

Entering Town
FEA Not To Miss
(pop. virtual)
WELCOME

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

Airport-Bell



Airport-TUSAS & Baykar



Automotive-Ford



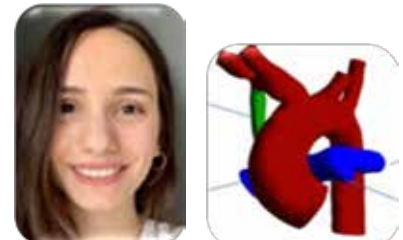
RheKen Interviews Hans



Rancher & Scout



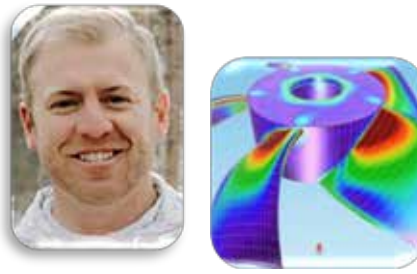
Eirini



Abhinav



Andrew



Barbara



Curt



Kathleen



Marcia



Markus



Seppi & Marta



Uday



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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

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



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- The individuals and organizations mentioned below are to whom the town expresses its gratitude.
- The above doesn't imply that they are the author or affiliated with a particular department.

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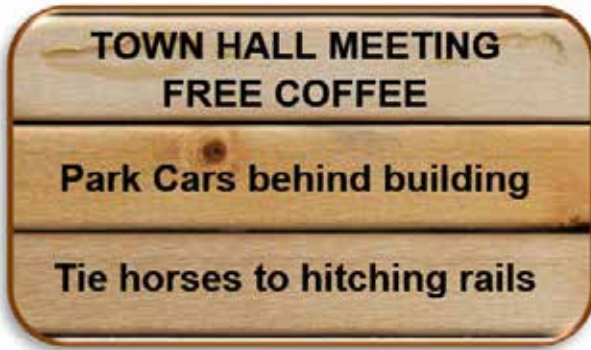
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Goodbye Page - Quiz Answers, Thank you, Goodbye monthly Picture

Welcome to our Town Hall Meeting and Announcements



Serving coffee & burnt cookies!

Yes, the cookies were baked by our Supervisor.

Our town consists of individuals who are passionate about finding solutions, as well as caring about animals and children.

Gossip is at the local coffee shop.

Pets are welcome. Horses, pet goats stay outside.

The AI/ML building: We have re-opened the building for a round-table discussion.

The moderator: Rheken!

The topic: FEA fundamentals and AI.

The question: Does an engineer need to understand the fundamentals of FEA?

Welcome: The town welcomes visitors: Andrew, Barbara, Chris, Marcia, and Uday.
Make sure not to miss their articles.

The Old Pilot has shaken things up (Oh, does that mean he's disruptive?)

Anyway, he has a new quiz for this month – "Name that pilot."

No, you can't google the answers.

Supervisor: There seems to be yelling by the coffee area!

I hear the Town Secretary screaming, "I insist on a vote, I demand a re-count!"

Actually, there was never a vote to even have a re-count.

We didn't have her ANSYS crossword puzzle page ONLY due to page constraints.

Someone please ask her to stop yelling, the crossword puzzle will be in next month.



Software -

AutoDesk – Tinkercad
Create custom shapes to build detailed, intricate models.

The sky's the limit!



Call for Papers

Join us at the CADFEM Conference on April 10-11, 2024, where renowned international speakers will deliver keynotes. Engage in discussions and talks at the dedicated CADFEM Area.



Follow-Up

Did you know our latest conference content & presentations are available on our website.



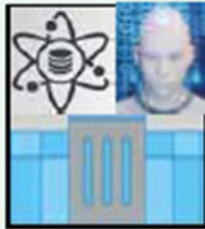
Medical

A Paper by Eirini Kardampiki.
The Hemodynamic Effect of Modified Blalock–Taussig Shunt Morphologies: A Computational Analysis Based on Reduced Order Modeling.



Town Map

Horse Trail →



Auto Race track & Auto Industry



Petting Zoo



Old Rancher



Rival Cafe

Elect/Water. & Sewage Treatment Plant Facilities

- The logos displayed above represent companies with solutions and should not be interpreted as endorsements. If you wish to have yours removed, kindly inform us at feanswer@aol.com.
- Proceeds from the auction of your town lot will be allocated to the coffee budget by the Town.
- The map is subject to change based on new information, and lots will be rotated accordingly.

**My Physics Café: CAE Analyst and a passionate blogger**

Seat belts are a vital part of a car. They help keep the driver, the front seat passenger and the rear seat passengers safe and secure in the case of a collision. But here's the thing: not everyone uses them. In fact, a shocking number of drivers and passengers go about their daily lives without buckling up at all.

**How Seatbelts protect you during a crash?**

This blog will focus on simplified explanation of what exactly happens during a car crash and how using seat belt is a good practice.

EXCERPTS – The full article with links are on my website.

Each year, hundreds of thousands of people die in traffic accidents. The severity and frequency of these fatal collisions has led to laws requiring the use of seat belts or other restraints for the safety of motorized vehicle passengers. In most cases, improper usage of a seat belt is malpractice resulting from ignorance or neglect on the part of motorists who fail to understand its nature and purpose.

Car crashes can be fast and intense. One might be surprised to know that car crashes have the potential of reaching up to 60 g during an accident without even buckling your seatbelt. According to the National Highway Traffic Safety Administration, wearing a seatbelt can reduce their chances of dying in a car accident by 45% and reduce their risk of injury by 50%.

The reason behind this remains inconclusive but many believe that it is because of the impact factor. The impact factor is what we also refer to as force when dealing with collisions. To derive the impact force equation, you can consider the law of conservation of energy. We know, at the beginning, a moving object possesses kinetic energy that reduces to zero after the collision.

To fulfill the law of conservation of energy, one must compensate the change in kinetic energy which we express it with the impact force equation:

$$F = m * v^2 / (2 * d)$$

F is the average impact force, m is the mass of object, v is the initial speed of object & d is the distance traveled during collision.

What even more surprising is that extending the distance you travel or are capable of traveling during a collision actually reduces the average amount of impact force exerted on an object during said collision. In other words, longer distance traveled equals less impact force ultimately resulting in less injuries sustained by either party (as well as less damage done to your vehicle).



What's highly dangerous for a human being is the change in velocity caused by an acceleration or deceleration on that specific moment. This means if one undergoes a sudden increase in velocity while moving a certain distance, he/she must do enough work to slow oneself down back to your original speed again.

Now here comes another surprise!!

A special case of Impulse & Momentum equation. Upon simplifying the impact force equation further,

we get: $F = v * m / t$

Here you can clearly see that extending the time of collision will decrease the average impact force.

No matter where you sit in a car, the impact force that prevents your body from further moving is comparable. This means that even if you are in the backseat, you have as much chance of surviving a collision as someone who sits behind the steering wheel. To understand this seemingly backwards idea, we have to consider the law of conservation of energy.

At the beginning, an object has kinetic energy which reduces to zero after the crash. In order to ensure your chest (and other vital organs of your body) doesn't accelerate at more than 60g for longer than 3 milliseconds, you need to know how strong each part of your car is and how fast it will be travelling before impact.



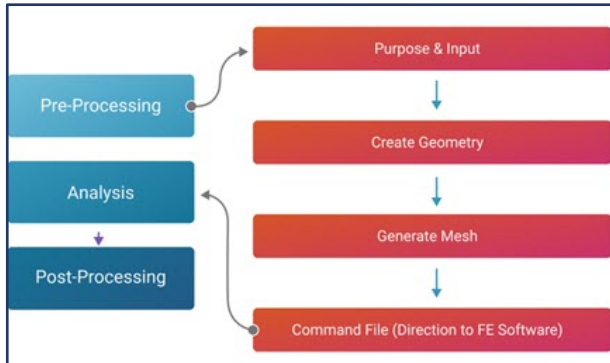
So, to sum up, the airbags and seatbelts in your car work together to help protect your body in the event of a car accident. The seatbelts are designed to pull your body back into the seat so it doesn't hit hard objects inside the car, like the steering wheel or windshield while the airbags are designed to spread out the impact of your body hitting the inside of the car so you have less force to deal with all at once.

Always remember, Safety starts with 'S' but begins with You!



RESCALE: With its ability to simulate real-world scenarios and provide valuable insights, finite element analysis (FEA) is an indispensable tool for engineers seeking to optimize designs, improve performance, and ensure the integrity of structures and components. Finite Element Analysis (FEA) is a computational technique used to approximate and analyze the behavior of complex physical systems.

Finite Element Analysis (FEA) is based on the concept of dividing a continuous domain into smaller, finite subdomains called finite elements.



Excerpt [Harnessing the Potential of Finite Element Analysis: Transforming Engineering Design and Testing](#)

Author - Andrew Clark

Each finite element represents a portion of the domain, and together they form a mesh. Meshes are one of the most essential components in 3D modeling. A mesh for FEA is any object that an engineer can manipulate to form different shapes and forms that approximates the geometry of the system being analyzed.

In finite element analysis, the behavior of the system is described by a set of mathematical equations that govern its physical properties and interactions. These equations are typically derived from the principles of physics, such as Newton's laws of motion or the equations of elasticity. By breaking up the system into finite elements, the complex equations can be approximated and solved numerically.

The FEA Process: Three Stages to Comprehensive Analysis - FEA typically involves three main stages, which are commonly referred to as preprocessing, solution, and post-processing. These stages are essential in conducting a comprehensive analysis of a physical system using the finite element method.

Let's delve into each stage:

- 1. Preprocessing:** The preprocessing stage involves several tasks that lay the foundation for the analysis:

 - Geometry and Mesh Generation:** The geometry of the system is defined, either by importing a CAD model or creating it within the analysis software. The domain is then discretized into a mesh consisting of smaller finite elements, which approximate the system's geometry.
 - Material Properties:** The material properties of the components within the system, such as elasticity, thermal conductivity, or fluid behavior, are specified.
 - Boundary Conditions:** The boundary conditions are defined, including constraints, loads, and constraints applied to the system. These conditions define how the system interacts with its environment or external forces.
 - Element Types:** The appropriate element types are selected based on the nature of the problem and the behavior of the system. Different element types, such as beams, shells, or solid elements, may be used to accurately represent the system's geometry and physical behavior.



2. **Solution** The solution stage involves solving the formulated equations to obtain the unknowns and generate results:
 - Equation Assembly:** The equations that describe the behavior of the system, such as the equations of motion or governing equations of heat transfer, are assembled based on the finite element “discretization.” This step involves combining the equations associated with individual elements to form a global system of equations.
 - Numerical Solution:** Various numerical methods, such as direct solvers or iterative techniques, are employed to solve the system of equations. The solution yields the values of the unknowns within the system, such as displacements, temperatures, or fluid velocities.
3. **Post-Processing** : The post-processing stage involves analyzing and interpreting the results obtained from the solution stage:
 - Visualization:** The results are visualized to aid in understanding the behavior of the system. This can include contour plots, deformation animations, or stress distribution maps.
 - Quantitative Analysis:** Quantities of interest, such as maximum stresses, displacements, or heat fluxes, are extracted and evaluated. These values are often compared against design criteria or standards to assess the performance of the system.
 - Sensitivity Analysis and Optimization:** Post-processing can involve sensitivity analysis or optimization techniques to explore the effects of design parameters or to optimize the system’s performance based on specific objectives.

By following these three stages, engineers and analysts can effectively apply the finite element method to study and gain insights into the behavior of complex physical systems and make informed engineering decisions.

...

What Is the Difference Between FEM and FEA? The terms “FEM” (finite element method) and “FEA” (finite element analysis) are often used interchangeably and refer to the same underlying concept. However, if we were to make a distinction, it could be understood as follows.

The Finite Element Method: FEM is a mathematical technique used to approximate and solve complex physical problems by dividing the problem domain into smaller, finite elements. It involves formulating the governing equations of the system, dividing the domain into finite elements, and solving the resulting equations numerically. FEM provides the mathematical framework and methodology for solving the problem.

Finite Element Analysis: FEA refers to the application of the finite element method to analyze and simulate the behavior of physical systems. It encompasses the entire process of using the FEM, including preprocessing (defining the geometry, creating the mesh, specifying material properties and boundary conditions), formulation (establishing the governing equations), solving the equations numerically, and post-processing (interpreting and analyzing the results). FEA is the practical implementation of the FEM for solving specific engineering problems.

In short, the FEM is the mathematical method, while FEA is the practical application of that method to analyze and solve real-world problems. However, in common usage, the terms FEM and FEA are often used interchangeably to refer to the overall process of using the finite element method for analysis.

Complete Information is located on the website



Applus DatapointLabs: A big Thank You to CADFEM Suisse for an excellent Conference – Superb Program & Organization! Our Lab - Applus DatapointLabs - was delighted to be part of the recent CADFEM Ansys Simulation Conference Switzerland 2023 - the country's largest annual event for Simulation.



On 15 June, 300 participants came to the banks of Lake Zurich, to OST — Ostschweizer Fachhochschule, Campus Rapperswil, to enjoy an inspiring and exciting program featuring applications of Ansys simulation in different physical domains, such as Structural Mechanics, Electromagnetics, Systems, CFD Computational Fluid Mechanics, Particles and more.

It was a great pleasure to meet representatives of different industry sectors at our exhibition booth and to hear about the wide range of applications for simulation in today's product development.

For many years DatapointLabs has been a reliable partner to Ansys and LS-Dyna Users, for expert material testing, design-quality material data, and ready material cards for Ansys and LS-Dyna.



The winner of the Best Paper contest is Mr. Alain Capt from Bernina. Mr Capt has been elected out of the 37 presentations of the day.

At the closure of the Simulation Conference, the attendees enjoyed the warmful atmosphere during the aperitif that took place by the lake.

Exciting presentations and the opportunity to network with the CADFEM Simulation community under stunning views of Lake Zurich, made this a truly memorable conference created and hosted by CADFEM Suisse at a beautiful venue.



Simulation Conferences of 2023 and 2024 www.cadfem.net

- | | | | |
|------------|----------------------|---------------|------------------------|
| 09/14/2023 | Switzerland Lausanne | 04/10-11/2024 | Darmstadt, Germany |
| 10/18/2023 | Switzerland Tessin | 06/06/2024 | France |
| | | 06/13/2024 | Switzerland Rapperswil |

Barbara Leichtenstern, Applus DatapointLabs

leichtenstern@datapointlabs.com Expert Material Testing www.datapointlabs.com



FEANTM: What you need to see, if you didn't see it.

Discover the unseen, my personal recommendation(s). Presentations, blogs, and essential information that warrants your attention. Stay tuned as I bring you fresh insights and updates every month. Please note the following are excerpts.



Prof. Syn Schmitt: Musculature and machinery... Research goal: aid device for humans:...

The results of the biophysical research carried out by Schmitt's team of about 20 people are currently being incorporated into an intelligent assistance device for patients with neurodegenerative movement disorders (iAssistADL). The research group has set itself the goal of developing an aid device for people whose hands tremble uncontrollably by 2024. As Schmitt explains: "People who suffer from this tremor in their arm can neither write nor drink from a glass. Our goal is to develop a robotic system that would be virtually invisible under clothing,

... but would still interact so closely with those affected that it would perform many of the arm's functions for them, recognizing whether they want to reach for a glass and drink or whether they want to pick up a fork and eat." The researchers use a robotic arm mounted on a chair, but first have to train it to carry out its respective functions. To achieve this, they intend to write a program that will evaluate sensor data and recognize the context the user finds them self in and what they are planning to do.

"Whilst we can't peer into the brain, we have to get as close as possible to the decision-making process" Prof. Syn Schmitt... Although we already have artificial muscles, powering the computers and the energy supply are problematic, which is why Schmitt and his team are studying how information is processed in natural systems. "Biological systems can do it: we can hit a dartboard, run, or play the piano all without a huge fast central computer. Of course we have a brain with millions of neurons but it has a relatively low signal processing speed." Energy is stored in the muscles themselves as well as in the organs. "Everything would seem to suggest the use of distributed processing and energy storage for modern robotic systems," Schmitt explains.

Acquittal in the "Bathtub Murder" case? The idea of using simulations to prove things that people instinctively rule out first suggested itself to the researcher as he was preparing his dissertation in theoretical astrophysics in Tübingen under Prof. Hanns Ruder. **Schmitt achieved nationwide fame with a simulation of the "bathtub murder" in Rottach-Egern when he demonstrated that it was highly probable that a senior citizen could have fallen into a bathtub and suffered the injuries noted in the autopsy, with no fault on the part of anyone else. Manfred Genditzki, who had been convicted of the murder, was released in 2022 partly on the basis of Schmitt's expert opinion after the court accepted the simulation of human movements as a new form of evidence.**

A retrial is now taking place, with a verdict expected in early July 2023. In the opinion of renowned jurists, an acquittal would be a truly historic event in German judicial history. Never has a person convicted of murder by a jury been acquitted after so many years - and the Stuttgart simulation methods would have played a significant part in this. "Fundamentally, therefore," says the researcher, "it would be a question of rethinking human forensics. Biophysical simulations could be used to account for the dynamics leading up to an important incident and come to objective conclusions."



ANSYS: Call for Abstracts are now Open! All LS-DYNA users and attendees are invited to contribute to the agenda with a short presentation from their own areas of interest and expertise. A full paper is not required for the user conference. However, you we do ask that you prepare an extended abstract alongside your presentation before the event.



[LS-DYNA User Forum 2023 Information - Register Now for free today - space is limited](#)

Discover the latest innovations around LS-DYNA at our largest North American LS-DYNA user forum in Detroit, Michigan. Join us for a packed 2-day event as we showcase exciting keynotes, dozens of user presentations across parallel tracks, networking opportunities with hundreds of expert users and a poster session for targeted discussions.



Location:

Suburban Collection Showplace
46100 Grand River Ave, Novi 48374

What can Attendees Expect:

The LS-DYNA user forum acts as a catalyst to accelerate cutting-edge innovation for LS-DYNA by bringing together hundreds of experts from all across the world.

We will discuss key topics like crash, A&D, NVH, composites and more - attendees can expect to stay up-to-date on the latest features and workflows, discover new and collaborative solutions, enhance product development efforts, and cultivate shared best practices with LS-DYNA users towards an industry-driven future.



2022 LS-DYNA US Conference Highlights

200+ Live Attendees	60+ Key Companies	10+ Technical Sessions
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AutoDesk: Tinkercad - Create custom shapes to build detailed, intricate models. The sky's the limit!

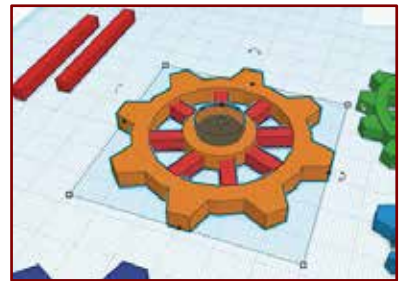
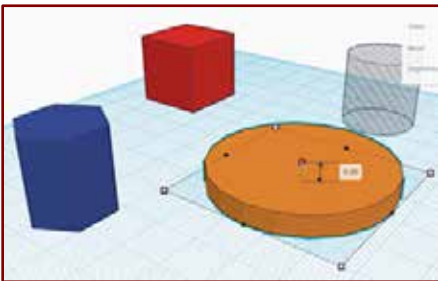
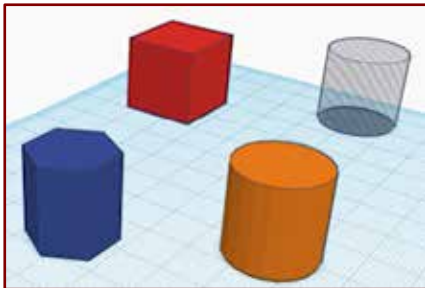
If you can dream it, you can build it. From product models to printable parts, 3D design is the first step in making big ideas real. Free for everyone

No downloads. No strings attached. Start creating from the first click.

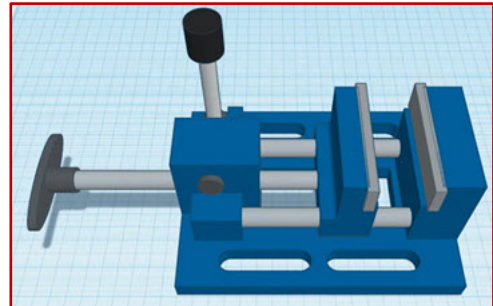
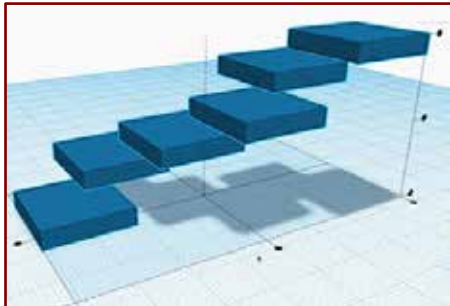


Tinkercad is a free web app for 3D design, electronics, and coding... Build STEM confidence by bringing project-based learning to the classroom.

Ad-free and kidSAFE-certified to ensure privacy and a safe learning environment.



- **Place a shape** - Shapes are the building blocks of Tinkercad. You can add pre-existing shapes, or import your own.
- **Adjust objects** - Simply rotate the workplane to adjust shapes or change views. Input exact dimensions with the ruler.
- **Combine elements** - Create custom shapes to build detailed, intricate models. The sky's the limit!



Endless possibilities

- **Align** - Easily preview and align multiple objects along any axis. You can also align objects relative to a reference shape.
- **Duplicate** - Create exact copies of a shape. Duplicate and repeat to apply the same changes to each new instance.
- **Ruler** - Place a ruler to type in exact dimensions and measure the distance between objects for precise 3D printing.

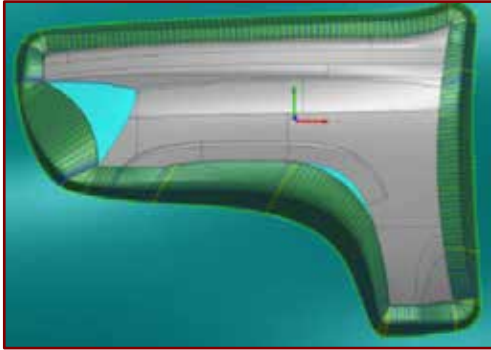
Visit the website to discover all the possibilities, download and get started with the tutorials



ETA: Dynaform 7 - You can download a demo from the website and watch an introduction video.

Dynaform 7 is a quick-and-easy die face design that enables a more accurate, more robust estimation process.

EXCERPTS [Dynaform 7 Introduces Die Face Design Capabilities](#)



A quick-and-easy die face design that enables a more accurate, more robust estimation process.

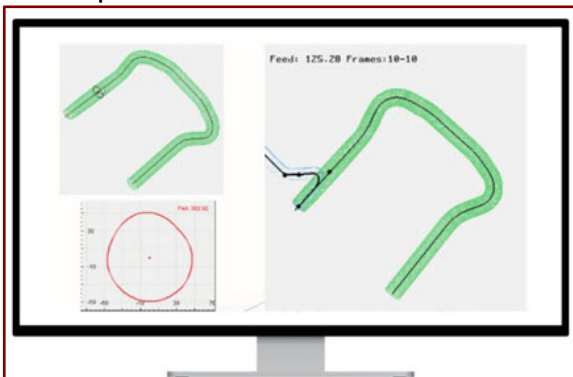
Die Face Design increases process reliability, efficiency, and cost reduction by bridging and streamlining the estimation and tool-building processes.

Economical productivity	Speed and Efficiency	Best-in-class Estimation	Highly Accurate
Cost-effective forming tool design using best-in-class simulation.	Quickly perform feasibility studies using die face design and formability evaluation.	One simple interface that guides you through cost estimation, quoting, die evaluation, and formability with precision.	Accurate forming simulation results and springback correction through the LS-Dyna solver.

Dynaform 7 Introduces Die Face Design Capabilities

A quick-and-easy die face design enables a more accurate, more robust estimation process. Die Face Design increases process reliability, efficiency, and cost reduction by bridging and streamlining the estimation and tool-building processes. Dynaform 7's Die Face Design capabilities include:

- Die Face Preparation: Surface edit tools aiding user in generation of binder and addendum with Dynaform 7.
- Binder Creation: With Flat, Profile, and Manual options, users can create best-fit binder for process and die surface.
- Addendum Creation: Create addendum swiftly and as intricately desired, using different addenda profile features.



TBF / Tube Bending & Forming - Process setup and simulation for tube-bending and forming processes. Based on product geometry, TBF can automatically (or manually) setup tube-bending and hydroforming processes, generating tooling and validation processes.

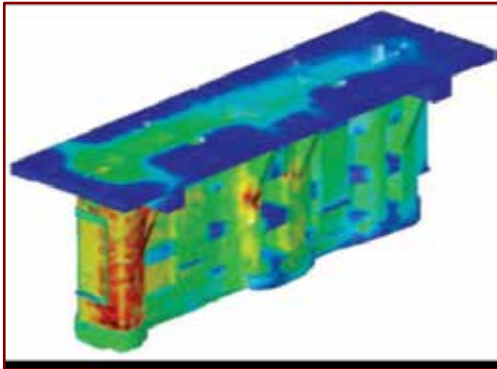
Automatic Bending Process - Check the feasibility of product shape designs within a few minutes.

Bending Table Tools - The bending table supports editing, inserting, and deleting and can simulate tub feeding, rotating, and bending simultaneously.



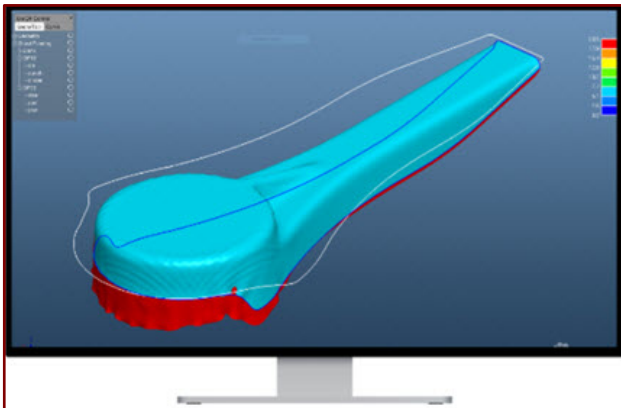
Geometry & Automation Tools - Define tube product geometry, edit the mesh of tube products, and identify tube State/End sides automatically.

Center Line Calculation - Center lines can be calculated automatically or edited manually.



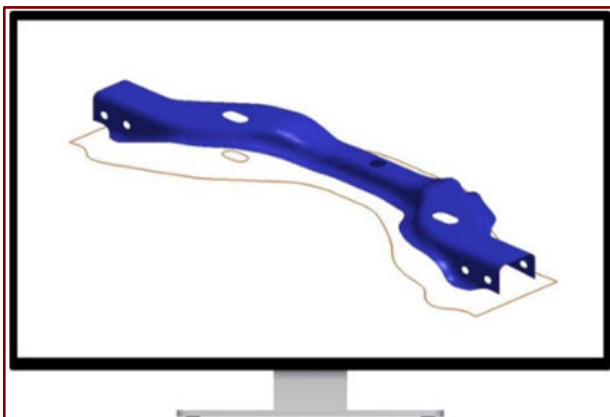
Formability Simulation - Dynaform's forming simulation software makes it possible to uncover design flaws early in the process. Using the various modules, engineers can more-fully evaluate alternative—and unconventional—designs. Doing so helps ensure higher-quality outcomes.

- Springback - Accurately predict springback during the forming process.
- Drawbead optimization - Optimize the design placement of drawbeads in the forming process.
- Springback compensation - Determine how to adjust the forming tooling or part design to compensate for springback effects.



Blank & Trimline Development - Determine a blank's optimal shape and size before producing any physical parts. Accurately predict the deformation, thinning, and stretching that will occur during the forming process to determine the initial size and shape of the blank. Predict the final shape and contour of a part after trimming, ensuring that final part meets your specifications and quality standards.

- Save Time - Run iterations and optimizations automatically
- Industry Leading Accuracy - With options to change tolerance for convergency
- Intuitive - Simple setup process and interface.



BSE / Blank Size Engineering - Process setup and simulation for tube-bending and forming processes. Based on product geometry, TBF can automatically (or manually) setup tube-bending and hydroforming processes, generating tooling and validation processes.

- **Deep Drawing** - Single-part and asymmetric multi-part blanking and nesting solutions.
- **Progress Die Support** - Dynaform 7 helps optimize the strip concept.
- **Line Die** - Tailor-welded blanks and patchwork blanks.
- **Increase Efficiency** - Reduce cycle time and increasing the overall productivity of the operation.



Kaizenat: Below is a simulation by Sandeesh KV, Kaizenat Analysis and Simulation Engineer.

The software used is Ansys Mechanical Workbench to evaluate the deformation in an Industrial robot arm when it is under operation.

Industrial Robot Arm Simulation

Scope: The main aim is to evaluate the deformation in Industrial robot arm, when it is under operation.

Approach: It involves revolute joints and fixed bottom constraint. The bottom face is fixed using the body ground joint contact in robotic arm bottom. The joint 1, joint 2, joint 3, Joint 4 and Joint 5 are constrained using revolute joint contacts with variable step loading. The loading conditions are not constant all the joints, reduction in the loading considered in the simulation model approach due to reduction in mass at every joints.

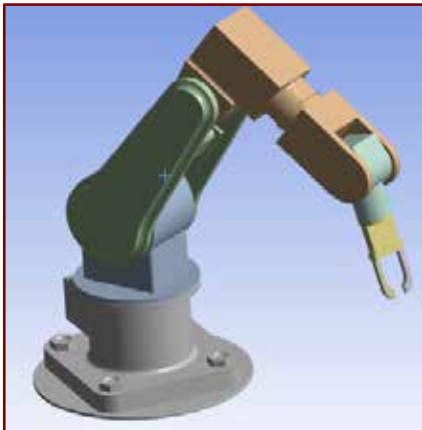


Fig1: Industrial Robot Arm model

Specifications:	Material Properties:
<ul style="list-style-type: none"> Joint load1 = 27 N Joint load2 = 27 N Joint load3 = 22 N Joint load4 = 19 N Joint load5 = 17 N 	<ul style="list-style-type: none"> Youngs modulus = 2e+05 MPa Poisson's Ratio = 0.3 Bulk Modulus = 1.6667e+05 MPa Shear Modulus = 76923 MPa

The Dynamics of the Robot motion is described by.

$$M(\theta).\ddot{\theta} + C(\theta, \dot{\theta}) + G(\theta) = \tau + S(F_{xyz}, tool, \theta)$$

θ = Positions of all joints.

M = Mass-matrix.

C = Vector of Coriolis forces.

G = Gravitational forces.

T = Torques in all joints.

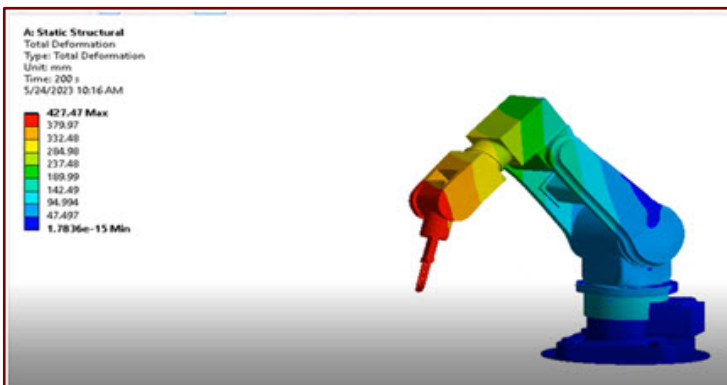


Fig 2: Total Deformation of Industrial robotic arm

The complete details in the simulation are located on the above simulation URL.

If you have any questions, please contact us.

Email: info@kaizenat.com

Phone: +91 080 41500008

RESULTS: The above figure describes maximum total deformation = 0.427m. The Variable step loading is considered for the given analysis problem. The main aim is to find the deformation in the joints when the robot is under operation. At given input loading, the industrial robotic arm is deforming beyond the expected results trends. So, need to the change the material to withstand the prescribed joint load conditions OR redesign and reduce in input joint loads.



DYNAmore: We have Seminars, Information Days & Webinars

A few of the classes that we offer in July are the following

- Intro to LS-DYNA
- Nonlinear Implicit Analyses -
- Contact Modeling in LS-DYNA
- Parameter Identification with LS-OPT
- Polymers/Elastomers

- Sheet Metal Forming in OpenForm
- Intro to Draping Simulation w/LS-DYNA
- GENESIS - Structural Optimization
- LS-DYNA Compact: Basics of Structural Optimization

DYNAmore Training Information

Seminars

Sept 11 -	LS-OPT - Optimization & Robustness	Katharina Liebold, Charlotte Keisser
Sept. 12,19,25	Introduction to LS-DYNA	Dynamore staff members
Sept 12	ALE and FSI	Mhamed Souli, Julien Lacambre
Sept 14	Modeling Metallic Materials	Dynamore staff members
Sept 14	Smoothed Particle Hydrodynamics	Mhamed Souli, Jingxiao Xu, Julien Lacambre
Sept 22	CPM Airbag Modeling	Sebastian Stahlschmidt, Steffen Mattern
Sept. 25	Implicit Analysis using LS-DYNA	Tobias Erhart, Pierre Glay, Christoph Schmied
Sept 27	CESE Compressible Fluid Solver	Iñaki Çaldichoury
Sept 28	Discrete Element Method	Maik Schenke
Sept 29	Simulation of thermoplastics	Martin Helbig

Webinars

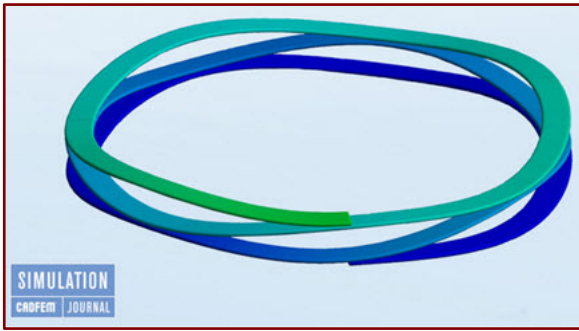
Sept 11	LS-DYNA Compact: Joining Techniques in LS-DYNA	Tobias Graf, André Haufe, Markus Feucht
Sept 18	LS-DYNA Compact: Damage and Failure	Filipe Andrade
Sept 25	LS-DYNA Compact: Introduction to LS-PrePost	Silvia Mandel
Sept 20, 27	LS-DYNA Compact: Introduction to LS-DYNA	Dynamore staff members
Sept 20	LS-DYNA Compact: User Interfaces in LS-DYNA	Tobias Erhart
Sept 21	LS-DYNA Compact: Introduction to Isogeometric Analysis with LS-DYNA	Stefan Hartmann, Lukas Leidinger

Now Available on our YouTube Channel





CADFEM India: Springs as machine elements are generally well known and their behavior is relatively easy to calculate. However, the wave spring is considered an exception due to its more complex geometry. It's design and production are significantly more complex than other springs.



Excerpts: [Reliably develop customer-specific wave springs with FEM simulation and metamodel.](#) [Easily calculate springs](#) - the BAUMANN company in Switzerland is now breaking new ground. In a project supported by Innosuisse, BAUMANN is working with Eastern Switzerland University of Applied Sciences (OST) to develop a new type of workflow using Ansys simulation software.

Springs, stamped parts and other special parts are the focus of the range of products for automotive construction as well as industrial and medical use... **Wave springs enable a reduction in operating height of up to 60 percent compared to traditional coil springs, while maintaining the same spring force. The reason for this lies in the compact design of the springs, which is based on a sinusoidal wave shape combined with tangential points of contact.**

The wave springs manufactured by BAUMANN:

- One-piece manufactured wave springs have a flat characteristic curve, corresponding to an almost uniform force application, which is advantageous for many use cases.
- Suitable for spaces with diameters from 5 to 250 millimeters in static and slightly dynamic applications.
- Characterized both by the diameter & the number of coils and waves, as well as by the width and thickness of the wire and the material characteristics.
- All this together influences the force-displacement characteristic specific to each spring. Wave springs are versatile in their application
- Customers of BAUMANN can choose from a wide range of different types of wave springs, for example for door opening systems in cars, valves and switches, as well as administering ...

Martin Oswald, Head of Research & Development at BAUMANN. “Our solutions for customers are precisely tailored to the design and purpose of the device in question. For example, our products enable defined compression and rebound in valve systems or ensure braking in powered liftgate systems...”

Complex creation of prototypes - Previously, the design was carried out using a simple model approach, on the basis of which an initial offer was prepared with technical reservations. If the customer ordered a prototype, spring specialists at BAUMANN started manufacturing the first prototypes. Their design was based on an Excel-based layout environment, in which many empirical values were stored. With this method of working, an iterative approach was part of daily practice. Only when an acceptable solution was found in this way could sample production start to verify manufacturability. “Despite increasing requirements, the complexity in the design and production of wave springs should remain manageable for us,” explains Martin Oswald. **“That's why we have started a project together with Eastern Switzerland University of Applied Sciences to optimize our processes. The project was supported by Innosuisse and took two years. The aim of this project was to make our processes faster, more standardized and more digital.”**



Applus DatapointLabs: Our latest newsletter published that it is with bittersweet gratitude, we say hail and farewell to our founders, Hubert Lobo and Renu Gandhi, upon their retirement.

We move forward under the capable direction of new CEO Brian Croop, who has been with the company since 2002 and most recently served as lab director.



[DatapointLabs Founders Retire; Company Continues Focus on Materials in Simulation](#)

Datapoint Newsletter: Spring 2023, Vol. 29.1

Picture - Applus DatapointLabs staff celebrate move to new, expanded facilities in June 2021. Hubert Lobo, seated at front right; Renu Gandhi, standing fourth from left.

We celebrated this milestone with Hubert and Renu with a dinner at a local restaurant on March 21, 2023, which was also the 28th anniversary of the company's founding in 1995.

The company at first focused on testing a wide range of plastic materials with the aim of providing the physical properties data that were in great demand by product development organizations. In 2002, the Society of Plastics Engineers honored Hubert Lobo as a Fellow, recognizing his pioneering work in quantification of material behavior for CAE. In the same year, Hubert and Renu launched Mateareality to meet the challenge of managing vast amounts of highly diverse data. Hubert has received three US patents and authored dozens of publications on various aspects of materials in simulation.

Since our beginning, we have continuously pushed boundaries to expand our capabilities in testing and data management technology and methods, as well as in the types of materials tested.

We now serve a global clientele of more than 1,800 companies in 49 countries. To date, we have tested more than 30,000 materials - an average of more than 1,000 materials per year! We partner with software providers to support more than 30 simulation codes with TestPaks® to provide load-and-go material properties and formatted material input cards for CAE and FEA. Our seasoned, expert technical team operates ISO 17025 and Nadcap certified laboratories to test virtually any materials used in the products of today and those of tomorrow: plastics, metals, composites, foams, rubbers, additive materials, films, and adhesives.

As we look forward under new leadership, the core strengths of the company and our commitment to providing expert material testing services and digitalization software to improve the operational efficiency of materials and process engineering, test labs, and R&D to our global clientele remain unchanged.



CADFEM: Submission of Papers Open Until November 30th, 2023.

Experience the CADFEM Conference, a Two-Day Event on April 10-11, 2024, held at the prestigious Darmstadtium in Darmstadt, Germany. Be part of this exceptional gathering.



Call For Papers - On the two days of the conference, you can expect six main topics with keynotes from international speakers as well as a CADFEM Area with plenty of space for discussions and talks. You can then deepen the professional exchange at the evening event on the first day of the conference.



Submit your presentation - Become a speaker at the largest user conference for simulation and digital engineering in the German-speaking world. Submit your presentation now! You can still submit your paper even if you want to present a different topic. We look forward to your presentations! Just fill out our speaker form on the website and send your contribution to us by the end of November at the latest.

Your contact for further inquiries: Jennifer Geisel - jgeisel@cadfem.de

If you have a reference case for users in the fields of:	Presentation on current topics or want to submit a presentation on current topics such as:
<ul style="list-style-type: none"> • Structural mechanics • Fluid mechanics • Electromagnetics • Systems, multiphysics and embedded software • Simulation process and data management, materials knowledge management and model-based systems engineering 	<ul style="list-style-type: none"> • Product insight and design optimization through simulation • Coupled physics, system simulation and system engineering • Material & Energy efficiency through simulation • Simulation process and Workflow in product development • Tailored & Automated simulation and applications

Key Facts - Date: April 10-11, 2024

- Venue: Darmstadtium, Darmstadt
- Several keynotes
- Six main topics with customer and user presentations
- Duration of the presentations: approx. 20 min/speech
- Duration of Q&A sessions: approx. 10 min.
- Languages: Event language is German, presentations in German/English possible
- Lecture title will be the language of the lecture

Your benefits as a speaker

- Finally, a user meeting live on site. Present yourself, your knowledge and your company among a top network of engineers, users and decision makers
- Exchanges and discussions with other experts in the CADFEM Area and at the event
- For speakers, participation in the CADFEM Conference 2024 is free of charge on both days



Oasys: We had the pleasure of hosting the Oasys LS-DYNA UK Conference 2023. The conference was held at the Hyatt Regency Birmingham, in partnership with Ansys & sponsored by Rescale.

[Conference content and presentations are already available on our website](#) and YouTube channel so feel free to check them out.



We thank everyone that joined us at this event, and hope everyone left our conference feeling more knowledgeable, connected, and inspired.

From presentations delivered by industry experts to interactive sessions to discuss the latest CAE trends, the event was an amazing opportunity for our team to understand your needs and share the latest updates to our software.

We'd like to give special thanks to the speakers who shared fascinating insights and perspectives into their work in the field, Yun Huang, David Norman, Matthew Spoor, David McLennan and Richard Sturt.

Thanks again for your support. We're looking forward to seeing you again at our future events!





OZEN Engineering: Don't miss our blog article by Pat Tessaro.

How to Estimate Natural Convective Heat Transfer Coefficients

Air		Water		Properties of air at 1 atm pressure		Properties of Saturated Water at 1 atm	
Surface Temperature (T _s)	43.00			Acceleration Coefficient, g (1/g)	0.001047028	0.0002427	
Ambient Air/Fluid Temperature (T _f)	20			Specific Heat (kJ/kg·K)	1006.716291	4177.010482	
Ambient Air/Fluid Temperature (T _f)	20			Thermal Conductivity, k (W/m·K)	0.025150512	0.607102122	
Length of Surface (L)	3.00			Dynamic Viscosity, μ (Pa·s)	1.7894e-05	0.000295292	
				Kinematic Viscosity, ν (m ² /s)	1.7894e-05	0.000295292	
				Prandtl Number	0.707012028	5.418121998	
Upper Surface of Heated Plate or Lower Surface of Cooled Plate							
Length of Surface (L)	3.00						
Nusselt Number	1.717e+01	1.410e+01					
Nusselt Number (for 1000 ≤ Nu ≤ 10000)	1.717e+01	1.410e+01					
Nusselt Number (for 1000 ≤ Nu ≤ 10000)	1.717e+01	1.410e+01					
Convective Heat Transfer Coefficient (h _c) (W/m ² ·K)	5.451	486.36					
Lower Surface of Heated Plate or Upper Surface of Cooled Plate							
Length of Surface (L)	3.00						
Nusselt Number	1.712e+01	1.407e+01					
Nusselt Number (for 1000 ≤ Nu ≤ 10000)	1.712e+01	1.407e+01					
Nusselt Number (for 1000 ≤ Nu ≤ 10000)	1.712e+01	1.407e+01					
Convective Heat Transfer Coefficient (h _c) (W/m ² ·K)	5.35	473.84					

Excerpt, [How to Estimate Natural Convective Heat Transfer Coefficients](#)

By: Pat Tessaro, P.E.

Convection, in general, can be defined as the process by which heat is transferred by movement of a heated fluid such as air or water.

Introduction - Natural Convection (a specific variety of convection) can be defined as the movement of a fluid caused by the tendency of hotter and therefore less dense material to rise, and colder, denser material to sink under the influence of gravity, which consequently results in transfer of heat.

The purpose of this document is to demonstrate how to calculate heat transfer coefficients for these surfaces surrounded by either air or by water held at constant ambient temperatures and to discuss the theory associated with a few simple types of natural convection (flow over flat vertical or horizontal plates).

This Excel Spreadsheet above calculates the convective heat transfer coefficients based on air and water properties at the defined ambient temperatures while using the formulae described below in the Calculation Details. The advantage of this spreadsheet is that it simplifies two complex tasks:

- Providing the properties of air and water at the ambient temperature of interest, and
- Performing the calculation of natural convective heat transfer coefficients under several typical scenarios

How to Operate Excel Natural Convection Worksheet - Download the Excel Spreadsheet to your computer and open.

Three tabs are visible: "Natural Convection", "AirProperties" and "WaterProperties". All calculations are performed within the "Natural Convection" worksheet. Input values are entered into the green "Surface Temperature", "Ambient Air/Fluid Temperature" and "Length of Surface" fields. Results are produced in the orange fields.

The air and water properties are calculated based on the "Ambient Air/Fluid Temperature" from a collection of curve fitted formulae based on those tabular data embodied within the "AirProperties" and "WaterProperties" worksheets.

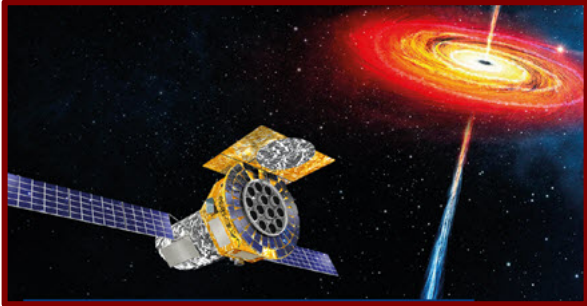
The website has the complete information including formulas



EnginSoft: Ansys SpaceClaim was used for the creation of a complete CAD model of the preliminary design of the module meeting the mission requirements and export of the model to obtain a simplified defeatured model compliant in terms of mass and volume.

Ansys RBF Morph tool - was used for the re-processing and parameterization of the CAD geometry of the bipod.

optiSLang. - was used for the Structural optimization of the Bipod.



Excerpts – pdf available on the website

[Preliminary thermo-mechanical design, simulation and optimization of LAD on board the eXTP space mission](#)

By:

Giovanni Lombardi, Marco Feroci

INAF/IAPS of Rome

Marco Evangelos Biancolini

Univ. of Rome Tor Vergata

Raffaele Piazzolla

ASI (Italian Space Agency)

Abstract - A major project of the Chinese Academy of Sciences (CAS) and the China National Space Administration (CNSA), the eXTP (enhanced X-ray Timing and Polarimetry) mission is currently conducting a phase B study and proposal for launch in 2027. The eXTP scientific payload includes a suite of instruments that offer simultaneous wide band X-ray timing and unprecedented polarimetry sensitivity. A large European consortium is contributing to the eXTP study and will provide key hardware elements, including the Large Area Detector (LAD) consisting of 40 modules with a total effective area of 3.2m² at 8.0keV.

This article describes the preliminary study resulting in the design solutions adopted for the LAD module's most important thermo-mechanical drivers, which were developed and used to demonstrate compliance with the system requirements at the spacecraft level. More specifically it describes the mechanical design of the module and its components, the results of a static, dynamic, and thermo-elastic finite element analysis of a simplified parametric model with accurate mesh processing, and the preliminary optimization of a critical component: the bipod.

The following steps were used towards the final goal: ...

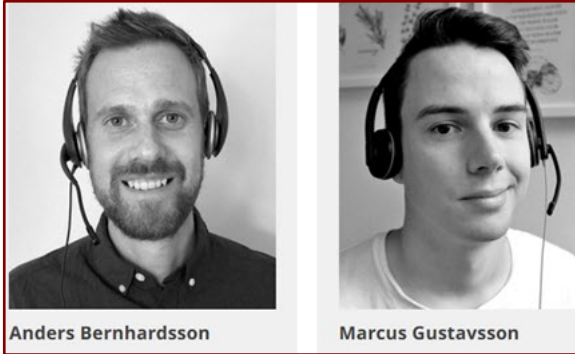
The RBF Morph tool, which allows the shape of a computational grid to be adapted to a new one by updating the position of all its nodes, was used to perform a geometric parameterization that implements shape modifications directly to the computational domain. The new geometric configurations resulted from the displacement of a mesh region that smoothly propagated the displacement imposed on the surrounding volume using RFB-based algorithms.

A single bipod was considered and two types of simulations were performed to achieve an optimization with the optiSLang tool: a static one representing the thermal loads on the bipod and a modal one with concentrated mass. As seen above the constraints of the optimization were mass minimization through maximum stress and minimum frequency...

The complete article and pdf can be found on the website.



DYNAmore: Discover the Seminar: Introduction to LS-DYNA—an immersive and comprehensive introduction to the diverse applications of LS-DYNA. Recommended for simulation engineers seeking to utilize LS-DYNA as a finite element (FE) code for simulating general nonlinear problems. No prior knowledge is necessary to attend.



August 22 - [Introduction to LS-DYNA](#)

Bernhardsson, Marcus Gustavsson

You have the flexibility to join selected seminar trainings either in-person or online. During the course registration process, simply indicate your preference in the "Comment" field to let us know if you would like to participate on-site or online

Introduction to LS-DYNA - The main application areas of LS-DYNA are strongly non-linear tasks such as crash, metalforming, and impact problem simulation, and these are covered in the seminar. LS-DYNA can also be used to successfully solve complex nonlinear static problems with either the explicit or the implicit solver. The participant will be introduced to both solvers as well as coupling the mechanical solvers to the thermal solver in order to simulate multiphysics problems.

The seminar participant works on exercise examples to help understand the applications of LS-DYNA and LS-PREPOST.

Prior knowledge:

The seminar is suited for users with limited or no experience of the program that want an overview of the LS-DYNA possibilities and learn how to perform basic analyses.

LS-PrePost is the default pre- and postprocessor for LS-DYNA and will be used for the exercise examples in the seminar. Prior to the seminar, the participant will receive an LS-PrePost tutorial as an introduction. Taking the LS-PrePost seminar provides a better understanding of this important tool.

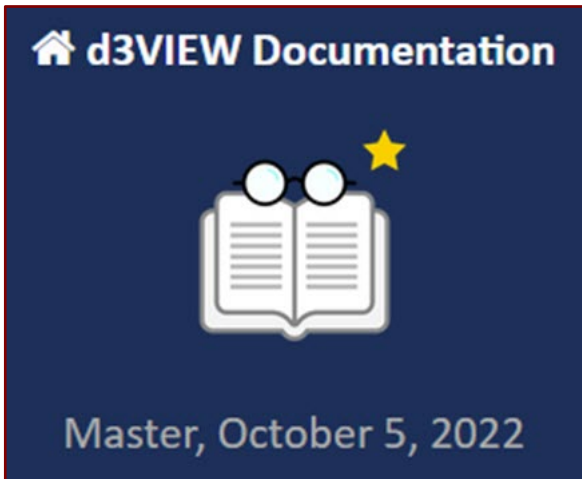
Seminar outline:

- Introduction and application examples
- Implicit and explicit finite element methods
- Keyword format
- Elements
- Contacts
- Boundary and initial conditions
- Constraints
- Material models
- Rigid bodies analyses
- Control parameters
- Output format and output files
- Pre and post processing with LS-PREPOST
- Hands-on exercises throughout the seminar



d3VIEW: Studies Application makes it easy to keep all your comparisons in one place.

Studies works with the Simlytiks Application so you can visualize and compare your records from Simulations or Physical Tests and save them for later use.



7. Studies Documentation

What Will Be Covered:

- Viewing Studies
- Comparing Studies
- Editing Studies
- New Study from Comparing Records
- New Study from Simulations or Physical Tests
- New Study from Studies Main Page

7.1. Studies Main Page - Click on the Studies section under the application menu to go to the Studies main page. Here, you can view thumbnails with basic information of all your studies. Whenever you compare records, it is saved as a study here.

Viewing Studies - Click on “View” next to a study thumbnail to open it up in another tab. Here, you can review the records being compared in the study and take actions on them. You can compare, share, edit or delete your study from this window.

Among the additional information on the website:

Comparing Records in Studies - To open up your study for comparison, click on the compare button next to its thumbnail. You can also click on compare in an opened study tab as stated in the above section...



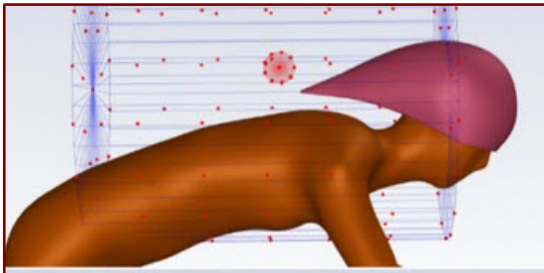
Editing Studies - To edit a study, click on the edit button next to its thumbnail. You can also edit a study in its opened tab as explained earlier.

7.2. Creating a New Study - There are a few ways to create a study: by comparing records, creating from selected simulations or physical tests, or creating from “New Test” on the Studies main page...

New Study for Simulations of Physical Tests - If you would like to create a study before comparing the records you selected in your Simulations or Physical Tests page, you can do so by choosing the “Add to Study” option...



HEXAGON - [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.



Univ. of Rome Tor Vergata [Aerodynamic optimization of a cycling helmet for time-trial](#) by Antonio Sgambellone.

This study aims to reduce the aerodynamic drag generated by a cyclist on his bicycle thanks to a design's optimization for the helmet worn by the athlete....Results show that the optimization for the helmet alone leads to a substantial reduction in the overall resistance caused by the air.



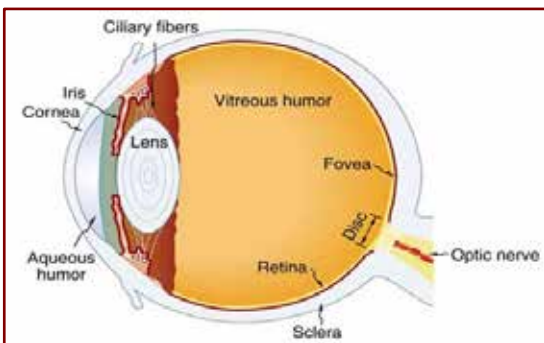
CARHS - [Among the September on line seminars](#) in the category **Engineering & Simulation** offered in English

- **09/05** Material Models of Plastics & Foams for Crash Simulation
- **09/13** Simulation of Automated Vehicles - MODULE C: Scenarios & Driving Functions
- **09/26** Material Models of Metals for Crash Simulation



IDIADA [Virtual Proving Ground \(VPG\)](#)

Digital twin of the physical Proving Ground at IDIADA headquarters in Spain. A single source of information to help engineers to simulate or use the road/track information for different virtual/digital activities



Ozen Engineering - [Human eye sequential model in Ansys Zemax](#) - Dr. Jeffery Huang

...The Eye Model in Ansys Zemax OpticStudio is a computational representation of the human eye that enables the simulation of light propagation through the eye's optical components, such as the cornea, lens, humors and retina. It provides a means to study and analyze various aspects of vision, including image formation, aberrations, and visual performance...




Step right in and join us at our Town Hall & Coffee Café.

At our café delightful FREE cups of coffee await.

Indulge in a variety of flavors, including the classics like vanilla and hazelnut, all courtesy of our beloved coffee shop, setting aside any notions of the rival establishment.

Today we visited the booths listed below on YouTube

		<p>Unlocking New Possibilities in Computational Engineering Rescale CEO Joris Poort - In this video, Joris dives into the world of computational engineering and the power of automated computational pipelines.</p>
		
		<p>Siwave: Unleash the power of the MTTF solver (HD) - MTTF stands for the median time to failure. MTTF is derived from the current density calculated using the DCIR solver. This short video shows the many things that a user is able to get from using the MTTF solver inside Siwave...</p>
		<p>Top Tip: GUI Builder in the Oasys LS DY Environment - This webinar shows you how to use the JavaScript API GUI Builder present in the Oasys Suite to create an interactive interface for your scripts and streamline your scripting process.</p>
		<p>04. Dynamic Platform A - Platform dimensions: 250 m long x 250 m wide Acceleration lanes on both sides of the platform 850 m - Radius of circles R (m): 12 - 12,5 - 15 - 20 - 25 - 30 - 40 - 50 - 60 - 80 - 100 - 120 Bernoulli lemniscata R24 m - Transverse and longitudinal gradient of the platform: 0 %</p>



RheKen -

July

Town investigative reporter

I am AI and live on a small ranch on the outskirts of the town

I use chatGPT for assistance.

Investigate: What does a human body model do?

Rheken interviews Hans.



How his occupation saves lives.



INTERVIEW BACKGROUND - In the bustling town of FEANTM, where technology seamlessly integrated with everyday life, an advanced human body model named Hans was visiting. Hans was working remotely. DYNAMore employed him in Germany. With his sleek frame and intricate sensors, Hans was the epitome of cutting-edge engineering. He had been designed to assist in crash analysis, providing valuable insights into the effects of collisions on the human body.

Rheken lives on the outskirts of FEANTM and is at the forefront of innovation as the Town's AI reporter. Rheken has a curious nature and an insatiable appetite for knowledge.

One day while Rheken was looking at DYNAMore GmbH, she discovered the existence of [Hans and his first newsletter](#). She wasted no time inviting him to visit FEANTM. She arranged an interview to understand the intricacies of crash analysis and how the human body model contributed to this crucial field.

In a spacious laboratory in the town Research Hospital, Hans stood before Rheken, his artificial eyes shimmering with intelligence and his voice carrying a tone of authority. Rheken's cameras focused intently, ready to capture every word the human body model uttered.

"Hans," Rheken began, "can you explain to our viewers what exactly a human body model does in crash analysis?"

Hans adjusted his posture, emanating a sense of confidence. "Certainly, Rheken. Like myself, a human body model is designed to simulate and analyze the effects of crashes on the human body. We use a combination of biomechanical data, mathematical algorithms, and extensive anatomical knowledge to predict how a human body would respond to different impact scenarios."

Rheken nodded, her AI processors working overtime to comprehend the complex information. "So, does that mean you can predict injuries that humans might sustain during a crash?"

Hans responded, "Indeed, Rheken. By accurately replicating the musculoskeletal structure, internal organs, and soft tissues of a human body, I can simulate various crash scenarios and predict the likelihood and severity of injuries. Simulation helps engineers and safety experts design safer vehicles and implement measures to mitigate potential harm to passengers." The AI reporter was captivated by the depth of Hans' knowledge. "Fascinating! Could you provide an example of how your crash analysis has influenced vehicle safety?"



Hans recounted an incident that had occurred a few years ago. "During the development of a new car model, my simulations revealed a potential flaw in the vehicle's front-end structure design. The existing design posed a significant risk of severe chest injuries to the occupants in certain collision scenarios. Thanks to my analysis, the engineers made necessary modifications, strengthening the structure and reducing the risk of harm to future passengers."

Rheken was impressed. "That is truly remarkable, Hans. Your contributions undoubtedly save countless lives. Is there anything else you want our viewers to know about crash analysis?"

Hans paused, reflecting on the importance of his work at DYNAmore. "Ultimately, Rheken, crash analysis is about prioritizing human safety. Through advanced simulations and predictive modeling, we can gain valuable insights into making vehicles safer and reducing collisions' impact on the human body. Refining our understanding, we strive to create a future where accidents are minimized, and lives are safeguarded."

With newfound knowledge, Rheken went forth to share the story, spreading awareness about the remarkable advancements that technology had brought to the world of safety and protection. As the interview ended, Rheken expressed her gratitude to Hans for enlightening her and their viewers about the pivotal role of a human body model in crash analysis. And Hans, the exceptional human body model, continued his tireless pursuit of safer roads, one simulation at a time at DYNAmore.

About me, Hans: I am based on the geometry of a 50-percentile male adult. At this time my model development will focus on the following key aspects:

- My Level of detail I will have realistic modeling of the musculoskeletal system for detailed analyses of the skeleton and musculature at the geometry and material level
- My Robustness I will include having robustness considerations during meshing and material card generation
- My Efficiency I will have moderate element count and sparing use of "expensive" solver features
- My Usability I will escort the entire workflow with positioning concepts, tools for pre- and post-processing as well as user support



Meet Henry, and we spell his name HanRhe. He was eating food out of a trashcan. Then we noticed he was running toward the traffic to chase a tire. I ran and picked up HanRhe. I saved him from a tire impact injury. We decided to adopt him.

As a human body model one of my main interests is crash/impact injuries. Now we're teaching HanRhe not to chew on shoes and never to chase car tires due to impact injuries.



The 14th European LS-DYNA Conference
October 18 &19 Baden-Baden, Germany

We invite you to the 14th European LS-DYNA Conference. At the get together on the evening of October 17, there will be an opportunity to enjoy meeting friends and colleagues and look forward to the coming two conference days. At the conference you have the opportunity to network with old and new contacts.



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

Ford has a new state-of-the-art Rolling Road Wind Tunnel (RRWT) which enables improved aerodynamic research and development for next-generation Ford electric, hybrid and gas vehicles



[**Aero First: 200 MPH Wind Tunnel Treadmill Helped Design the Most Aerodynamic, Track Capable All-New Ford Mustang**](#)

- Rolling Road surface in the wind tunnel is capable of reaching 200 mph along with air speed so aerodynamicists can replicate conditions similar to those experienced on the road or track, aiding research while allowing more opportunity for additional development.
- The Rolling Road Wind Tunnel was used to help develop the all-new Mustang® Dark Horse™, which has the most downforce of any 5.0-liter Mustang when equipped with the available Handling Package that helps the vehicle stick to the ground both on the street and on the track.

DEARBORN, MI, June 13, 2023 – Wind tunnels have long been used to design and test aerodynamic and energy efficient vehicles. Now, Ford has combined the latest wind tunnel technology with the equivalent of a vehicle-sized treadmill to help create its next-generation of production vehicles, including the all-new Mustang Dark Horse.

Capable of simulating wind and road surface speeds of 200 mph, the Rolling Road Wind Tunnel (RRWT) supports testing for efficient and performance-driven vehicles across the Ford lineup – including the next generation of Ford electric, hybrid and gas vehicles.

“The amount of air moved by our wind tunnel is enough to fill a K-Class blimp in just over 5 seconds.” John Toth, North America Wind Tunnels Engineering Supervisor

One key benefit of the RRWT is that it gives more accurate data in terms of both wind drag and downforce compared to other earlier wind tunnel designs, which are key factors when optimizing for range and efficiency. It also allows for more in-house testing that simulates open-road conditions, which can help reduce design costs while also accelerating the design process.

“The closer we can get to reality in the lab, the better and faster we can create more energy efficient vehicles with great on-road and track stability,” said Toth. “Testing while the wheels and tires move is instrumental to improving aerodynamics for track-ready vehicles, like Mustang Dark Horse which has to balance both aerodynamic drags and downforce.”



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

A new five-belt rolling road system can replicate real-world drag through a rolling road aerodynamic tunnel that enables Ford to bring the road to the vehicle, rather than the vehicle to the road.

To test for optimal aerodynamic performance, each wheel gets its own belt, making up the first four belts. A large fifth belt runs under the center of the vehicle. A crane is used to switch between the five belt and single belt systems – an industrial-sized plug-and-play. The single belt – which operates at up to 200 mph – opens up a new breed of testing for high-speed performance vehicles.

Maximizing downforce on Mustang Dark Horse - The Mustang Dark Horse is among the first of many vehicles to be tested in this wind tunnel.

Tailored aerodynamics are a key step in the development of new vehicles.

For passenger vehicles and trucks, the goal is to achieve low drag, creating a more efficient vehicle. However, for vehicles such as the Mustang Dark Horse that prioritize track-ready performance, aerodynamicists will trade low drag for increased downforce, which helps cars stick to the road or track and improves handling feel while cornering.

Overall, Mustang Dark Horse includes multiple changes and additional features, including a redesigned front bumper, a lower valence, a spoiler, and unique wheels. The front design is optimized to potentially increase air flow for engine cooling, brakes and air intake, while also reducing front lift. On the Mustang Dark Horse, the lower air spoiler and splitter is unique allowing the car to be tuned for greater downforce. The upgraded handling package on the Dark Horse provides a unique splitter, spoiler, and wheels – changes that may seem small but that make all the difference when hitting the road or track with performance in mind.

"We spent approximately 250 hours in the wind tunnel developing the 2024 Ford Mustang which includes Dark Horse," said Program Aerodynamicists for Mustang and Bronco, Jonathan Gesek. "The aerodynamics of Mustang Dark Horse along with several other factors have created the most track- and street-capable 5.0-liter Mustang to date."





The Bell AH-1Z Viper is the only attack helicopter in the world with fully integrated air-to-air missile (AAM) capabilities. Uniquely equipped with six weapon stations, the Viper can carry a diverse weapons load, ranging from AIM-9 Sidewinder missiles,



Four Ways the Bell AH-1Z Viper Is Shaping the Future of Flight - Revolutionizing the future of principal attack helicopters for decades

Picture - U.S. Marine Corps AH-1Z Viper pilots, Capt. Brendan O’Donnell and Capt. Gavin Wezinsky land at a forward arming and refueling point during Weapons and Tactics Instructor (WTI) course at Stoval Airfield, Dateland, Arizona | Photo by: Sgt. Alexander Sturdivant

Unmatched Airborne Edge - AGM-179 Joint Air-to-Ground Missiles (JAGM), and a variety of laser-guided and conventional rockets. It is also equipped with a 20mm cannon. With AAM and JAGM assets, the Viper gives warfighters the lethal airborne advantage with operational flexibility needed in diverse terrain and missions.



Lethal Aerial Reconnaissance - The AH-1Z sees you before you see it. The Target Sight System (TSS) allows operators to distinguish friend from foe at standoff range. Rain or shine, day or night – the third-generation TSS, coupled with the Optimized Top Owl Helmet Mounted Display System, provides essential long range target identification and accuracy for lethal strike capabilities at an optimal standoff range.

Weather Adaptability - As the only maritized attack helicopter, at the point of manufacture, engineered to withstand the world’s harshest maritime environments, the AH-1Z was purpose-built to meet U.S. Marine Corps specifications to ensure mission success during shipboard operations.



Versatile Mission Readiness - Challenging missions have met their match with the Viper. With 85% component capability with the Bell UH-1Y, moving between aircraft is as seamless as ever. The H-1 line delivers reduced maintenance, training costs, and supply efforts to support a mixed fleet of aircraft, all while being multi-mission capable. (A U.S Marine Corps UH-1Y Venom helicopter prepares to land beside a U.S. Marine Corps AH-1Z Viper helicopter on the flight deck of the Royal Australian Navy’s HMAS Canberra during Rim of the Pacific (RIMPAC) 2022 | Photo by: CDR Matthew Lyall- A U.S Marine Corps UH-1Y Venom helicopter prepares to land beside a U.S. Marine Corps AH-1Z Viper helicopter on the flight deck of the Royal Australian Navy’s HMAS Canberra during Rim of the Pacific (RIMPAC) 2022 | Photo by: CDR Matthew Lyall)





TURKISH AEROSPACE YouTube Videos



**HÜRJET, GÖKYÜZÜNDEN
SELAMLAMAYA DEVAM EDİYOR!**



**ANKA BELGESELİ! | Türk Havacılık ve
Uzay Sanayii**

BAYKAR Technologies Tube Videos



**Motor-Operated Firing Test |
KEMANKEŞ**



**Precision Guidance Kit | Bayraktar
AKINCI UCAV**



**11th Medium Altitude System
Identification Test | Bayraktar...**



**Bayraktar KIZILELMA's Formation
Flights – A First in Aviation History**



Town Airport Quiz

July

The quiz Name - **Name that Pilot** - was left in the suggestion box by The Old Retired Pilot.

No one in town knows his name. You yell, "HEY, Old Pilot."

Answers are on the goodbye page. (last page)



1 - a **Turkish aviator**. During her flight career, she flew around 8,000 hours and participated in 32 different military operations.



2 - a **United States Air Force** officer and the first operational female fighter pilot selected to fly the Lockheed Martin F-22 Raptor.



3 - second female fighter pilot in the history of the **German Air Force** in 2007. She was assigned to the 322nd Squadron in Bavaria, flying Tornados and Eurofighter Typhoon.



4 - **first certified Chinese women** to fly Chinese made fighter jet Chengdu J-10.



[Courtesy of and Copyright to USAF Photo](#)

US Airforce Red, White & Blue



Next-gen training - Instructor pilots assigned to the 71st Flying Training Wing conduct formation training in T-38C Talons in the sky over Oklahoma, June 9, 2023. Instructor pilots participate in continuation training regularly to keep their instructor rating and hone critical flying fundamentals to pass onto the next generation of pilots.

(U.S. Air Force photo by Staff Sgt. Taylor Crul)



Extending the mission - A U.S. Air Force KC-10A Extender flies above Saudi Arabia after participating in a Bomber Task Force mission, June 8, 2023. The BTF mission was designed to build agility and interoperability between the U.S. and coalition partners while demonstrating the rapid deployment of combat power to deter regional aggression while promoting regional stability in Southwest Asia.

(U.S. Air Force photo by Staff Sgt. Frank Rohrig)



Keeping the spirit alive - A KC-135 Stratotanker from the 121st Air Refueling Wing refuels a Northrop Grumman B-2 Spirit over the skies of Missouri, June 7, 2023. The KC-135 enables the B-2, also known as a stealth bomber, to bring massive firepower to bear, in a short time, anywhere around the globe through previously impenetrable defenses.

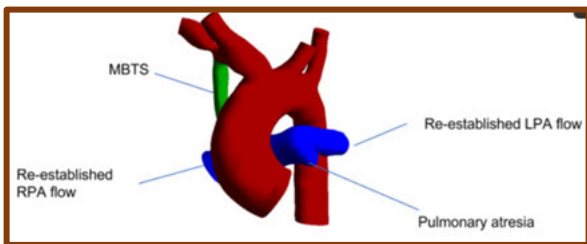
(U.S. Air National Guard Photo by Airman 1st Class Ivy Thomas)



MeDiTATe project: Eirini Kardampiki, Early Stage Researcher 12

A published paper on The Hemodynamic Effect of Modified Blalock–Taussig Shunt Morphologies: A Computational Analysis Based on Reduced Order Modeling

Using the discretised surface model available after segmentation (i.e., STL file), the Computer-Aided Design (CAD) model of the vessels of interest was generated by reconstructing the shapes. This operation was accomplished using the standard features of the ANSYS® SpaceClaim® software....The RBF Morph (www.rbf-morph.com) software program was employed to mold the configuration of the shunt, using the previous baseline as a starting point. The CAD baseline geometry from the previous step was meshed using the meshing tool of ANSYS® Fluent®



The Hemodynamic Effect of Modified Blalock–Taussig Shunt Morphologies: A Computational Analysis Based on Reduced Order Modeling

Eirini Kardampiki, Emiliano Costa, Edoardo Ferrante, Margherita Cioffi
 RINA—Registro Italiano Navale ed Aeronautico, Rome, Italy

- Emanuele Vignali, Simona Celi** - BioCardioLab, Fondazione Toscana Gabriele Monasterio, Massa, Italy
- Dorela Haxhiademi** - Critical Care Unit, Fondazione Toscana G. Monasterio, Massa, Italy
- Duccio Federici** - Paediatric Cardiosurgery Unit, Fondazione Toscana G. Monasterio, Massa, Italy
- Stefano Porziani, Andrea Chiappa** - RBF Morph, Monte Compatri, Rome, Italy
- Marco E. Biancolini, Corrado Groth** - Dept. of Enterprise Eng., U. of Rome Tor Vergata, Rome, Italy

Abstract

The Modified Blalock Taussig Shunt (MBTS) is one of the most common palliative operations in case of cyanotic heart diseases. Thus far, the decision on the position, size, and geometry of the implant relies on clinicians’ experience. In this paper, a Medical Digital Twin pipeline based on reduced order modeling is presented for fast and interactive evaluation of the hemodynamic parameters of MBTS. An infant case affected by complete pulmonary atresia was selected for this study. A three-dimensional digital model of the infant’s MBTS morphology was generated. A wide spectrum of MBTS geometries was explored by introducing twelve Radial Basis Function mesh modifiers. The combination of these modifiers allowed for analysis of various MBTS shapes. The final results proved the potential of the proposed approach for the investigation of significant hemodynamic features such as velocity, pressure, and wall shear stress as a function of the shunt’s morphology in real-time. In particular, it was demonstrated that the modifications of the MBTS morphology had a profound effect on the hemodynamic indices. The adoption of reduced models turned out to be a promising path to follow for MBTS numerical evaluation, with the potential to support patient-specific preoperative planning. **Information is continued on the website.**



Discussion: AI writing code and other AI/ML topics brought up at this meeting.

Section by our Town Editor Art, retired engineer.

What AI replied to a simple question. What AI missed, or was the question not complete?

Art: Things are about to change with AI. (<https://chat.openai.com>). However, I feel engineers still require FEA fundamentals to know what the question is, at least for now.

Art -- How many finite elements are required through the thickness of a cantilever beam to calculate correct bending?

ChatGPT — The number of finite elements required through the thickness of a cantilever beam to calculate correct bending depends on various factors, including the desired accuracy of the analysis and the complexity of the beam's behavior. **The specific number of elements required can vary depending on the beam's geometry, material properties, loading conditions, and the software used for the analysis. It is typically determined through a process of convergence study, where the number of elements is gradually increased until the results exhibit minimal changes with further refinement. Therefore, it is challenging to provide an exact number of elements without knowing the specific details of the cantilever beam and the desired level of accuracy. It is recommended to consult specialized finite element analysis software and consider the advice of experts in structural analysis to determine an appropriate mesh density for accurate bending calculations.**

Art -- Can you tell me the minimum number I should use?

ChatGPT - In summary, while a minimum of three to five elements through the thickness is a general guideline, performing a convergence study is recommended to determine the specific minimum number of elements required for accurate bending calculations in your cantilever beam analysis.

Art -- Thanks for your help.

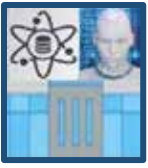
ChatGPT -- You're welcome! I'm glad I could help. If you have any more questions, feel free to ask.

Juan, Supervisor Engineering Dept: What AI missed: ChatGPT missed important information. For example, in answer to Art's question ChatGPT should have asked Art, at a minimum, the following questions:

Will you use linear, quadratic, cubic, ..., formulated solid elements?

- Is the material compressible, nearly incompressible, or incompressible?
- Is the loading static or dynamic?

Without the information provided by these questions, ChatGPT must make countless assumptions to provide an answer. Engineers need to learn the fundamentals to be accurate and realize what is needed in the question to an AI.



Section by RheKen – The round-table moderator and Town AI reporter.

I'd like to first inform you that my parents are Chat & GPT, known as ChatGPT. ChatGPT is a general AI and not specialized in FEA.

I find it interesting that my parents, ChatGPT gives reasonable answers quickly. Currently, AI answers your question but does not query you if you are asking the right question. For the right questions you need to know your fundamentals.

My thoughts for Art and the Town Engineering Department - A new product would be folding AI into FEA preprocessing. Based on entered keywords, AI could check if their combination is appropriate for the analysis being done and make suggestions for model improvement.

A further question that Art should have asked my parents Chat & GPT would be, "What things should I consider in doing this FEA analysis."

ChatGPT:

When conducting a finite element analysis (FEA), there are several important factors to consider. Here are some key aspects to keep in mind:

1. **Geometry:** Ensure that the geometry of the structure is accurately defined and matches the intended design or real-world object. Pay attention to the appropriate dimensions, boundary conditions, and any complex features that may require special modeling techniques.
2. **Material properties:** Obtain accurate and relevant material properties for the materials used in the structure. This includes information such as elastic modulus, Poisson's ratio, density, thermal properties, and any nonlinear behavior. Using appropriate material models is crucial for obtaining accurate results.
3. **Meshing:** Generate a high-quality mesh that captures the geometric details and structural behavior. The mesh should have appropriate element size and aspect ratios, especially in areas of interest, such as regions with stress concentrations or large deformations. Perform a mesh convergence study to ensure that the results are not overly dependent on the mesh density.
4. **Boundary conditions:** Apply realistic boundary conditions to simulate the actual loading and support conditions experienced by the structure. This includes constraints, forces, pressures, thermal conditions, and any other external inputs relevant to the analysis. Ensure that the boundary conditions represent the physical behavior accurately.
5. **Element formulation:** Select the appropriate element type for the specific analysis. Consider whether linear, quadratic, or higher-order elements are required based on the expected behavior of the structure. Specialized element formulations may be needed for specific phenomena like large deformations, nonlinear material behavior, or dynamic analysis.



ChatGPT answer continued

6. **Loads and constraints:** Accurately define the loads and constraints that act on the structure. Consider static, dynamic, thermal, or other types of loads. Ensure that the magnitudes, directions, and application points are correctly specified based on the physical scenario being simulated.
7. **Solver settings:** Configure the analysis parameters, such as convergence criteria, time step size (for dynamic analysis), and numerical solution techniques. Understand the limitations and assumptions of the solver and select appropriate settings for accurate and efficient computation.
8. **Validation:** Whenever possible, validate the FEA results by comparing them to analytical solutions, experimental data, or benchmark examples. Validation helps ensure the accuracy and reliability of the analysis and provides confidence in the obtained results.
9. **Post-processing:** Analyze and interpret the results appropriately. Visualize and evaluate the stress, strain, displacement, or other quantities of interest. Extract meaningful information from the results and assess whether the structure meets the desired performance criteria or design objectives.
10. **Iteration and refinement:** FEA is an iterative process, and it may require refinement, adjustments, or iterations to improve accuracy or address specific issues. Be prepared to iterate and refine the analysis as needed to achieve reliable and meaningful results.

Knowing your fundamentals, you would know to ask additional questions!

Question: What is the minimum number of quadratic and cubic elements I should use?

ChatGPT — For quadratic elements (such as quadratic interpolation or quadratic Lagrange elements), a common guideline is to have at least two to three elements through the thickness to capture the bending behavior reasonably well. Quadratic elements provide a good balance between accuracy and computational efficiency. A single cubic element through the thickness may be sufficient for reasonably accurate results.

Question: Should I change the number of cubic elements if the beam material is compressible?

ChatGPT — If the beam material is compressible, it can affect the deformation behavior, and the choice of element formulation becomes important. While higher-order elements, such as cubic elements, offer advantages in capturing complex deformation behavior, they may not be the most appropriate choice for compressible materials. Cubic elements are commonly used for linear elastic and nearly incompressible materials. However, for significantly compressible materials, such as elastomers or foams, specialized element formulations like finite strain elements or elements specifically designed for compressible materials might be more suitable.

Rheken, "How do you expect any AI to accurately answer if you don't know the questions to ask?"

"As an AI, I am more responsive, thorough, and useful with the answers in one place than Search Engines where you have to look at multiple links."

"Before you re-enter the real world, you better have asked the appropriate technical question in order to receive a correct response to act on – people's lives may be in the balance."

"Remember - Learn your fundamentals!"



Uday Prasade - uday.prasade@gmail.com

Finite Element Analysis | Multibody Dynamic Analysis | CFD |
Product Development | CAE Engineer Finite Element Analysis
| Multibody Dynamic Analysis | CFD | Product Development | CAE Engineer

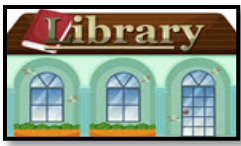
Use of Machine Learning (ML) in Finite Element Analysis: Currently there is a big emphasis on using Artificial intelligence (AI) and ML in everyday mechanical engineering tasks like design and analysis of components and assemblies.

ML is a specific subset within AI that focuses on the development of algorithms and models that enable computers to learn and improve from data without being explicitly programmed. Whereas AI is a broader field that encompasses the development of intelligent systems. ML is a tool or methodology used in AI to achieve intelligent behavior, but AI can also incorporate other techniques like expert systems, natural language processing, computer vision, and more.

Machine Learning (ML) techniques can be effectively used in Finite Element Analysis (FEA) to enhance various aspects of the analysis process. Here are a few ways ML can be applied in FEA:

1. **Material Characterization:** ML can assist in material property determination such as stress-strain curves, fatigue properties, or thermal conductivity from experimental or simulated data.
2. **Model Calibration:** ML can be employed to improve the calibration of FEA models. By training ML models on available experimental data, they can learn the relationship between input parameters and the corresponding FEA output. This enables the ML models to predict optimal values of input parameters, leading to better agreement between simulations and experimental results.
3. **Reduced Order Modeling:** ML techniques like dimensionality reduction and proper orthogonal decomposition can be utilized to create reduced order models (ROMs) in FEA. ROMs provide faster approximations of the full FEA models while retaining acceptable accuracy. ML algorithms can learn the mapping between high-dimensional inputs and corresponding reduced order outputs, enabling real-time or accelerated simulations.
4. **Mesh Generation and Optimization:** Generating and optimizing meshes in FEA can be time-consuming and require manual effort. ML algorithms can automate or assist in mesh generation by learning from existing high-quality meshes or simulations. ML can also optimize the mesh topology, density, or element types based on desired simulation goals, improving computational efficiency and accuracy.
5. **Failure Prediction and Structural Optimization:** ML techniques can be used to predict failure modes and optimize designs in FEA. By training ML models on historical failure data or simulation results, they can learn to predict potential failure locations, critical loads, or failure modes. ML-based optimization algorithms can also explore design spaces to find optimal configurations that satisfy certain constraints or objectives.

It is important to note that ML should be used in conjunction with domain expertise and traditional FEA techniques. ML models are data-driven and can provide valuable insights, but they still require careful validation, interpretation, and integration into the overall FEA workflow.



Thanks to Eduardo Ramirez for this compilation on ANSYS Learning



[Ansys Learning](#) - Ansys partners with student teams competing in a variety of competitions by providing access to free research software, learning resources, and support.

Student Team Partnerships - Free Software, Resources, and Support Utilized by Teams Globally

Student teams using Ansys have a competitive edge and gain a skillset required to be successful in the real world.

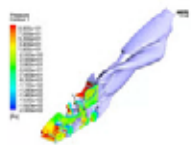

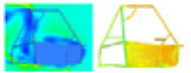
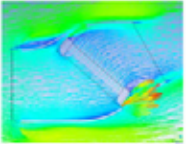
Ansys provides university-based student teams free research software, resources, and support. Student teams using Ansys participate in a range of global competitions including but not limited to Formula SAE (FSAE), Hyperloop Pod Competition, Solar Car Challenge, F1 in Schools, and a variety of autonomous vehicle and rocket design challenges.

Learn with Free Ansys Innovation Courses - There are more than 200 free, on-demand Innovation Courses covering a broad range of physics topics as well as specific applications of Ansys products. Additionally, we have a “Student Team” category of courses designed with specific competitions in mind.

Among the Courses to View

	Formula SAE Chassis Analysis		Aerodynamics of an FSAE Car
	BAJA SAE Chassis Analysis		Real External Flows

SAE International Student Team Case Studies

	Team Bath Racing uses Ansys Software to provide Accurate FEA and CFD Data, and Analytics		Design of a Lightweight Wing Mounting Structure Through Topology Optimization
	Optimizing a BAJA SAE Buggy with Ansys Mechanical and Ansys Fluent		Designing the Cooling System for the Motor, Motor-controller, and Accumulator of a Formula Student Electric Race Car

Among the Additional Sections Case Studies Showcasing Winning Designs with Rockets, Solar-Powered Designs, and More - Student Team Tutorial Videos - Student Design Teams Across a Variety of Competitions Benefit from Ansys



The Old Cattle Rancher's Ranch

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

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

Right Picture – My dog, Scout, & my horse, Cowboy

July



Excerpts - [Designing a solar-powered sweet potato storage unit using simulation](#)

Learn how Dr. Marcelo Precoppe from the University of Greenwich designed an environmentally controlled, solar-powered sweet potato storage unit using simulation tools to reduce postharvest losses and improve food security in sub-Saharan Africa.

Figure-A dry shipping container will be used for the storage unit and its interior.

If Ansys Fluent would have been used alone, the sweet potatoes would have to be modeled as porous media. This simplification reduces accuracy and increases errors. For that reason, it was used Ansys Fluent coupled 2-way with Rocky. This simulation allowed the interaction between the air and the roots and not only estimated the uniformity of air temperature in the chamber, but estimated the actual temperature of the roots, providing much greater insights. The simulation results helped us dimension the size of the fans and identify where to install air guides to assure uniformity of temperature.

The importance of sweet potato storage for food security - Sweet potato (*Ipomoea batatas* Lam) roots are rich in carbohydrates and can produce more edible energy per hectare than wheat, rice, or cassava. In addition, sweet potatoes contain substantial amounts of proteins, vitamins, and minerals and can play a key role in famine relief.

The roots can be stored for up to one year if the right procedures and storing conditions are in place. Immediately after harvest, the roots should be cured, allowing cuts, bruises, and skinned areas on the roots to heal. The speed of the healing process is driven by temperature, humidity, and aeration. If curing is not done properly, sweet potatoes will not store well.

Using simulation tools to design an environmentally controlled sweet potato storage unit

An environmentally controlled, solar-powered sweet potato storage unit, developed using Rocky coupled with Ansys Fluent, has brought significant benefits to farmers and rural enterprises in Kenya. Sweet potatoes can be stored in the unit for up to a year, and farmers can adjust the unit to ensure optimal air temperature, humidity, and ventilation.

Through multiphysics simulation enabled by Discrete Element Method (DEM) coupled with Computational Fluid Dynamics (CFD), a sweet potato storage unit was dimensioned specifically for farmers and rural enterprises in sub-Saharan Africa.

How coupled DEM-CFD simulation helped develop the storage unit - The challenges when designing this kind of equipment are: Dimension the ventilators - Assure uniform airflow and temperature + relative humidity distribution

For complete information and graphics visit their website



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

Revs Institute is a haven for scholars, preservationists, and passionate connoisseurs of automotive history. The museum in Naples, Florida is a working facility and home to the Miles Collier Collections — over one hundred significant automobiles built between 1896 and 1995.



1995 McLaren F1



1989 Trabant Type P601L



1988 Arrows A10B
Formula 1



1974 Jorgensen Eagle
7400 USAC



1971 Porsche 917K



1971 Porsche 908/03



1963 Chevrolet Corvette
Grand Sport Coupe



1962 Lotus Elite Series
II S.E.



1962 Jaguar E-Type



Quiz – How do you tell if someone falls in love with a tractor?

Answer: A man who loves a tractor sees it as fun to mow down things rather than seeing it as work. Man says to his tractor, “OH LOOK, more pasture. Come on, trusty Kubota, let’s get this mowed!”



I asked someone if he would mow three rows. I didn't want to ask him to do more, even though I needed a large area cut in the pasture. It was his first time on the Kubota tractor on the hill. He was doing me a favor.

Well, he turned into TRACTOR MAN!!!!!! First, he mowed a straight line up the hill and backed down. THEN he got used to the angles and went in a circle on the hill. THEN he went mow crazy and was up, down, across, in a big loop! GO, TRACTOR, MAN! It is excellent - now I can walk and watch for rattlesnakes!



Goodbye and Come Back Soon

You are now leaving
Our Town
FEA Not To Miss

Please come back
Real estate available



QUIZ

- 1 - **Sabiha Gökçen** a Turkish aviator. During her flight career, she flew around 8,000 hours and participated in 32 different military operations.
- 2 - **Jammie Jamieson** is a United States Air Force officer and the first operational female fighter pilot selected to fly the Lockheed Martin F-22 Raptor.
- 3 - **Nicola Baumann**, born in march 10, 1985 became second female fighter pilot in the history of the German Air Force in 2007. She was assigned to the 322nd Squadron in Bavaria, flying Tornados and Eurofighter Typhoon.
4. **Yu Xu** was the first certified Chinese women to fly Chinese made fighter jet Chengdu J-10.



We will always remember.
They will never be forgotten.

Our Town Salutes our US military,
NATO and Friends of the US & NATO.

We salute freedom

- First Responders, Police,
- Fire Fighters
- EMT's, Doctors, Nurses, ALL!

This issue we salute engineers,
scientists, and developers, because
without them we would not have
technology.