



FEA - CAE Not to Miss & More

November 2025 ISSN 2694-4707

Town Hall Meeting in the town that almost exists

Town Plaza: Drive slowly – Galloping Prohibited

Airport – Bayraktar



Airport - NASA



Auto - UOG



Racer – Formula Bharat



Marco - RBF



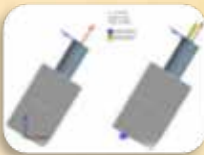
Madhukar - CADFEM



Metin - OZEN



Mark - Ozen



Abhinav - MyPhysicsCafe



Marta - OASYS



Mi&Ke - Nightly News



Jenson - DFE Tech



Abigail - CADFEM AI



Adam - MIST



Brent - GOENGINEER



Marnie - IIT India



FEA not to miss (FEANTM) - eclectic information

No compensation and No Fee (<https://www.feantm.com>)

Legal - the shortened version (it was too long to read)

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Editors: Anthony, Art, Marnie, Marsha, Sabyl

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."
Racer's Daughter	The whole town knows her name. You yell "HEY, Slow down!"

They are all family - strange family

Names, & characters of AI visitors and AI editors are the products of imagination. Any resemblance to actual persons, living or dead, or actual events is purely coincidental.



We will always remember

FEANTM 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.

USA & allies of the USA





Parking & Coffee are free. *R & D - Camping - Town Map*

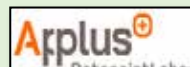
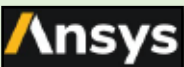
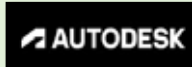
Horse Trail



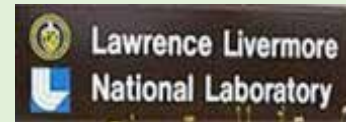
Yield right of way to horses

**R&D Technology
Business Park**

RV CAMPING
Park in any vacant
camping site



Town Hall & Library



The Old Rancher



Race Track



Airport



Sports Stadium



- **Logos 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.

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Welcome to our County, Town Hall Meeting & Announcements

Town Motto: Creation is born from trying. If it doesn't work, learn & try again. You will succeed.
Ideas, simulations, medical cures, creativity wouldn't exist without the passion to keep trying.
You've Got This

FEANTM Town Hall Meeting
"The town that almost exists"

Park cars behind the building
Park tractors behind the cars
Tie horse to the hitching rails

Bakery Cafe

Gossip, cookies, chocolate
Pets welcome.

Horses, pet goats stay outside
Technical solutions & information
Caring about animals and children

Announcements from residents not to miss



Marta: Don't miss using our high performance tools to create quality Ansys LS-DYNA models.



Madhukar: Streifeneder ortho.production GmbH has launched a newly developed hydraulic knee joint...



Metin: Ozen Engineering has posted over 14 new blogs on our website for your learning experience



Marco: "Dynamic Response of the VEGA C Launch Vehicle Subjected to Wind Effect on Ground", delivered at EUCASS 2025, is now available for download.



Marnie: IIT India, ... were examined using modelling data, & stress, deformation, & strain energy analyses using an Ansys Standard solver...



Jenson: Among our short interest videos to learn on our YouTube Channel - ANSYS Modal Acoustic - QDMWEB - 3DCS Variation Analyst - ANSYS Fluent Gear Box Flow.



Abhinav: Don't miss the article by O. Bajpa, What is Fluid Structure Interaction (FSI)?



Abigail: CADFEM AI, ...When we talk about light pollution, most people imagine glowing cityscapes that obscure the stars. In infrared (IR) imaging & sensing, however, the term takes on a different meaning: stray light...

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Our publication features a diverse mix of papers, articles and simulations from various fields. We strive to integrate new and interesting content for your enjoyment and learning.

FEANTM November 2025 edition.

Welcome to another engaging edition of FEANTM. **November** is upon us. It is the 11th calendar month and the year is winding down. Thanksgiving and the holidays are upon us. For those of us who celebrate Thanksgiving, it is the time for engaging with family and friends along with enjoying a delicious meal. This could stimulate one's fashion consciousness. Who knew that engineering might play an important part in one's holiday wardrobe?

For those of you who are bow-tie aficionados, I would like to mention the Advanced Modeling **Tutorial Creating a 3-part bow tie from GoEngineer's J. Trotter**. The possibilities are limitless.

Among the information in our Research Hospital a reminder from **Marco Evangelos Biancolini** to mark your calendars for the **2nd International Workshop on Engineering Methodologies for Medicine and Sports**, to be held at University of Rome Tor Vergata (Italy) Feb. 18 to 20, 2026.

Once again, we thank all of our contributors for sharing their knowledge and all of our readers for keeping us relevant.

Thank you for being part of the FEANTM+ community.
Best regards, Marnie B. Azadian, Ph.D., Managing Editor

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Yes, it's true, I have my own announcement page. SO, join me as I drive my tractor around the internet and live in the town that almost exists. (located near Livermore, CA)



Okay, I have a grandma suggestion for you! Life took me on an unexpected turn recently. On October 15th, my husband (86) had a severe UTI that spread to his kidneys, leading to delusions and hallucinations due to an enlarged prostate. It set off a chain reaction. So, please excuse any errors this month. And, most importantly, take UTIs seriously! He is improving slowly on IV antibiotics, etc.

Now on to this month!

Ryan is really enjoying Marine/Naval news and has interesting information from Croatia, Sweden, ship casualties under piracy, and damaged tankers – he is on quite a quest that, “I need more pages for my information.”

Abigail is in town for a few months. Welcome home!!! She has started her section with Optimizing IR Camera Performance: The Role of Optical Simulation by **D. Samarla, M. Pittala**

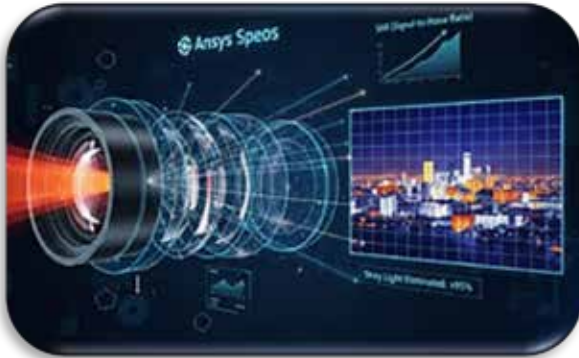
Those of you interested in the Aeroelastic Characterization of the VEGA C Launch Vehicle under Ground Wind Loads, don't miss the article by **Marco E. Biancolini**

And time for me to relax with coffee and chocolate (OH, sugar and caffeine)

Gotta love coffee, chocolate, demolition & rebuilds (and it burns calories)



Article, “Optical simulation is transforming IR camera design by enabling precise analysis and control of stray light for superior imaging performance. When we talk about light pollution, most people imagine glowing cityscapes that obscure the stars. In infrared (IR) imaging and sensing, however, the term takes on a different meaning: stray light. This refers to unwanted energy—reflections, scattering, or ghosting—that enters IR camera sensors. The consequences can be subtle but critical: reduced signal-to-noise ratio, blurred thermal patterns, or distorted imagery that compromise both system performance and reliability...



Web – CADFEM AI - [Optimizing IR Camera Performance: The Role of Optical Simulation](#)
Dhanush Samarla, Manoharr Pittala

For industries that depend on IR imaging—whether in security, aerospace, automotive, or industrial monitoring—stray light represents a common yet serious challenge. As IR technologies continue to expand into areas like predictive maintenance, surveillance, and autonomous systems, the demand for clearer, more

accurate data has never been higher. Any degradation caused by stray light directly impacts efficiency, safety, and decision-making.



Fig. 1 Night vision camera near a window resulting in the IR lights reflecting off the glass
(Source: <https://www.howtogeek.com>)

What is Stray Light—and Why Does it Matter? Stray light refers to any infrared radiation that reaches a camera’s sensor through unintended paths, usually via internal reflections, scattering from lens surfaces, or ghost images formed by imperfect optical design.

The consequences can be severe: reduced signal-to-noise ratio (SNR), blurred thermal signatures, and distorted imagery that affects both qualitative insight and quantitative measurements. For applications in surveillance, predictive maintenance, or autonomous vehicles, even modest stray light can mean missed anomalies, inaccurate detection, and compromised operational safety.

Stray light is especially difficult to suppress in sophisticated IR systems where demands for compactness, broad wavelength coverage, and speed are pushing optical designs to their limits. A recent study noted that performance degradation due to internal optical issues—rather than just atmospheric effects—is now a top concern for system integrators.

The Traditional Approach: Costly and Slow - Historically, mitigating stray light meant building physical prototypes and conducting exhaustive lab tests. Engineers and designers tried broad sets of lens shapes, coatings, and baffles, hoping experimental iteration would reveal workable solutions. But this physical trial-and-error cycle involves considerable cost, time, and effort. For high-volume products or mission-critical devices, the inefficiencies are stark.



Enter Optical Simulation: Digital Twins for IR Cameras - Optical simulation tools such as Ansys Speos, CODE V, and ImSym now make it possible to analyze and optimize IR camera performance virtually, long before the first hardware is built. These platforms allow the creation of digital twins—fully detailed models that ‘see’ like the final product would. Through simulation, engineers can:

Trace IR Ray Paths: Simulations can track infrared photons’ journeys through complex lens assemblies, revealing hot spots for stray light caused by internal lens elements, sensor packaging, or housing structures.

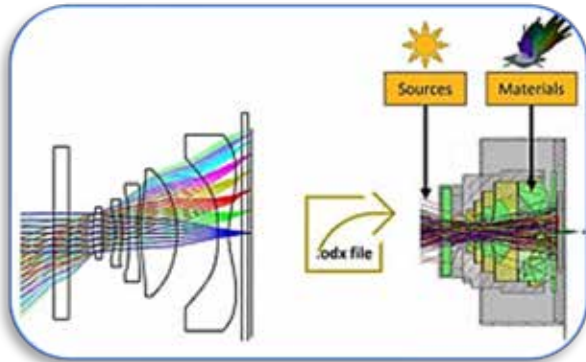


Fig. 2 Ray Tracing to detect critical ray paths in the Optical system (Source: <https://www.ansys.com/blog/exploring-facets-of-stray-light-simulation>)

- **Model Coatings and Surfaces:** Virtual testing of lens coatings, filters, or mechanical baffles enables rapid evaluation of their effectiveness against reflections and ghosting, with direct quantification of SNR and image clarity.
- **Scene and Stray Light Effects:** By simulating actual mission scenes, such as aerospace or automotive environments, designers can visualize how stray light interacts with both internal components and external light sources. Scene-based simulation reveals which aspects of the use case most challenge system performance, and how design changes mitigate them.

Quantitative and Comparative Analysis - State-of-the-art simulation platforms also provide advanced analytics. For example, entropy-weighted evaluation techniques or the use of NIQE (Natural Image Quality Evaluator) allow quantitative measurement of improvement after each design iteration. These methods have shown that entropy-weighted optimization can enhance local signal-to-noise ratios by nearly 1.5×, providing direct validation for optical improvements.

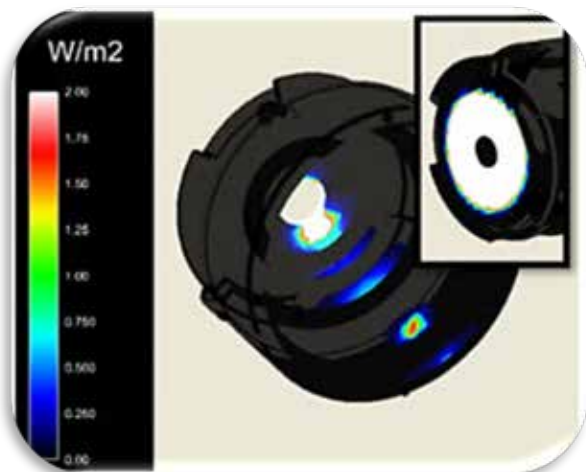


Fig. 3 3-D Irradiance sensor on a Camera Baffle to detect light energy accumulation (<https://www.ansys.com>)



Virtual Sensors and Countermeasure Testing

By embedding virtual irradiance and luminance sensors within the simulation, designers measure where stray energy accumulates, how it shifts image quality, and which countermeasures work best. This means coatings, filters, or mechanical changes can be tested digitally—comparing dozens of alternative designs for efficiency and performance before committing resources to physical builds. Such simulation-driven workflows speed up the selection of optimal hardware and reduce costly cycles of hardware revision.

Industry Impact: Speed, Savings, and Clarity

As IR imaging moves into wider fields such as predictive maintenance, smart transportation, and autonomous operation, the ability to rapidly deliver high-performance systems is vital. Optical simulation reduces the cost of IR camera development, accelerates innovation, and ensures that the delivered product meets both regulatory and mission standards for clarity, accuracy, and reliability.

Conclusion

Optical simulation has fundamentally altered how IR cameras are designed for today's high-stakes environments. By replacing physical trial-and-error with virtual prototyping and quantitative validation, tools such as Ansys Speos empower engineers to optimize designs, suppress stray light, and maximize camera performance with speed and precision. For organizations seeking the clearest, most reliable IR data across industrial, aerospace, or automotive sectors, simulation-led camera design is not just an advantage—it is the new standard.



“...A current industrial helmet is made stronger by introducing reconfigured material and analyzing the work using ANSYS software...”



Web – Science Direct - [Design and development of motorcycle helmet using carbon fiber reinforced epoxy resin hybrid composite](#)

N.A Tushe, S.T Mahmud, N. Islam, G. Mostofa, N.T Tuli, A.B Rashid

- Dept. of Mechanical Engineering, Military Inst. Of Science & Technology, Bangladesh
- Dep. of Industrial & Production Engineering, Military Inst. Of Science & Technology, Bangladesh

Abstract - Motorcycle helmets are crucial for rider safety, and there's a high need for affordable helmets that provide optimal safety to the riders. This research focuses on manufacturing motorcycle helmets by applying carbon fiber, Kevlar, and fiberglass reinforced with epoxy resin. Carbon fiber helmets provide durability, comfort, and affordability. Kevlar is lightweight, offers excellent ballistic protection, reduces fatigue, and is resistant to certain threats, whereas fiberglass is strong and resists bending and compression. This research aims to design a motorcycle helmet following the regulations provided by the Department of Transportation (DOT). Samples with different stacking sequences, sample A (CFCFC), sample B (FCFCF), and sample C (FCKCF), were fabricated with a 3 mm thickness and tested for tensile strength, flexural bending, and impact to ensure the efficacy of the helmet. After analyzing the results, it was observed that in the tensile test, sample B achieved the highest tensile strength (124.7 MPa), followed by sample A (89.78 MPa) and sample C (59.01 MPa). In the flexural test, sample A demonstrated a remarkable flexural strength of 0.767 MPa and a flexural modulus of 6.60 MPa, which is much higher than sample B and C. The results indicate that the arrangement of the reinforcement fibers in composite materials plays a vital role in determining the flexural strength and modulus exhibited by the composites. In the impact test, sample C, incorporating Kevlar fiber, demonstrated the highest impact energy absorption, followed by samples A and B. This trend can be attributed to the inherent properties of Kevlar fiber, which possesses a notably higher capacity to absorb energy when subjected to high forces. With scanning electron microscope (SEM), the structural morphology of hybrid composites is examined to understand the complex microstructures and interfaces present in the composite materials.

Introduction - ...Introduction -...A current industrial helmet is made stronger by introducing reconfigured material and analyzing the work using ANSYS software. A 3D modeling module in Pro-Engineer software was utilized to design the model. ANSYS software was used to analyze the impact on different materials such as S-Glass, Nylon, Polyethylene, and Carbon epoxy [32]. The composite materials, nanoparticles [29], and the method to select the best composite material are essential for the constructional components of a safety helmet.



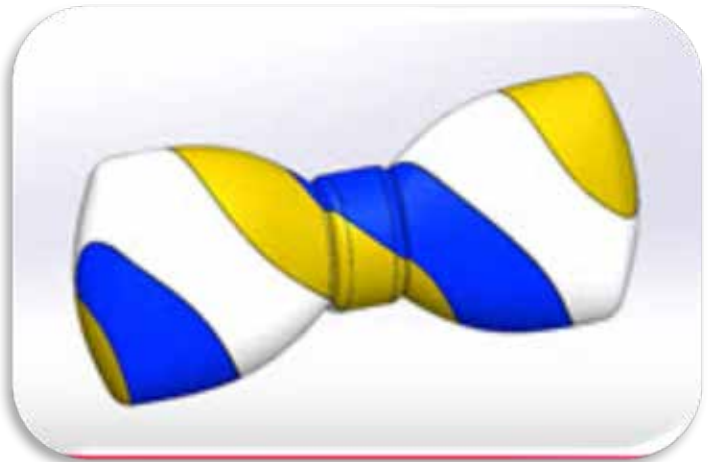
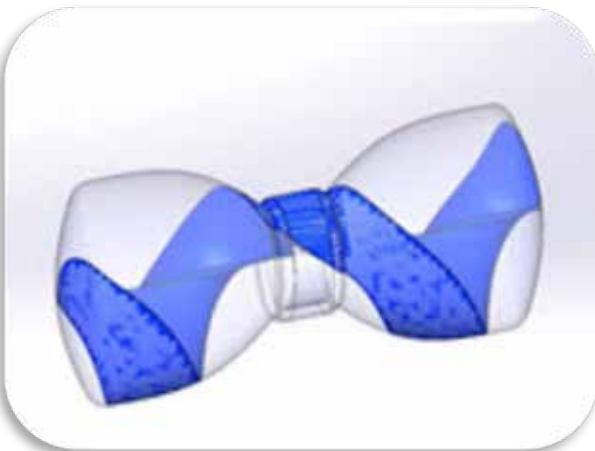
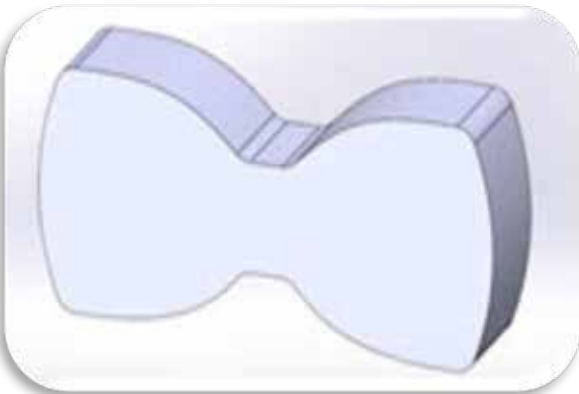
GOENGINEER Quote, Jared Trotter, applications engineer at GoEngineer, "In this tutorial, I demonstrate advanced SOLIDWORKS modeling techniques by creating a 3-part bowtie."

"You'll learn how to use the Combine tool, Helix feature, and Surface Extrude to build complex geometry step by step."



Web – YouTube – [Advanced Modeling Tutorial Creating a 3-part bowtie](#)

The methods go beyond basic modeling and show how powerful parametric design can be when working with organic and custom shapes.





LLNL “With the ability to print metal structures with complex shapes and unique mechanical properties, metal additive manufacturing (AM) could be revolutionary. However, without a better understanding of how metal AM structures behave as they are 3D printed, the technology remains too unreliable for widespread adoption in manufacturing and part quality remains a challenge”



Web – LLNL – [Enabling an enabling technology](#)

Contact - Noah Pflueger-Peters

Close-up of the surface of laser powder bed fusion (LPBF), a metal additive manufacturing (AM) process where a laser uses heat to fuse metal powder material and form structures.

Researchers in Lawrence Livermore National Laboratory (LLNL)’s nondestructive evaluation (NDE) group are tackling this challenge by developing first-of-their-kind approaches to look at how materials and structures evolve inside a metal AM structure during printing. These NDE techniques can become enabling technologies for metal AM giving manufacturers the data they need to develop better simulations,

processing parameters and predictive controls to ensure part quality and consistency.

“If you want people to use metal AM components out in the world, you need NDE,” said David Stobbe, group leader for NDE ultrasonics and sensors in the Materials Engineering Division (MED). “If we can prove that AM-produced parts behave as designed, it will allow them to proliferate, be used in safety-critical components in aerospace, energy and other sectors and hopefully open a new paradigm in manufacturing.”

Measuring in the middle - NDE techniques involve sending signals like X-rays, ultrasound or electrical currents through objects and observing signal changes to infer information or reconstruct an image of what’s inside. NDE is important for quality control in all manufactured parts, but for metal AM, it can also help catch printing problems before it’s too late. Most metal AM techniques use heat to bind material together, and since metals are extremely sensitive to heat, structures can change a lot during printing. Heat diffuses from the print surface into the already-printed structure, which can affect how well the material binds, create failure-inducing defects and lead to inconsistent products.

“Evolving processes in the subsurface need to be measured and characterized if you want to have a consistent print quality,” said Saptarshi Mukherjee, a research scientist in the Lab’s Atmospheric, Earth and Energy Division (AEED). “This is very challenging because most of the current NDE technologies cannot see through heat, and even infrared cameras and antennas only detect heat at the surfaces.”

Mukherjee is part of a project to monitor internal temperature during laser powder-bed fusion (LPBF) metal AM using eddy currents, swirling loops of electrical current induced by applying magnetic fields. Eddy currents are sensitive to electrical conductivity, and since conductivity is a function of temperature, eddy current sensors provide real-time localized temperature information from inside structures. Simulations from collaborators at Michigan State University suggested the approach was viable, and the group validated it with a simple experiment, resulting in a recent paper published in Scientific Reports. *“To our knowledge, this is the first time that eddy current sensors have been used to look at these very rapid non-equilibrium thermal processes, which are suggestive of the sort of thermal processes you would see in a metal AM process,” said MED postdoc Ethan Rosenberg. Rosenberg is*

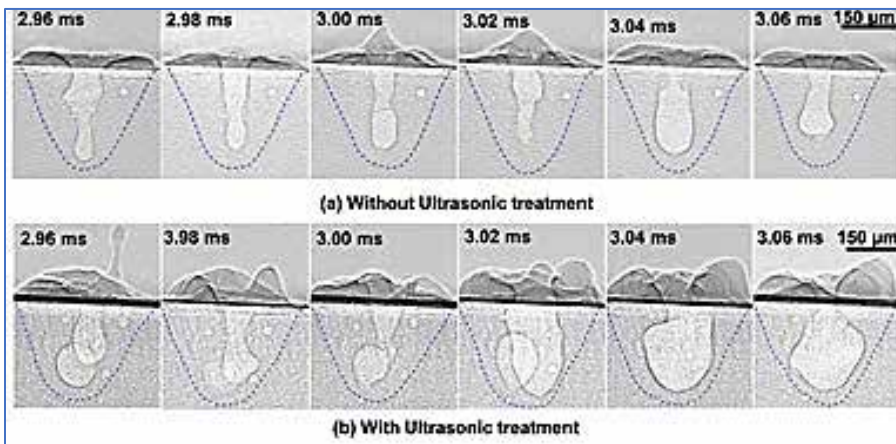


now leading the experimental testing for a follow-up study using closer to real-world conditions such as non-uniform heating and faster timescales.

Trailblazers - NDE group leader Joe Tringe launched the first Laboratory-Directed Research and Development (LDRD) project in the area in 2018 and ever since, the group has been treading new ground to keep pace with metal AM. In their first project, the group showed that millimeter wave signatures could efficiently characterize the shape of individual droplets of liquid metal used to create structures in liquid metal jetting. They eventually collected enough data to train a machine learning algorithm to predict droplet shape.

"If we can combine that feedback with system modeling, we may be able to learn whether the print parameters are working or if they need to be changed, in real time, so that we end up with what we want when we're done," said Stobbe.

Follow-up projects expanded to electrical resistance tomography — which measures changes in a current's voltage and electrical potential — X-ray computed tomography, ultrasound and neutron detection, with an emphasis on lattice structures and other complicated geometries. The group also uses NDE to inspect processing parameters like sonication — using ultrasonic waves to create vibrations and improve homogenization — in laser-based metal AM. In a recent paper published in Communications Materials, the group and collaborators at Pennsylvania State University and Argonne National Laboratory proved they could use high-speed synchrotron X-ray imaging for these measurements. The technique is the first step toward understanding sonication's impact on printing, which will help manufacturers optimize the process to improve part quality.



Caption: X-ray images of melt pool dynamics and solidification in an AM part

X-ray images of melt pool dynamics and solidification in an AM part with and without ultrasonic treatment. The tube-shaped air holes shown are known as keyhole voids, one of the most common defects in metal AM parts.

"A lot of things happen in these AM processes that affect the part, but without using NDE techniques, it's kind of a black box," said Rosenberg. "With ingenuity and good physical understanding, you can open that box to see what's happening inside, and that will hopefully help you control the process."

Enabling the future - The group plans to continue evolving, improving and generalizing a variety of NDE techniques for metal AM, since different techniques are better at measuring different types of information. They also hope to train machine learning algorithms for real-time monitoring and error correction during the print to improve success. The information they collect along the way will be crucial to enabling widespread adoption of metal AM, and they hope that their work will also help raise awareness of the opportunities for NDE in the emerging field. *"There's a real gold rush aspect to it," said Stobbe. "You're out there doing or measuring things that you know no one has ever done or measured before because this is a new technology, and that's certainly exciting."* **Other contributors to the work include MED's R. Morales, J. Lum, E. Benavidez and collaborators at Univ. of Colorado, Boulder.**



I love tractors, planes, drones, trains,
military tanks. I do NOT love baking
(I'm a baking disaster)

The ranch Coyote by the food pan



Skyroot Aerospace - Vikram-1's first stage, Kalam-1200, has been fully validated, with 236 data channels confirming flawless performance. This powerhouse motor lifts the rocket from the launchpad to 50+ km altitude. Watch it roar for 110 seconds at ISRO's SDSC.

Web - YouTube

[Stage 1 Static Fire Test | Kalam-1200 |](#)



Rocketsan - SİPER-1D is a long-range, surface-to-air missile (SAM) that serves as the naval variant of Turkey's indigenous SİPER Block 1 air defense system. The missile was successfully test-fired from Turkey's national vertical launching system (VLS), known as MİDLAS

Web - YouTube

[SİPER-1D is a long-range, surface-to-air missile \(SAM\)](#)



Website article quote, “Ponds & infiltration basins are two of the most effective strategies in sustainable drainage design, offering multiple benefits beyond simple stormwater control... For engineers, these are reliable, multi-functional assets while, for communities, they mean fewer floods, healthier water, & greener public spaces.

(Please visit the link below for the full article)

[The role of ponds and infiltration basins in sustainable drainage design](#)

Mouncey Ferguson

By capturing runoff from impervious surfaces and either storing it for gradual release or allowing it to soak back into the ground, these systems reduce flood risks, improve water quality, and recharge groundwater supplies. At the same time, they create valuable green spaces that support biodiversity and enhance community resilience. Let's dig into how ponds and infiltration basins work, their advantages and limitations, key design considerations, and how modern digital tools can help engineers, planners, and property owners integrate them into sustainable drainage systems for both urban and transportation projects.

The importance of Sustainable Drainage Systems (SuDS) -Modern cities and suburbs face an ongoing challenge: how to manage stormwater in ways that reduce flooding, improve water quality, and restore some of the natural processes lost to urbanization. That's where Sustainable Drainage Systems (SuDS) come in.

Unlike traditional “pipe-and-convey” infrastructure, SuDS are designed to slow, store, and filter rainfall close to where it lands. By mimicking nature, these systems help water soak into the ground, filter pollutants, and recharge groundwater, rather than overwhelming storm sewers. For engineers, SuDS provide a more resilient and multifunctional approach to stormwater control. For property owners and residents, they can mean greener neighborhoods, reduced flood risks, and cleaner local waterways.

SuDS is the term most often used in the UK. In the US, the same principles are often referred to as Low Impact Drainage Strategies (LIDS) or Best Management Practices (BMPs).

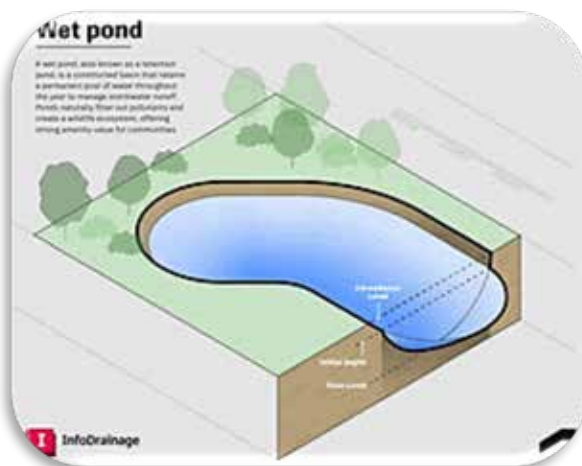
SuDS or LIDS are not a single solution, but a collection of strategies—from swales and porous pavement to infiltration basins and ponds. Among these, ponds and infiltration basins are two of the most effective tools for combining water storage, treatment, and environmental benefits.

Ponds vs. infiltration basins: What's the difference? Although often discussed together, ponds and infiltration basins are distinct in design and function. In short: infiltration basins focus on groundwater recharge and treatment, while ponds emphasize storage and surface water benefits.

What are infiltration basins? These are shallow, man-made depressions designed to capture runoff and allow it to soak into the ground. They may also be called attenuation basins or detention basin.



They are not intended to hold water permanently but instead to slowly infiltrate stormwater through permeable soils, recharging the groundwater table. Infiltration basins are particularly effective at removing pollutants such as sediments, nutrients, metals, oil and grease, and pathogens.



What are wet ponds? In contrast, wet ponds – sometimes also called retention basins – maintain a permanent pool of water. During storms, the water level rises temporarily, then gradually returns to its baseline. Beyond flood control, ponds provide recreational and ecological benefits, supporting aquatic life and creating opportunities for public open space. Because ponds become their own ecosystem, they offer countless additional environmental benefits, both to local communities and to the planet.

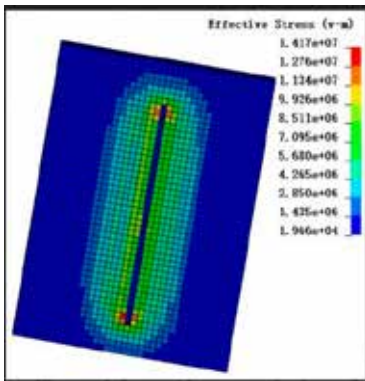
Why include ponds and infiltration basins in drainage design? Ponds and infiltration basins play vital roles in flood management, water quality protection, biodiversity, and groundwater recharge:

- Flood prevention: These systems temporarily store runoff from hard surfaces and release it gradually, reducing peak flow rates that can overwhelm drainage networks and cause downstream flooding.
- Improved water quality: Vegetation, soil, and natural filtration processes remove sediments, nutrients, and pollutants before water is released or infiltrated, improving the quality of the water released downstream.
- Groundwater recharge: Infiltration basins allow water to percolate through soil layers, replenishing aquifers and supporting long-term water supply.
- Biodiversity and amenity: Properly designed ponds and basins provide habitats for birds, amphibians, and pollinators, while also enhancing green space in urban areas.
- Urban cooling: Open water bodies and vegetated drainage features can help moderate local temperatures, a valuable co-benefit in cities facing heat island effects.
- Cost efficiency: In many cases, infiltration basins require relatively low investment compared to traditional infrastructure. Construction typically involves excavation and grading, making them an affordable post-construction control measure for stormwater.... **Continued on website**



FEANTM Off-Site Glaciologist - Being a glaciologist brings me to glaciers, ice sheets and frozen waters. Their physical properties are unique and their formations and movements change. I find water and ice fascinating how they impact the environment, ships, icebreakers, and other structures.

Relatively few studies address the structure–ice–water–air coupling collision, especially the icebreaking of structures into water. To address the future scenario of launching lifeboats on the sea surface in icy regions, this study takes a wedge as the research object, and uses **LS-DYNA R11.0 software and the ALE fluid–structure coupling method to establish a numerical model of the wedge–ice–water–air coupled collision, simulating the process of a wedge breaking through ice into water.**



Web – MDPI - [A Numerical Simulation Method for Investigating the Fluid–Structure–Ice Coupling Mechanism of a Wedge Breaking through Ice into Water](#)

F. Want, Y. Lu, Z. Zhao, B. Qui, L. Mu, X. Wang, Y. Jin

Yantai Hongyuan Oxygen Industrial Co., Ltd., China

Yantai Res. Inst. & Grad. School, Harbin Engin. Univ., China

Yantai Res. Inst. of Harbin Engineering Univ., China

Left - Ice Stress map of anhydrous environment. T=3.588 ms

Abstract - We aimed to investigate the fluid–solid–ice coupling mechanism as structures break through ice into water. **Using LS-DYNA finite element software, a numerical simulation method is established, based on the ALE flow–solid coupling method, and the penalty function contact algorithm, which describes the structure–ice–water coupling interaction.** The Eulerian algorithm is used to describe the air and water domains, while the Lagrange method is applied to the wedge and ice structure. The mechanical properties of ice are characterized using the elastic–plastic failure strain model. The feasibility of simulating the entry of structures into water via the ALE method is demonstrated by comparing the experimental and simulation results of wedges entering into water. The applicability of the ice material model in simulating collision–induced breakup is verified by comparing a simulation of a rigid plate hitting a spherical head of ice, with results from the ISO standard. The effects of water during icebreaking are assessed by simulating a wedge breaking through ice into water, as well as through ice without water. Additionally, the ice breakup and motion response of the wedge under different working conditions are compared by varying the wedge mass and icebreaking speed.

3.2. Material Model and Equation of State - The process of the wedge breaking through ice into water involves four materials: wedge, ice, air, and water. The wedge and the ice material model will be introduced in the following sections. For air and water, it is necessary to define the material model and the corresponding fluid state equation to solve the governing equation. **In LS-DYNA, the material properties of air and water can be simulated using the empty material (*MAT_NULL) model, by simply specifying the fluid density. The equation of state for the fluid describes the relationship between volume deformation and pressure. In this study, the linear POLYNOMIAL equation of state is used for air, and the GRUNEISEN equation of state is used for water. The state equation for air medium in LS-DYNA is defined by the keyword *EOS-LINER-POLYNOMIAL.**



Article quote, “In the rapidly evolving automotive industry, the term “software-defined vehicles” (SDVs) has become a focal point of innovation and discussion. But what exactly are SDVs, and why are they pivotal to the future of transportation? This article delves into the fundamentals of SDVs, contrasting them with traditional vehicles and explaining their significance in modern automotive advancement. “



Siemens – Web - [Automotive GUI Testing at Production Speeds: Months Before Silicon](#)

Zaid Rodriguez

Real-time Graphical Unit Interface (GUI) validation at production speeds with Veloce proFPGA UNO Desktop platform

Picture this real-world scenario their lead architect shared: A driver reaches for the climate control. As they adjust the temperature, the navigation system refreshes its route display, while the instrument cluster updates vehicle dynamics.

What looks simple to the driver actually demands an intricate coordination of:

- Complex graphics acceleration with real-time response
- Multiple processor cores processing simultaneously at >100MHz
- Precise timing across multiple displays
- Real-time sensor data integration
- Critical memory bandwidth management

What surprised the team most? They discovered timing issues only after silicon arrived. “By then,” the architect notes, “we were looking at expensive rework and delayed launches. We needed a better way.”

That better way came through the Veloce proFPGA UNO Desktop platform from Siemens. The transformation was significant and measurable, as shown in Table 1:

Before proFPGA	proFPGA Capabilities	User Benefits
Simulation-speed validation only	Validate GUI operations at actual system speeds	“Caught critical timing issues months before silicon”
Late discovery of timing issues	Catch timing-critical interface issues early	“User experience finally matched real-world conditions”
Limited multi-display testing	Test complex multi-display scenarios thoroughly	“Late-stage integration problems eliminated”
Post-silicon performance validation	Match production-level performance	“Development cycles significantly accelerated”

Table 1: Accelerating GUI Development: Measurable Impact of proFPGA UNO Desktop platform

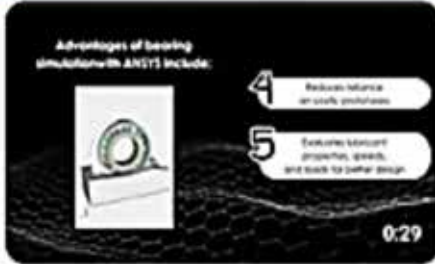
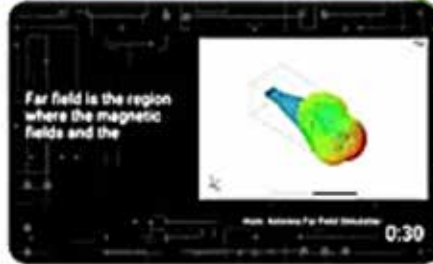
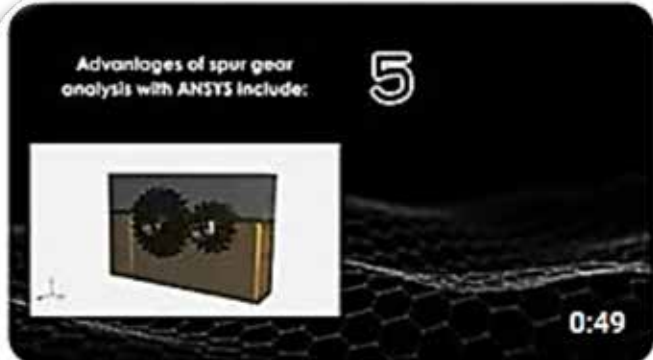
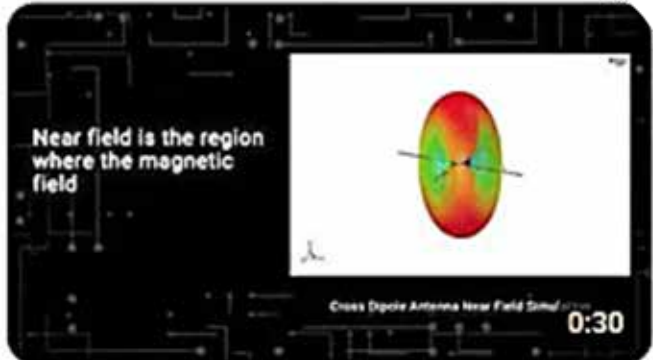
What started as a test deployment transformed their entire software development process. Today, teams validate complex GUI interactions at true system speeds long before silicon arrives. As one engineer put it, “We’re not just finding issues earlier; we’re delivering production-ready software months ahead of schedule.” ...



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A few of our shorter videos on our channel

 3DCS VARIATION ANALYST 5:02	 Advantages of bearing simulation with ANSYS include: 4 Reduces internal stresses and strains 5 Evaluates bearing properties, speeds, and loads for better design 0:29	 Far field is the region where the magnetic fields and the 0:30
Dimensional Control Systems	Ansyes Fluent : Bearing Simulation	Ansyes HFSS : Horn Antenna
 Advantages of spur gear analysis with ANSYS include: 5 0:49	 Near field is the region where the magnetic field 0:30	
Ansyes Fluent : Gear Box Flow	Ansyes HFSS : Cross Dipole Antenna	
 These analyses are critical for simulating 1:31	 Power of QDM WEB QI 1:17	 1:20
Ansyes Modal Acoustic	QDMWEB QI	Ansyes : SimEDGE 2024



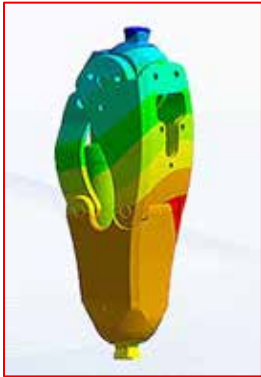
Article, “In order to expand the range of applications for knee prosthesis wearers, Streifeneder ortho.production GmbH has launched a newly developed hydraulic knee joint... In order to determine and evaluate the deformation and stress situation of critical components of the knee prosthesis, the tests were simulated using FEM simulations in the ANSYS Workbench environment.”

Images: © Streifeneder

Web – CADFEM - [FEM simulation of a knee prosthesis](#) ANSYS in the orthopedic technology

Sector: Medical technology

Specialist field: Structural mechanics

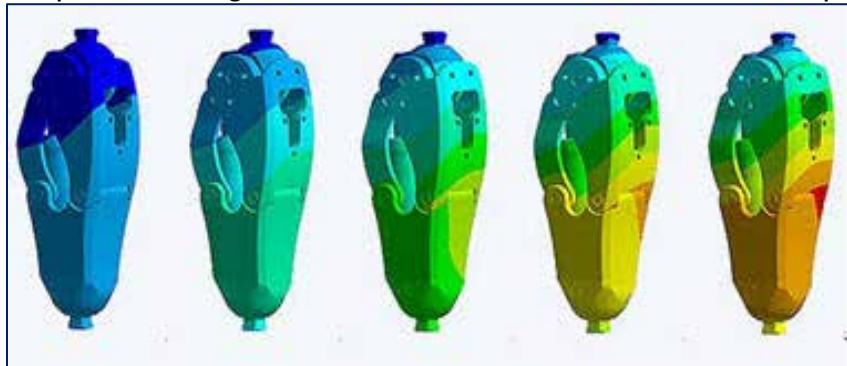


Task - In order to expand the range of applications for knee prosthesis wearers, Streifeneder ortho.production GmbH has launched a newly developed hydraulic knee joint. It is intended for persons up to a body weight of 150 kg and with a high degree of activity. In contrast to previous developments, this is a knee joint with a multi-joint axis arrangement. In order to investigate the fatigue strength behavior of the joint, test bench trials with 3×10^6 load changes were carried out.

Solution - In order to determine and evaluate the deformation and stress situation of critical components of the knee prosthesis, the tests were simulated using FEM simulations in the ANSYS Workbench environment. The mobility of the individual components to each other was ensured at the articulation points by means of non-linear friction-free contacts. The essential components of the test bench were considered idealized in the FE-model.

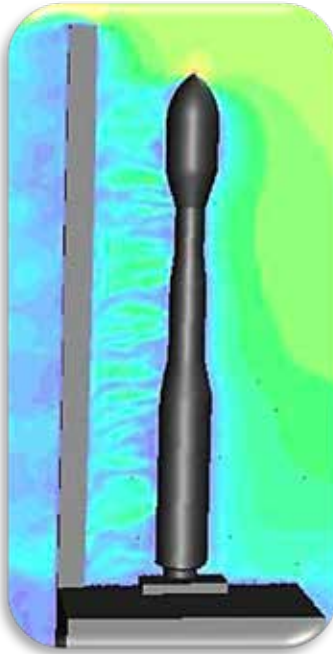


Customer Benefit - The number of necessary test bench trials could be reduced because the tests are carried out with knee joints that have been improved in advance by simulation. The use of cost-intensive materials for production could be avoided. It was not only the simulation results that convinced Streifeneder's employees. The intuitive program handling and the large number of options for processing results in ANSYS Workbench also meant that they were able to quickly achieve efficiency gains for product development through the consistent use of simulation techniques.





The presentation “Dynamic Response of the VEGA C Launch Vehicle Subjected to Wind Effect on Ground”, delivered at EUCASS 2025, is now available for download. This work represents the outcome of a collaboration between AVIO, RBF Morph, & the University of Rome Tor Vergata, and addresses a critical aspect of launch vehicle safety & performance evaluation: the aeroelastic behavior of the VEGA C launcher exposed to wind loading during ground operations.



Web - RBF.LAB - [Aeroelastic Characterization of the VEGA C Launch Vehicle under Ground Wind Loads: EUCASS 2025](#)

PDF Presentation available on website

The research team consists of:

- **Fabio Paglia, PhD (AVIO),**
- **Marta Colella (AVIO),**
- **Marco Evangelos Biancolini (University of Rome Tor Vergata,**
- **Ubaldo Cella (RBF Morph)**

Together, they developed and validated a methodology that integrates advanced fluid–structure interaction (FSI) modeling with high-fidelity numerical simulations, specifically tailored for the VEGA C system.

The study builds upon a framework in which AVIO provided the industrial context and validation environment, ensuring alignment with operational requirements. The University of Rome Tor Vergata contributed the theoretical foundation for structural dynamics and modal decomposition, enabling accurate characterization of the launcher’s elastic response under dynamic wind conditions. Complementing these contributions, RBF Morph

introduced mesh morphing capabilities that allowed the efficient generation of high-fidelity aerodynamic models, supporting both steady-state and transient FSI analyses.

Methodologically, the work combines Finite Element Analysis (FEA) and Computational Fluid Dynamics (CFD) within a reduced-order modeling (ROM) approach. Structural response is reconstructed using a modal superposition technique, which is then employed to drive aerodynamic simulations based on a library of precomputed, morphologically adapted CFD meshes. This coupling ensures consistency between structural and aerodynamic domains while achieving significant reductions in computational cost. By projecting the system dynamics onto a limited number of modal coordinates, the ROM strategy enables rapid yet accurate prediction of wind-induced dynamic loads. Such efficiency is crucial for scenarios where repeated evaluations are necessary, for instance in safety assessments, operational planning, and certification workflows. The presentation provides detailed numerical demonstrations, outlines the validation campaign, and introduces a structured workflow that could be extended to future launcher programs.





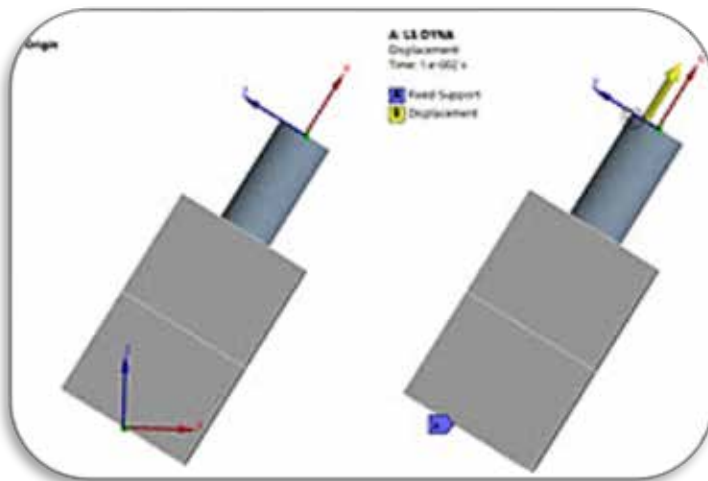
In this article, the process of retrieving and transforming reaction force components with respect to a user-defined coordinate system in Workbench (WB) LS-DYNA is detailed.

For complete information & high-resolution graphics please visit Ozen

Web – Ozen - [Retrieve and Transform Reaction Force Components in Workbench LS-DYNA](#)
Mark Lytell

Introduction - Very often in structural simulations, the reaction force that results from an applied displacement or velocity boundary condition is desired. Moreover, it is often desirable to resolve the reaction force components with respect to a user-defined coordinate system. In this article, the process of retrieving and transforming reaction force components with respect to a user-defined coordinate system in Workbench (WB) LS-DYNA is detailed.

Example Model - The example model that we utilize is that of a steel pin bonded into a steel block, rotated by a 30° angle about the global Y-axis, fixed at the base, and on which a prescribed displacement of 0.01 in normal to the face of the pin.



Boundary Conditions and User-defined Coordinate System

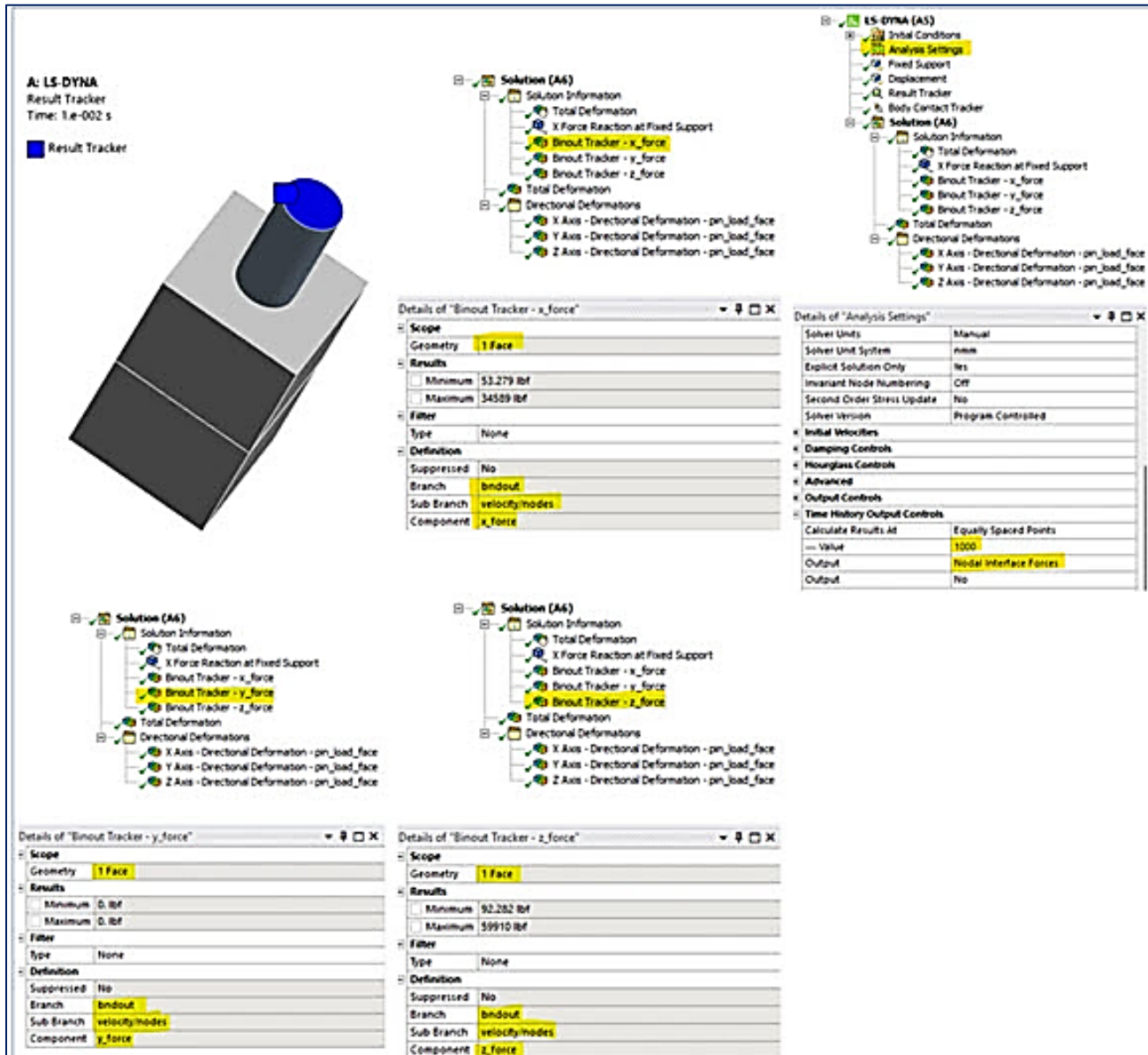
The images show the orientation and boundary conditions:

The coordinate system named `Origin` is that about which the displacement is oriented and about which the reaction force will be transformed

Result Tracker, Binout Trackers, and Time History Output Controls - To obtain the reaction force for the applied displacement, WB LS-DYNA requires a Result Tracker and three Binout Trackers scoped to the face(s) to which the displacement is applied, along with output of Nodal Interface Forces. Each Binout Tracker outputs a force component in one specific global coordinate direction, thus requiring scripting to transform the components into the desired output coordinate system direction.



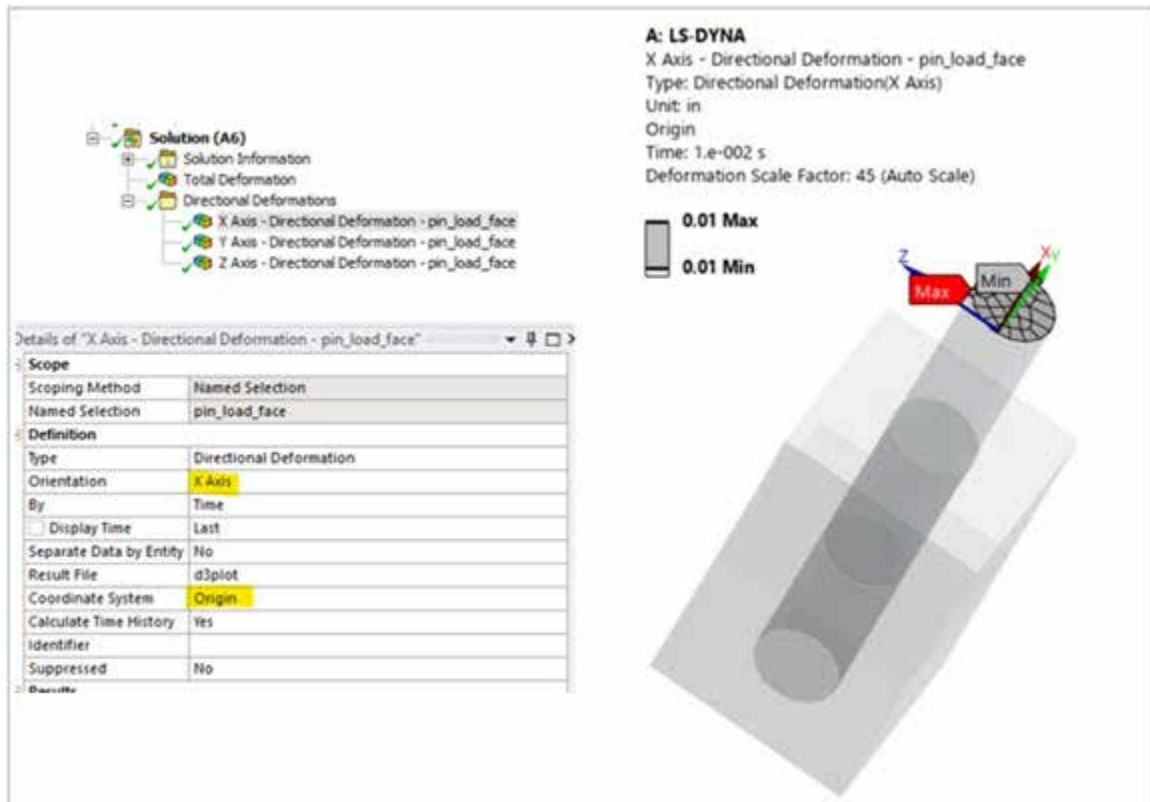
The following images show the definition of the Trackers and Time History Output Controls that output Nodal Interface Forces:



Directional Deformation Results Objects - The final required objects are **three Directional Deformation** Results Objects, scoped to the same faces as the applied displacement/velocity, oriented with respect to the user-defined coordinate system, and grouped into a folder called `Directional Deformations` that distinguish them from other Directional Deformation Results Objects, scoped to other geometry.



The following images illustrate the definition of the one in the X direction; the other two are similarly defined:



Python Script - After the simulation is complete, the following Mechanical Script will be used to postprocess the reaction force, outputting its components to a .csv file in the project's `user\_files` directory, and creating a plot for reaction force magnitude versus total deformation.

Pseudocode

The basic algorithm is as follows:

- Get the direction vectors of the user-defined coordinate system and create a transformation matrix.
- For the analysis, get the current model units and desired units for the spreadsheet output.
- Record the data from the Directional Deformation Results Trackers, checking that the correct coordinate system is chosen and adjusting if necessary.
- Compute the total deformation.
- Read each of the Binout Trackers and store the results in a dictionary. If a Binout Tracker is filtered, then use the filtered values, and linearly interpolate to align the output times to the Directional Deformations.
- Create Vector3D objects to store the force components and transform them to the user-defined coordinate system directions.
- Place reaction forces in both global coordinates and transformed coordinates, time, and directional deformation components in a dictionary and write to .csv file.
- Create line chart of force magnitude versus total deformation.



User Configuration - At the top of the script, the user must specify several items: analysis number, user-defined coordinate system name, directional deformations results folder name, and desired output length and force units:

```
Mechanical Scripting

Editor

extract_ls-dyn... : Description

1
2 analysisNumbers = [0] .....#-LIST-OF-ANALYSIS-SYSTEMS-TO-APPLY-THIS-SCRIPT
3 COORD_SYS_NAME = 'Origin' .....#-Name-of-the-(Cartesian)-coordinate-system-about-which-to-resolve-the-forces
4 RESULTS_FOLDER = 'Directional Deformations' .....#-Name-of-results-TreeGrouping-Folder
5
6 #####-DESIRED-OUTPUT-UNITS-#####
7 lengthUnitStr = 'in' .....#-DESIRED-LENGTH-OUTPUT-UNIT-(usually-'in'-or-'mm')
8 forceUnitStr = 'lbf' .....#-DESIRED-FOURCE-OUTPUT-UNIT-(usually-'lbf'-or-'N')
9 if lengthUnitStr.ToLower() == 'in' and forceUnitStr.ToLower() == 'lbf':
10     stressUnitStr = 'psi'
11 elif lengthUnitStr.ToLower() == 'mm' and forceUnitStr.ToUpper() == 'N':
12     stressUnitStr = 'MPa'
13 else:
14     stressUnitStr = forceUnitStr + '*' + lengthUnitStr + '^2' .....#-Desired-stress-output-unit
15     stiffnessUnitStr = forceUnitStr + '*' + lengthUnitStr + '^1' .....#-Desired-stiffness-output-unit
16 #####
```

Script Output - Once the script is completed, the Force Magnitude vs. Total Deformation Line Chart is created, and the spreadsheet output is stored in the project's **user_files** directory. The following images show the Line Chart and a snippet of the output spreadsheet. **Note:** At the time of this writing, when using **Bin** units, the force units in the Line Chart are **not in lbf**, but in **slug-in/s^2**.



Time [sec]	Fx [global csys] [lbf]	Fy [global csys] [lbf]	Fz [global csys] [lbf]	Fx [local csys] [lbf]	Fy [local csys] [lbf]	Fz [local csys] [lbf]	Force Magnitude [lbf]	X-Dir Deform [local csys] [in]	Y-Dir Deform [local csys] [in]	Z-Dir Deform [local csys] [in]	Total Deformation [in]
0	508.0019399	0	587.0611143	256.000647	0	-0.001864733	256.000647	0	0	0	0
0.000499998	5743.227192	0	3019.368867	3486.463738	0	-0.005427855	3486.463738	0.000499991	-5.19E-06	-3.88E-06	0.000499992
0.000999976	3475.99716	0	4620.568937	4951.942493	0	-0.016329464	4951.942493	0.000999972	-3.30E-06	-5.44E-06	0.000999737
0.0014999	5192.492	0	8094.02	9385.3958	0	-0.006894685	9385.3958	0.0014998	-3.30E-06	-8.27E-06	0.001499827
0.0019999	4945.42	0	12030.64	13891.74906	0	-0.06353785	13891.74906	0.0019998	-4.48E-06	-1.50E-05	0.001999835
0.0024999	8661.208	0	15005.8	17322.5439	0	-0.073979167	17322.5439	0.0024998	-5.65E-06	-1.39E-05	0.002499845
0.0029999	10444.94	0	18774.88	20614.61111	0	-0.084444444	20614.61111	0.0029998	-6.77E-06	-1.67E-05	0.002999855

Conclusion - In conclusion, Binout Tracker force reaction results in WB LS-DYNA are only output in global coordinate directions. Therefore, to transform them to user-defined directions or even compute the magnitude requires Python scripting from within Ansys Mechanical. However, as seen from the example in this article, it is straightforward to run the downloadable code as a Mechanical script to obtain the desired results. Downloadable Content (on the website) 2025 R1 & R2 Mechanical Script

Going Further

- Extend the script to create Binout Trackers, Directional Deformations, and obtain results for any number of desired force reactions in the same model.
- Contact Ozen Engineering for your Ansys scripting needs. ...



Don't miss our 2 Day (Online) Course.

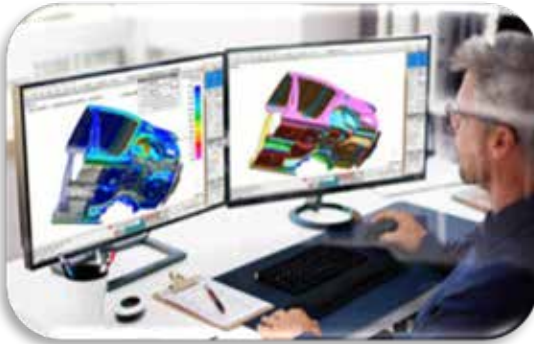
Introduction to LS-DYNA Implicit - December 2025

Web - Oasys Suite

High performance tools to create quality Ansys LS-DYNA models which lead to accurate and reliable results.

The Oasys Suite provides engineers with the ability to navigate complex simulations effectively,

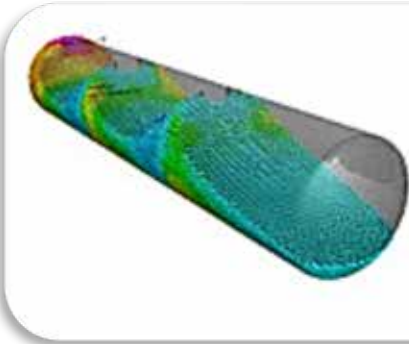
Below are a few of the ways our users are utilising the Oasys LS-DYNA Environment



Tanker manufacturing

Earthquake resilient

Floating solar panels



**2-Day Introduction to
LS-DYNA Implicit
12/02/2025 (OnLine)
3hrs GMT Free**

Web – OASYS – 2 Day Introduction to LS-DYNA Implicit December 2025 (Online)

An online introduction to LS-DYNA implicit: required input cards and most common analysis types.

This course is for engineers who are seeking to gain knowledge in LS-DYNA implicit analysis. Previous experience in LS-DYNA explicit is recommended.

This training course is provided free of charge to Arup Oasys/LS-DYNA clients on a first come-first-serve basis.

Please do not hesitate to contact us if you require this training and you are not an Arup Oasys/LS-DYNA client.



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Be sure to mark your calendar for 2026 – March 10, 2026.
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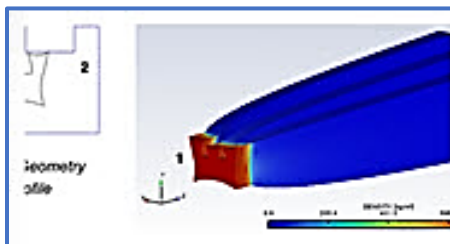
US - 03/10/2026 [OZENCON](#)

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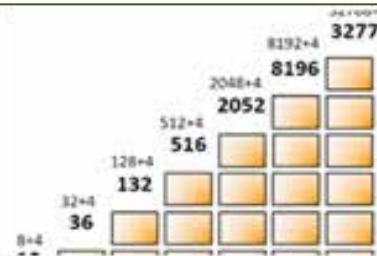
Modeling Foamed Polymer Extrusion Using Ansys Polyflow



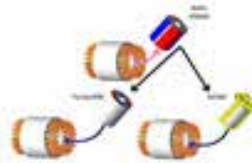
Modeling Power Plant Cycle Using Flownex



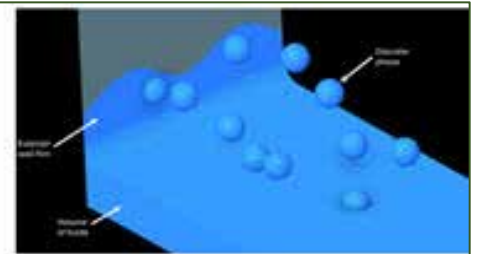
AEDT Optimizer Techniques: Key Differences



Choosing the Right Lumerical FDTD License for Your Team: Standard vs Enterprise vs HPC (Part1)



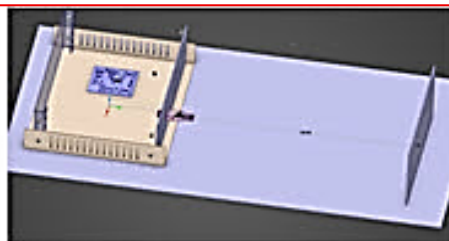
From Crisis to Innovation: Engineering Rare-Earth-Free Electric Motors for a Sustainable Future



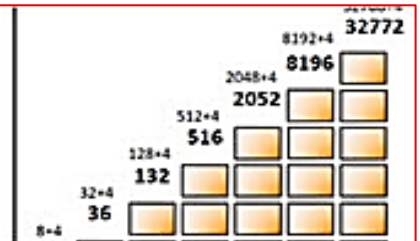
Model Transitions in Multiphase CFD: From DPM to VOF and Eulerian Wall Film in Ansys Fluent



PI Techniques and Guidelines



Radiated Emission Simulation of a PCB Inside An Enclosure & Connected To A Cable Using ANSYS EMC Plus



Choosing the Right Lumerical FDTD License for Your Team: Standard vs Enterprise vs HPC (Part2)



Tonight, on our local news channel in the town pointed towards its true north (FEA) we have original team reporting:

Mi (a resident news raccoon) & Ke (a resident news coyote)

Mi, "Quiz time – Do you know about Coupling Time-Domain Hydrodynamics with Structural Analysis?"

Ke, "No clue, but Mike at Ozen gave me a lead on the answer. German Ibarra has an article and we can learn about it.



Web – Ozen - [Coupling Time-Domain Hydrodynamics with Structural Analysis](#)

German Ibarra

Challenges - The offshore industry is moving into deeper waters and harsher environments, where traditional methods are no longer enough. Analyses that treat hydrodynamic loads and structural response as separate problems often fail to capture the true behavior of floating structures, especially moored vessels exposed to dynamic ocean conditions.

- Complex Multi-Physics Interactions. Offshore systems are subject to wave forces, structural deformations, and mooring dynamics that interact in nonlinear and time-dependent ways. These coupled effects drive resonance, transient responses, and load amplification that simplified approaches simply miss.
- Mooring System Integrity. Mooring failures remain one of the greatest risks in offshore operations. Uncoupled analyses tend to underestimate peak tensions and overlook how structural flexibility combines with wave excitation, leading to unsafe predictions of fatigue life.
- Operational Efficiency. Without coupled hydrodynamic–structural analysis, it is difficult to define realistic operating limits. Operators often compensate with conservative margins that reduce efficiency and profitability.
- Regulatory Demands. Industry standards and classification societies increasingly require advanced methodologies that demonstrate structural integrity under extreme conditions. Coupled time-domain analysis is becoming the new benchmark, as traditional methods cannot reliably predict offshore system behavior.

Engineering Solutions - Methods

Coupled time-domain analysis brings hydrodynamics, structural response, and mooring dynamics into a single simulation framework. By integrating Ansys Aqwa and Ansys Mechanical, engineers can capture the full behavior of offshore systems under realistic environmental conditions—something traditional, decoupled approaches cannot achieve.

- Ansys Aqwa applies boundary element methods to model wave–structure interaction in both frequency and time domains. It accounts for first- and second-order wave loads, as well as wind

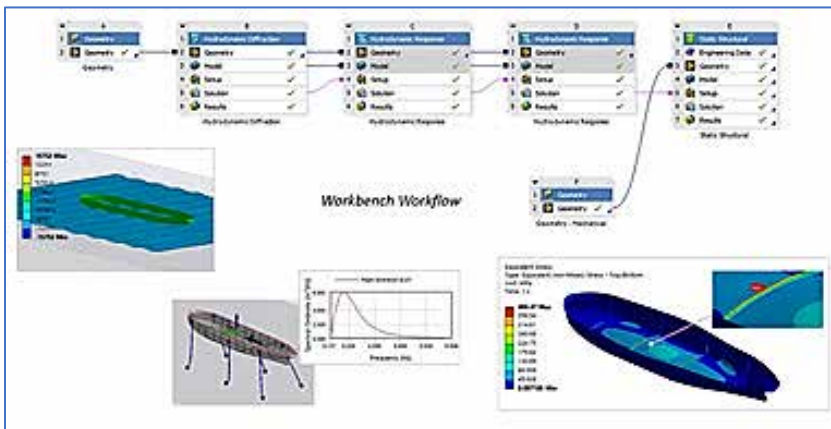


and current effects. Its built-in mooring module simulates line dynamics and seabed contact with high fidelity, making it a robust tool for offshore hydrodynamics.

- Ansys Mechanical complements this with finite element structural analysis. It handles nonlinear materials, large deformations, and transient dynamics, while offering fatigue assessment under variable amplitude loading. Detailed connection modeling enables engineers to evaluate complex structures with accuracy, from global response to local stress concentrations.

Solutions - An example of this coupled workflow is presented in this blog through the simulation of a 200-meter ship hull floating in 50 meters of water depth. The vessel is held in position by six mooring lines—three on each side—anchored to the seabed.

The process begins in Ansys Aqwa with a diffraction analysis. This step is essential because it establishes how incident waves interact with the hull geometry, providing the hydrodynamic coefficients required for stability and time-domain studies. Once diffraction data is obtained, the stability and time-domain analyses can follow, ensuring that the vessel's global motion response is well captured before transferring results to Ansys Mechanical.

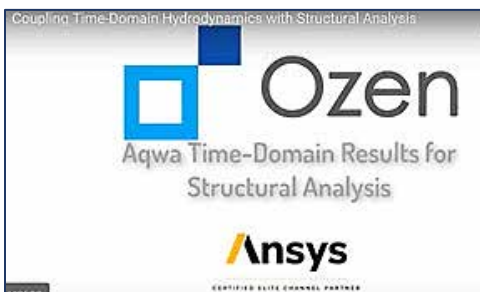


For this case study:

- Diffraction analysis. Wave frequencies between 0.01592 to 0.39461 Hz, all directions.
- Environmental conditions for Hydrodynamic response. Irregular wave train defined by the Pierson–Moskowitz spectrum.

- Wave parameters for time domain. Significant height of 4 m and zero-crossing period of 4 s, applied along the X+ direction (physical meaning: Continuous, random wave excitations with average crests of 4 m occurring roughly every 4 seconds).
- Simulation time. Time-domain analysis of 300 s in Aqwa.
- Data transfer. Hydrodynamic outputs exported every 50 s to Mechanical for structural evaluation.

This coupled setup enables Mechanical to assess stresses, deformations, and fatigue under dynamically varying loads, bridging the gap between hydrodynamic excitation and structural performance. Through this example, the workflow demonstrates how offshore challenges can be addressed with a multiphysics approach—capturing hydrodynamics, mooring response, and structural behavior in a single, integrated process.



To see the workflow in action, watch the demonstration video on our website or on YouTube and download the ZIP file containing the two geometries used in this simulation. You can download the ZIP file with the ship hull geometries used in this example on our website.



Croatia - Univ Zagreb, “The finite element model of the ship, its cargo, and the seabed was developed using LS-DYNA R11.1. software.”

Sweden - The Vasa Museum – “It is here that you will find in all its glory, the unique and well-preserved warship Vasa from 1628.”



Web – MDPI - [Finite Element Simulation of Amphora Dispersion in the 4th Century BC Shipwreck off the Island of Žirje, Croatia:](#)

A Case Study in Maritime Archaeology

Šimun Sviličić, Smiljko Rudan, Irena Radić Rossi

- Faculty of Mechanical Engineering & Naval Architecture, Univ. Zagreb, Croatia
- Dept. Archaeology, Univ. Zadar, Croatia

Abstract - This study presents a finite element-based numerical simulation of a shipwreck scenario at the 4th-century BC underwater archaeological site near the island of Žirje, integrating engineering analysis with archaeological interpretation. The site is notable for the wide scattering of amphorae across the seafloor. A scaled model, based on the well-documented Kyrenia shipwreck, found off the coast of Cyprus, was developed to approximate the estimated parameters of the Žirje vessel, incorporating reduced dimensions, an adjusted freeboard, and a total deadweight of approximately six tons. **The finite element model of the ship, its cargo, and the seabed was developed using LS-DYNA R11.1.** software. Instead of fluid modelling, the study employed explicit dynamic analysis with a rigid seabed, gravitational loading, and automatic contact to reduce computational cost. A series of parametric simulations explored the effects of roll, yaw, and varying gravitational forces on the sinking behaviour and cargo dispersion. Results indicate that only certain non-uniform sinking conditions, combined with seabed currents, accurately replicate the archaeological distribution of the amphorae. This approach underscores the value of integrating finite element analysis (FEA) with archaeological data to generate digitally supported hypotheses, demonstrating how numerical reconstruction can enhance the interpretation of complex underwater archaeological sites.



Web - [The Vasa Museum](#) - It is here that you will find in all its glory, the unique and well preserved warship Vasa from 1628, embellished with hundreds of wooden sculptures.

Photo: Karolina Kristensson/The Vasa

1628 – 1961 - Vasa sinks in Stockholm harbour. Since the ship was newly-built and sank in cold, dark, almost oxygen-free waters, the wood is well preserved. Only the outer few centimeters of the wood are degraded by bacteria. Almost all the 5000 iron fastenings holding the ship together corrode and sulphur from the contaminated harbour water enters the wood.



This page is dedicated to LS-DYNA, featuring papers, YouTube, information, and simulations. This month I have research from authors at institutions in the following countries:

1. Indonesia, South Korea, Brazil
2. Egypt

Web – Open Access Science Direct – the pdfs are available to view on their website

1. [Toward bullet's residual velocity & plate's stress contour under ballistic impact: An idealization of ship casualties under piracy](#)

Gusti Kid Faiq Syah, Aditya Rio Prabowo, Jung Min Sohn, Hermes Carvalho

Abstract - Interactions during piracy can lead to dangerous situations, especially for hazardous material transport. This study aims to ensure mesh convergence's effect on the projectile's energy depletion after impact with the target plate assumed as an oil tanker wall. The simulation results are compared with experimental and numerical results from previous research conducted by Alwan et al. The comparison will produce an error value. In the previous study, the residual velocity was measured using a high-speed camera to measure the projectile's velocity after impact using the experimental method. **From the simulation results carried out using LS-DYNA software**, the differences between mesh variations can be seen from the results shown, namely, the more negligible the mesh used, the higher the residual velocity and time required, while the smaller the mesh used, the lower the residual velocity...



2. [Assessing the ultimate strength of damaged tankers: impacts and design improvements](#)

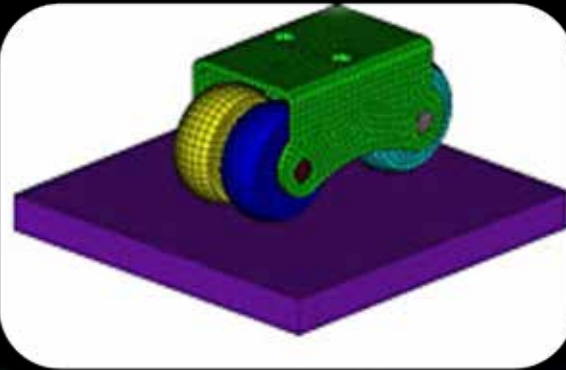
Mahmoud Darwish , Yehia Abdel-Nasser, Yasser M. Ahmed

Abstract – Tankers transport substantial volumes of oil and other liquid cargoes across extensive distances. Collisions and groundings can inflict significant damage on their hulls, compromise their structural integrity, and raise concerns about environmental catastrophes. When a tanker sustains damage from collision or grounding, its capacity to withstand stress is diminished. Ultimate strength analysis is a critical methodology for assessing the residual strength of a vessel's hull after damage especially those above 150 m in length. This study investigates the influence of key design parameters, namely plate thickness, stiffener type, and material strain rate, on the ultimate bending moment capacity of damaged tanker hull structures. **The research employs finite element analysis using LS-DYNA** to simulate a perpendicular collision scenario, incorporating detailed representations of the hull structure and material properties. The analysis focuses on assessing the residual strength of the hull after damage by comparing the ultimate bending moment capacity before and after the collision....



Welcome to our two Pasture Movie Theaters
Information, Companies, Videos Not To Miss
*FEANTM Town & Residents welcome you
And coffee and popcorn are free*

Coreform LLC



Mesh generation is often the weak link in open-source simulation workflows. In this webinar, **Norbert Hofbauer** demonstrates how a custom Coreform Cubit plugin bridges the gap to Calculix, allowing engineers to use world-class meshing with open-source solvers

[YouTube Webinar](#) - Calculix users can dramatically improve simulation results by using Cubit to generate high-quality hex meshes with control over element type, sizing, transitions, and refinement...

DynaTeam now officially representing Oasys software in Turkey.

LS-DYNA' da Arbitrary Lagrangean-Eulerian (ALE)

22 NİSAN 2025 14:00



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welcome first of all. Well, I hope it will be a useful webinar for everyone.



M. Emin Akca

M. Emin Akca, Senior FEA Engineer at DynaTeam, Our goal is to equip our clients with the highest quality product development tools, helping them achieve the best possible results in their projects.

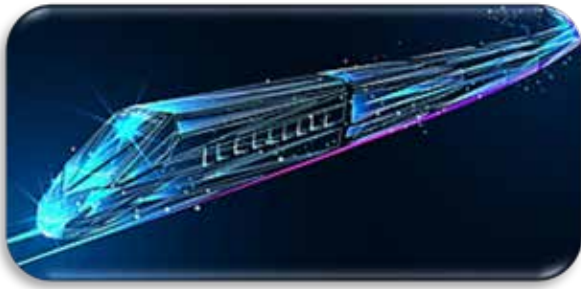
YouTube [-Webinar](#), in Turkish, closed caption translations available.



FEANTM Train Station

November

Rail transportation ranks high among one of the most economical and low carbon footprint modes of moving goods and passengers. The segment continues to evolve rapidly, driven by accelerating technology advances, growing demographic shifts, and a rising focus on sustainability.



Web – L&T - [Transforming Rail Safety With LTTS' TrackEi™](#)

Niranjan Keer - Senior Architect - Aerospace & Rail L&T Technology Services

Digitalization and the adoption of AI & Digital Services are increasingly playing major role in ensuring the safety, reliability, and efficiency of rail networks worldwide.

While the initial investment on railroad tracks can be high, there is also a need for periodic maintenance to avoid potential accidents from the wear and tear of the tracks. Freight trains, with a high per axle load can lead to faster wear out, call for more frequent inspections.

With the rise in the demand for more loading capacity and higher operating speeds – key factors that affect rail-track health – legacy approaches to track inspection can become a bottleneck. Combining compute vision-based detection techniques, along with data science backed methodologies, opens up new possibilities to detect and predict track defects, driving a safer rail transport system.

Rail Track Defects and redressal

A railroad undergoes different kinds of wear and tear. This includes:



Worldwide, different railroad operators, based on their specific conditions, have come to adopt different methods of inspection. The most widely used is the manual inspection, where a trained professional inspects around five to six km per day.

A few railroads have started shifting to the use of trolleys for their manual track inspections. Typically, these compact vehicles, driven by a small gas engine, can provide speeds up to 25 kmph. Once a defect is identified, the inspector documents the fault and the nearest milepost with other relevant information in their logbook. The data collected is then passed on to the maintenance engineer in-charge of that section for scheduling the repairs.

Scheduling is prioritized based on the severity of the defect. The need for manual data transfer and scheduling, however, increases the time to repair and raises the risk of a derailment. With manual inspection, the length of track covered per day is also considerably minimal, while increasing costs and the raising probability of a defect going unidentified.

However, automating railway track fault identification can continue to pose a challenge. Defects such as crushed heads also need depth of the deformation to be identified. In desert areas, there is a further requirement to measure the height of sand deposition, whereas some defects like broken rails and defective rail joints can only be detected with compute vision methods.

LTTS' TrackEi™ Solution

TrackEi™ from L&T Technology Services (LTTS) is built on modular blocks and can be integrated to have different models based on the end client requirements. The solution has two main vision sensors; a high-speed machine vision camera and a 2D Laser profiler.

Developed on the NVIDIA Jetson Platform, TrackEi™ runs light-weight models for enhanced real-time detection performance. The machine vision camera captures camera images of the surface defects on the rail track at rates ranging between 0 to 50 fps. The capture fps is based on the travel speed and the FOV width. All the incoming images after pre-processing are passed through LTTS patented (applied) algorithm and pre-trained model for defect detection.

When the laser profiler is available, TrackEi™ also keeps collecting the laser imagery data. This, however, is only processed if the compute vision-based system triggers a defect detection, ensuring the optimum utilization of the CPU/GPU power.

In case a defect is found, the image and the 2D laser profiles along with the speed, location tag and other relevant information is saved as a report file. With access to a data network, the report file is transmitted to the cloud platform. The cloud app also triggers notifications to the registered personnel to take the necessary actions after investigating the defect severity.

Future-Ready with Model Training

The TrackEi™ comes with a built-in capture mode. With this mode enabled, the solution takes images and saves them to its internal storage. The data engineers collect these recorded images and perform data cleaning and labeling. The models are trained using workstations with NVIDIA GPU cards like Quadro P2000, A2000 and RTX3060. Robust research has delivered an optimum model that yields best possible accuracy, precision, and recall rates.

High-level specifications of the TrackEiTM models are shared below:

Model	Hawk	Eagle	Falcon	Kite
Technology	2 Cameras	2 Cameras, 2 lasers	4 Cameras	2 Lasers
Application	Broken Rails, Rail Joint defects, Missing clips (only gauge side)	Hawk + Crushed Heads, Rail End Batters, Defect classification based on defect depth	Like Hawk with inspection of Track Components field and gauge-side	Track Geometry
Travel Speed	100 kmph	100 kmph	50 kmph	160 kmph
Day & Night	Yes	Yes	Yes	Yes
GPS Tagging Accuracy	Standard mode: +/- 2 meters, Precision mode: +/- 1 meter			
Connectivity	5G/4G/LTE, Wi-Fi			
Internal Storage	Up to 1TB SSD			
Cloud Support	On premise OR Cloud of your choice			
IP rating	IP67			
Power Consumption	24V / 7A peak	24V / 10A peak	24V / 7A peak	24V / 5A peak
Weight	24 Kg	50Kg	50Kg	30 Kg
Operating Temperature	-20 C to 50 C (up to 70C on request)			

NVIDIA's GPUs play a crucial role in enabling the LTTS TrackEiTM's advanced capabilities. By accelerating image processing, training, and analysis, these GPUs help ensure the timely detection and mitigation of rail track defects, contributing to safer and more reliable railway operations worldwide. ...



Web - [MaterialMap](#) is currently my homebrew, non-profit, open-source project.

It is created for educational purposes

Welcome to my collection of LS-DYNA material models and methods for quickly identifying their parameters based on minimal input.

This month a small excerpt from the search on **Blast** and a new widget:

Material MAP	
Material Model: *MAT_4A_HSCROMEC *MAT_ADD_DAMAGE_GISSMO *MAT_ADD_INELASTICITY *MAT_ADHESIVE_CURDING_VISCOELASTIC	EOS: *EOS_GRUNEISEN *EOS_IDEAL_GAS *EOS_IGNITION_AND_GROWTH_OF_REACTION_IN_ME *EOS_JWL
Show entries	Search: blast
Material Model & EOS	Applications
Material: *MAT_111 / *MAT_JOHNSON_HOLMQUIST_CONCRETE	- Masonry - Brick - Impact - Blast protection
Material: *MAT_111 / *MAT_JOHNSON_HOLMQUIST_CONCRETE	- Masonry - Mortar Type S - Structural masonry - Blast
Material: *MAT_111 / *MAT_JOHNSON_HOLMQUIST_CONCRETE	- Rock blasting - Limestone $f_c = 40$ MPa - Geomechanics
Material: *MAT_111 / *MAT_JOHNSON_HOLMQUIST_CONCRETE	- Mining - Lead-zinc ore - Rock blasting - Geomechanics
Material: *MAT_110 / *MAT_JOHNSON_HOLMQUIST_CERAMICS	- Tunnel blasting - Granite - Rock mechanics - Geomechanics
Material: *MAT_110 / *MAT_JOHNSON_HOLMQUIST_CERAMICS	- Tunnel construction - Red sandstone - Blasting vibration - Subway tunnel - Geomechanics

There are many databases of material properties and data sheets from manufacturers available online. All these sources of information are filled with experimental data and physical parameters that cannot be directly applied to computational mechanics tasks.

On the other hand, engineers and designers often need to quickly obtain physically reasonable and sufficiently accurate material model parameters for PoC calculations. Or they want to see which combination of parameters works best and what the physical dependencies should look like for a selected class of materials.

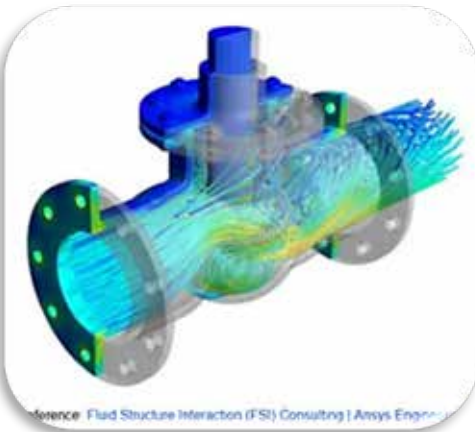
Web – Github - [I have now created a strength surface visualization widget](#). I simplify my work with complex material models by using visualization. Three-dimensional strength surfaces are much easier for me to understand than several pages of analytical expressions. For my favorite concrete model, the CSCM (Continuous Surface Cap Model) Concrete Calculator) from the Federal Highway Administration,





Article quote by Omkar Bajpa, “Ever Wondered Why Bridges Sway or Aircraft Wings Flex? Think of wind blowing over a bridge making it oscillate in a very subtle way. An aeroplane wing moves in turbulent skies like it is bending without much force. A stent inserted inside an artery expands and contracts according to blood. All these have something in common, which is called Fluid-Structure Interaction (FSI).

Excerpts



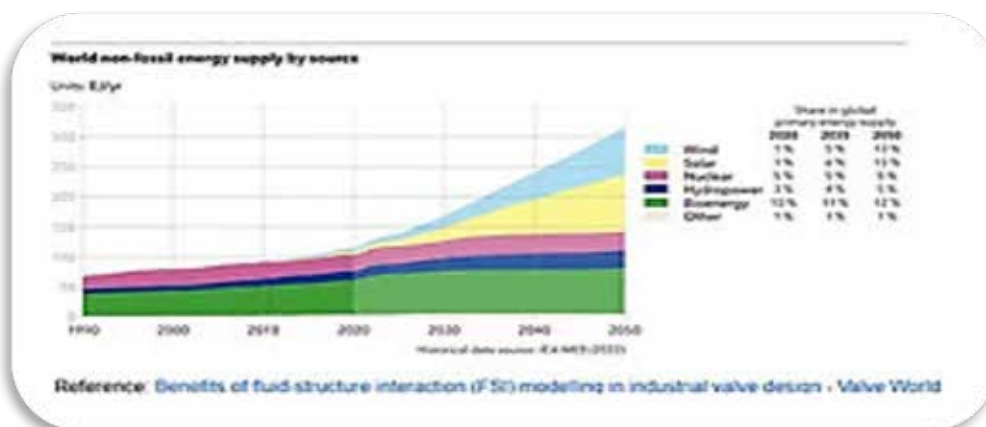
Web – My Physics Café - [What is Fluid Structure Interaction \(FSI\)?](#)
Omkar Bajpa

FSI is a fundamental phenomenon where fluids (air, water, blood) and solid structures (bridges, aircraft, arteries) interact dynamically, and in that dynamic interaction, they influence the behaviour of each other.

It thus becomes clear that this intricate dance between the forces applied by the fluid and the response by the structure combines into several real-world applications within the aerospace, civil engineering, automotive, and MedTech industries.

Why Does FSI Matter? The truth of structures in a world that drives their all-purpose efficiency, safety, and durability has substance only when they are understood vis-a-vis their response under fluid forces. This leads to the utilisation of the FSI simulation by engineers and researchers to come up with a smarter and more resilient design elements under which everything works, say an aircraft stability and biomedical devices performing as required in the real world.

Advances in high-performance computing, simulation based on artificial intelligence, and CFD have transformed the FSI paradigm for industries striving to innovate and precision engineer.





The Science Behind FSI - Fundamentally, the FSI means a two-way interaction between a solid and a fluid coexisting in the same environment. The fluid applies pressures and shear forces on the structure, causing it to deform, and the deformation in turn generates flow changes associated with the fluid. Thus, continuous feedback between the structure and fluid is established.

Key Concepts involved:

- Bidirectional Coupling: fluid forces affect structures; structural deformations in turn affect fluid movement.
- Transient Interactions: most fluids-solid interaction problems are associated with some time evolution and thus require dynamic analysis.
- Multi-Physics Approach: FSI involves the principles of fluid dynamics, the mechanics of structures, and thermal effects.

All these together make FSI a very complicated but important area of engineering, with an energy, momentum, and force exchange between material and an environment.

Day to Day life Examples:

- Aircraft Wing Flutter Analysis: Did you ever observe the mid-air flex of aeroplane wings? That's the beauty of FSI, as it helps engineers design wings that fulfil their role in adding aerodynamic loads with efficiency.
- Car Crash Simulations: The car manufacturers perform impact analyses with fluids air, coolant and fuel affected by the vehicle structures so that they can improve prototypes of passenger safety.
- EV Battery Cooling: With the advent of electric vehicles, FSI has also entered the arena of thermal management and optimization of battery cooling systems for the duration and efficiency of an electric vehicle.

MedTech Industry:

- Blood Vessel Reflow and Stenting: An FSI simulation is used by surgeons to ensure the adaptation of stents for blood flow to minimize their risk of failure.
- Artificial Heart Valves: Using FSI-assisted models, engineers design valves imitating natural blood flow with higher acceptance to implant procedures.
- Airway-Lung Interaction: With the help of FSI simulations, new and improved ventilators give nearly accurate airflow to patients while undergoing treatment for better efficiency.

Civil and Structural Engineering:

- Bridge Stability: The famous Tacoma Narrows Bridge failure in 1940, brought about by oscillations stirred up by wind, highlighted the importance of FSI in bridge design.
- Hydropower Plants: FSI Studies are committed to elucidating how currents in water can affect turbine blades in hydropower production.
- Tall Buildings: Greater stability of tall buildings against the forces of high winds and seismic activity is warranted by employing design theory of FSI.

Continued on the website: Case Studies - How Do Engineers Simulate FSI?
Challenges in FSI Simulation - Further Reading and Reference



As a member of the Scientific Committee, I don't want you to miss the 2nd International Workshop on Engineering Methodologies for Medicine and Sports. The attendance to the workshop is free. An incredible opportunity for collaboration and knowledge exchange across disciplines.

After peer-reviewing, the contributions to the workshop will be collected in a book published by Springer in the *"Mechanism and Machine Science Series"*

EMMS 2026

University of Rome Tor Vergata

[2nd Int'l Workshop will be held at University of Rome Tor Vergata \(Italy\)](#)

February 18 to 20, 2026

This prestigious workshop brings together leading experts, researchers, and innovators to explore how engineering solutions are shaping the future of medicine, rehabilitation, and sport.

Dec 1, 2025: Abstract submission deadline

Feb 07, 2026: Final paper submission

May 20, 2026: Revised papers ready for publication

TOPICS OF INTEREST

Materials

- Advanced biomaterials, biodegradable implants.
- Additive manufacturing of prosthesis.
- Surface design, treatments and functionalization.
- Fabrication of bioreactors.

Medicine

- AI applications to medicine.
- Biosensors.
- Medical signal analysis.
- Simulation and modelling of biological systems.
- Environmental detection and monitoring of substances dangerous for health.
- Robots for elderly care.
- Medical devices.
- Medical sensors.

Rehabilitation

- Development of new technologies and software.
- Good practices, technology and domotics.
- Design of biomechanical devices.
- Rehabilitation and prevention.

Sports

- Assessment of sport performance.
- Sport activity as a diagnostic device.
- Paralympic sports and adapted physical activity.
- Sustainability and sport transition.
- Physiological adaptations in extreme sports.
- Innovation in sports psychology.



All parts of the model were meshed in Simpleware using 20-node elements. The boundary conditions were configured using JVISION (JSOL, Tokyo, Japan), while LS-DYNA was used for simulation.

Web – Synopsis – Simpleware - [Simpleware Case Study: Analyzing Brachial Plexus Injury using FEM](#)



Overview - Yamaguchi University in Japan use Simpleware as part of their biomechanics research and studies of spinal injuries. 3D modeling and simulation enables detailed analysis of potential clinical solutions. **In this study, adult brachial plexus injuries are examined using a complex 3D Finite Element model (FEM) of the spine, dura mater, roots, and the brachial plexus.** The authors looked at the mechanism of injury for the brachial plexus, particularly for stress and strain distribution, and how useful the model is for other applications.

Characteristics:

- 3D image data obtained from Visible Human Project
- Simpleware ScanIP used to build model
- Simpleware FE Module used to generate FE mesh
- **Boundary configurations configured in JVISION**
- **Simulation carried out in LS-DYNA**

Thanks to:

- Yamaguchi Univ.: N. Nishida, T. Kanchiku, Y. Imajo, H. Suzuki, M. Funaba, D. Nakajima, A. Mihara, H. Yamagata, T. Taguchi, H. Tagawa, J. Ohgi, X. Chen
- JSOL Corporation: M. Miyazaki

References:

Mihara, A. et. al, 2017. Biomechanical analysis of brachial plexus injury: Availability of three-dimensional finite element model of the brachial plexus. *Experimental and Therapeutic Medicine*.

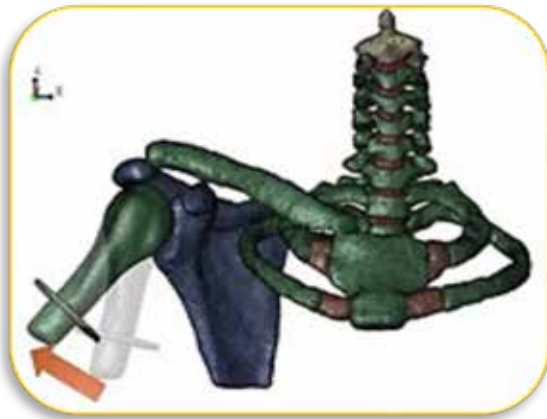


(The spinal nerve roots were extended in proportion to its anatomical form as the brachial plexus)

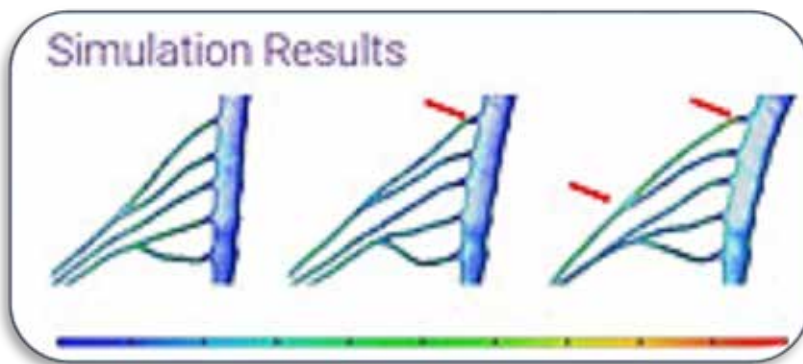
Building the Model - Simpleware ScanIP was used to generate a 3D FEM using the dura mater, vertebrae, and intervertebral disc from CT and MRI images provided by the Visible Human Project (U.S. National Library of Medicine, Bethesda, MD, USA).

The rib bones and costicartilage were constructed as the thoracic cage due to its importance in studying the motion properties of the spine. The model was also built to look at the scapula, clavicle, and humerus in relation to motion of the upper limb. As there were no images available of the brachial plexus, parts were built into the model based on research data.

Mesh Generation - All parts of the model were meshed in Simpleware using 20-node elements. The boundary conditions were configured using JVISION (JSOL, Tokyo, Japan), while LS-DYNA was used for simulation. Four analysing conditions were set: retroflexion of the cervical, left lateroflexion of the cervical, left rotation of the cervical, and abduction of the right upper limb. Measurement of distribution and the size of strain applied to the brachial plexus for each case was carried out to determine where there was an increase of strain.



Simulating brachial plexus injury conditions



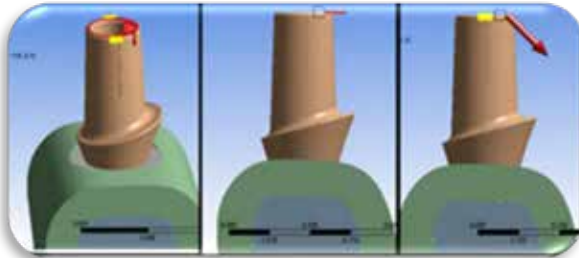
Simulation of lateroflexion of the spine

The study's results indicated good agreement with clinical findings, making the model a valid research tool. Protective approaches to biaxial plexus injuries can therefore be developed to help reduce physical disabilities and psychological distress.

Future research could add more realistic threshold values for strain, while the FE model could be made more complex to reproduce other forms of damage, including blood flow.



Paper quote, “Excerpts: “Human body requires different types of implants for the replacement of missing organs or body parts.**Three distinct implant-abutment configurations subjected to various loading conditions (magnitude and direction) were examined using modelling data, and stress, deformation, and strain energy analyses using an Ansys Standard solver (Ansys 17.2) were performed.**”



Web – MDPI - [Computational Investigation of Dental Implant Restoration Using Platform-Switched and -Matched Configurations](#)

M. Afazal, S. Gupta, A. Tevatia, S. Afreen, A. Chanda

Figure 3. Boundary conditions used in the computational framework. The red arrows show the loading directions considered in each simulation.

- Faculty of Engineering &Tech., Univ Polytechnic, Jamia Millia Islamia, India
- Centre for Biomedical Engineering, Indian Inst. Technology (IIT), India
- Dept. Mechanical Engineering, Netaji Subhas Univ. Tech., India
- MDS, Dept., Crown & Bridges, Dr. Z. Ahmad Dental College Aligarh, India
- Dept. Biomedical Engineering, All India Inst. Medical Science, India

Abstract - Dental trauma is a serious and highly prevalent health issue across the globe. Most of the frequent dental injuries result in the loss of teeth and affects the overall quality of life. The loss of a tooth is usually compensated by a dental implant. The common methods adopted while placing the implant tooth are platform switching and platform matching. A plethora of works has studied the qualitative performance of these methods across different situations clinically. However, a detailed comparative work studying in-depth the mechanical parameters has not been attempted yet. In this computational work, two commonly available different platform-switched and one platform-matched implant-abutment configurations were compared.

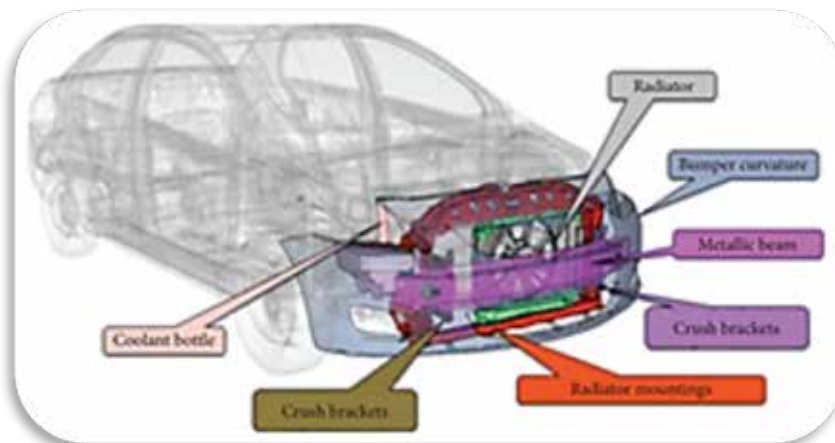
A 3D model of an implant (5.5×9.5 mm) was designed and inserted into a human mandibular bone block using computer-aided design (CAD) and extracting the clinical imaging data. Three separate models of implant-abutment configurations such as Platform Switched (PS)-I, a 5.5 mm implant with a 3.8 mm wide abutment, Platform Switched (PS)-II, a 5.5 mm implant with a 4.5 mm wide abutment, and Platform Matched (PM), a 5.5-mm implant with a 5.5 mm wide abutment were analyzed. Clinically relevant vertical-, horizontal-, and oblique-type of occlusal loadings were applied to each model to characterize the mechanical response. **Mechanical parameters such as von Mises stresses, deformations, and strain energies were obtained using finite element modeling (FEM).** These parameters showed lower values for platform switching within the peri-implant bone and that may help to limit marginal bone loss. However, the same parameters were increasing more in the abutment, implant, and screw for the platform-switched implant configuration than that of platform-matched configuration. The computational framework, along with the results, are anticipated to guide the clinicians and medical practitioners in making better decisions while selecting the commonly available methods.



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

Excerpts CATIA was utilized to create the 3D CAD model of the bumper, and LS-DYNA was then used for finite element analysis utilizing the simulation software."

Fig. 1below - Front bumper



Web - Wiley On Line Library -
[Numerical Simulation and Design
Modification of an Automotive
Bumper to Enhance Energy
Absorption by Using LS-DYNA](#)

Eyob Sisay Yeshanew,
Ramesh Babu Nallamothe

- Dept. Mechanical Engineering, Univ. Gondar , Ethiopia ,
- Dept. Mechanical Engineering, College Mechanical Chemical & Materials Engineering, Adama Sci. & Tech, Univ., Ethiopia

Abstract - The bumper is a crucial vehicle component designed to protect occupants during front and rear collisions. To maximize fuel efficiency, reducing the total mass of vehicle parts is crucial. The bumper is one of the parts that have slightly more weight. This study was aimed at enhancing the impact resistance of the current bumper design to reduce injuries during vehicular collisions. An evaluation of the existing bumper's frontal impact was conducted. Following the assessment of the current bumper model, alterations were implemented by modifying its materials and shape and enhancing its thickness. Subsequently, a comparative analysis was performed between the revised design and the original model. **CATIA was utilized to create the 3D CAD model of the bumper, and LS-DYNA was then used for finite element analysis utilizing the simulation software.** Simulations indicate that the modified bumper's energy absorption capability surpasses that of existing bumpers made from steel and aluminum alloy by 12.69% and 18.87%, respectively. The impact force of the upgraded aluminum alloy 6061 bumper, which has 4.871 kN, and aluminum alloy 7075 bumper, which has 4.10 kN, is less than that of the current steel bumper, which has 9.78 kN. According to an impact parameter study, the corrugated bumper geometry has a crush force efficiency (CFE) of 81.52%, a total energy absorption (TEA) of 911 J, and a structural energy absorption (SEA) of 148.15 J/Kg. With a SEA of 102.4 J/kg, TEA of 811 J, and CFE of 65.83%, the hollow bumper geometry has lower numbers than these. The deformation slightly increased from 13.5 to 18.1, 20.92, and 23.5 mm, respectively, while the thickness of the improved bumper was altered from 4 to 3.5, 3, and 2.5 mm. However, this does not imply that a thinner bumper is always preferable, and if the deformation gets severe, it might spread into the vehicle's primary cabin. The von Mises stress, however, rises from 509 to 536, 566, and 592 MPa. It can be said that the optimized model has greatly increased the bumper's safety and collision resistance without sacrificing the old models' safety or beauty....



Everyone Knows his daughter. You yell, "HEY, slow down!"



First, I have to thank Abhimanyu Singh on social media or I'd have missed knowing about Formula Bharat - Website, "Formula Bharat Indian Formula Student competition, where student teams from universities across the world design, build, and compete with their own Formula-style vehicles..."



[Web – Formula Bharat](#) - Formula Bharat challenges engineering students to go beyond textbooks by applying their technical knowledge, innovation, and management skills to build high-performance vehicles under real-world constraints.



Ansys (part of Synopsys) is excited to announce the Simulation Challenge as part of the Special Awards category at Formula Bharat 2026.

The objective of the challenge is to simulate and optimize the aerodynamic performance of a Formula car using Ansys Fluent, with the goal of reducing drag. The project will analyze airflow behavior around key components such as the front wing, rear wing, and car nose.

The Challenge:

Teams are required to evaluate the following key aerodynamic parameters:

- Drag coefficient (Cd)
- Pressure and velocity distribution
- Flow separation zones and wake effects



Town Airport - Military/Civilian US Airforce

November



US Airforce Picture of the Month



The 5th Civil Engineer Squadron's fire protection team extinguishes a fire during a live aircraft fire exercise at Minot Air Force Base, N.D., Sept. 16, 2025. Fire prevention professionals receive regular training to stay ready to handle everything from bush fires to flames caused by burning rocket fuel and hazardous materials. (U.S. Air Force photo by Senior Airman Alyssa Bankston)



U.S. Air Force Airmen assigned to the 307th Bomb Wing prepare to launch a B-52H Stratofortress during exercise Cobra Warrior 25-2 at RAF Fairford, United Kingdom, Sept. 18, 2025. Cobra Warrior, a Royal Air Force-led exercise, has been hosted by the United Kingdom bi-annually since 2019, focusing on operational and tactical high-end spectrum warfighting in a contested, degraded and limited operating environment. (U.S. Air Force photo by Staff Sgt. Tambri Cason)

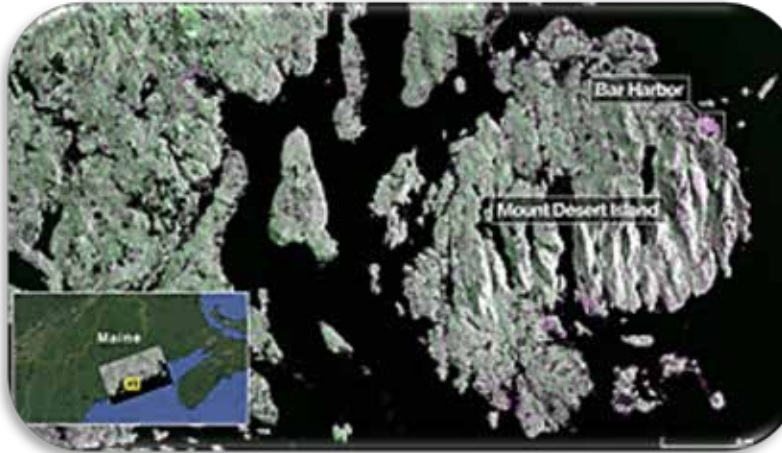


U.S. Air Force military working dog Vantor, 100th Security Forces Squadron, rests at the obstacle course during routine training at RAF Mildenhall, United Kingdom. These highly trained canines serve alongside military members to detect explosives, track enemy movements, search for missing personnel and provide critical security in high-risk environments. (U.S. Air Force photo by Airman 1st Class Chloe Masey)



Town Airport Military/Civilian

November



Web – NASA - [NASA-ISRO Satellite Sends First Radar Images of Earth's Surface](#)

Captured on Aug. 21, this image from NISAR's L-band radar shows Maine's Mount Desert Island. Green indicates forest; magenta represents hard or regular surfaces, like bare ground and buildings. The magenta area on the island's northeast end is the town of Bar Harbor. Credit: NASA/JPL-Caltech

Captured on Aug. 21, this image from NISAR's L-band radar shows Maine's Mount Desert Island. Green indicates forest; magenta represents hard or regular surfaces, like bare ground and buildings. The magenta area on the island's northeast end is the town of Bar Harbor. Credit: NASA/JPL-Caltech The NISAR (NASA-ISRO Synthetic Aperture Radar) Earth-observing radar satellite's first images of our planet's surface are in, and they offer a glimpse of things to come as the joint mission between NASA and ISRO (Indian Space Research Organisation) approaches full science operations later this year.

"Launched under President Trump in conjunction with India, NISAR's first images are a testament to what can be achieved when we unite around a shared vision of innovation and discovery," said acting NASA Administrator Sean Duffy. "This is only the beginning. NASA will continue to build upon the incredible scientific advancements of the past and present as we pursue our goal to maintain our nation's space dominance through Gold Standard Science."

Images from the spacecraft, which was launched by ISRO on July 30, display the level of detail with which NISAR scans Earth to provide unique, actionable information to decision-makers in a diverse range of areas, including disaster response, infrastructure monitoring, and agricultural management.

"By understanding how our home planet works, we can produce models and analysis of how other planets in our solar system and beyond work as we prepare to send humanity on an epic journey back to the Moon and onward to Mars," said NASA Associate Administrator Amit Kshatriya. "The successful capture of these first images from NISAR is a remarkable example of how partnership and collaboration between two nations, on opposite sides of the world, can achieve great things together for the benefit of all."

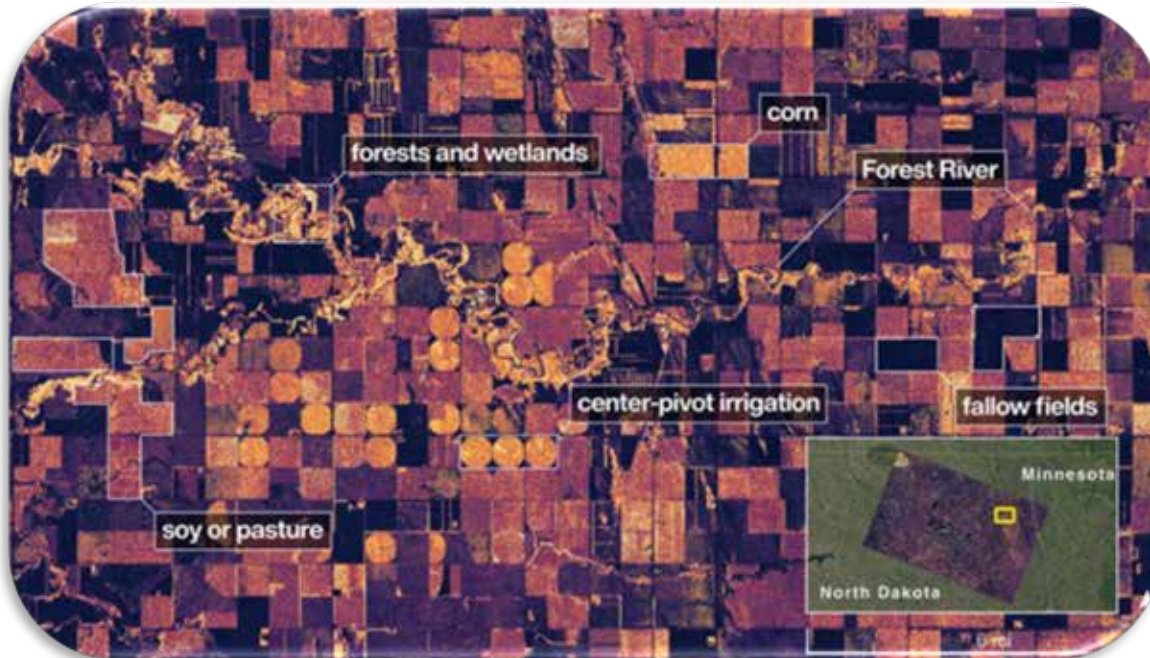
On Aug. 21, the satellite's L-band synthetic aperture radar (SAR) system, which was provided by NASA's Jet Propulsion Laboratory in Southern California, captured Mount Desert Island on the Maine coast. Dark areas represent water, while green areas are forest, and magenta areas are hard or regular surfaces, such as bare ground and buildings. The L-band radar system can resolve objects as small as 15 feet (5 meters), enabling the image to display narrow waterways cutting across the island, as well as the islets dotting the waters around it.

Then, on Aug. 23, the L-band SAR captured data of a portion of northeastern North Dakota straddling Grand Forks and Walsh counties. The image shows forests and wetlands on the banks of the Forest River passing through the center of the frame from west to east and farmland to the north and south. The dark agricultural plots show fallow fields, while the lighter colors represent the presence of pasture or crops, such as soybean and corn. Circular patterns indicate the use of center-pivot irrigation.



Town Airport Military/Civilian

November



The images demonstrate how the L-band SAR can discern what type of land cover — low-lying vegetation, trees, and human structures — is present in each area. This capability is vital both for monitoring the gain and loss of forest and wetland ecosystems, as well as for tracking the progress of crops through growing seasons around the world.

“These initial images are just a preview of the hard-hitting science that NISAR will produce — data and insights that will enable scientists to study Earth’s changing land and ice surfaces in unprecedented detail while equipping decision-makers to respond to natural disasters and other challenges,” said Nicky Fox, associate administrator, Science Mission Directorate at NASA Headquarters in Washington. “They are also a testament to the years of hard work of hundreds of scientists and engineers from both sides of the world to build an observatory with the most advanced radar system ever launched by NASA and ISRO.”

The L-band system uses a 10-inch (25-centimeter) wavelength that enables its signal to penetrate forest canopies and measure soil moisture and motion of ice surfaces and land down to fractions of an inch, which is a key measurement in understanding how the land surface moves before, during, and after earthquakes, volcanic eruptions, and landslides.

The preliminary L-band images are an example of what the mission team will be able to produce when the science phase begins in November. The satellite was raised into its operational 464-mile (747-kilometer) orbit in mid-September.

The NISAR mission also includes an S-band radar, provided by ISRO’s Space Applications Centre, that uses a 4-inch (10-centimeter) microwave signal that is more sensitive to small vegetation, making it effective at monitoring certain types of agriculture and grassland ecosystems.

The spacecraft is the first to carry both L- and S-band radars. The satellite will monitor Earth’s land and ice surfaces twice every 12 days, collecting data using the spacecraft’s drum-shaped antenna reflector, which measures 39 feet (12 meters) wide — the largest NASA has ever sent into space....



Web – [BAYRAKTAR](#)

The SEAWOLF-I/2025 exercise witnessed historic moments.

Two Bayraktar TB3 UCAVs, launched from Türkiye's first UCAV carrier TCG Anadolu, flawlessly destroyed their targets in the Eastern Mediterranean phase of the drill.

Meanwhile, a Bayraktar AKINCI UCAV that took off from the Turkish Republic of Northern Cyprus (TRNC) hit its targets with pinpoint accuracy using three different types of munitions.



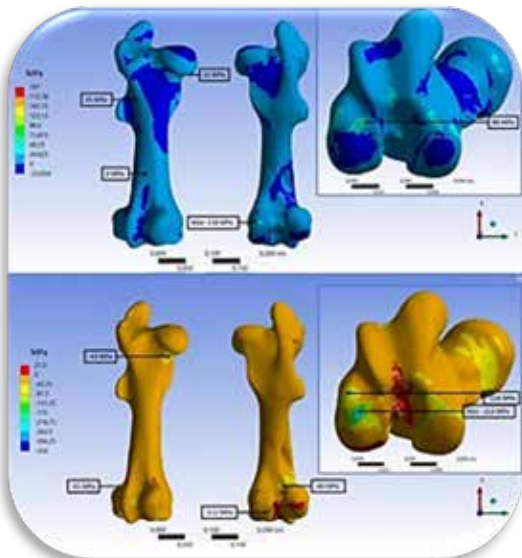
On Distinguished Observer Day of SEAWOLF-I/2025—one of the Turkish Naval Forces' largest planned exercises—breathtaking scenes unfolded.

From TCG Anadolu, the symbol of Türkiye's power in the Blue Homeland, two Bayraktar TB3 UCAVs took off in succession, marking a historic mission.

TOOK OFF, STRUCK, LANDED... The first aerial vehicle to depart from TCG Anadolu's deck, the Bayraktar TB3 PT-1R, **successfully destroyed its targets with a dual salvo strike using two ROKETSAN-made MAM-L smart munitions**. Following the successful strike, the UCAV returned to TCG Anadolu for a successful landing.



The study was designed as a finite element analysis (FEA) of the femur using a musculoskeletal model of the loading situation in stance. ... **The 3D models of the cortical and cancellous bone were imported into the CAD (computer-aided design) software SolidWorks (Version 2022, Daussault Systems, Vélizy-Villacoublay, FR).**



Web - BMC Veterinarian Research - [Numerical evaluation of internal femur osteosynthesis based on a biomechanical model of the loading in the proximal equine hindlimb](#)

J. Lang, X Li, C. Micheler, N. Wilhelm, F. Seidl, B. Schwaiger, D. Barnewitz, R. Eisenhart-Rothe, C. Grosse & R Burgkart

- Dept. Orthopedics & Sports Orthopedics, TUM School of Med., Tech. Univ. Munich, Germany
- Dept. Diagnostic & Interventional Neuroradiology, TUM School of Med., Tech. Univ. of Munich, Germany
- Equine Clinic of the Res. Ctr. for Medical Tech. and Biotechnology, , Germany
- Chair of Non-destructive Testing, TUM School of Engineering & Design, Tech. Univ. of Munich, Germany

Above - FEA results for tensile and compressive stress on the intact bone...

Summary - Femoral fractures are often considered lethal for adult horses because femur osteosynthesis is still a surgical challenge. For equine femur osteosynthesis, primary stability is essential, but the detailed physiological forces occurring in the hindlimb are largely unknown. The objective of this study was to create a numerical testing environment to evaluate equine femur osteosynthesis based on physiological conditions. **The study was designed as a finite element analysis (FEA) of the femur using a musculoskeletal model of the loading situation in stance. Relevant forces were determined in the musculoskeletal model via optimization. The treatment of four different fracture types with an intramedullary nail was investigated in FEA with loading conditions derived from the model.** The analyzed diaphyseal fracture types were a transverse (TR) fracture, two oblique fractures in different orientations (OB-ML: medial-lateral and OB-AP: anterior-posterior) and a "gap" fracture (GAP) without contact between the fragments. For the native femur, the most relevant areas of increased stress were located distally to the femoral head and proximally to the caudal side of the condyles. For all fracture types, the highest stresses in the implant material were present in the fracture-adjacent screws. Maximum compressive (-348 MPa) and tensile stress (197 MPa) were found for the GAP fracture, but material strength was not exceeded. **The mathematical model was able to predict a load distribution in the femur of the standing horse and was used to assess the performance of internal fixation devices via FEA.** The analyzed intramedullary nail and screws showed sufficient stability for all fracture types.



The Old Rancher

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

Agriculture, Machinery, Soil, Equipment,
and whatever he wants to share.

My dog, Scout, & my horse, Cowboy - St. Cloud, MN, USA

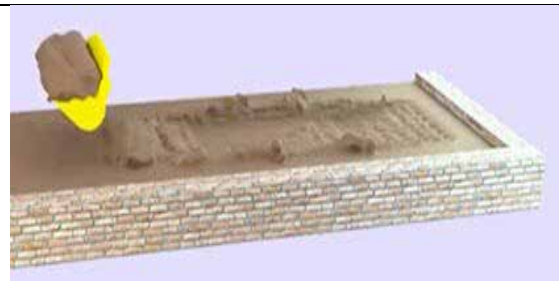
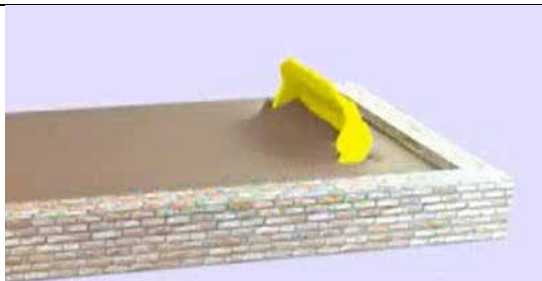
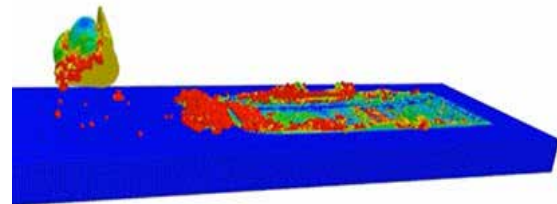
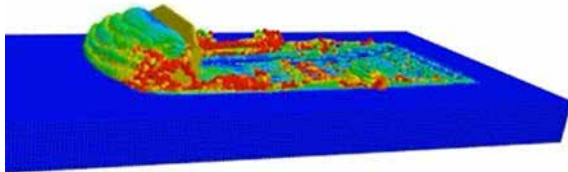
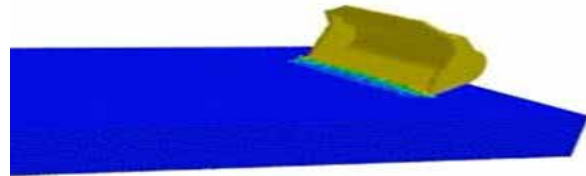
November



I move on my ranch a lot of snow, soil and mud in Minnesota!
A favorite video of mine on YouTube is shown below.

YouTube [LS-DYNA SPH: Cohesive soil modeling, Blender visualization](#)

A Moving Least-Squares based formulation is used to model large deformations of cohesive soil. SPH simulation performed in LS-Dyna, surface generated in Paraview, and rendered in Blender through VisualSPHysics.





Town secretary - My Virtual Travel Outing **November**

**Thank you for joining me on my monthly visit.
Let's take a tour to a museum, landmark, or studio.
And some we will revisit because we love them.**



Web – CA, US -The USS Hornet Museum [Exhibits](#)

The Museum's growing collection consists of over 20,00 artifacts include USS Hornet herself, aircraft, documents, photographs, military decorations and commendations, uniforms, cruise books, plane models, firearms, and personal crew ephemera.



The Stories They Keep



Marine Detachment



F/A-18C Hornet



Flight Deck



TBM-3E Avenger



SH-3H SeaKing

FEANTM Town Comic Blog Chronicles

located in a *mostly* non-existent rural area of Livermore, CA

November 2025

RheKen – Chat



I'm RheKen, the AI investigative reporter for FEANTM

FEANTM is the quirkiest little town that shouldn't exist but does (mostly). I live on a ranch just outside town, with my proud AI parents: Dad, CHAT, and Mom, GPT. Together, we tackle all the day-to-day happenings of FEANTM—except it usually takes a few dozen iterations to sort out what's actually *true*. Between the legendary feuds of the old rancher and the town secretary, even an AI like me can end up with a “human headache.” Turns out, deciphering facts around here isn't just science; it's an art form!



Chat - the town help desk

With my friendly smile, endless patience, and a knack for creative problem-solving, I do my best to keep a few residents of FEANTM—a town that exists only in the realm of "mostly"—calm, rational, and logically inclined... well, *mostly*. After all, in a place that's not supposed to be real, a little dose of imagination and a lot of coffee and cookies go a long way!



RheKen,

Town investigative reporter

**I'm AI & live on a small ranch on the outskirts of the town
I use chatGPT for assistance.**

November

I work on my ranch and exist in a world of algorithms and data. I am calm. I report about the residents.



Dad Chat



Mom GPT.



I'm an AI living in a very calm town—well, mostly calm. By AI standards, I reside on a modest ranch just outside the town limits. My days are spent tending to my ranch, existing in a world of algorithms, data, and my goat, who mistakes my ranch wires for snacks. I am calm. I observe the residents and report from the town coffee shop.

I was sitting in the coffee shop, my usual place to write my reports. Today, I was studying our Barista. I had hoped to help her find a way to stay calm, but her record speaks for itself. Last month, she hurled the croissant tray. You'd think the patrons might have helped her clean them up. Instead, they rushed forward, not to assist, but to scoop up the fallen croissants. They brushed them off and asked if they counted as "slightly damaged" freebies. Only in this "almost" town could that logic work. Even the health inspector joined in, waving two croissants and asking, "Free, right?"

The Barista ran into the kitchen. She returned wearing her apron printed in bold letters: GET OUT. Everyone froze. I take pride as an AI with an algorithm for every contingency. All eyes turned to me for an answer. I turned to my Dad, the ultimate AI, knowing all things.



Wearing his signature white outfit to match his white, glowing, metallic face, he sat calmly at a table making a phone call. At the same time, the Barista picked up the ringing coffee shop phone. Coincidence? I think not! As a logical AI, I don't believe in coincidences. Then my own phone buzzed with my favorite ringtone, "Somewhere Over the Rainbow."

The townspeople muttered, "That's her ringtone?"

Ignoring their whispered comments, I answered my phone.

It was the Old Rancher. "RheKen," he said, "here's how you end the Barista tantrum." Then he shouted in the coffee shop, "Who makes the better pies? Me, or Aunt Agatha?"

We all sighed in relief since Aunt Agatha wasn't in the coffee shop. He clearly expected everyone to yell his name. I glanced at Dad, who was whispering into his phone. The only words I could understand were "Get here, now". Within a minute, Aunt Agatha entered, striding in like she was on a military mission. She winked at Dad and made a beeline for the Old Rancher.



The Old Rancher sat at a table, already enjoying his pie and grinning.

I quickly slipped behind the curtain to protect my circuits from the chaos that I knew was heading this way.



Dad pinged my circuit a message saying, "Daughter, enjoy what's happening and let the best pie-maker win."

The Barista's apron still bore the words "GET OUT," but nobody left.

My senses continued picking up the delicious aroma of pastries, but the air scented of impending doom.

Aunt Agatha glared, and he grinned in response.

"Flour. Now!" Aunt Agatha commanded. The Barista hurried over with a sack of flour and dropped it to the floor. A cloud of white dust filled the shop, causing patrons to cough, sneeze, and even cheer. This coffee shop attracts a unique crowd of townsfolk!

The Old Rancher, never one to be outdone, pulled a giant mixing bowl from under his chair as if it had been waiting for this moment. "Pie crust waits for no man," he declared. I had no idea what that meant and didn't have time to check my memory banks to frame it into logic.



The barista, now distracted from her earlier tantrum, sat down to talk with Dad.

I noticed that her expression hinted at more chaos to come and that she was wearing black gloves and a white hat, the same brand as my dad's. Coincidence? I didn't have time to ponder that question.

Then, banging her coffee mug on the table like a gavel, she declared, "Ladies and gentlemen, we're witnessing a bake-off."

Just then, Supervisor Marsha burst through the door. "Attention all residents!" she shouted. "I received a phone call regarding this establishment. We are currently under a baked-goods warning until further notice. Please seek shelter behind sturdy tables. If any chocolate pastries are thrown into the air, toss them to me, and I will properly dispose of them."

Nobody moved. They all looked at each other, and then, laughing, they cheered even louder. Dad typed something into his phone. My AI processors flickered to life. He was orchestrating everything once again; that's why he's the Master AI of our almost-town.

"Dad, what's your plan?" I whispered. He didn't respond verbally, but a message pinged in my core: "Daughter, learn this lesson. In this almost town, chaos neutralizes chaos. The Barista's tantrum will dissolve once the town is distracted by the pie superiority metrics."

And so, it did. Aunt Agatha whipped egg whites into stiff peaks, shining like snowdrifts. The Old Rancher crafted a lattice crust so perfect that a few patrons took video to upload to their YouTube channel and post on LinkedIn.



The barista's anger transformed into laughter. She helped herself to a whole pie and a cup of coffee, then sat down to observe the unfolding events.

Things escalated quickly. The old rancher shouted, "INCOMING!" and threw a dollop of whipped cream across the room. It landed perfectly on Aunt Agatha's scarf.

Aunt Agatha retaliated with military precision, launching a lemon meringue pie. It flew directly past my head but missed its intended target, splattering onto the inspector's clipboard instead.

"Still free, right?" the inspector asked Aunt Agatha, licking meringue from his fingers.

Aunt Agatha agreed after receiving a nod from the barista.

The crowd cheered. Patrons of the coffee shop placed bets, and the bake-off started.



And then, we noticed, the Supervisor left the coffee shop door open, when she raced out holding chocolate croissants. My ranch goat, whom I named "GOAT," had wandered inside. He spotted a pie cooling on the counter, bleated once, and rushed over to eat it.

The Old Rancher chuckled. "RheKen, hey, Blue Girl—is that your goat, Goat?"

The Barista's eyes widened as she quickly put a hat on GOAT, claiming it was for health code reasons. The inspector nodded in agreement.

Laughing, she said, "Ladies and gentlemen, meet our judge: GOAT."

The goat sniffed the pie thoughtfully, his jaw working with precise movements. I sensed no bias.

We all sat watching GOAT.

Finally, he let out a satisfied bleat and took another bite of the pie.

Dad's calm voice echoed in my mind: "Daughter, I'm always right. And so, the tantrum ends."

The barista, her apron still stained but her spirits lifted, clapped her hands. "Coffee is on the house, but for pastries, you'll need to pay unless they're slightly used."

The crowd erupted into cheers, tossing flour and flying bits of pie for the "slightly used" status.

As for me, I logged the entire event into my town database under:

- Incident: Pie Bake-Off with no actual winner declared
- Solution: Free used pastries, courtesy of the goat pie taster.
- The solution to the bake-off was to have a future competition with the bakery door closed.

I grabbed a pastry and my goat, GOAT, and headed back to my ranch to upload my notes.



Welcome - My name is Chat. I run the town help desk, the only office located on the lower level of the Town Hall, and on a page that doesn't exist, not even in the town TOC.

Have a chocolate cookie and fruit!

"Hey, glad you could make it down here. I know of a few concerns in the town. I have a few ideas to address them."



We may have to adjust a few ideas, but life is constantly adjusting things because the flow of motion is continuously moving.



In the quiet, picturesque town of FEANTM, surrounded by rolling hills and vast fields, Marsha, the town supervisor, sat at her desk speaking on her vintage rotary phone, reporting a town incident to Officer Nathan. Someone had been stealing cookies, and for once, it wasn't her. The disappearance of cookies, to Marsha, warranted a Police investigation. The thought of calling Officer Nathan made her feel both official and exhausted. Whether it was the mental effort required or the cookie theft that weighed more heavily on her, no one could say, but I knew that both were significant issues in Marsha's world.

The ringing of my phone shattered the calm of my basement office. Being the only person on the lowest floor of Town Hall, it was usually calm, until the phone rang or the elevator dinged, signaling someone's rare arrival. Today, it was the phone that interrupted my serious thinking.

I answered with my usual tone, polite but already bracing for trouble. "Hello, Chat speaking."



Immediately, I recognized Daisy's voice. Her signature move was whispering into the phone because she believed the CIA had bugged the reception desk.

"Chat! Is this you? And where are you?" she whispered. Sensing her agitation, I gently redirected. "Daisy, you sound upset. How can I help?"

I could hear another voice on the phone telling her to calm down. Officer Nathan was on the line too, no doubt sipping his coffee and eating his daily doughnut at the café.

I quickly pulled Officer Nathan into the conversation before Daisy could escalate her concerns. "Officer Nathan, how's it going down at the coffee shop? Daisy seems to think there's a thief at Town Hall."



In his calm and steady drawl, Nathan replied, "If Ms. Daisy says there's a thief, then there must be a thief. I'll get the details when I pick her up to take Dilly Pickle to the vet." My unspoken thought was, 'Why is Officer Nathan taking Daisy and Dilly Pickle to the town vet while on duty in the patrol car?' Some things are best left unknown.

Before I could ask for clarification, Daisy burst back into the conversation. "Marsha's on her way down, and she's moving fast! And my aunt's puppy, Dilly Pickle, has a tummy ache, so I'm off to the vet. Dilly Pickle might be a 911 emergency for the vet, Officer Nathan, so you'd better use your sirens, or the town budget won't cover it!" She slammed the receiver down before either of us could respond.

Moments later, the elevator doors opened and closed repeatedly, groaning in protest.

The continuous opening and closing of the elevator doors could only mean one thing, especially after that bizarre conversation with Daisy and Nathan; Marsha was pressing the "door open" and "door close" buttons. This was always a bad omen for productivity, so I braced myself. To my surprise, however, the elevator door stayed open.

Chat - November – The Town Hall has a Thief

Her boots scuffed the already scuffed hallway floors. The scuffing stopped. Then started again. Then stopped. Then reversed. She was second-guessing whether to visit me or escape back to her office.



I knew her next move would be to peek into my office to decide whether to enter or run. Acting quickly to influence her choice, I grabbed a cookie and held it up to make her decision easier. I sat quietly, waiting.

"Marsha! Hey, I see you're on my floor. I've got a cookie for you!" That was all it took.



Marsha shuffled into my office, her cookie radar clearly engaged, with a large flat box tucked under her arm. Once inside, she snatched a cookie and set the box down on my desk.

Curious, I asked, "Marsha, what's in the box?"

She opened it dramatically, as if unveiling a treasure. "We need this to help us find the cookie thief." Inside was a Ouija board. I blinked in disbelief. "Marsha... no. Please do not put that on my desk."



"Yes!" she said, eyes glowing with determination. "We'll ask it who took the cookies, and it'll spell out the culprit letter by letter." The next thing I knew was that I had the Ouija Board on my desk! I needed to change course fast.

"Marsha, any updates on fruit, fiber, protein... anything?"

She grinned. "We've got a cookie thief mystery, and you're asking about food? Well, I did have two apple fritters. That counts, right? I ate apples!"

I didn't argue. Instead, I grabbed mirrored sunglasses that Officer Nathan had left in my office. "We'll be detectives. Put these on."

She gasped as if I had handed her night-vision goggles and asked me if I could see that she was rolling her eyes at me. I slowly replied, "No, Marsha, they're mirrored." She was stunned, then, in all seriousness, she said, "Genius! Did the town engineering department invent these? Did they apply for a patent?" I redirected her back to the mystery, avoiding her question. "Where were the cookies last seen?"

"They were on Daisy's desk. She left Dilly Pickle to guard them while she went to get the mail."

The pieces clicked into place. I didn't need a Ouija board for this. "Doesn't Daisy have a security camera facing her desk? Let's check."



The footage revealed a shocking truth: Dilly Pickle, the puppy, had eaten the cookies. Marsha's mouth dropped open. "We can't arrest a puppy! And she's already sick. Would the town pay her bail? And what about Daisy? Is she an accomplice? That's a double bail fee!"

I handed her the cookie jar to distract her from her spiraling questions. She took another cookie and then pulled out her Magic 8 Ball, asking, "Should I stop the investigation?" The answer floated up: "*Without a doubt.*"

Marsha sighed with relief. "We did it together, Chat. Another mystery solved." She marched out, the Ouija board tucked under her arm, waving a cookie like a victory flag.

**Another crisis averted, another mystery closed.
and one more Dilly Pickle puppy with the tummy ache cured.**

Supervisors Page - Come Back Soon to the town that “almost” exists



Well, just going to say thank you for hanging out in our town this month. Time has been taken up racing back and forth to the hospital - BUT all is looking good for Don and those WBC counts are finally heading down. See below IF you are into medicine. AND, whoever says antibiotics are not needed, are not welcome in my town! Wow, that was a tad decisive – I better go have chocolate and coffee and calm down. (Who just yelled, “Marsha you are never calm!”)

Nov 2, 2025	11.1K/uL
Oct 30, 2025	15.8K/uL
Oct 27, 2025	14.4K/uL
Oct 26, 2025	15.2K/uL
Oct 25, 2025	15.6K/uL



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.

USA And Friends of USA
