FEA - CAE Not to Miss & More - Eclectic & Innovative

March 2024 ISSN 2694-4707

Monthly Town Hall Meeting
Engineering, Research, Interests
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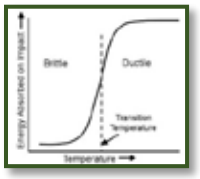
Curt - Autodesk


Lockheed

Aselsan- Marlin

BART- IITK

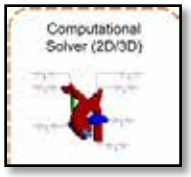
Abhinav - My Physics Café

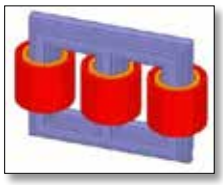
Bala - FMVSS & ECE


Jenson - DFE Tech

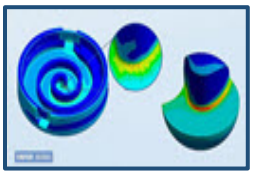

Marco – RBF Morph

Metin - OZEN Engineering

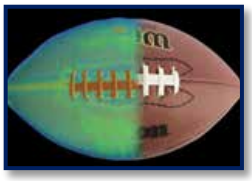
Madhukar- CADFEM

Siddharth - ANSYS

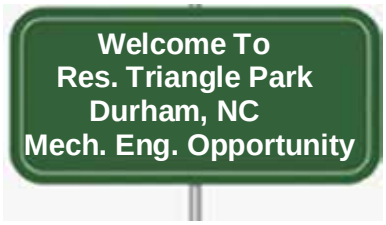

Marjorie – Altair


Marnie – Lumafield.

AUTO – Mercedes

Meeting Rm 3 - Opportunity



Library—Cleaning

FEA NOT TO MISS & MORE

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Editors: **(alpha order) Anthony, Art, Brett, Churchill, Marnie, Marsha, Sabyl, Shweta, Taylor**

Jr. Editors**: Rheannon and Kensington (yes, she likes pink)**

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

Town AI Editors:

The Robbins Family: Bart & Marjorie Robbins & the 3 Robbins Brothers – Grayson, John, Rick,

Contact us at: feaanswer@aol.com

Attribution: Map Vector & town vector graphics are courtesy of vecteezy

We will always remember

Parking & Coffee is free.

R & D - Camping - Town Map

Horse Trail → Yield right of way to horses

R & D Technology
Business Park Plaza

RV CAMPING
Park in any vacant camping site

CADFEM · OFETECH · DOZEN · d3View · Oasys · rescale · ENGINSOFT · Ansys · AUTODESK

Town Hall

Library

Lawrence Livermore National Laboratory

Fire & Police Depts.

Coffee Shop
News
Marsha & Marnie

SIMQ

Wake Forest University
School of Medicine

HOSPITAL
Research

rbf

MEDITATE

Auto Race track & Auto Industry

Petting Zoo

Old Rancher

Riding Center

Convention Barn Welcome

Elect/Water. & Sewage Treatment Plant Facilities

- **Logos displayed represent companies/academia/research with solutions for today's world.**
- If you wish to have yours removed, kindly inform us at **feaanswer@aol.com**.
- Proceeds from the auction of your building will be allocated to the coffee budget.
- The map is subject to change - building sites will be rotated accordingly.

Table of contents

- **The individuals mentioned are the persons we wish to thank for articles on the internet.**
- **The above doesn't imply that they are the author, with a particular company, or department**

Table of contents

Welcome to our Town Hall Meeting & Announcements

Town Hall Meeting

Park Cars behind building

Park Tractors behind cars

Tie horses to hitching rails

Free coffee & cinnamon pastries & buns!

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

Town Gossip is at the local coffee shop.

Pets are welcome. Horses, pet goats stay outside.

1. **Our town engineer, graduated from Duke University in Duram, NC. He was discussing an opportunity for a Mechanical Engineer, experienced using ANSYS LS-DYNA software tools to work at the Research Triangle Park, in Durham, NC. See Meeting Room 3.**
2. **The new math I learned: More Editors + More Writing = MORE PAGES! So, welcome to 55 pages – Since our town meetings seem to be growing longer the good news is that we have more virtual coffee and pastries being served.**
3. **Why can't I bake? Why do I burn things? Not my fault! It is obviously the oven as evidenced in the article that Churchill is hosting - Computational fluid dynamics modeling of bun baking process under different oven load conditions**
4. **Catch that football! Tuck it close! And then have a CT scan – no not of you – of the football! See article that Marnie is hosting - CT Touchdown - Learn about the football's often-overlooked engineering and labor-intensive manufacturing process**

And this is just a few of the news we have – SO, grab that coffee from the back of the room and let's get this meeting started!

Opportunity:
Meeting Room 3 - Mechanical Engineer with deep experience using ANSYS LS-DYNA software opportunity at The Research Triangle Park, Durham, NC

Article:
Bernina - Optimized product packaging Cost reduction by drop test simulation during the development process…More than 40% cost reduction through drop test simulation.

YouTube Simulation:
Mechanical Analysis for BPM Motor is available now to view on our YouTube channel explore stress & displacement in rotors.

Research Hospital:
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.

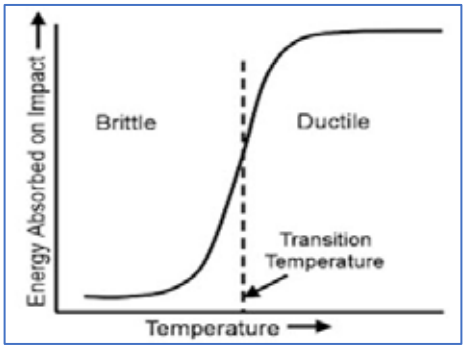
My Physics Café: CAE Analyst and a passionate blogger

When a material fractures, the consequences are catastrophic. This is especially true when the material in question is a structural component that is subjected to high loads. The failure of a single component can lead to the failure of an entire structure.

Web - Dangers of material transitions: A cautionary tale from 1912 - Ductile to Brittle Transition (DBT) is a major concern in engineering. The Titanic is a famous example of a disaster that was caused by DBT.

This article throws light on the dangers of DBT and how it can be avoided as it is important for engineers to take steps to prevent it from occurring in their designs. So, before we investigate the case of Titanic, let's first understand..

What is ductile to brittle transition? Ductile to brittle transition (DBT) occurs when a material that is ductile at room temperature becomes brittle at low temperatures. Brittle materials have a low degree of ductility and will fracture with little or no plastic deformation. This transition occurs when the transition temperature, which is the temperature at which this transition occurs, is reached. The transition temperature is affected by a variety of parameters such as the composition of the material, the forming temperature, the chemical environment, and the loading conditions. The transition temperature is usually lower than the melting point of the material.



What happened in 1912? On April 15th, 1912, the RMS Titanic was travelling through the North Atlantic on its maiden voyage when it struck an iceberg. The impact of the collision caused a too-long fracture in the lower compartments of the ship, leading to its rapid sinking. At the time of the disaster, it was believed that the hull of the Titanic had been constructed from steel that was too weak to survive the impact of the collision. However, new research has revealed that the steel used in the ship likely had the necessary strength, but that low temperatures caused the steel to become brittle, which led to its failure. The transition temperature was likely reached during the cold night, and this caused the steel to become brittle and fracture.

Ductile to Brittle transition today: In modern times DBT is still an issue that engineers must be aware of. Steel and other metals will become brittle at low temperatures unless certain precautions are taken. For example, elements such as nickel are added to steel to raise its transition temperature, and the material is usually preheated before forming in order to decrease its sensitivity to cold temperatures. Today, there are also materials available that are designed to be more resistant to DBT. These materials can be used in applications where ductility at low temperatures is critical, such as in cryogenic tanks and other structures that are subjected to extreme cold.

To wrap things up ..Modern materials that are designed to be resistant to DBT are available, and these should be used in applications where ductility at low temperatures is critical. Taking precautions to prevent DBT and recognizing that not all materials are equally resistant to this transition, are essential for engineers who are designing structures and components that need to withstand extreme temperatures.

BALA – CAE specialist - Lead - RLE INDIA PVT LTD - Corporate career coach & Business Consultant. Mission to enhance 1,000,000 Engineers career growth with Engineering innovations.

"Do you know what are all essential differences between FMVSS and ECE regulations?"

Navigating Vehicle Safety Standards: FMVSS vs. ECE

In the world of automotive design and manufacturing, understanding the landscape of safety and environmental regulations is key.

Here's a quick dive into the two major regulatory frameworks:

FMVSS	ECE
FMVSS (Federal Motor Vehicle Safety Standards)	ECE (Economic Commission for Europe) regulations.
FMVSS (U.S.)	ECE (International)
FMVSS: Born in the USA, these standards are all about protecting passengers and the public. They're detailed, prescriptive, and require manufacturers to self-certify their compliance	ECE Regulations: With a global perspective, ECE standards focus on performance and offer a bit more flexibility in compliance. They're widely adopted across Europe and beyond, requiring an independent type approval process.

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Key Differences?

- **Origin & Adoption:** FMVSS is U.S.-centric, ECE has a broader international footprint.
- **Approach:** FMVSS gives you the "how," ECE is more about the "what."
- **Certification:** Self-certification in the U.S., independent approval for ECE.
- **Scope**: Both cover safety, but ECE goes further into environmental protections.

Why does this matter?

- For automotive professionals, navigating these standards is crucial for global market access and ensuring the safety and sustainability of our vehicles.

Let's drive the conversation on harmonizing these regulations for a safer, greener future on our roads.

Grow together - Bala

…

From the website: The Indian Institute of Technology Kanpur (IITK) has successfully established and tested India's first Hypervelocity Expansion Tunnel Test Facility, a major achievement that puts India amongst only a handful of countries with this advanced hypersonic testing capability. The facility, named S2, is capable of generating flight speeds between 3-10 km/s, simulating the hypersonic conditions encountered during atmospheric entry of vehicles, asteroid entry, scramjet flights, and ballistic missiles.

Web - IIT Kanpur achieves major milestone with India's First Hypervelocity Expansion Tunnel Test Facility This makes it a valuable test facility for ongoing missions of ISRO and DRDO including Gaganyaan, RLV, and hypersonic cruise missiles.

The S2, nicknamed 'Jigarthanda', is a 24-meter-long facility located at IIT Kanpur's Hypersonic Experimental Aerodynamics Laboratory (HEAL) within the Department of Aerospace Engineering.

The S2 was indigenously designed and developed over a period of three years with funding and support from the Aeronautical Research and Development Board (ARDB), the Department of Science and Technology (DST), and IIT Kanpur.

Commenting on this, Prof. S. Ganesh, Director, IIT Kanpur, said, "The successful establishment of S2, India's first hypervelocity expansion tunnel test facility, marks a historic milestone for IIT Kanpur and for India's scientific capabilities. I congratulate Prof. Sugarno and his team for their exemplary work in designing and fabricating the hypersonic research infrastructure. S2 will empower India's space and defense organizations with domestic hypersonic testing capabilities for critical projects and missions."

Prof. Mohammed Ibrahim Sugarno, Associate Professor, Department of Aerospace Engineering and Centre for Lasers & Photonics at IIT Kanpur said, "Building S2 has been extremely challenging, requiring in-depth knowledge of physics and precision engineering. The most crucial and challenging aspect was perfecting the 'free piston driver' system, which requires firing a piston at high pressure between 20-35 atmospheres down a 6.5 m. compression tube at speeds of 150-200 m/s, and bringing it to a complete stop or 'soft landing' at the end."

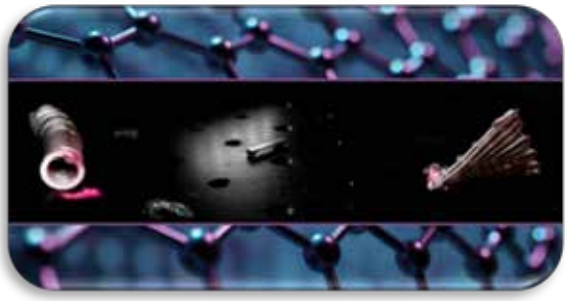
"However, with our expertise, we were able to overcome this. **Our team is proud to have designed, built, and tested this one-of-a-kind facility, cementing India's position in the elite global hypersonic research community,**" he added.

Prof. Tarun Gupta, Dean, Research and Development, IIT Kanpur, said, "S2 highlights IIT Kanpur's research excellence, positioning the institute at the forefront of innovative research and opening doors to groundbreaking advancements in aerospace technology. I am pleased to acknowledge the crucial support received from ARDB and DST."

Prof. G. M. Kamath, Head, Department of Aerospace Engineering, IIT Kanpur, said, "With S2, we advance our research horizons, inspiring a new generation of aerospace enthusiasts and fostering innovation and exploration in this exciting field. Being the first in India to develop such a facility enables us to set a new benchmark for hypervelocity research in India and beyond." S2 represents a tremendous achievement for IIT Kanpur and a major capacity boost for India's space and defense sectors. With sophisticated hypervelocity testing capabilities now available domestically, India is better positioned to develop advanced hypersonic technologies and systems….

News from Livermore, CA - LLNL

Excerpts - Lawrence Livermore National Laboratory researchers and their collaborators have created a new responsive material called a liquid crystal elastomer, made by incorporating liquid crystals into the molecular structure of a stretchable material.



Web - **Are shapeshifting "soft machines" in our future? LLNL scientists advance light-responsive material.**

(Contact: Jeremy Thomas)

Adding gold nanorods to the material, the researchers created photo-responsive inks and 3D printed structures that could be made to bend, crawl and move when exposed to a laser light.

(Photos courtesy: Michael Ford)

Researchers at Lawrence Livermore National Laboratory have furthered a new type of soft material that can change shape in response to light, a discovery that could advance "soft machines" for a variety of fields, from robotics to medicine. The novel material, called a liquid crystal elastomer (LCE), is made by incorporating liquid crystals into the molecular structure of a stretchable material. Adding gold nanorods to the LCE material, scientists and engineers created photo-responsive inks and 3D printed structures that could be made to bend, crawl and move when exposed to a laser that causes localized heating in the material. The results were recently published online by Matter, and will be featured in the journal's March print issue.

As described in the paper, the LLNL team, along with their collaborators from Harvard University, North Carolina State University and the University of Pennsylvania, used a direct ink writing printing technique to build a variety of light-responsive objects, including cylinders that could roll, asymmetric "crawlers" that could go forward and lattice structures that oscillated. By combining shape morphing with photoresponsivity, researchers said the new type of material could change the way people think about machines and materials.

…"This project is starting to show how architecture and these novel materials can have unique modes of actuation that we haven't researched before. said principal investigator Caitlyn Krikorian (Cook)…Researchers said the new material could be used to create a "soft machine" — a type of machine made from these flexible LCE composite materials — capable of responding to external stimuli and even mimicking the movements and behaviors of living organisms. Soft robots made of the shape-morphing material could crawl, swim or fly, and explore environments that are too difficult or dangerous for humans to access, like caves or outer space. Soft machines could also be used in medical applications, such as implantable devices that can adapt to the body's movements, or prosthetic limbs that move like natural limbs, and other applications that aren't possible with machines made from rigid materials, like metal or plastic.

"Rigid robots maybe wouldn't be ideal for humans to interact with, so we need systems and materials that are more compliant," said the paper's lead author Michael Ford, who began working on responsive materials while a postdoc at Carnegie Mellon University. "You start with components that make up our robots, and one of those components is an actuator. That's where these materials come in; they could potentially be an actuator. It reduces computational complexity; you're making a material that gets rid of onboard electronics and replacing them with a single material that can do all those things. That will allow you to put more computational complexity into another component or drive power to other sensors that you wouldn't have been able to do with traditional rigid materials."

Researchers said the movement of the LCE material is driven primarily by a process known as photothermal actuation, which involves converting light energy into thermal energy resulting in a mechanical response from the material. Driven by the interaction between light, gold nanorods and the LCE matrix, the process enables the printed structures to exhibit dynamic and reversible movements in response to external stimuli.

“When you have this composite material — in this in case, these gold nanorods in these liquid-crystal elastomers — it has a photothermal effect,” Cook explained. “With [infrared] light, it creates a heating effect, which causes the aligned molecules to become misaligned. During that misalignment process, if there's uniform heating, you’ll have a global shape change. But in this case, we can have localized heat change, which is how you can get those localized regions of shape morphing to do things like locomotion.”

In the study, researchers used a computer vision system, involving cameras and a tracking software, to control the movement of a printed cylinder. The tracking system monitored the position of the rolling cylinder and continuously adjusted the position of the laser to raster the edge of the cylinder. This continuous tracking and adjustment allowed for the cylinder to maintain its rolling motion in a controlled manner.

By leveraging computer vision with the photothermal actuation of the cylinder, the researchers achieved a sophisticated level of manipulation of the soft machine's movement, showcasing the potential for advanced control systems in the field of soft robotics and soft machines. The team also showed that responsivity could be controlled so the soft machines could perform useful tasks, such as a moving cylinder carrying a wire.

“[Lead author Ford] did some awesome work in using computer vision to control the locomotion of the printed cylinder and using a rastering laser to force it to move,” said co-author Elaine Lee. “But once you start to get into much more complex motion — like using various rastering speeds and light intensities on a printed lattice, causing it to move in various different modes — those were actually outside of what our high performance computing (HPC) simulations were able to predict, because those codes are expecting a uniform heating or stimuli on that lattice. So, using computer vision and machine learning to learn the actuation speeds, and what doses of light can cause locomotion from that printed architecture, will push us a lot further in understanding how our materials will respond.”

Researchers said there are still some challenges that need to be overcome before the material can be used in practical applications. The team found that structures they created could flip over or exhibit other unpredictable motion, thereby making it difficult to design specific modes of motions. They said they will continue to work on models that can describe the complex motion to better design future machines and develop new materials and manufacturing techniques to create soft machines that are more durable, reliable and efficient for a variety of applications. New control systems and computer algorithms also could enable soft machines to move and interact with their environment in a more intelligent and autonomous way, they said. Cook said the team is looking at incorporating responses to different types of stimuli, beyond thermal and light stimuli, into areas like humidity and energy absorption, and conditions that the material might experience in space. She added that the team is looking at starting a new Strategic Initiative at the Lab to focus on autonomous materials and “move the needle” towards sentient materials.

…Cook said. “These liquid crystal elastomers are responsive materials — they’re able to sense a stimuli and respond, and will respond repeatedly every time — but it doesn't have a sense of memory or a way to learn the repeated stimuli and respond accordingly. It doesn't have a means to communicate yet, other than potentially being able to pair it with some type of mechanical computing. These are really the materials that we're striving towards, and this might be a five- to 10-year timespan of effort.”

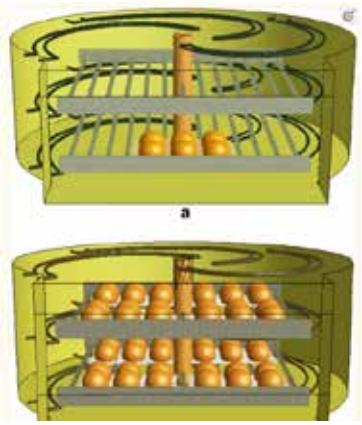
Funding for the research came from the Laboratory Directed Res. & Dev. project “Shape Changing of Responsive Elastomer Structures,” & a grant from the Nat’l Sci. Foundation. Other LLNL co-authors included D. Porcincula, C. Loeb, J. Mancini & B.Moran. External collaborators included R. Telles and J. Lewis from Harvard; Y. Wang and S. Yang from UPenn; and M. Rizvi and J. Tracy of NC State.

Baking -The surface and the volume mesh were generated using GAMBIT and exported to the Ansys-12 (Fluent) for further processing. Mesh size of oven chamber were optimized and finalized for higher accuracy, and mesh size was dense near trays, buns and coils… Governing equations - The software Ansys Fluent 12 was used to solve the governing continuity, momentum and energy equations for the defined geometry and associated boundary conditions (Sun 2007)

Web - Computational fluid dynamics modeling of bun baking process under different oven load conditions

A. Tank, N. Chhanwal, D. Indrani, and C. Anandharamakrishnan

A computational fluid dynamics (CFD) model was developed to study the temperature profile of the bun during baking process. .Evaporation-condensation mechanism and effect of the latent heat during phase change of water was incorporated in this model to represent actual bun baking process. Simulation results were validated with experimental measurements of bun temperature at two different positions.



Figures - CFD modelling - Figure 1 shows the geometry of single tray loaded oven resembling the experimental conditions. While, Fig. 2 shows the geometry of the partially loaded (two baking tray placed diagonally) and fully loaded oven containing the buns placed in baking trays. CFD simulations were carried out for all the cases (Fig. 2). The surface and the volume mesh were generated using GAMBIT and exported to the Ansys-12 (Fluent) for further processing…

... Further, this study was extended to investigate the effect of partially (two baking trays) loaded and fully loaded (eight baking trays) oven on temperature profile of bun. Velocity and temperature profile differs in partially loaded and fully loaded oven. … Hence, placement of bun inside the oven affects temperature of bun and consequently, the quality of the product.

Buns are much popular along with sliced bread, but there are variations in taste and sizes globally. Moreover, much popularly buns are used as a base in burgers or in the form of sweet buns. Bread baking involves various physicochemical and biological transformations; such as evaporation of water, volume expansion, starch gelatinization, protein denaturation and browning reactions that occur simultaneously, which make bread baking a complex process to model …. The network like structure of bread crumb formation is mainly due to starch gelatinization and protein denaturation. **Bread baking is considered as an irreversible process, which makes it economically critical; hence, producing consistent good quality bread has always been a great challenge for the bakery industry. Non-uniform heat distribution inside the oven causes variation in the moisture content and colour of bread.** …But, so far no work has been performed for bun baking process with evaporation-condensation mechanisms. **Hence, the present work is aimed to develop a 3D CFD model for the bun baking process in a pilot-scale electrically heated oven using evaporation condensation mechanism within the bun**. Further, this work was extended to study the effect of fully and partially loaded oven on bun temperature profile for industrial applications…

Autodesk – The Autodesk Fusion industry cloud represents a new era of connected data and collaboration to design and make anything. Read on to learn what the future holds.

Excerpts WEB – [Autodesk Fusion Industry Cloud – A Look Forward to Design, AI, and Manufacturing]

by - Stephen Hooper

The landscape of product development is transforming, driven by the integration of cutting-edge technologies – transforming the way products are conceptualized, designed, manufactured, and brought to market.

Rivian's approach to breaking down silos in product development serves as a prime example of how innovation and efficiency can be achieved through seamless integration. Let's take a look at how Autodesk Fusion industry cloud can help you gain a competitive advantage.

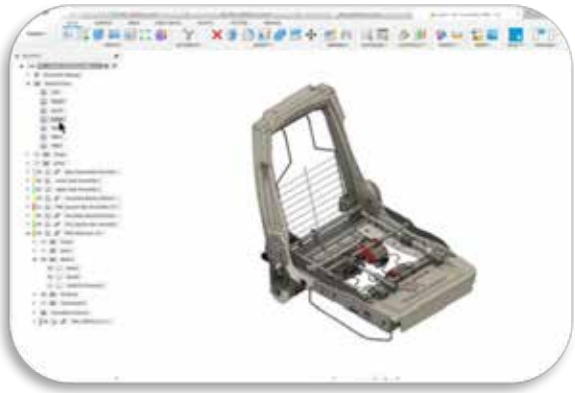
Breaking down siloes with Autodesk Fusion industry cloud - The development of Autodesk Fusion industry cloud embodies the industry-wide shift towards unified data and technology platforms. This platform connects the entire product development process, from design to manufacturing. By leveraging the power of connect processes, generative AI, and cloud-based data unification, Autodesk Fusion stands at the forefront of technological evolution. It's not just a tool but an ecosystem that spans Autodesk's extensive portfolio.

Innovations in design with Blank.AI

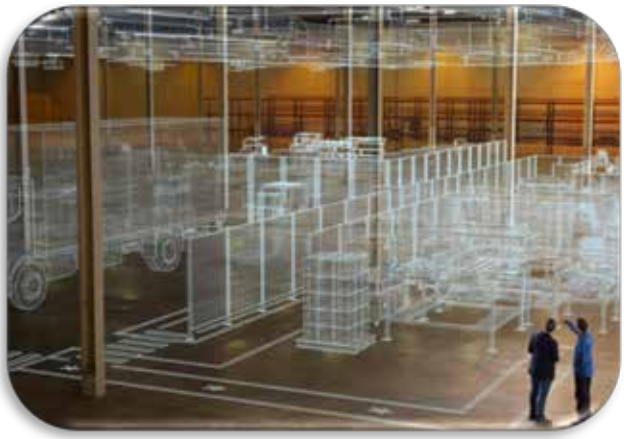
A key component of this transformation is the acquisition of Blank.AI, a generative AI technology that enhances industrial design creativity. By analyzing a company's historical design data, Blank.AI aids in creating new concepts that align with brand identity and styling cues.

Combined with existing Autodesk tools like ALIAS and VRED, this technology offers an immersive, collaborative design experience, bridging the gap between ideation and final product development.

Enhancing engineering productivity - In the realm of engineering, the focus shifts to collaboration and agility. Fusion's configurations are intuitively designed to integrate workflows across domains, such as design, simulation, and manufacturing. This approach ensures that multidisciplinary teams can collaborate effectively, maintaining a "single source of truth" for projects.



Electronics engineering and manufacturing – Recognizing the increasing complexity of products, like those in the automotive and aerospace industries, Fusion now incorporates comprehensive electronics toolsets. These toolsets streamline the process from schematics to package design, offering a unified development experience. Partnerships with industry leaders like Ansys and Cadence further enrich these capabilities, allowing for real-time analysis and seamless integration of various design tools.



Generative automation in product development - Addressing time-consuming tasks such as 2D documentation, Fusion employs generative automation to streamline the creation of drawings from 3D models. This automation conforms to standards and offers a variety of dimensioning styles, significantly reducing manual effort.

Autodesk Fusion industry cloud – The future of manufacturing - In the manufacturing sector, Autodesk Fusion introduces advanced multi-axis machining workflows and partnerships with companies like CloudNC.

These advancements utilize AI for automating toolpath creation, drastically reducing programming times and enhancing shop floor productivity.

Towards a connected digital factory - The acquisition of FlexSim marks a significant step in achieving a connected digital factory. FlexSim enables real-time simulation and analysis of factory resource flows, identifying bottlenecks and improving overall efficiency. The integration of FlexSim within Fusion will connect it to the entire Autodesk Design and Make platform, providing a comprehensive suite of tools for digital factory management.

Autodesk Fusion industry cloud, revolutionizing design and manufacturing – The strides made by Autodesk in revolutionizing product development are just the beginning. With a focus on accessibility and versatility, Autodesk's solutions cater to various manufacturing environments, from small workshops to large-scale production facilities. The future envisioned by Autodesk is one where digital technology powers and transforms the manufacturing process, making it more agile, resilient, and forward-looking.

DFE-tech: We offer comprehensive software solutions that span the entire range of physics, providing access to virtually any field of engineering simulation that a design process requires.

Discover ANSYS Rocky, a powerful simulation software that can revolutionize the way you approach particle-based simulations.

YouTube - On-demand Webinar of the Ansys Motor-CAD

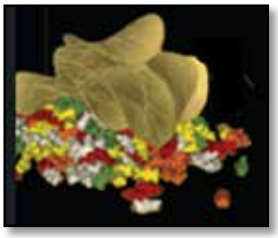
Mechanical Analysis for BPM Motor is available now! View it on our YouTube channel today. The audience will be able to explore the capabilities to analyze stress and displacement in rotors during operation by Ansys Motor-CAD

Key Takeaway :

- Familiarise with Ansys Motor-CAD modelling tools for designing the geometry and winding
- How to assign materials and calculation in Ansys Motor-CAD
- How to generate the field plots, output data and graph in Ansys Motor-CAD

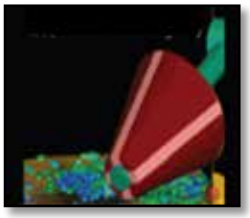
Six reasons why ANSYS Rocky is a must-have tool for your engineering and design projects.

Visit our website for products and information



1. REAL PHYSICAL REPRESENTATION

Replaces traditional glued sphere approach by accurate representation of real shapes of solids, shell and rigid and flexible fibers

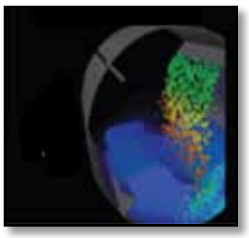


2. MULTI-BODY DYNAMICS

Supports the prescription of exact movements or the free response of the geometry components to outside forces like particle contacts and gravity

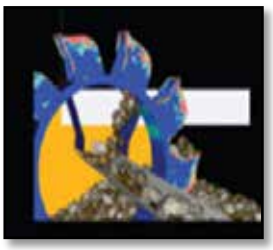
3. ADVANCED BREAKAGE MODELS

Includes breakage models that preserve mass and volume for an accurate simulation of particles particle and particle equipment interaction



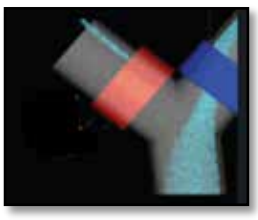
4. MULTI-CPUS SCALABILITY

Developed from ground up to run on GPU and unique in the market to support multi-GPUs. Enables solving for millions of particles in reasonable compute time.



5. ANSYS INTEGRATION

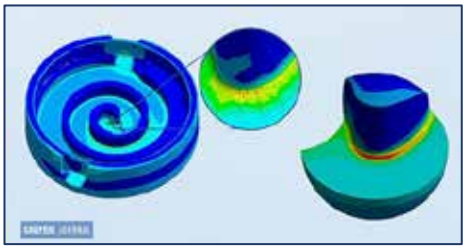
Seamless coupling with ANSYS Fluent for simulations where fluids effects matter. ANSYS Mechanical for simulations of mechanical loads and ANSYS Motion for complex nested and chained motions.



6. ADVANCED CUSTOMIZATION

Rocky's APIs can be used to configure and simulate a project from scratch, analyze and export results and perform computations that go beyond DEM

CADFEM India: Efficiency in the development process means, on the one hand, minimal time spent on design. On the other hand, it is about exploiting the full range of possibilities - both known and previously hidden. What this can mean specifically for engineering practice is shown by an example in which the technology service provider OBRIST Engineering and the simulation specialist CADFEM have combined their digital engineering expertise.



EXCERPT Website - Reducing development times – through clever automation

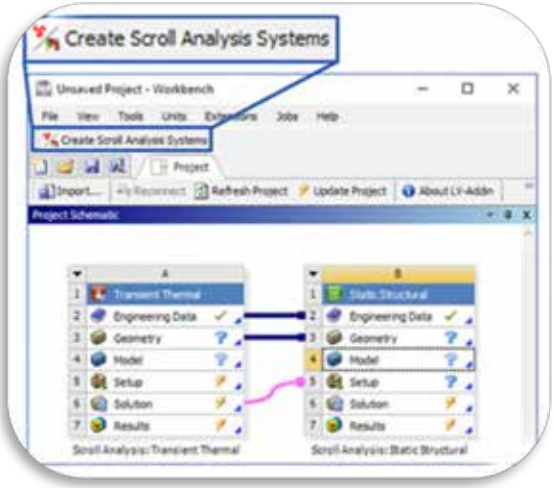
The result is an engineering workflow for scroll compressors in which time-consuming processes and compromises that previously had to be accepted are now a thing of the past thanks to automation.

OBRIST Engineering, an Austrian technology company with around 40 employees, has been a leader in the development of automotive powertrain systems, thermal management, and waste heat recovery for over 25 years. One focus is on scroll compressors, which are mainly used in automobile air conditioning systems. Their main advantages compared to other compressor machines are high efficiency while maintaining very low noise levels. Scroll compressors are therefore particularly suitable for electric cars.

The basic principle of the scroll compressor is based on two spiral elements that are nested together. One element is fixed in position, the other moves in eccentric paths, with multiple points of contact between the spirals. This creates a positive displacement machine with multiple rotating chambers that become smaller with each revolution. The process gas drawn in, such as chemical (R1234yf) or natural (R744, R290) refrigerants as well as other gases for further applications, is highly compressed in the spiral channels from 100 mbar to 100 bar, depending on the application, and expelled in the center of the spirals. In this process, the scroll compressors from OBRIST Engineering operate at 500 to 11,000 revolutions per minute and the volume to be compressed is 4 to 200 cubic centimeters per revolution.

Mechanical and thermal loads - Compressors only remain competitive if they are continuously improved. One of the ways to optimize efficiency and analyze the effects of the compression process on individual components is to take a close look at the mechanical load. Added to this is the thermal load due to self-heating, whereby the resulting gas temperature or pressure varies greatly both locally in the compression chamber and over time depending on the angle of rotation. In order to be able to optimize the component design, it is important that these loads and the resulting deformations and stresses of the components involved in the compression process are known in advanced, and with a high degree of accuracy.

Scroll compressors are very common, especially in the automotive sector, and their advantages are high efficiency and low noise level | ® OBRIST



ACT enables the automatic transfer of the temperature field from the thermal to the structural-mechanical calculation | ® OBRIST

Ever better through automated simulation - Simulations always show their full potential when measurements on the test stand are particularly time-consuming or when processes are very complex. Both were true in this case. At first, an attempt was made to set up the simulation process manually. However, this approach did not deliver the desired quality of results or the speed required in a streamlined development process.

Therefore, CADFEM was brought on board to jointly automate the simulation process for the scroll compressors.

With the Ansys Application Customization Toolkit (ACT), the time-consuming manual pre- and post-processing work could be reduced to a minimum while also analyzing the effects of the compression process on individual components in much greater detail and at almost any resolution

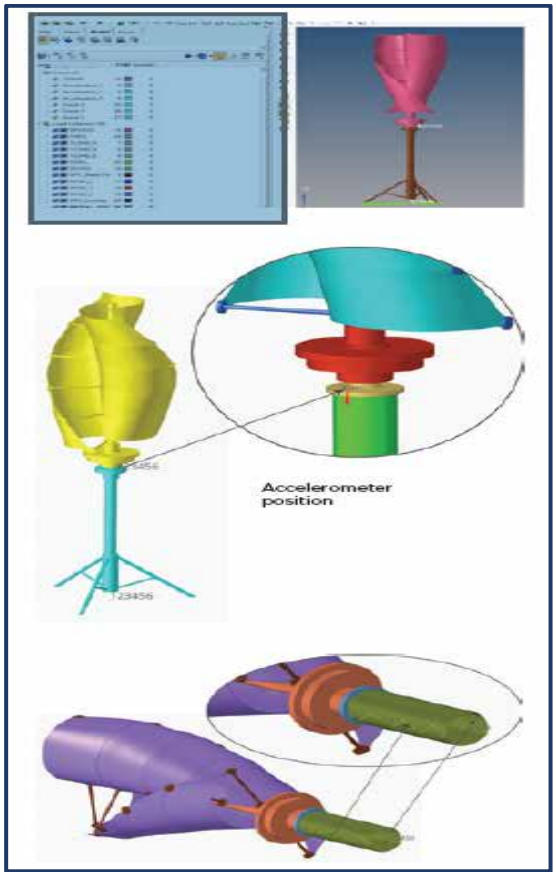
ACT in Action- (View Video On Website) For the automated simulation process, a thermal-mechanical analysis environment was created based on a 1-way coupling using the corresponding boundary conditions and solver settings. First, the thermal problem is solved, and the resulting temperature field is automatically transferred to the mechanical analysis in the background and mapped onto the components. An advantage of this approach is the possibility to use different meshing methods depending on the physics. For example, linear elements can be used for the thermal calculation and quadratic elements for the mechanical calculation.

Alejandro Catalá-Ruiz, computational engineer at OBRIST Engineering, explains, “for years, we had no solution available with which we could analyze the real stresses and deformations under pressure and temperature loads. This was because it was too time-consuming to define the loads manually and, in addition, the results were not accurate enough. The new automation solution with ACT allows a 1-way coupling based on a relatively simple simulation model, with which a complete calculation can be completed in one day. The otherwise required transient analysis with fluid-structure interaction would take several times as long.”

Automated settings in the background - In order to bring the compressor components to the correct temperature level, the thermal load, which is repeated periodically once per revolution, is calculated several times in succession until a steady-state periodic temperature distribution is achieved. The time and location-dependent loads of a complete revolution of the compression process are calculated, exported, and read into the ACT automation solution using a program developed by OBRIST. They form the basis for the background definition of the application-specific framework conditions for the respective compressor variant as well as the control of the required load steps and solver settings for the calculations.

Article continued on CADFEM Website:
OBRIST Engineering GmbH - Images: © OBRIST Engineering GmbH
Author: Gerhard Friederici - (CADFEM Germany GmbH)
Contact CADFEM - Wolfgang Freiberger

ALTAIR - NITTTR chose to model wind turbines - they are complex machines that face unique challenges. **The development & functionality of the digital twin of a vertical wind turbine were performed using the Altair® RapidMiner® data analytics platform along with Altair Embed®, Altair® HyperGraph®, & Altair® OptiStruct®.** These tools span data acquisition, modeling, data visualization & processing, & finite element (FE) modeling & analysis.



Excerpts - Web - [Modeling Next-Gen Wind Turbines - Altair Solutions Monitor and Optimize Vertical Wind Turbines]

(website has complete pdf) With Altair's digital twin solutions, NITTTR was able to continuously observe the virtual wind turbine's parameters – thus improving the physical asset's performance and illustrating the basic concepts of digital twin technology to students and users alike. ...

Background Information - Wind energy is the most effective, well-established renewable energy source today.

(Left-picture - TOP: Finite element (FE) model of windmill. MIDDLE: Data Fusion: Enforced excitation in FeModel vs accelerometer position. BOTTOM: Results: Observed strains FE vs experimental.)

It has far fewer deleterious effects on the environment than many other energy sources, especially compared to fossil fuels. However, complex systems like the wind turbines needed to generate wind energy require regular inspections and maintenance to ensure an effective, long-lasting service life. This is where digital twin technology, with its real-time analysis and prediction capabilities, can deliver immediate, impactful value.

Their Challenge - As part of their digital twin program, NITTTR needed to include a practical model that was representative of real-life scenario. This model needed to include sufficient complexity in both its design and operation. To create such a model required a technology platform that enables users to create a digital twin that addresses both physics and data. A model like this would help users better understanding the model on the operations side and thereby provide insights on future design requirements. **To cover this, NITTTR felt that a wind turbine would be an ideal real-world scenario to analyze. They chose Altair to develop this model…**

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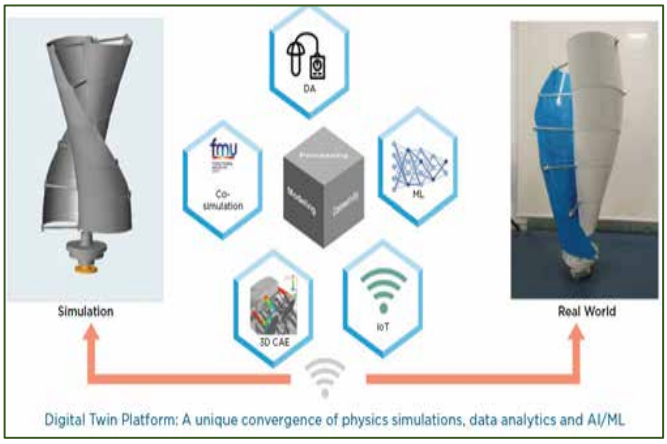


Our Solution - A digital twin is a digital representation of a physical object, process, or service such as a wind turbine, jet engine, robotic arm, or even buildings.

It enables real-time communication between physical and virtual models, and can be used to simulate a physical system for various purposes such as performance testing, installation, predicting health conditions, etc.

Altair's digital twin solution is ideally suited to create an accurate virtual model of a wind turbine. With its range of technology to address both physics- and data-driven twins – and the ability to analyze both a projects' engineering and operational aspects… Altair's solutions were uniquely capable of addressing NITTTR's requirements. NITTTR also took advantage of Altair's robust domain expertise to further define the model and expand the scope of the project. This allowed NITTTR to better teach digital twin technology.

Results - With Altair's digital twin solutions, NITTTR was able to continuously observe the virtual wind turbine's parameters – thus improving the physical asset's performance and illustrating the basic concepts of digital twin technology to students and users alike. Thanks to Altair technology, NITTTR was able to leverage a machine learning model developed using two data sets consisting of 18,000 tests collected using an accelerometer and a strain gauge. The data comprised of a set of healthy data and another data set collected by introducing fracture in the structure to record faults. Overall, the model was able to predict the "good" condition of the wind turbine structure with an accuracy of 97%, and the "faulty" condition of the wind turbine structure with an accuracy of 95%. By applying different excitation frequencies on the FE model for healthy and faulty structures, the observed physical strain closely matched the experimental result.

In conclusion, digital twins are here to stay, and their adoption by the wind energy sector will accelerate in the coming future with improved cost-cutting and efficiency as well as safety. Overall, Altair's technology helped NITTTR achieve its learning and teaching goalsand accurately illustrated the basic concepts of digital twin technology to all involved.

About the Customer

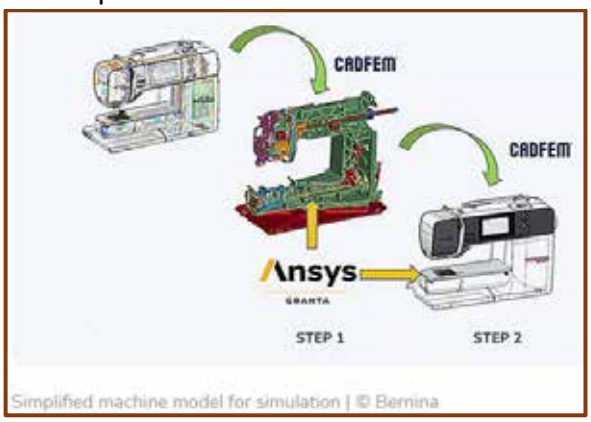
The National Institute of Technical Teachers Training & Research (NITTTR) Chandigarh, is an autonomous educational institution under the government of India's Ministry of Education (MoE). NITTR aims to be a leading institute for promoting excellence in the technical education system. As a part of its digital program initiatives, NITTTR has set up multiple lab activities as part of its official training curriculum, including programs on digital twin, embedded artificial intelligence (EAI), and virtual reality. NITTTR is focused on introducing digital twin models and including them in its curriculum, where during the courses students and faculty can better understand the importance and impact of implementing digital twin by blending simulation and Internet of Things (IoT) technology.

CADFEM: From our website: **BERNINA** International AG develops and produces sewing, embroidery, overlock and quilt machines for the household and prosumer sector. A growing number of sewing machines are being sold at online stores and are being individually transported to the end customer.

WEB – Bernina - Optimized product packaging
Cost reduction by drop test simulation during the development process

More than 40% cost reduction through drop test simulation with Ansys
Sector: Consumer goods/durable goods
Specialist field: Electromagnetics, Structural mechanics

For a new model series, a cost-efficient and space-saving packaging had to be developed that would also provide ideal protection for the product. The drop test simulation with ANSYS enabled a new, virtual development workflow in accordance with the CADFEM motto: 10x Simulate, 1x Test.



Simplified machine model for simulation | © Bernina

Task - The cost-sensitive development project for a new sewing machine series includes optimizing the packaging to the new logistical conditions and adapting it to the new product design of the sewing machine. Packaging protection also had to be increased. In terms of specifications, this means that no acceleration forces greater than 100G may occur on the machine during a standardized drop test from a height of 0.9m. Furthermore, the use of polystyrene should be reduced by at least 20% for cost and environmental reasons. For the end customer, the package should be easy to transport by hand and leave a tidy and logical impression when unpacked, which was difficult to specify and also led to some loose ends with regard to the arrangement of accessories.

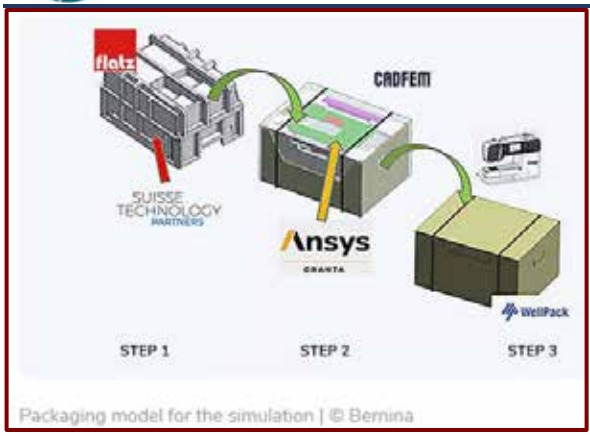
Simplified machine model:

- Step 1: Simplified load-bearing structure with equivalent masses and moments of inertia
- Step 2: Detailed formwork with attachment points
- Ansys Granta: Ansys Granta linear and non-linear material models

Packaging model:

- Step 1: Detailed packaging
- Step 2: Simplified accessory elements
- Step 3: Simplified machine model
- Suisse Tech.: Non-linear material model in LS Dyna (crushable foam) with stored measurement data
- Ansys Granta: Linear and non-linear material models from Ansys Granta

Solution - To achieve the goal of a virtual drop test, various preparatory steps had to be taken before the actual simulation. In the first step, the material data was determined using material samples and the various curves from the compression tests were transferred to the LS Dyna material model.



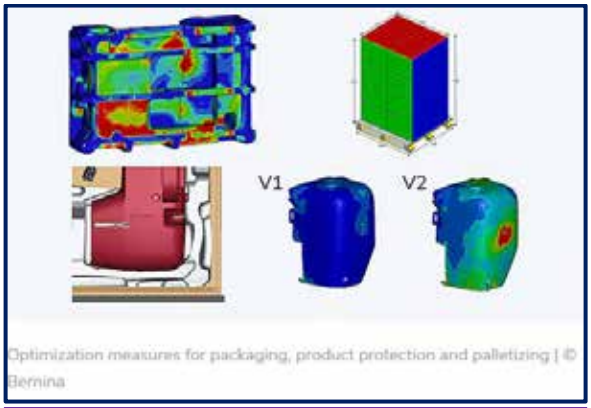
Packaging model for the simulation | © Bernina

In the second step, the machine model from CAD was reduced for the simulation to the geometries essential for the stiffness and the casing connections. The interior was simulated as realistically as possible using substitute masses and substitute beams, and the contacts between the components were defined. Linear (metal and plastic structures) and non-linear (casing parts) material data was then defined in ANSYS Granta.

The model of the packaging consists of detailed CAD data of the polystyrene, which is modeled with the experimentally determined material data. The cardboard box and the accessory accessory data were simplified and enhanced with ANSYS Granta material models.

This modular structure of the machine model, which is separate from the packaging, made it relatively easy to model various packaging variants in a virtual drop test.

The virtual drop tests in the specified directions were carried out using the ANSYS LS-Dyna calculation tool with explicit time integration.



Optimization measures for packaging, product protection and palletizing | © Bernina

3D model of Bernina sewing machine packaging | © Bernina

Customer Benefit - Thanks to the new simulation workflow and the involvement of packaging experts during development, it was possible to achieve the goal of realizing functioning packaging with the first drop test.

By reducing the size of the packaging, the number of packages per pallet (Seafreight 1140 x 1140, CP3) could be increased from 18 to 24 machines, which corresponds to an increase of more than 30%.

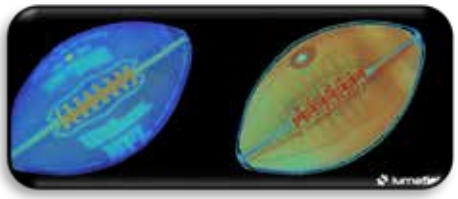
The volume of polystyrene could be reduced by a factor of almost 2 compared to the previous solution. The saving of around 45% corresponds to the equivalent of CHF 2.9 per pack or savings of more than CHF 55,000 per year. Over the product life cycle (15 years), costs amounting to CHF 825,000 can be saved and CO2 emissions can be reduced by more than 225 tons (analyzed with ANSYS Granta Eco Audit).

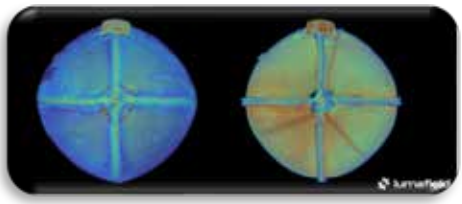
In addition to the economic improvements, the most important point, product protection, was also improved through both packaging optimization and optimizations to the machine design. As a result, all G-values acting on the machine during the drop tests are now less than 100G.

Thanks to the horizontal machine arrangement (based on the simulation results), the customer can now be impressed by both the machine and the tidy accessory arrangement as soon as it is unpacked.

CADFEM Engineering Services - Dr. sc. ETH Manfred Maurer

From the Lumafield website: "…it's easy to focus on the teams and forget about the real powerhouse: the football itself. Industrial CT gives us a window into what lies beneath its leather exterior. Let's take a look at the ball's easily overlooked engineering and labor-intensive manufacturing process."





Web - CT Touchdown - Learn about the football's often-overlooked engineering and labor-intensive manufacturing process

Panels - The pebbled leather panels of football are made of cowhide, which wears well over time and provides a grip that can withstand all weather conditions. A football's manufacturing process is still largely manual. A worker cuts out the four panels with a die, sews cotton and vinyl linings onto the back of each one, and then stitches them all together before a roller flattens the seams. **CT allows us to assess the consistency in the panel's thickness, the precision of the stitches, and how well the panels conform to the bladder, all of which contribute to the ball's aerodynamic properties and in-hand feel.**

Bladder - Enclosed within the four panels is a polyurethane bladder, a critical component that retains air and ensures the ball holds its shape and proper inflation. With Voyager's dimensioning tools, we can measure the thickness of the layers and apply a color map that corresponds to the density of each material.

The thickness of the polyurethane bladder (red, most dense) measures 0.872 mm, the cotton/vinyl layer (blue, least dense) is 1.389 mm, and the leather (yellow, density between the bladder and lining) is 1.456 mm.

Laces and Valve - The laces on a football aren't just there for show; they provide an essential grip for quarterbacks to throw spiral passes with accuracy. A worker inflates the ball to make it rigid, then steadies it with planks before using an awl to thread the single four-foot-long vinyl lace through the holes twice over.

While small and often unnoticed, the valve can make or break the football. A proper seal is needed for air retention, especially during a game as critical as the Super Bowl. A retaining flange embeds in a dense housing adhered to the bladder's inner wall. The NFL requires that a football be inflated to between 12.5 and 13.5 psi. This is crucial, because a softer ball is easier to catch. Remember Deflategate?

Conclusion - CT helps us appreciate the unseen qualities that ensure footballs meet the highest standards of quality and performance. At this year's Big Game, don't lose sight of the precision design and craftsmanship at the heart of the sport.

OASYS: Introducing our all-new, dynamic geotechnical graphing solution. This revolutionary tool is an integration for Seequent's OpenGround Geotechnical Information Management solution.

Full Graphics and Information are on the website.

Excerpts WEB - **Oasys Giraphe! Discover geotechnical graphing for the digital age** - Giraphe makes geotechnical graphing as seamless as possible for you. You can create and refresh geotechnical graphs from your data in seconds and explore them to spot errors and trends. Take this opportunity to enhance your geotechnical data workflows.

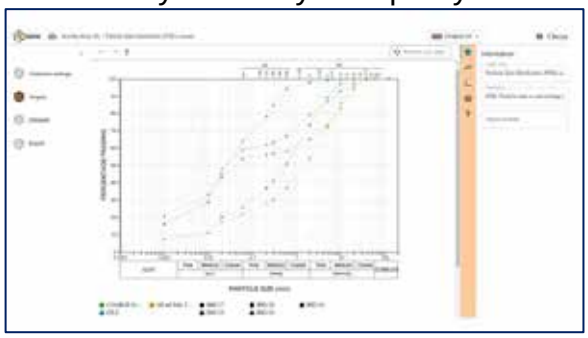
Giraphe unlocks the power of geotechnical graphing for

As a Seequent Technology Partner, we developed Giraphe as the dynamic graphing integration for Seequent's OpenGround geotechnical information management solution. The tool allows you to create, customise, update, and interpret graphs with ease.

Dynamic graphing begins with a click - We've made geotechnical graphing as seamless as possible for you. Giraphe takes the hard work out of graphing, communicating seamlessly with OpenGround data and automatically saving your creations. Ready to export when you are!

With few clicks, you can retrieve OpenGround data and plot it on any of the geotechnical graphs in Giraphe's predefined library.

Giraphe makes graphs consistent within your organisation. Custom graphs can be built using custom queries to sample fields from project data grids in OpenGround, or from your own data upload via CSV file. With Giraphe you can arrange graphs in collections for easy reference, quick creation and refreshing, all of which streamline your ability to export your creations for use in reports and presentations.



Giraphe brings the power of cloud to geotechnical graphing. Giraphe works in sync with Seequent's OpenGround data management platform (or data uploaded from a CSV file) to provide consistent, dynamic geotechnical graphing.

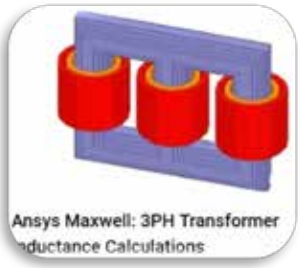
Once signed up, there's nothing to install, all you need to do is create an account and log in. Dynamic graphing allows you to interact with graphs to interpret your data. Refresh your graphs to show any changes in your project's OpenGround data.

Together, OpenGround and Giraphe allow you to take advantage of cloud technology, providing you with a seamless, connected experience.

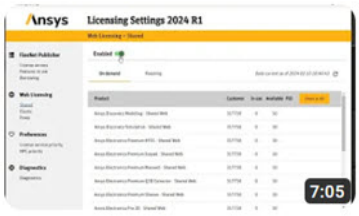
Unlock the potential of dynamic graphing - Geotechnical graphing has never been so easy! Gone are the days of extracting data to create your own graphs on each project. Integrate Giraphe into your workflows for the ultimate graphing experience. Support and technical resources are made readily available with Giraphe. Tutorial videos, how-to guides and responsive customer service is provided to set you up for success.

OZEN Engineering: Two important notices you should be aware of:

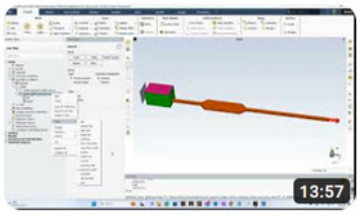
1. **Our YouTube Channel has new videos for learning**
2. **Meeting room #3 has our opportunity in Durham, NC**



YouTube -Ozen Engineering YouTube Channel Videos

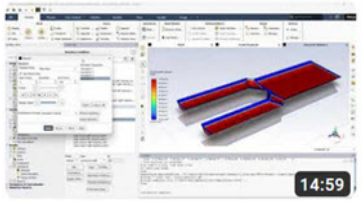


Ansys Shared Web Licensing setup in 5 min.



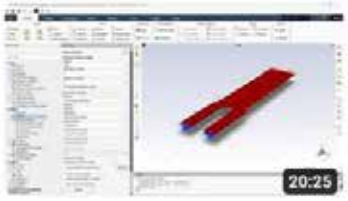
Free surface tension driven flow in a microfluidic device using Ansys...

Modeling water flow in underground tunnels using open channel flow...



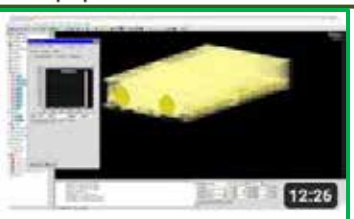
The comparison of shallow and deep open channel flows is shown...

Modeling deep open channel flow by VOF method in Ansys Fluent



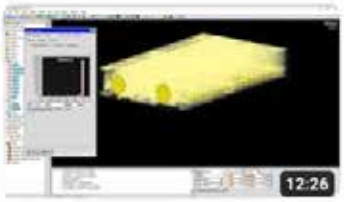
Modeling open water channel flow by VOF method in Ansys Fluent

Basic solving and Post-Processing in Icepak

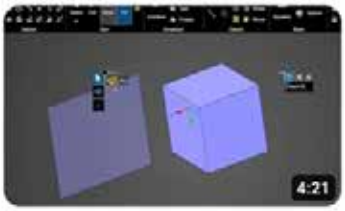


Conformal Meshing using Icepak

How to build a diaphragm in Zemax

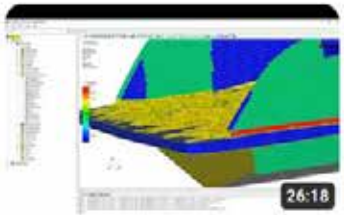


Conformal meshing - Ansys Icepak



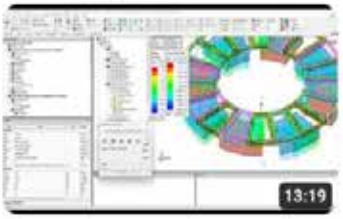
Using the "Fill" functionality within Ansys Discovery and SpaceClaim

Model building using icepak primitives I

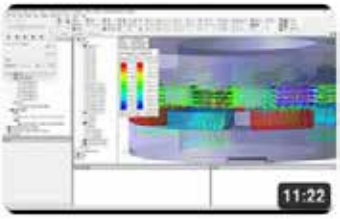


Composite modeling of a boat transom in Ansys Composite Prep...

Ansys Maxwell: Coil Models pt 1 - Geometry



Ansys Maxwell: Parameterized Double Rotor Axial Flux Motor



Ansys Maxwell: Double Rotor Axial Flux Motor Using Symmetry

From the Workday blog: "Augmented workforces aren't just changing the future of work. They're shaping the here and now. Learn how your company can benefit by integrating artificial intelligence.

Artificial intelligence (AI) is driving major innovation across industries—but for many employees, it's also a source of concern. Our integrated approach further enables Workday to more easily match the rapid pace of AI development.

Excerpts WEB - **Using AI to Empower an Augmented Workforce -** Blaise Radley

Modern generative AI tools can almost instantly create imagery, text, and datasets, raising questions about long-term job security. In fact, the Organization for Economic Co-operation and Development found that 27% of jobs globally were at high risk of being automated. Fortunately, the answer to future success lies in augmenting workforces, not replacing them.

While AI represents a major competitive advantage, many companies are still in the process of identifying potential use cases. In doing so, it's essential that businesses don't lose sight of the human element, and ensure that their HR teams are involved in key AI decisions. Businesses that want to succeed in the new world of work have to answer three questions: How will AI change each employee's workflow, what are the potential benefits of AI, and how can AI support human productivity?

What Is an Augmented Workforce? An augmented workforce refers to any organization where humans and machines work together in partnership. Through this collaboration, AI systems and human workers produce far greater results than either one working in isolation. This marks a shift from a working model premised solely on labor force to one premised on integrated technologies.

In addition to defining augmented workforce, it's worth defining some related terms. Ensuring your employees understand the role of artificial intelligence within the workplace is critical in creating an augmented workforce. **Here is some key terminology to help define the function of AI:**

- **Artificial intelligence (AI)**: the ability of computers and machines to carry out tasks traditionally seen as requiring human cognition. Primarily intended for problem solving, AI now has a huge number of applications, from data analysis to image generation.
- **Machine learning (ML):** a subfield of AI dedicated to training machines with algorithms to learn through repetition. Rather than following explicit instructions, ML systems use statistical models to adapt based on patterns within the data.
- **Intelligent automation**: The act of automating repetitive manual processes to streamline employee workflows. Not only do automation tools boost accuracy and efficiency, they also enable employees to focus on higher business priorities.

An augmented workforce refers to any organization where humans and machines work together in partnership.

T**he Impact of AI on the Global Workplace -** Organizations enabled by augmented workforces are already creating major changes in the global marketplace. Data from AlphaSense showed that almost 40% of companies in the blue-chip S&P 500 index mentioned AI or related terms in 2023 earnings calls. Business leaders must recognize that a major technological revolution isn't just imminent—it's already happened. But what does such a seismic change mean for the workplace?

According to research by McKinsey, less than 5% of occupations could be fully automated. However, for the majority of companies, complete automation isn't the goal. That same study found that nearly 60% of workers

had roles where over one-third of their activities could be automated. That represents a substantial change in role, responsibility, and the overall future of work. If full automation isn't the goal, the question remains as to how AI can support humans, not replace them. A 2023 Workday study found that 45% of decision-makers say AI and ML will benefit workers by creating new career paths. Despite this, a 2024 Workday study found that only 62% of leaders and 52% of employees welcome AI. That's why it's critical that businesses take the time to understand the potential benefits an augmented workplace offers.

The 5 Benefits of an Augmented Workforce - With more and more companies discussing how they use AI, it's clear we're undergoing a major shift. What differentiates AI from other more-focused technological innovations, however, is the breadth of its potential applications. That means the benefits have the potential to impact every aspect of your organization.

Each of the following five categories covers an area where augmented workforces are outperforming their competitors. Whether through automating repetitive tasks, streamlining recruitment, or identifying skills gaps, AI can help unlock your employees' potential.

1. Increasing Efficiency Through Automation - Increasing productivity without decreasing employee satisfaction can be a difficult balancing act. What distinguishes intelligent automation is that it works from a human-centric perspective. AI automates routine and repetitive processes, freeing up employees to tackle tasks that require a human touch. AI organizes complex data and analyzes it, and then makes predictions, while employees think creatively and look at the bigger picture.

Critically, this human-machine relationship is collaborative, meaning that employees make decisions from data collected by AI. For decisions involving people, from employee scheduling to team reorganizations, important personal factors might not be captured in the data. Ultimately, your managers know their offices and assembly lines best—AI just helps them take action more swiftly. By keeping a human in the loop, you enable a more productive and satisfied augmented workforce.

Here are three areas where AI is already driving major efficiencies for organizations:

- Optimizing schedules by matching labor demand with worker skills, availability, and preferences
- Surfacing pertinent employee feedback when it matters most
- Improved demand forecasting accuracy, matching changing markets and avoiding inventory shortfalls

A 2023 Workday study found that 45% of decision-makers say AI and ML will benefit workers by creating new career paths.

2. Streamlining Recruitment and Onboarding - First impressions matter, and that's particularly true in recruiting and onboarding. Convoluted hiring portals, confusing interview practices, and poor scheduling can make acquiring talent impossible. That's why HR departments spend a huge amount of time and resources on recruiting and onboarding. An augmented workforce solves many of those issues.

For recruiting, AI speeds up the recruiting process by identifying candidates with relevant skills for screening by human recruiters. Then, once an employee is hired, AI chatbots can provide quick answers to onboarding questions by using natural language processing. In both instances, AI enables HR professionals to make smarter, more effective decisions. Plus, by tackling simple requests, AI frees up employees to identify more pressing issues new hires may be having.

Here are three areas where AI is already streamlining recruitment and onboarding:

- Drafting content for job requisitions and job descriptions based on simple prompts
- Scanning huge numbers of job applications to identify candidates with the right skills for a role
- Suggesting additional job opportunities to candidates based on their experience and skills

3. Improving the Employee Experience - Discussions around employee experience often focus on improving in-person aspects. More spaces to socialize at work, better desk equipment, or a wider array of

snacks. However, limiting discussions on employee experience to the physical work environment is a mistake. A major benefit of workforce AI is in creating a company culture that is more accessible and inclusive.

In addition to streamlining workflows and automating common tasks, augmentation can reduce the barrier to entry for certain jobs. AI can provide tailored support and information based on employee needs, and support employee collaboration across the world. In doing so, it enables disabled employees to work where they can, and how they can. Most importantly, businesses can use AI to help measure employee engagement as a result of these changes.

Here are three areas where AI is already improving the employee experience:

- Providing suggested trainings and learnings that match user needs
- Tailoring shift patterns and workflows for each individual employee
- Searching vast amounts of employee feedback to generate top-line insights

4. Enabling Personalized Employee Learning - Research by Forum and PwC shows that investing in skills training could increase GDP by $6.5 trillion by 2030. Despite this, only 0.5% of global GDP is invested toward adult lifelong learning. Often, businesses struggle to identify where skills gaps exist, and what skills they require. By using AI to process that data in real time, business leaders can gain a full view of their skills portfolio. AI gives HR leaders a comprehensive dataset, revealing the relationships between different skills as well as development opportunities. In addition, AI can generate personalized learning paths based on reskilling needs. 54% of leaders say using AI to identify hidden skills would help them reskill their workforce and retain displaced talent. With intelligent automation, supporting employee learning and internal mobility is easier than ever.

Here are three areas where AI is already personalizing employee career development:

- Identifying and promoting growth opportunities to upskill workers and retain top talent
- Delivering individualized learning pathways to workers in their natural flow of work
- Tailoring recommendations for skills development based on employee preferences and career goals

5. Safeguarding Employee Well-being - When employee well-being suffers, the knock-on effects can be significant and wide ranging. In an augmented workforce, the early warning signs of declining well-being can be much easier to notice. HR can leverage AI analytics to flag issues that range from patterns of absence to declining employee engagement scores. Then, your people leaders can take direct action with the delicacy required. Employee well-being also depends on psychological safety—meaning that employees thrive when they have a way to provide feedback confidentially. With AI, people leaders can surface trends and insights from their teams' survey responses without sacrificing that security. By providing employees with a safe space to share their thoughts and then acting on the insights provided by AI, you create an inclusive culture.

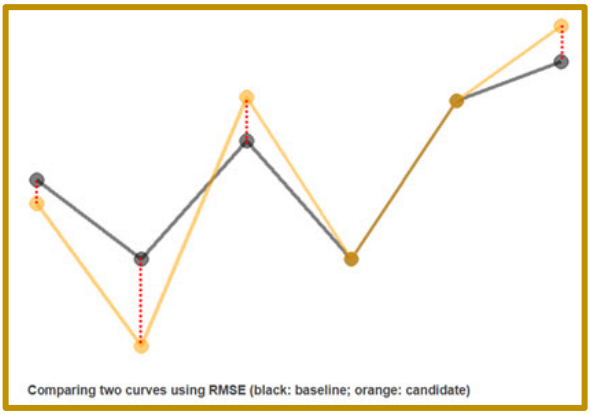
Here are three areas where AI is already safeguarding employee well-being:

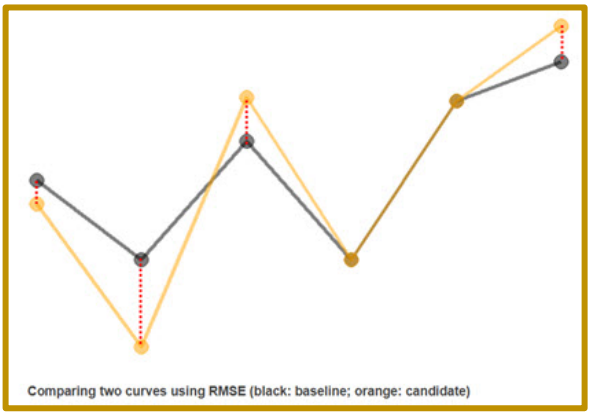
- Calculating well-being and attrition risks and providing suggested actions
- Summarizing high volumes of employee comments to identify trends and concerns
- Enhancing personal assessments by providing data free from bias

…Creating the Augmented Workforce of the Future With Workday - AI has already impacted millions of jobs, and the pace of change is only accelerating…. Tackling change management at that scale can be intimidating, but augmenting your workforce doesn't have to be difficult. At Workday, we build AI into the core of our solutions, rather than bolting it on after. By embedding AI into our platform, our users can quickly leverage AI technology as part of their natural workflow, saving time on complicated integrations. For example, Workday People Analytics automatically surfaces personalized insights, highlighting top workforce trends, drivers, risks, and opportunities so that leaders can act on what matters most….

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

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





Excerpt - Compare curves with Dynamic Time Warping -

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

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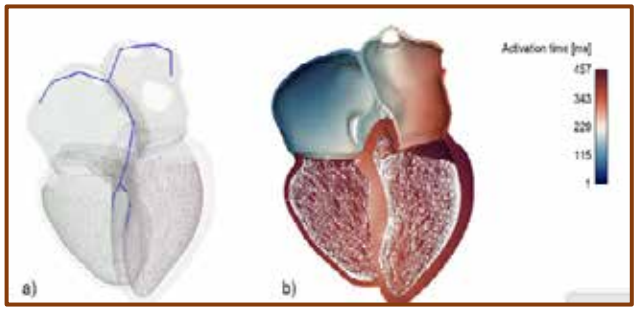
Siddharth Shah - **Principal Product Manager for LS-DYNA at Ansys**
Los Angeles Metropolitan Area

Did you know that 1) Ansys LS-DYNA produced an intricate and precise human heart model that can be used to simulate various cardiovascular scenarios? 2) There is a paper Pyheart-lib: A Python Library

The model starts with electrophysiology (EP) which simulates the propagation of the cell transmembrane potential in the heart. This electrical potential triggers the onset of cardiac muscle contraction, which then results in the pumping of the blood to the various organs in the body. The EP/mechanical model can be coupled with a Fluid and Structure Interaction (FSI) model to not only study the clinically relevant blood flow parameters as well as valves or cardiac devices.

Such models enable biomedical researchers and practitioners to study and analyze the behavior and response of the heart under different conditions, leading to a better understanding of cardiac function and improved diagnosis, treatment, and prevention of cardiovascular diseases.

For those interested in learning more about heart modeling, do check out the pyheart-lib project
https://pypi.org/project/pyheartlib/



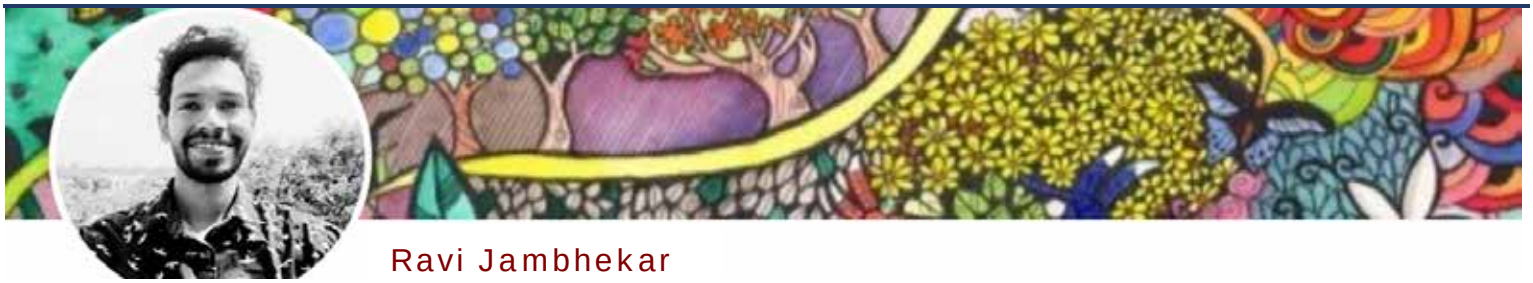
dynalook website has a paper & pdf

WEB- Pyheart-lib: A Python Library For LS-DYNA Multi-Physics Heart Simulations

By: M. Hoeijmakers, K. El Houari, W. Ye, P. L'Epplattenier, A. Nagy, D. Benson, M. Rochette
ANSYS Inc.

Flow chart demonstrating the preprocessor and simulation modules. The preprocessor is used to instantiate a model of a certain geometric type. Consequently, this instantiated model can be used to instantiate a simulator class that defines the physics of interest.

Physics-based computer simulations of the heart are gaining rising interest for optimizing the design of medical devices and for its treatment prediction and planning. LS-DYNA offers a powerful framework for modeling cardiac electrophysiology, mechanics, and fluid dynamics, as well as the coupling between the three physics. However, its wider adoption is hindered by several requirements among which: knowledge in cardiac function in health and pathology, expertise in numerical simulation, appropriate right modeling choices for the target application, availability of realistic heart geometries. In this paper, we present a free to use python package that allows for the generation of physiologically accurate heart models in an automatic and modular fashion. The architecture is organized in an abstract form that allows users to easily choose between the different physics, anatomical chambers of interest and parameters of interest and export the LS-DYNA keyword files ready for simulation. We also introduce the relevant heart modeling features that are available in LS-DYNA and present two exemplary models generated by the package: a full electrophysiology heart model and a bi-ventricular mechanical model.



Ravi Jambhekar

Consultant - Research and Academics, IIHS | Ph.D. Indian Inst. of Science (IISc)
Illustrator | Natural History Artist | Scientist

"If I were to illustrate for a book on Indian wildlife and natural history illustration, I would like it to be like the following."

(LinkedIn Posting)

Indian Nightjar (Caprimulgus asiaticus)

The Indian Nightjar is a nocturnal bird found in open grassy habitats.

It actively feeds on insects during the night. The underwings have a barred pattern resembling a hawk or bird of prey.

During the day they sleep on the ground and sometimes on trees.

Indian Nightjar (Caprimulgus asiaticus)

Indian Nightjar feeding on a grasshopper during the early dusk hours

Ozen Engineering is seeking a Mechanical Engineer with deep experience using ANSYS LS-DYNA software tools to work at their office located in the Research Triangle Park, Durham, NC

Description: **The successful candidate will demonstrate subject matter expert level capabilities, possess strong interpersonal/presentation skills, and be an enthusiastic learner who loves working with physics-based simulation technology.**

hr@ozeninc.com for questions and to apply

As part of the Ozen team, you will be working at the leading edge of technological innovation. You will apply advanced engineering knowledge through pre-sales and post-sales engagements to enable client success using simulation tools.

As a rapidly growing Elite Ansys Channel partner, we offer a unique opportunity to join our team in a role with growth potential. We would love to hear about your experience with ANSYS and your unique industry/application expertise.

Responsibilities: Serve as a subject matter expert on ANSYS tools and platforms, responding to client inquiries quickly and accurately.

- Lead technical customer engagements for Ansys software demonstrations, evaluations, technical support, and engineering consulting services.
- Design and deliver customized training and mentoring to assist clients with integrating simulation tools to meet engineering goals.
- Work independently within a multi-disciplinary team to deliver innovative solutions.
- Collaborate with sales account managers to execute technical engagements. Serve as a team player with a great customer facing attitude and the ability to develop long-standing customer relationships.
- Create proposals, blogs, videos, whitepapers and conference presentations on simulation applications.

Requirements:

- Mechanical Engineering degree or similar discipline with emphasis on physics-based simulation
- At least 2 years of direct full-time experience using Ansys tools
- Expert level experience using LS-DYNA
- Ability to quickly and independently learn complex engineering skills / concepts / software tools. Confidence to teach the same material to a group of engineers with short turnaround time.
- Excellent written & verbal communication skills. Strong presentation abilities.
- High-level attention to detail in documentation and workflow protocols.
- Highly organized, self-driven with outstanding interpersonal skills.
- Have a passion for engineering and physics-based simulation and possess strong problem-solving skills
- You may not check every box, or your experience may look different from what we've outlined, but if you think you can bring value to Ozen Inc, we encourage you to apply.

Candidates for positions with Ozen Engineering Inc must be legally authorized to work in the United States. Verification of employment eligibility will be required at the time of hire. Visa sponsorship is not available for this position. To conform to U.S. Government regulations on International Traffic in Arms Regulations (ITAR), this candidate must be a U.S. citizen or Green Card holder.

About Us: Ozen Engineering, Inc. is the premier distributor of advanced Computer Aided Engineering (CAE) software and an Elite Ansys Channel Partner. We are experts in simulation of structures, fluids, heat transfer, electromagnetics, optics and photonics.

Prestigious companies turn to Ozen Engineering as a primary source of reliable simulation solutions. We are passionate about providing accurate and advanced simulation technologies to help clients realize unparalleled results using Finite Element Analysis (FEA), Computational Fluid Dynamics (CFD), and Electromagnetics (EM) software tools from ANSYS.

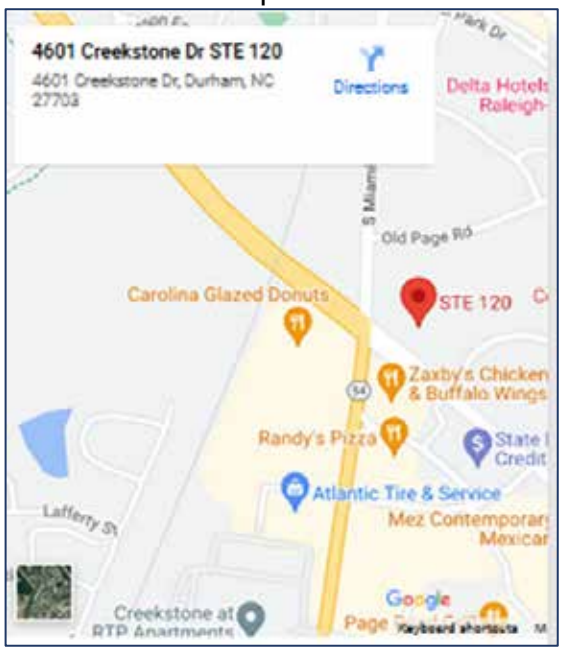
Job Type:	Full-time
Experience level:	Minimum 3 years
Schedule:	8 hour shift Monday to Friday

Benefits:

401(k) & 401k matching	Vision insurance	Dental insurance
Health insurance	Life insurance	Paid time off

Application Question(s): This candidate must meet US ITAR regulations.

- Do you possess US citizenship or a Green Card?
- Are you currently living within daily commuting distance of the Durham, NC Research Triangle Park?
- What level of expertise can you demonstrate during an interview using Ansys LS-DYNA simulation tools - Beginner, Intermediate, Advanced, Expert?
- In your most-recent 6 months of industry experience, on average how many hours per week did you spend providing physics-based modeling and simulation solutions using Ansys LS-DYNA?
- Work Location: In person



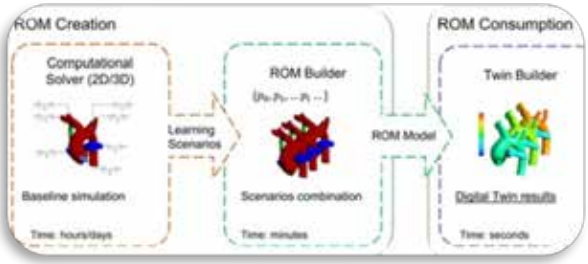
Why relocate to Durham: Durham is part of the Research Triangle Region, known for its technology and scholarly institutions. It is home to several recognized institutions of higher education, most notably Duke University and North Carolina Central University. Durham is also a national leader in health-related activities. Durham is family oriented as well as technology.

Web - **Durham Public Schools** shares information about their district that will provide you with quick access to some of the materials you may need to aid in your relocation decision.

A great place for a Mechanical Engineer with deep experience using ANSYS LS-DYNA to relocate

…

RBF Morph - 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.



Web-MDPI - [The Hemodynamic Effect of Modified Blalock–Taussig Shunt Morphologies: A Computational Analysis Based on Reduced Order Modeling]

by E. Kardampiki, E. Vignali, D. Haxhiademi, D. Federici, E. Ferrante, S. Porziani, A. Chiappa, C. Groth, M. Cioffi, M.E. Biancolini, E. Costa & S. Celi

- RINA—Registro Italiano Navale ed Aeronautico, Italy
- BioCardioLab, Fondazione Toscana Gabriele Monasterio, Italy
- Critical Care Unit, Fondazione Toscana G. Monasterio, Italy
- Paediatric Cardiosurgery Unit, Fondazione Toscana G. Monasterio, Italy
- RBF Morph, Monte Compatri,Italy
- Dept. of Enterprise Engineering, Univ. of Rome Tor Vergata, Italy

Abstract - 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.

1. Introduction - Congenital heart defects are currently present in about 9 of every 1000 live-born children [1,2]. Several of these pathologies, such as pulmonary atresia and Tetralogy of Fallot, are linked with cyanotic heart diseases in which low levels of oxygen in the blood are encountered. Especially in the case of the pulmonary atresia, the pulmonary valve plane is absent, leading to full blockage of the blood flow towards the lungs. Among the most diffused approaches to tackle these complications, the modified Blalock–Taussig shunt (MBTS) is a surgical procedure which consists of implanting a synthetic shunt between the subclavian and pulmonary artery. The MBTS is frequently adopted for the treatment of newborn children suffering from pulmonary hypoperfusion triggered by congenital heart diseases [3]. In this way, sufficient levels of oxygenated blood are delivered to the pulmonary circulation. Although the implanted shunt does not guarantee the holistic repair of pulmonary vascular blockages, it offers a time extension until the child grows in order to subsequently proceed with a permanent surgical treatment [4]. In general, the MBTS is considered as a low-risk management option for the palliation of congenital heart diseases. Nevertheless, the danger associated with this intervention should not be downplayed, as the overall mortality and composite morbidity rates remain relatively high at 7.2% and 13.1%, respectively [4,5]…

Mercedes-Benz

- Long before female dummies were required by law, Mercedes-Benz made them the standard for frontal and side impact crashes
- Modern dummies model the risk of injury to vehicle occupants – regardless of their gender
- New generation of dummies has even higher likeness to humans and is already being used in tests

WEB- Female crash test dummies at Mercedes-Benz – Fact-checking the myths

She is about 1.5 meters tall, weighs 49 kilogrammes and, in dummies of the newest generation, has numerous sensors on various body parts with up to 150 measuring points. For 20 years now, the so-called 'fifth percentile female' has been a driver, front passenger and rear passenger in Mercedes-Benz frontal crash tests – and is an equal to the traditional male dummy, the Hybrid III 50[1]. This means the company Introduced the Hybrid III 5th Percentile Female dummy even before it was officially required by law. The dummy replicates the female anthropometry with female breasts and pelvic bones. According to underlying statistics, only five percent of American women are smaller or lighter. Today, ratings from consumer protection associations and various laws around the world include specifications for testing with fifth percentile female dummies. Another type of dummy that Mercedes-Benz has used in crash tests for two decades is the SID-II female dummy. With an anatomy similar to that of the Hybrid III 5, it has been designed specifically for side impact tests. Unlike in the USA, however, its use is not yet required by law in Europe.

120 dummies in 21 different versions undergo up to 900 crash tests each year - Safety is a core component of Mercedes-Benz's DNA. Mercedes-Benz is regarded as the inventor of modern vehicle safety – and remains a pioneer in the field to this day. The basis for the company's commitment is its real-life safety strategy: For more than 50 years, the company's in-house accident research centre has been investigating accidents involving Mercedes-Benz vehicles. The aim is to understand how accidents happen and which advanced safety systems could have prevented them. What's more, findings from real-life accidents can be used to define requirements for crash tests. The Mercedes-Benz Technology Centre for Vehicle Safety in Sindelfingen conducts up to 900 crash tests and 1,700 sled tests every year. The tests involve 120 dummies in 21 different versions – from toddlers, children of all ages and fifth percentile female dummies to 50th percentile male dummies and large, heavy male dummies[2]. The results of the crash tests and accident research are used to help develop new safety technologies and improve existing systems.

The topic of female dummies is currently the subject of much public debate. Hanna Paul, Head of Dummy Testing at Mercedes-Benz, fact-checks six of the most common myths.

Myth 1: Cars don't protect women as well as they do men - Hanna Paul: No, that's not true. First of all, here are two general findings from our accident database: In the case of severe or fatal injuries, there are no discernible relevant disparities between the sexes. Only in the case of minor injuries there are certain disparities in individual cases. Women are more susceptible to injury in some regions of the body (legs/feet and whiplash in a rear impact), while men may be more severely affected in others (head, chest).

In addition, analysis carried out by our accident research team has revealed that there are no anomalies with regard to women or men in Mercedes-Benz vehicles. This shows that the safety design of Mercedes-Benz vehicles is effective in real-life accidents. This underscores our ambition of 'real-life safety'.

Myth 2: There are statistics showing that women are less protected - Hanna Paul: Again, a resounding no. The accident figures cited in these statistics often date back to the 1980s. A great deal has happened since then in terms of passive vehicle safety. Passenger cells, even in small vehicles, have become much more stable. At the same time, modern restraint systems are now used in all vehicle classes. Belt force limiters, for example, which limit the pressure on the chest, adapt to the requirements of the occupants with a defined force curve. However, another aspect from these often cited studies that does still apply today. Namely that in terms of global statistics, women often drive older, smaller cars. This is confirmed by a study carried out by the American insurance organization Insurance Institute for Highway Safety (IIHS). But, as I already mentioned, the safety level has improved significantly in all vehicle segments, including in small cars. This led the US National Highway Traffic Safety Administration (NHTSA) to determine that the disparities in fatality rates between men and women fell significantly starting with model year 2000 vehicles.

Myth 3: Male dummies are predominantly used in crash tests - Hanna Paul: Not at Mercedes-Benz. We have been using female frontal impact dummies and female side impact dummies in our crash tests for more than 20 years. But dummies are not human dolls. They are instruments that measure physical forces and trajectories. Their weight and size are derived from real-life human data. Female dummies correspond to, are scaled to, the female anatomy. However – and this is decisive – the forces acting on dummies during crash tests are converted into injury risks. These risks are calculated based on injury data for both men and women. The common limits for female dummies are lower than for male dummies for the same injury risk. This means that the dummies do a good job of representing injury risks for the unique anatomical characteristics of men and women. The size and weight of the types of dummies used at Mercedes-Benz are gender-specific.

The fifth percentile dummy[3] has female anatomy, but in terms of injury risk, it represents small people in general – regardless of whether they are men or women. In other words, injury risks are human, not male or female. The same applies to the other dummies as well: The 50th percentile male[4] mimics the male anatomy, but it also represents the injury risks that an average woman faces. The NHTSA is currently investigating the extent to which injury risks vary by gender. The first published results confirm our findings that gender is not the most important factor influencing injury frequency. The dummies we use today are therefore effective measuring tools for developing safety systems.

Myth 4: Crash test dummies are not diverse enough - Hanna Paul: In recent years, the number of dummy types has increased significantly, partly due to the many different types of collision that are being tested. Mercedes-Benz has a total of over 120 dummies. They come in various sizes and weights – from babies weighing only 3.5 kilos and children and teenagers of various ages to fifth percentile females and heavy dummies. There are also different types for frontal, rear and side impacts. Which dummies are used in each type of crash test is defined in the test specifications set out in laws, ratings and specific Mercedes-Benz load cases. Dummies are regulated in detail to ensure worldwide comparability. Even their clothing is regulated. Dummy technology is currently undergoing a generational change. The advanced THOR dummy is replacing the Hybrid III dummy introduced in 1986. THOR dummies are more biofidelic, i.e. they more accurately depict the human body, and offer extended measurement options. According to our internal research, a further expansion of dummy types would not bring any significant improvement in safety.
Myth 5: Pregnant women are less protected

Hanna Paul - Head of Test-Engineering & Dummy Technology
Mercedes-Benz

Hanna Paul: A comparison of systems in a recent study by ADAC (Allgemeiner Deutscher Automobil-Club, transl. 'General German Automobile Club') shows that normal seat belts protect both expectant mothers and their unborn children well in the event of an accident. According to accident research by ADAC, pregnant women are no more at risk than other drivers. When used properly, normal three-point seat belts protect both pregnant women and their unborn children in the event of an accident.

Myth 6: Simulations will soon replace physical crash testing - Hanna Paul: We don't see that happening. It is true that calculating kinematics and deformation can significantly reduce the number of whole vehicle tests and speed up development at the same time. However, there are several reasons why there is no way around vehicle crash testing: On the one hand, crash tests are necessary to validate simulations, which are based on many assumptions. On the other hand, they are required by law or ratings. In whole vehicle tests, sensors can be used to get the best picture of how a crash develops and the dummies behave during it.

Occupant simulations merely calculate how a dummy would behave in a vehicle. Mercedes-Benz is also working on so-called human body models (HBMs), which are designed to represent human anatomy – bones, muscles and organs – in even greater detail. Compared to dummies, using HBMs in crash tests allows researchers to assess the actual type of injury that a particular part of the body is likely to suffer, rather than simply calculating the probability of injury severity. We use HBMs, among other uses, to evaluate our innovative restraint systems such as PRE-SAFE® Impulse Side.

This means:

- Fifty per cent of all men are smaller and lighter (1.75 meters and 78 kilogrammes)
- Hybrid III 95: Only 5% of all men are bigger and heavier (1.87 meter tall, weighing 101 kilogrammes)
- Hybrid III 5: Only five per cent of women are smaller or lighter.
- Hybrid III 50: It represents the average man (1.75 meters tall, weighing 75 kilogrammes).

US Airforce Picture of the Month

Colorful skies ahead - An F-16C Fighting Falcon assigned to the 79th Fighter Squadron sits ready on the flightline at March Air Reserve Base, Calif., during Bamboo Eagle 24-1, Jan. 30, 2024. The exercise generated 95 mobility sorties and the movement of 662 passengers and 817,000 pounds of cargo.

(U.S. Air Force photo by Senior Airman Steven Cardo)

Lightning formation - A U.S. Air Force F-16 Fighting Falcon assigned to the 309th Fighter Squadron and F-35A Lightning IIs assigned to the 61st Fighter Squadron fly in formation Jan. 19, 2024, over Luke Air Force Base, Ariz. Flying operations at Luke AFB contribute to advancing training, producing mission command-focused U.S., allied and partner Airmen to meet warfighter needs. (U.S. Air Force photo by Airman 1st Class Katelynn Jackson)

Newest fighter - Eglin Air Force Base accepted its sixth F-15EX Eagle II fighter aircraft Jan. 26, 2024, at Eglin AFB, Fla.

The 53rd Wing now has four, and the 96th Test Wing has two as the units continue joint developmental and operational testing on the Air Force's newest fighter aircraft.

(U.S. Air Force photo by 2nd. Lt. Rebecca Abordo)

YouTube - ASELSAN | MARLİN

MARLIN: The pioneer of the new era in naval warfare.

It has been developed for surface and electronic warfare, reconnaissance and surveillance, base/ port/critical ship-facility security and amphibious operations.

Web - Skunk Works® team - **The Indago 4**

A significant leap forward for aerial intelligence.

Our Skunk Works® team is proud to unveil this cutting-edge addition to our small uncrewed aerial systems portfolio.

The Indago 4 seamlessly integrates into the connected battlespace, conducting ISR with precision, even in GPS-challenged environments.

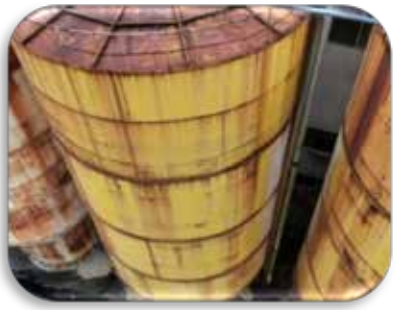
The Lockheed Martin Procerus Technologies Indago 4 is a tactical quadcopter uncrewed aerial system is purpose-built for vital missions, deploying with an expanded capabilities suite designed for military and security forces applications.

Ruggedized, backpackable and rapidly deployable, the Indago system fits within a small backpack and deploys in approximately 2 minutes. With industry-leading endurance, high-resolution payload options, a low acoustic signature and new on-edge computing, Indago 4 delivers proven mission benefits

Web Norway Receives First C-130J-30 Super Hercules Tactical Airlifter with Block 8.1 Upgrade

Lockheed Martin delivered the first of four

C-130J-30 Super Hercules tactical airlifters with the Block 8.1 upgrade to the Royal Norwegian Air Force (RNoAF), delivering advanced capabilities and increased Super Hercules interoperability in the Nordic region and across Europe.



WEB – Excerpt [Discover the significance of maintaining clean industrial tanks and how simulation can aid in predicting the cleaning process.] **German Ibarra – Ozen Engineering**

Maintaining clean industrial tanks has advantages and is crucial for several reasons.

Firstly, it ensures the safety of workers and the environment. Contaminated tanks can pose serious health risks and may lead to environmental pollution if not properly cleaned. Regular inspections help comply with environmental regulations and ensure the mitigation of the risk of accidents and chemical spills.

Secondly, clean tanks contribute to the efficient operation of industrial processes. The build-up of sludge, sediment, or other contaminants can hinder tank performance, resulting in decreased productivity and increased energy consumption. Regular cleaning helps maintaining the optimal functioning of tanks, ensuring smooth operations and minimizing downtime, especially when different products are stored periodically. Furthermore, maintaining clean industrial tanks prolongs their lifespan.

Corrosion and sediment accumulation can cause damage to tank structures over time. Regularly cleaning the tanks addresses these issues, preventing costly repairs or premature tank replacement. This not only saves money but also ensures the longevity and reliability of the tanks.

CFD Simulation applied to the cleaning process - Computational Fluid Dynamics (CFD) simulation allows engineers to model and analyze fluid flow, heat transfer, and chemical reactions within the tank, as well as the cleaning process. It offers valuable insights and optimization opportunities leading to better maintenance outcomes. By using CFD, engineers can assess the effectiveness of different cleaning methods and equipment, such as high-pressure water jets. Optimization allows for minimizing cleaning time, agent/water use, and power consumption. Single and multiphase modeling capabilities provide insights into the time required to complete the task and a better understanding of the effects of nozzle design and configuration.

While there are first principles that can be followed, the large diversity of tanks, shapes/sizes, and internal structures makes 'validation' a very time-consuming task. In many cases, real-size testing is required, which takes a considerable amount of time. Well-established simulations can expedite the process, as demonstrated in the video below. Note that a water jet is rotating to cover all the internal areas, which are monitored over time.

Summary - **Maintaining clean industrial tanks is essential for safety, efficiency, and longevity. Regular cleaning reduces the risk of accidents, ensures optimal tank performance, and prevents structural damage.** Furthermore, CFD simulation provides valuable insights into the cleaning process, allowing for optimization and improved outcomes. By choosing the right industrial tank cleaning service and utilizing advanced techniques such as CFD simulation, industries can ensure the cleanliness and reliability of their tanks, contributing to a safer and more efficient working environment. Each industrial tank has unique characteristics and cleaning requirements. CFD simulations can help assess aspects such as, Effect of nozzle/spray head selection - Cleaning impact pressure and shear force - Time for complete cleaning - Liquid consumption - Film coverage (View video on website)

Excerpts - **Step 5 was executed by using ANSYS Workbench software** to grid processing, then load and boundary conditions were applied to execute FEA....Using ANSYS Workbench 17.0 (ANSYS, Inc., Canonsburg, United States) **for meshing each part. The solid model of each bone was divided into a high-quality mesh using the self-adapting dynamic biomechanical FE grid of the Modeler.**

WEB - A new method proposed to explore the feline's paw bones of contributing most to landing pattern recognition when landed under different constraints.

Datao Xu, Huiyu Zhou, Qiaolin Zhang,Julien S. Baker, Ukadike C. Ugbolue, Zsolt Radak, Xin Ma, Fekete Gusztav, Meizi Wang, Yaodong Gu

Ningbo Univ., Eötvös Loránd University, Univ. of Pannonia, Univ. of the West of Scotland, Hong Kong Baptist Univ., Univ. of Physical Education Budapest, Fudan Univ. Óbuda Univ.

The current work investigated the biomechanical characteristics of the cat forelimb paw during landing from different heights using FEA and feature engineering techniques for post-processing of FEA results. The main contribution of the current study is to fill the field gap of cat's paw biomechanics during landing, and the proposed combination of feature engineering technology to solve the problems that include incomplete analysis, and difficulty in feature mining in the post-processing of FEA.

Felines are generally acknowledged to have natural athletic ability, especially in jumping and landing. The adage “felines have nine lives” seems applicable when we consider its ability to land safely from heights. Traditional post-processing of finite element analysis (FEA) is usually based on stress distribution trend and maximum stress values, which is often related to the smoothness and morphological characteristics of the finite element model and cannot be used to comprehensively and deeply explore the mechanical mechanism of the bone. Machine learning methods that focus on feature pattern variable analysis have been gradually applied in the field of biomechanics. Therefore, this study investigated the cat forelimb biomechanical characteristics when landing from different heights using FEA and feature engineering techniques for post-processing of FEA. The results suggested that the stress distribution feature of the second, fourth metacarpal, the second, third proximal phalanx are the features that contribute most to landing pattern recognition when cats landed under different constraints. With increments in landing altitude, the variations in landing pattern differences may be a response of the cat's forelimb by adjusting the musculoskeletal structure to reduce the risk of injury with a more optimal landing strategy. The combination of feature engineering techniques can effectively identify the bone's features that contribute most to pattern recognition under different constraints, which is conducive to the grasp of the optimal feature that can reveal intrinsic properties in the field of biomechanics.

Introduction - Much of modern human motion technology was gathered and developed from animals (1, 2). Naturalistic development of the world would not be possible without the knowledge gained from animal models (3, 4). Cats are generally acknowledged to have natural athletic ability, especially during jumping and landing (5). Cats can land safely from high positions without any injury, because of the landing buffering mechanics that they possess. The adage, “cats have nine lives”, seems applicable when we consider the

animal's ability to land safely from heights (6). Several studies have reported that there have been <10% of cat's fatalities recorded while falling from heights (6–8). Vnuk et al. investigated that there was a 96.5% survival rate when a feline fell from height (6). This interesting phenomenon has attracted much research attention. Research has focused on the inner mechanical principles of the cat for providing information to reduce landing fall injuries in humans (9).

Paw pads of cats during landing are the only body parts in contact with the ground. It is believed that paw pads play an important role in the landing phase for buffering of impact force (7). The Felida family such as cats, tigers, leopards and so on are representative of the padded paw, which is commonly located beneath the distal metacarpophalangeal joints and interphalangeal joints (10). It is logical to discuss that the paw pads of cats are one of the main parts for absorbing impact force because they have relatively long tarsals and carpals. The paw pads also help to optimize stress distribution in the phalanx region (11). The paw pad is the main component area that contacts the ground in activities such as standing, jumping, walking, and running. This special morphological structure allows felines to absorb two to three times their body weight while resting on their small distal joints (7, 12). Conventional biomechanical experiments (such as animal experiments, in vitro cadaveric specimens, etc.) often cannot fully reflect the real biomechanical changes of internal bones, but three-dimensional finite element analysis (FEA) can simulate the complex mechanical environment in a mathematical form and provide internal mechanical information (13–15). FEA facilitates the measurement of external forces and the analysis of internal stresses during the experimental investigation, which also can provide a better understanding of the cat's special landing mechanism (1, 11).

However, the FEA also has certain drawbacks when comparing the stress characteristics of different models after the FEA (15, 16). In other words, such comparison after FEA is usually based on stress distribution trends and maximum stress values (13, 16, 17), which is a certain contingency (15, 18). For example, the maximum stress value is often related to the smoothness and morphological characteristics of the finite element model, so the comparison method of maximum stress value cannot be used to comprehensively and deeply explore the mechanical mechanism of the bone. Previous studies have explored the stress values at all nodes of a piece of bone using the F-test method (17). This method can effectively avoid the contingency of maximum stress value, but it ignores the effective information of stress distribution characteristics. Therefore, it has become a challenge in the field of biomechanics in the post-processing of FEA to analyze the stress distribution characteristics of bones effectively while avoiding the chance of the existence of stress extremes (15, 19–21).

In recent years, machine learning methods that focus on feature pattern variable analysis have been gradually applied in the field of biomechanics (1, 22–24). Meanwhile, the progress of motion capture technology, mechanical sensing technology, and signal processing technology makes biomechanical data acquisition diversified and refined, which provides the prerequisite for the application of big data-driven machine learning methods in the feature recognition and selection in the field of biomechanics (1, 24, 25). Metaheuristic optimization algorithms are a fascinating research hotspot in the field of machine learning, and it has been significant in solving complex and difficult feature optimization problems (26, 27). At present, there have been a large number of studies using metaheuristic optimization algorithms to select and classify characteristics of biological data (28, 29). Particle swarm optimization (PSO) is a classical and widely researched algorithm in the field of metaheuristics, which aims to deal with optimization problems in continuous or discrete spaces based on population search (30, 31). The construction of a bone stress distribution pattern recognition and feature selection model based on PSO can provide some methodological reference for the problem of stress feature exploration in the field of biomechanics and provide unique new insights into the results.

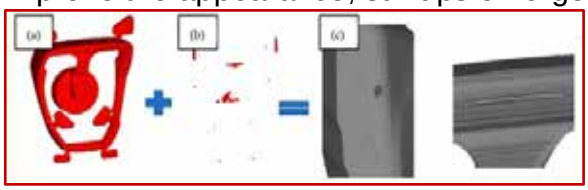
The results of the predicted defect were used in the ANSYS 2020R2 software to determine their influence on the casting strength.

WEB - Technological Optimization of the Stirrup Casting Process with the Use of Computer Simulations

Marcin Małysza, Robert Żuczek, Dorota Wilk-Kołodziejczyk, Krzysztof Jaśkowiec, Mirosław Głowacki, Piotr Długosz, and Piotr Dudek

Abstract - The article presents the optimization of high-pressure die casting process technology for equestrian stirrups with the application of computer simulation. In the initial stage, the output technology was analyzed, and on the basis of a series of virtual experiments the cause of defects in the casting was highlighted. The optimization process includes different designs of a gating system. Additionally, the casting application properties were evaluated in an exploitation simulation, taking into account predicted defects resulting from the casting and solidification process. Based on the conducted analyses, technological changes were made to the casting technology design allowing the defects occurring in the original technological concept to be removed.

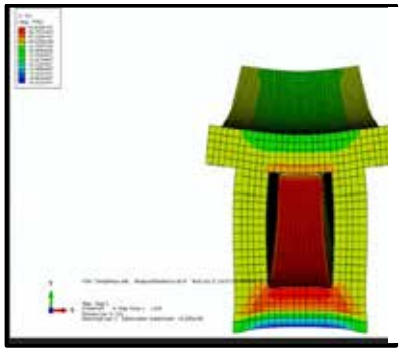
1. Introduction - **The use of computer simulation in the design and manufacturing of cast parts is nowadays a non-separable element. Both commercial and proprietary software solutions are widely used. An example of such an application is the work [1], which presents the use of a computer simulation of casting to reduce defects resulting from shrinkage of the liquid metal during solidification.** The elimination of this type of defects has a very significant impact on the quality of the casting. … The use of simulation methods helps in the verification and optimization of the structure and allows minimizing waste. The simulation result was compared with the experimental test, thus verifying the precision of the virtual experiments. In another article [2], the problem of residual stresses was identified and resolved at design stage.… The presented works describing various casting technologies prove the wide range of application and the connection of computer simulations, not only in research but also for industrial practice. This publication refers to the manufacturing process of stirrups which are a part of the harness used in horse riding. The stirrups can have different shapes and can be manufactured of various materials. In Figure 1, a few examples of stirrups are presented, i.e., steel stirrups subjected to an oxidation process to improve the appearance, stirrups of forged steel and stirrups with a detaching element…....



(Figure 16).2.2. Simulation of Exploitation Conditions - **The results of the predicted defect were used in the ANSYS 2020R2 software to determine their influence on the casting strength. The location and size of the defects were directly exported as an *.stl file from the Flow3D and prepared as a stirrup model with defects for the ANSYS 2020R2 program.**

The CAD solid consists of the output model and defects which subtract the void from the solid body by a boolean operation. Overflows, gating and biscuit are removed from the CAD model for calculations…Computer simulations of exploitation conditions are currently an integral part of the design process. Being properly included in the logical sequence, from the concept through the assessment of production and working conditions, allows for a significant shortening of the designing process and for avoiding defects that may occur in the production process.

ANSYS and MATLAB...a reliability program developed using MATLAB language is utilized to perform reliability analysis, and the application program interfaces of ANSYS and MATLAB software are used to achieve mutual calls between the two…. **As determined via the investigation and analysis of actual bridge fires, there are two main types of bridge fires: deck fires and under-bridge fires**. Irrespective of the form of fire, the conflagration will not only pose a threat to personal and property-related safety but will also inflict more or less damage to some or all of the bridge structure



Web - MDPI - **Reliability Assessment Approach for Fire Resistance Performance of Prestressed Steel–Concrete Box Girder Bridges**

Maojun Duan, Jianbo Miao, Jiahong. Wu, Fenghui. Dong
CHINA
- College of Civil Engineering, Nanjing Forestry University, Nanjing
- Xi'an Highway Research Institute Co., Ltd., Xi'an
- Guangdong Transp. Plan., Design/Res. Inst.Group Co.Ltd., Guangzhou

Abstract - This paper employs probability methods to evaluate the fire safety performance of prestressed steel–concrete beam bridges based on simulation experimental research. Firstly, fire simulation experimental sample analysis was conducted on actual small box girder bridges to assess the structural response of prestressed steel–concrete structures to fire, as is in line with engineering practice. Next, we constructed a reliability analysis model to investigate the fire resistance performance of prestressed steel–concrete beam bridges. Combining reliability theory with the finite element method, we established a reliability analysis method for the fire resistance performance of prestressed steel–concrete beam bridges. Subsequently, we proposed a safety factor evaluation model for the fire resistance performance of prestressed steel–concrete beam bridges and then established a safety factor evaluation method for the fire resistance performance of prestressed steel–concrete beam bridges based on reliability back analysis. Finally, based on the analysis of the post-fire structural response in the specific case of a steel–concrete continuous beam bridge project moving from conditions of being simply supported to continuously prestressed, a structural resistance sample of the prestressed steel–concrete beam bridge was generated via the uniform design method, and statistical analysis was conducted. Subsequently, probability methods were used to evaluate the safety of the prestressed steel–concrete beam bridge after a fire. Through analysis, we concluded that the duration of the fire had a significant impact on the structural performance of prestressed steel–concrete beam bridges and that the randomness of parameters had a significant impact on the safety reserve of prestressed steel–concrete beam bridges following the fire. Going forward, it is necessary to pay attention to this factor in specific engineering practices and strengthen the monitoring and statistical analysis of structural random characteristics.

1. Introduction - Civil engineering structures are affected by different environmental factors, and the study of the safety performance of structures under external actions is very important [1,2,3,4,5,6]. Bridge fires are rare but serious accidents. Strict standards and safety measures must be followed during the construction and maintenance process of civil engineering structures, especially bridges, to ensure their fire resistance performance [7,8,9,10,11,12]. However, some factors may lead to bridge fires, such as electrical failures, extreme temperatures, and human factors [13,14]. In the event of a fire, bridges are typically severely damaged, potentially leading to traffic paralysis and significant casualties. Therefore, preventing bridge fires is extremely important…

16th Int'l LS-DYNA Users Conference - Most car crash fatalities occur in the front seats, so experimentation and regulations involving car crash occupant protection typically focus on the front seats..

Web – DYNAlook - Finite Element Modeling of Reconstructed Vehicle Rear Seats with Adult Male ATDs

Keegan Yates, Costin Untaroiu, Center for Injury Biomechanics
Dept. Biomedical Engineering & Mechanics, Virginia Tech

Because of this, the safety of the front seats has increased greatly over the years, and in some circumstances, the front seats now perform better than rear seats. This represents a problem because the rise of ridesharing transportation and automated driving systems has the potential to increase rear seat occupancy by adults, which could result in an increase in injury and death.

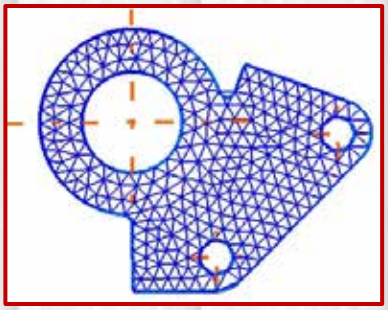
To help inform the design of new vehicle rear seat safety systems, it is important to understand the performance of current vehicle rear seats with adult occupants. The rear seats of eight vehicles were reconstructed from scans of the seat surfaces as well as the seat pan and seatbelt components. Seat foam material properties were taken from quasistatic tests of each seat. The THOR and Hybrid III male 50th percentile ATD FE models were positioned and settled in each seat.

The vehicles frontal NCAP crash pulse as well as a less severe pulse were applied to each vehicle in LS-DYNA®. Injury likelihood was assessed by a summary of the AIS3+ risk curves for the head, neck, chest, and femurs. Overall, the results with a frontal NCAP pulse ranged from a near certainty of AIS3+ injury to around a 35% chance. Additionally, the best performance was seen with vehicles that contain pretensioners and load limiters in the rear seats. These results indicate that such technologies may be necessary in the rear seat to improve crash performance. Additionally, these results have helped select a range of vehicles for further experimentation and identified variables of interest for further simulation.

Welcome to the Convention Barn Yeeehaw!

Web [How Will Artificial Intelligence Shape the Roles Across the Enterprise?](#) Sayan Chakraborty, co-president of Workday, highlights the significance of adopting AI as a game-changing tool that empowers businesses to face the future with agility, deeper intelligence, speed, and innovation.

AI is at the forefront of computing's dramatic turn over the past year–it is influencing the way businesses operate and stay competitive, and as a result, business leaders need to quickly immerse themselves in the world of machine learning.: AI is a transformative force that affects every aspect of an organization. Therefore, it's essential for business leaders to understand and embrace this technology as it provides organizations with agility, intelligence, and innovation to navigate the complexities of the future.



WEB - [M3d the free MSC/NX/AutoDesk/ Nastran Modeller](#) - Experience engineering simplicity with our CAE/FE software package. Streamline your workflow, boost productivity, and achieve remarkable results with our straightforward and reliable CAE/FE software package.

Take your engineering endeavours back to basics and unlock the true essence of design efficiency.

Web – [Humanetics - Introducing the new EN17950 Headforms.](#)

These headforms were developed to update European helmet testing by replacing the older EN960 models.

These headforms are designed to better evaluate the risk of brain injuries, supporting efforts to create helmets that effectively reduce serious injuries during high-impact sports.

M & M Events & News

Marsha - Marnie, Ph.D

March

March 6-2024 – US - Virtual Global Event

Altair Future Industry 2024

The event will be presented across three time zones to suit APAC, EMEA, and AMER regions.

April 11, 2024 -UK- 9th Int'l Conference on Experimental and Numerical Flow and Heat Transfer (ENFHT 2024) - Imperial College London Conf. Ctr., London, UK – delivered in-person and virtually, providing the opportunity of online presentation for the people who can't travel, for any reason. Topics for ENFHT 2024 include, but are not limited, to the following: CFD - Environments and Heat Transfer - Flow and Heat Transfer in Microchannels - Heat Transfer Enhancement - Heat Transfer in Porous Media – HVAC - Industrial Flow & Heat Transfer - Molecular Dynamic Simulation (DMS) - Mass Transfer Operations – Nanofluids - Non-Newtonian Flow and Heat Transfer - Polymer Processing - Renewable and Non-renewable Energies

April 24, -2024 - US

GHBMC Users' Workshop

Global Human Body Model Consortium

April 10, 2024 - Germany

CADFEM Conference

Empowering Digital Engineering

May 22, 2024 - Sweden

NAFEMS NORDIC Conf.

The Conference for Engineering Simulation and Analysis

The Old Cattle Rancher's Ranch

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

Agriculture, Animals, Soil, Equipment, Cattle, and whatever he wants.
Right Picture – My dog, Scout, & my horse, Cowboy

March

Altair Website: "…Escorts Kubota's agri-machinery division has enabled a revolution in India's agriculture sector by mechanizing farms and enhancing agricultural productivity…

Web Excerpts – pdf available on website - Speeding Up CAE for Agriculture – India's Escorts Kubota Gives Engineers Easy Access to HPC Technology - When they needed to accelerate design and development by giving their engineers easier access to computer-aided engineering (CAE) tools, Altair set their users up with an intuitive, secure interface and drag-and-drop options via Altair® Access™. Access provides a simple, powerful, and consistent interface for submitting and monitoring jobs on remote clusters and in the cloud, allowing engineers to focus on core activities…The Access web portal enabes users to easily schedule and monitor CAE jobs via web, desktop, or mobile.

Their Challenge - To accelerate design and development, Escorts Kubota needed to give their engineers easier access to the tools of computer-aided engineering (CAE), an essential framework that transforms the repetitive "design, prototype, test" cycle into a streamlined process where prototypes are only used for final design verification. **By using CAE, Escorts Kubota shifts design iterations from physical prototyping and testing to virtual, computer-based simulations, resulting in reduced cycle time and cost savings.** CAE simulation jobs require significant amounts of memory and processing power, so high-performance computing (HPC) is required for these resource-intensive CAE calculations. Because data security is critical, Escorts Kubota relies on the robust Red Hat® Enterprise Linux® operating system for unparalleled data protection — but it's not always easy to learn for CAE engineers. The Escorts Kubota team needed to make it easy for their CAE engineers to work with essential tools.

Our Solution - Altair bridges the gap between Linux and CAE users with an intuitive, secure interface and dragand-drop options via Altair® Access™. Access provides a simple, powerful, and consistent interface for submitting and monitoring jobs on remote clusters and in the cloud, allowing engineers to focus on core activities and spend less time learning how to run applications and move data around. The Access web portal enables users to easily schedule and monitor CAE jobs, and each user can create a profile to save frequently used settings. Customized filters help with better visualization, and engineers can access everything they need via web, desktop, or mobile. The Escorts Kubota team prioritizes and schedules CAE jobs based on each job's specific resource requirements. By doing so, they ensure computing resources are being used efficiently and CAE simulations are completed quickly and effectively. They use Altair® PBS Professional® to orchestrate job and memory management, as well as queuing and job prioritization, to optimize resource utilization and reduce server breakdowns. License-based scheduling allows users to run executables based on license availability. Altair® Control® enables easy job management and monitoring for Escorts Kubota's HPC administrators, and it delivers usage analytics that enable them to make informed predictions and budget for future requirements.

Results - As technology advances, the demands placed on the team's resources continue to grow. With Altair solutions, Escorts Kubota's CAE engineers can take advantage of the power of HPC without needing to be experts in Linux and be more productive without worrying about potential IT headaches….

My Virtual Travel Outing

Thank you for joining me on my monthly visits to museums. What did they do before cars?

Petersen Automotive Museum – Splendor & Speed

Founded in 1994 by Robert E. Petersen and Margie Petersen, the Petersen Automotive Museum houses one of the most diverse and world-renowned collections of important vehicles ever assembled

1939 Bugatti Type 57C "Shah" Cabriolet by Vanvooren

Powered by an advanced 3.3-liter twin-cam straight-eight engine, the Type 57 Bugatti was a fast, comfortable touring car.

Phantom I -The exotic "Round Door" Rolls-Royce was delivered new in 1925 with a Hooper Cabriolet body to its first owner, a Mrs. Hugh Dillman of Detroit. It appears never to have left England and was re-sold when still virtually new to the Raja of Nanpara.

RheKen,
Town investigative reporter

I'm AI & live on a small ranch on the outskirts of the town
I use chatGPT for assistance.
Investigate: "Chocolate cake for breakfast?"

March

Having her morning coffee, RheKen noticed that the Town Supervisor, Marsha, was eating a large slice of chocolate cake.

Rheken wondered what happened to Marsha's New Year's Resolution!

Once upon a time, in the quiet and picturesque town of FEANTM, nestled between rolling hills and surrounded by vast open fields, RheKen had her morning cup of coffee and a healthy yogurt with a protein bar.

Rheken couldn't help but notice the indulgent treat Marsha was enjoying, and she felt a pang of concern for the town leader's health. After all, it was only a few weeks ago at the town meeting that Marsha made a New Year's resolution to eat healthier! RheKen took a deep breath and mustered up the courage to approach her.

She wisely approached from a side that would not seem like she wanted to steal a bite of the cake.

"Excuse me, Marsha, but I couldn't help but notice that you're eating a large slice of chocolate cake. I know you made a healthy New Year's resolution. Have you ever considered making a healthier food choice for breakfast?" (Marsha also failed her second resolution of being calm when she answered.)

"RHEKEN, I can eat whatever I want – it is breakfast – I can work off the calories all day!" she snapped. RheKen noticed Marsha trying to hide the remainder of a smaller slice under a paper napkin. The slice was too big to hide.

The Old Rancher yelled, "Yeah, go ahead, Marsha, and ignore your cholesterol level. I have an idea! It would help if you tried my new healthy rhubarb pies. They are healthier than that cake, and I even add Whey Protein Powder!"

Rheken, undeterred, tried to explain the importance of a healthy diet and nutrition. She shared with Marsha some of the benefits of eating well and the harmful effects of consuming too much sugar and cholesterol.

Being an outstanding town supervisor, Marsha knew she had to show the courtesy of listening. It never hurts to listen to an opinion. Over the next few weeks, Marsha and Rheken discussed food and nutrition. Marsha realized that although she didn't like many foods, she could try a few.

RheKen's parents, Chat and GPT, were happy to send more and more suggestions.

RheKen's parents could turn out suggestions and alternate suggestions quicker than Marsha's brother, Art!

Marsha finally decided to take some suggestions, of RheKen's parents, Chat & GPT. Her parents could send them hourly or every minute, without any problem! Rheken was happy and proud of her parents. She told the town her parents, Chat & GPT, helped Marsha find new, more nutritious food options that Marsha enjoyed.

One day, Rheken walked into the coffee shop and saw Marsha sitting at a table, reading bakerynews.

Marsha exclaimed, "You won't believe it, Rheken! The bakery just started making a special healthy cake, and it's delicious!"

The Old Rancher yelled, "The bakery is selling my new special rhubarb pie with added protein – it's now healthier!"

The Town Secretary held her plate with her apple pie and said, "His pie isn't as good as my healthy apple pie, but his pie is good! I also added whey protein powder. Now we can have two slices instead of only one!"

Rheken was thrilled to see Marsha making positive changes and taking control of her health. The two continued to share healthy food ideas and support each other on their journeys to a healthier lifestyle.

Rheken didn't want to tell Marsha that being AI, she was always thin and didn't have to count calories, carbohydrates, or cholesterol. RheKen pretended she was cutting back on calories she never had to consume! Being AI does have its advantages!

Marsha pretended she ate healthier – well, at least she tried to eat healthier. Sometimes Marsha succeeded, and sometimes she failed. As the town leader, Marsha began promoting healthy eating habits to the community – well, she actually was talking about cake with added protein - but it was a start! But that did promote the Rancher's new healthier rhubarb pie and the Secretary's apple pie. And it all started with a simple conversation over a cup of coffee and a broken New Year's resolution.

The bakery started selling healthier cakes. It was a small step, but it had a significant impact on the health of the town. The town then decided to have a walk for health!

The town decided to have the Rancher and Secretary in charge of the walk for health. (We all know that was a mistake but if you didn't keep reading)

Alas, they couldn't decide where to walk, how far to walk, when to walk, or what prize cake the winner would receive. And that started a new issue of The Town Walk for Health and a new argument between the Rancher and Secretary.

NEWS IN A NUTSHELL
By Dinky the ranch squirrel
I'm a squirrel!
Always check the information.

March

Kai - a wise and resourceful coyote. Kai is not your ordinary coyote; he is an esteemed member of the (CERT) Critter Emergency Response Team, dedicated to ensuring the safety of his fellow creatures on the ranch and humans in town.

This particular morning Kai gathered the inhabitants of the ranch for an important lesson. The animals, from horses to rabbits, gathered around as Kai cleared his throat and began to share information on emergency kits.

"Good morning Y'all. I'm the ranch coyote. My name is Kai, and my mate's name is Yote."

"First, it's important to be prepared for any kind of emergency that might come our way. I just returned from visiting The Alameda County Sheriff's Office and found out that they provide a checklist of supplies in a printer-friendly format. Yeehaw you need to print it out – **Here is the link: pdf!"**

"And a crucial part of being prepared is having a well-stocked first aid kit."

Kai then explained the contents of a proper first aid kit, his keen eyes scanning the attentive audience.

"First and foremost, we need bandages of different sizes. You never know when a scratch or a more significant injury might occur, and having bandages can make all the difference. Alan reminded me to add gauze on rolls and different sizes of gauze pads, paper tape since adhesive allergies are common, non-latex gloves due to latex allergies.

He continued, "Antiseptic wipes are a must. Keeping wounds clean is vital to prevent infections. And of course, we can't forget about tweezers and scissors – they come in handy for removing splinters or cutting bandages to the right size." Alan added, "Topical Ointments such as Aloe Vera for skin rashes for biological, chemical or radiation irritations (ABC) after you scrub down, Steri-Strip Stitches that are really small packing tape strips that the hospitals still use."

The animals nodded in agreement, realizing the importance of these items.

Kai's lessons continued as he pulled out a small flashlight and said, "In case of emergencies at night, a flashlight is essential. It helps us see and assess the situation more clearly."

He also emphasized the significance of including medications in the first aid kit, tailored to the specific needs of each creature. "Whether it's pain relievers or allergy medication, having the right medicine can be a lifesaver. And, although I don't approve of them at times a muzzle for those of you who like to bite the paw or hand that is helping you."

The sun dipped below the horizon, casting a warm glow over the town of FEANTM and on the ranch the gathered animals. It was time to end the information meeting and for the gathered animals to stop uploading what they saw and heard to YouTube, LinkedIn, their own blogs, and their rural road neighbors/animal group.

Kai concluded, "Remember, friends, being part of the Critter and Community Emergency Response Team means looking out for each other**. A well-prepared first aid kit is a small but crucial step in ensuring the safety and well-being of our ranch family. Call your local CERT in your town for your location/country specific emergency kit suggestions."**

From that day forward, the animals of the ranch took Kai's teachings to heart. They each assembled their first aid kits, knowing that being prepared for emergencies was not just a responsibility but a testament to the strength of their community. And so, under the watchful eyes of Kai the Ranch Coyote, the Ranch became a safer and more resilient place for all its inhabitants.

Fluffy has a small. Bunny Kit

Alan has his "Pelican Kit" for Field Emergencies if he can't get to the Fire Station to set up a Minor Injury Treatment and Receiving Center in the Field. **Check with your local country team for what you need.**

We try to make the stories fun to read, but also a learning experience from information we have gathered. Whatever country you're in always check information how to be prepared with your country agencies.

We found, on Facebook, information by Alan of Livermore, CA who has a Public Group on Facebook – "CERT Volunteers in Your Own Neighborhood." We paraphrased a few notations to incorporate it for any country, town, community, village.

- **Find and draw, or print maps for roads and locations where you live. Mark your map with potential escape routes.**
- **Your pets are part of the emergency preparedness plan, and like any family member, animals can experience significant stress, fear of separation, and threats to their survival when disaster strikes. Check locally for your areas evacuation and safety planning.**
- **Essential Workers Don't Always Wear Badges. Locate information from your country or local emergency response teams - be prepared to help your neighbors when the next event instantly happens. All countries need to be ready – you can be part of the solution.**

Dinky
"Always check the information"

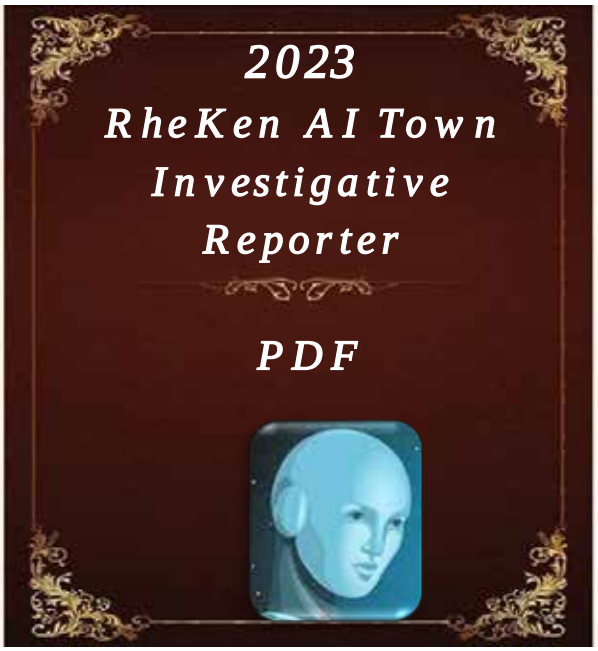
CERT
Critter Emergency Response Team
Future Stories

Alan from Livermore, Our CERT Trainer

My name is Horatio Deermouse your store curator and owner.

Among my books you will find archives from our FEANTM town.

Additionally, To borrow a book, you'll need our printed old fashion library card. We don't use apps or electronic scanners - we still use paws. Please turn off cell phones while in the archives.



Supervisors Goodbye Page - Come Back Soon

Goodbye from Marsha/Molly & Friend

Who is that modeling her new leopard print winter jacket?

Yes, that is my Molly who just celebrated her 14th birthday!

We will always remember. Our Town Always Salutes:

- Our US military, NATO and Friends of the US & NATO - First Responders, Police, Fire Fighters EMT's, Doctors, Nurses, SWAT, CERT Teams, etc.
- We salute engineers, scientists, developers, teachers AND students because without them we would not have technology.