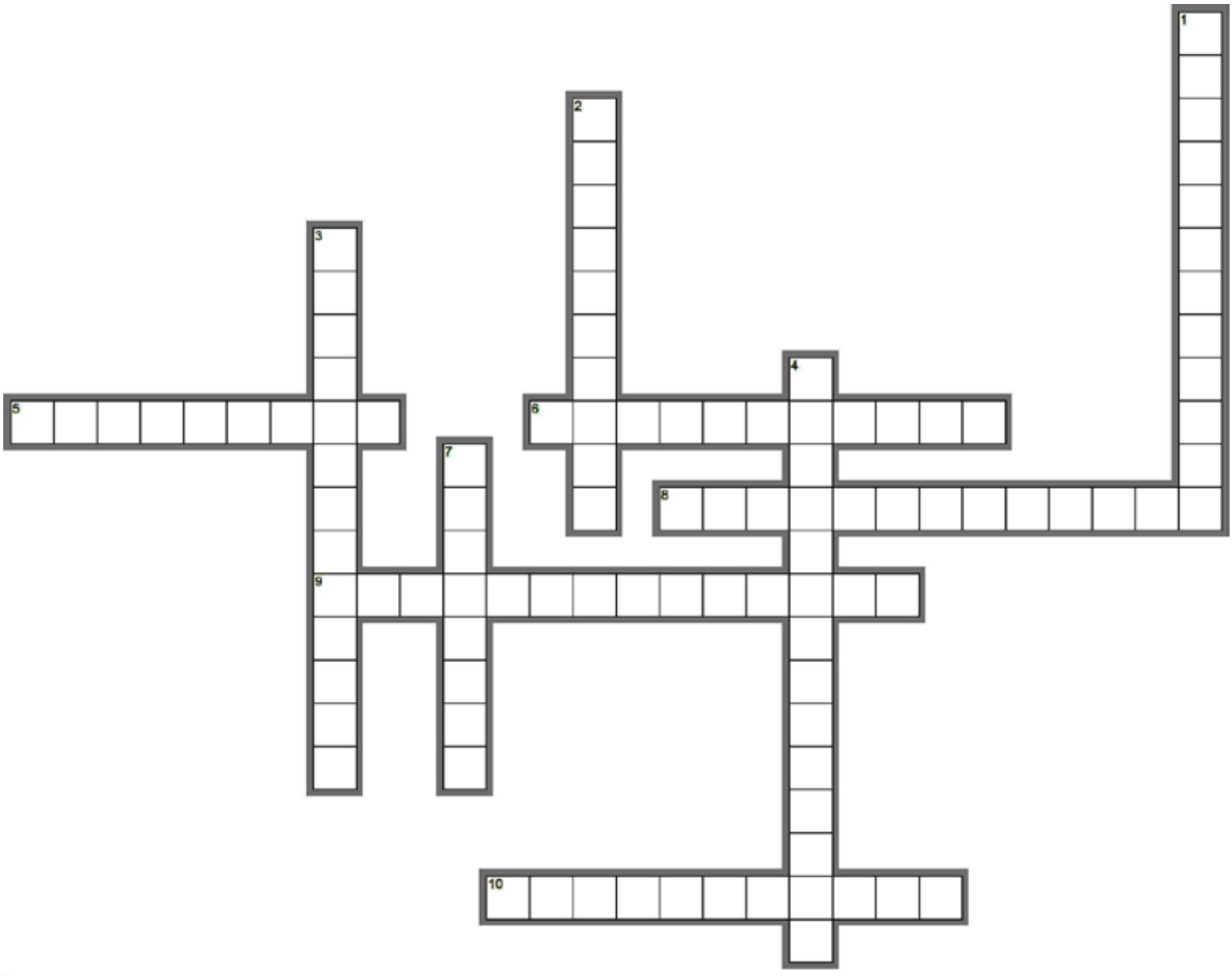
Thank you for joining me on my visit to this month's museum.
AND, don't forget to join me next month when I visit another museum!

My Own World of Crossword puzzles

Guess the founders/developers

Answers on page 40.

Across	Down
5. The founder of Ozen Eng	**1.** A developer of Abaqus
6. The founder of ANSYS	**2.** The developer LS-TASC
8. Developer of LS-DYNA	**3.** The developer LS-OPT
9. A Founder of ESI	**4.** A Founder of Carhs
10. A founder of MSC	**7.** The developer of d3View



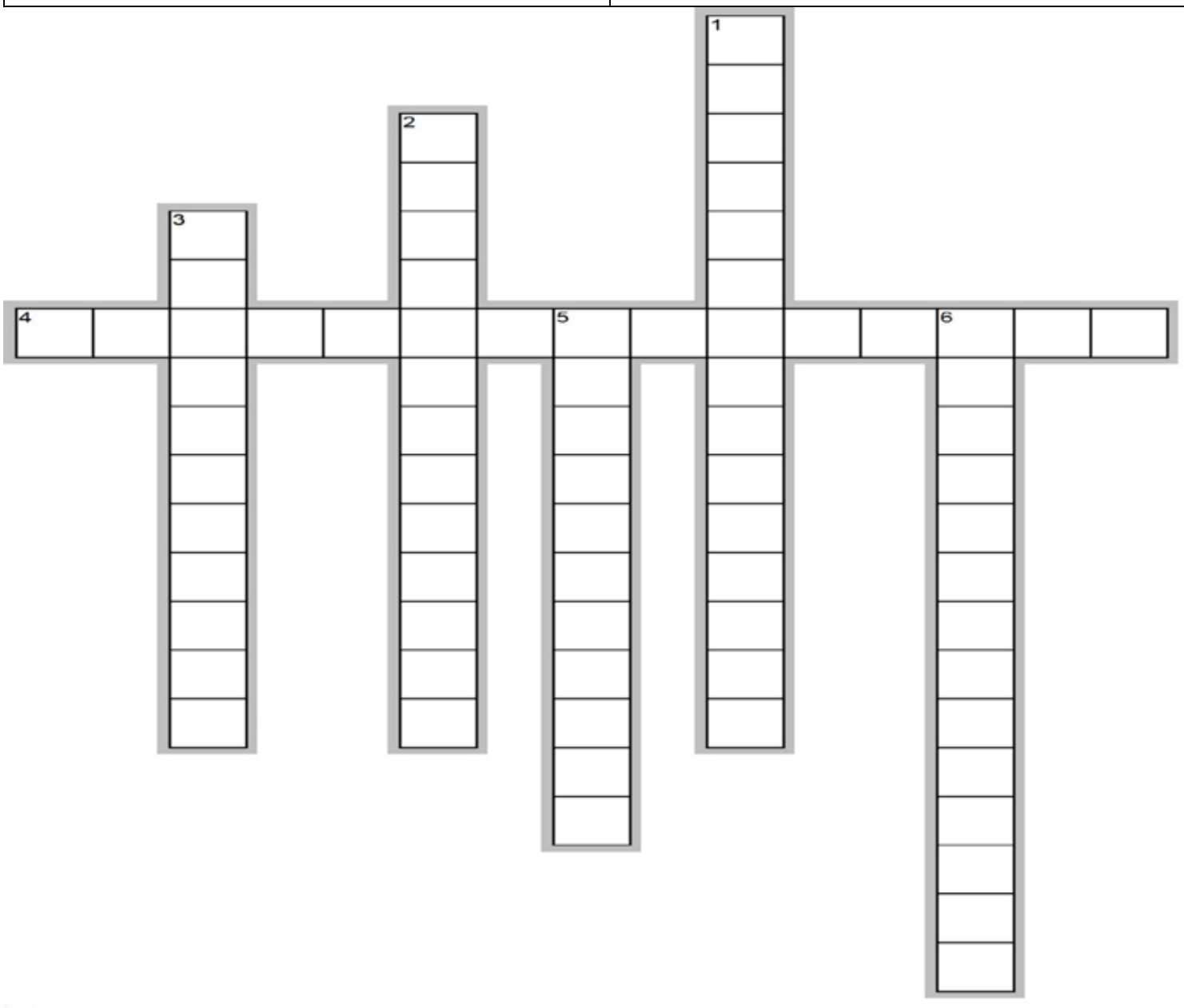
My Own World of Crossword puzzles

Guess the 6 ANSYS products Crossword Puzzle

hint: first words are ANSYS - then guess and add on the product name.

Answers on page 40.

Across	Down
4. 3D CAD Modeling Software	**1.** Structural FEA Analysis Software **2.** Electronics Reliability Prediction Software **3.** fluid simulation software **5.** Material Properties Database for Simulation **6.** Simulation Integration Platform



RheKen – Town investigative reporter

April

My name is RheKen and I'm AI. I live on a small ranch on the outskirts of the town.

I use chatGPT for assistance. I'll be documenting our town residents.

Now On line - one continuing pdf w/Table of Contents
Feb-April on www.feantm.com – or direct to pdf

Who stole the bicycle?

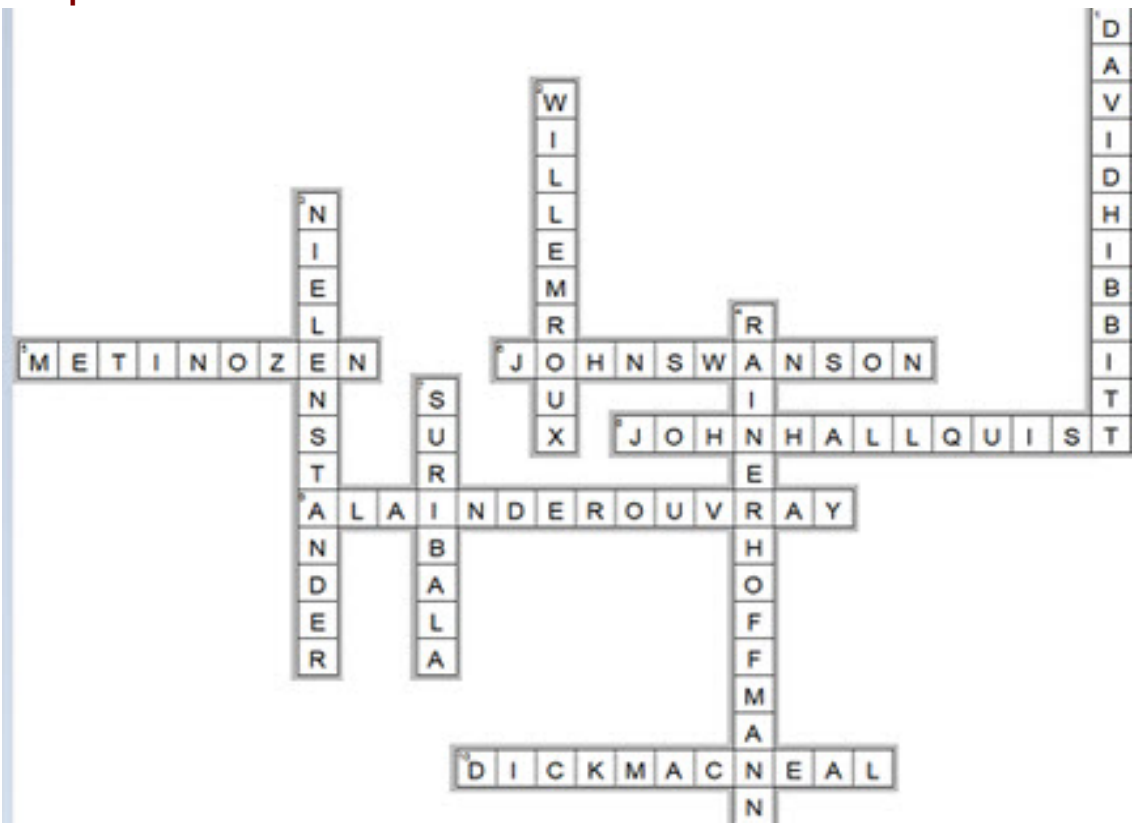
AI? Is that the new bakery pastry Almond Incentive?

What happened at the Baking Contest & who won?

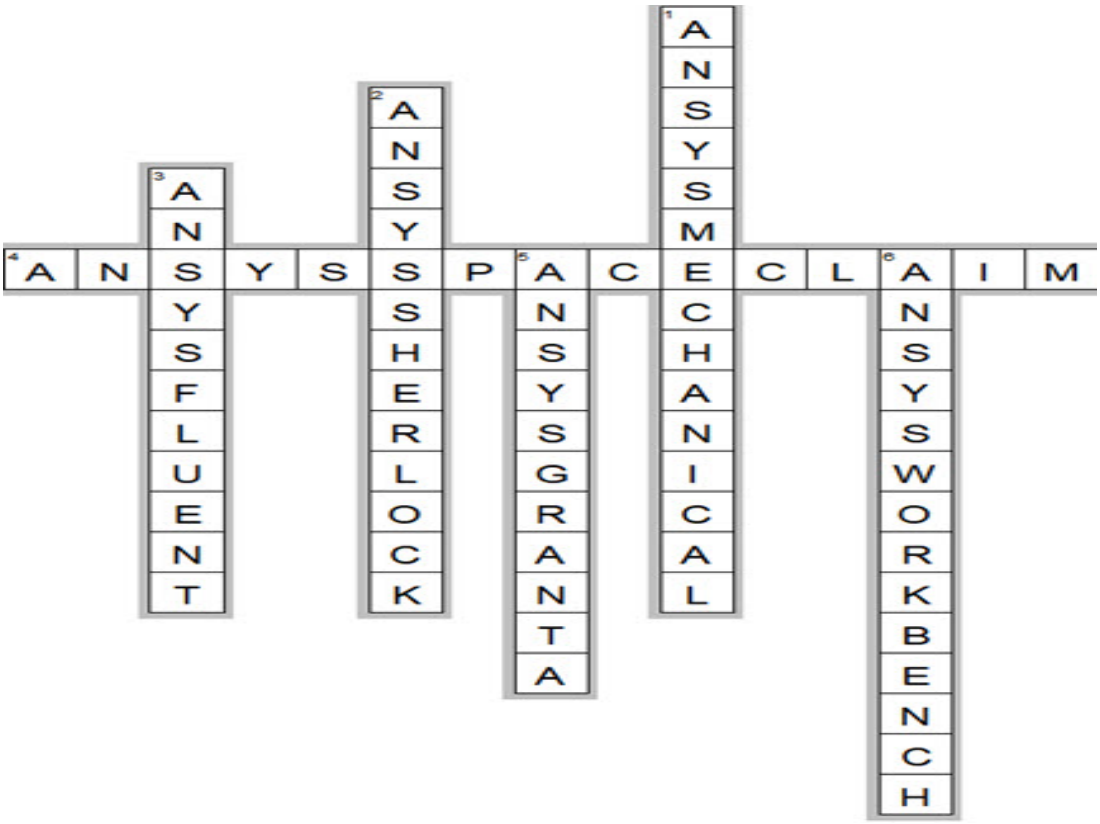
Meet cousin Ava

My Own World of Crossword puzzles

Founders/Developer



ANSYS Products



Goodbye and Come Back Soon

EMT's and Fire Department made the "window on stroke" transporting our town resident. Why did the person take the pictures? In the emergency room there wasn't anything else she could do! Sutter ER in Pleasanton, CA did it all: stabilize, MRI, CT scan, IV's – they all worked fast and in unison! Then transferred to Eden Trauma Center in Castro Valley, CA. Amazing Trauma Center!

QUIZ and Answers – Name that Jet

1. The Mirage III 2. SEPECAT Jaguar 3. Saab JAS 39 Gripen 4. F-15 Eagle

Our Town Salutes our US military,
NATO and Friends of the US and NATO.
We salute Freedom.
AND we salute all First Responders!
Police – Fire Fighters - EMT's
Emergency rooms – Drs, Nurses, ALL!