



FEA - CAE Not to Miss & More

March 2026 ISSN 2694-4707

Town Hall Meeting in the town that almost exists
Town Plaza: Drive slowly – Galloping Prohibited

Airport - Bayraktar



Airport - GDLS



Auto - Ford



Racer – Racing.



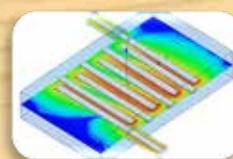
Marco - RBF



Madhukar - CADFEM



Metin - OZEN



Chris - SimuTech



Abhinav - MyPhysicsCafe



Marta - OASYS



Mi&Ke - Nightly News



Jenson - DFE TECH



Abigail - CADFEM APAC



Travis - Hexagon



Brent - GOENGINEER



Curt - AUTODESK



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

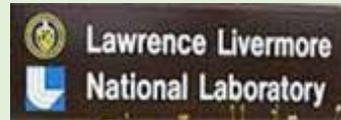
Horse Trail Yield right of way to horses

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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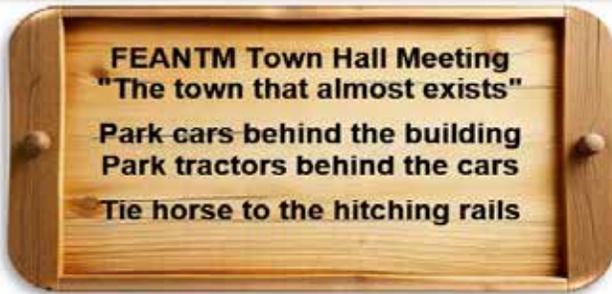
Secretary – Virtual Museum, Landmark, – Whatever she wants

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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



Announcements from residents not to miss



Marta: On our YouTube Channel you don't miss our latest Top Tips - Did you know? ...



Metin: ANSYS HFSS known for its frequency domain Finite Element Method solver & its efficiency in handling complex geometries & materials.



Marnie: Don't miss the study using ANSYS/LS-DYNA - - Dynamic Responses of Steel-Framed Subassemblies Under Falling Debris Impact on Mid-Span of Steel Beam. ..



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Madhukar: Military aircrafts are struck by lightning on average 10.5 strikes with an estimated occurrence every 10,000 flying hours in Europe. By Mohd Esa



Marco: A Fast Analytical Method for Elastic-Plastic Analysis of Threaded Connections... ..



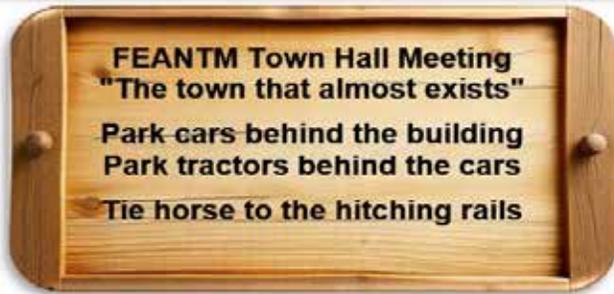
Jenson: Join us on our YouTube channel this month for our simulations, webinars and information..



Abigail: CADFEM - Dr.-Ing. Madhukar Chatiri , CEO of CADFEM APAC, and Prof. Satya Chakravarthy, Founder & CTO of The ePlane Company

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You've Got This



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 March 2026 edition.

Welcome to the March 2026 edition of FEANTM. March is an interesting month for math and science-oriented people. On March 14th, we celebrate Pi (π) Day. Pi is the mathematical constant that represents a circle's circumference to its radius. Much has been said about Pi.

Those of you that are mathematically oriented can count out Pi, but others may enjoy a delicious piece of pie to celebrate this magnificent concept. There are many individuals who eat pie and count out pi. Enjoy this wonderful day where you may simultaneously fill your stomach and stimulate your brain at the same time.

This month, we have a number of interesting articles and websites for your reading pleasure. To mention a few: For those of you interested in coding, Bret offers: Lockheed Martin - Code and Quest (R) Academy. Marsha offers a link to MIT's free Open Learning AI Library. Chris offers a look into using simulation technology in Medical Device Development. Don't forget to take a look at the USAF pictures of the month. There is something for everyone.

These are just a few of the interesting and pertinent articles we offer this month for your viewing pleasure.

As always, we thank our contributors and readers for their ongoing engagement with FEANTM.

Best regards, Marnie B. Azadian, Ph.D., Managing Editor

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

Grab your tractor and join me as I drive my tractor around the internet and live in the town that almost exists. (located near Livermore, CA, where LS-DYNA was born)



This month we had to shorten the publication due to constraints. One of our town residents died February 7th. It threw the town into a few weeks of chaos.

That said we are moving forward, one step at a time, and should be back to full articles for the April issue.

Chat, our resident Help Desk, has started a section for our town's new users who are starting to learn LS-DYNA.

He is using AI as an assistant source with review – you should always review and recheck! Okay, I'm old school and don't believe everything I read, and always check other sources. AI is great, but don't let it replace your brain – okay, that was grandma's lecture for the month. WAIT – one more thing. AI is a great assistant – notice the word "assistant". It isn't you, but you can ask a question. Use other sources also to learn: read conference papers, go to online courses, your teachers, books, not just fill in the "ask me a question" – Okay, now done with the lecture.

It is a trial, and we will see how it evolves, or we scrap it. It will be about LS-DYNA applications. Fine, I'm possessive of how great LS-DYNA is. Long history there! AND with the new and previous LS-DYNA developers and SYNOPSIS now at the helm, LS-DYNA is evolving with new applications, new energy sources, and significant developments. GO LS-DYNA – GO FEANTM Mayor!!!

FEANTM is also evolving and to my town resident now gone – We Will Never Forget!

AND, that's a wrap-up

GO FEANTM the almost existing town – work, fight, win!



YouTube, “CADFEM APAC - Did you watch this yet? Because this isn’t just another podcast episode. It’s a front-row seat to how India’s next aviation leap is being engineered—right now.”

“No hype. No distant timelines. Just honest insights into how engineering decisions made in simulation today are shaping aircraft that are nearly ready to fly.”



Web – YouTube – [CADFEM Techcast](#)

In this conversation, Dr.-Ing. Madhukar Chatiri , CEO of CADFEM APAC, and Prof. Satya Chakravarthy, Founder & CTO of The ePlane Company, dive deep into how simulation-first thinking is accelerating real-world flight programs—from multidisciplinary design and mission-level simulations to functional safety, digital twins, and system intelligence.

For CADFEM, it’s a reflection of a journey rooted in empowering engineers with confidence through simulation

For The The ePlane Company, it’s a glimpse into how deep tech, rigor, and systems thinking turn vision into reality—fast. An air taxi is about to take off in India. Not someday. Very soon.

Long before an aircraft prepares for its first flight, it flies thousands of times—digitally. Simulation has always been more than a tool. It’s been a way of thinking—about reducing uncertainty, validating decisions early, and engineering confidence into systems that cannot afford failure.



As ePlane’s e200X air taxi and air ambulance moves closer to its first real-world operations, the discussion goes beyond vision and into execution—where simulation-first engineering, digital twins, mission-level modeling, and functional safety become essential.

Together, they explore:

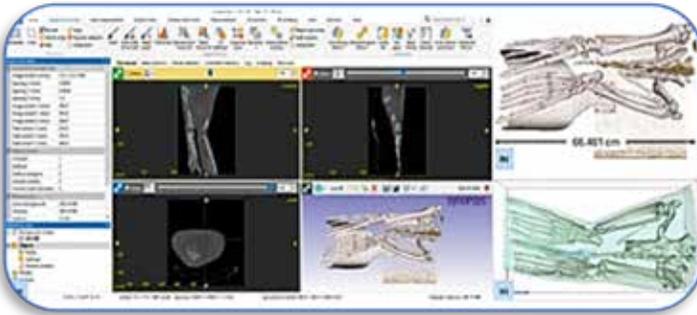
- Why simulation must lead when timelines are real
- How digital twins help minimize field trials
- The shift from aerodynamics alone to intelligent payloads and sensor fusion
- Where AI and physics-based models truly add value
- And how academia and industry must collaborate when innovation meets responsibility

This is not a future-facing conversation. It’s about engineering decisions being made right now—as systems prepare to fly. **From simulation to sky—this journey is unfolding.**



Article Quote, “**The CT image data was processed using Simpleware ScanIP software** to create detailed anatomical models, emphasizing the blood collection site at the caudal gluteal region and optimized for 3D printing.”

(a) Simpleware user workspace prior to image processing¹²; (b) 3D render of the raw CT scan of the sea lion’s lower body; (c) Processed render of model within workspace with body at 30% opacity.



Web - Nature - [Scalable DICOM 3D-printed phantoms mimicking marine mammal bone and soft tissue](#)

D. Fisher, N. Minaian, A. McClain & K.J. Kim

- Dept of Mechanical Engineering, Univ. of Nevada, Las Vegas, USA
- U.S. Navy Marine Mammal Program, San Diego, USA

Abstract - As charismatic sentinel species,

California sea lions (*Zalophus californianus*) are commonly found in professional care settings such as zoos, aquariums, and rehabilitation facilities, in addition to their free-ranging coastal populations. These animals frequently strand due to illness, trauma, or environmental stressors, including toxic algal blooms such as domoic acid poisoning, underscoring the need for innovative tools and training methods to improve diagnostic care, monitoring, and veterinary intervention. This study presents a systematic approach for developing scalable, 3D-printable phantoms of a California sea lion pelvis using DICOM (Digital Imaging and Communications in Medicine) standard images from computed tomography (CT) scans to aid in veterinary blood collection training. **The CT image data was processed using Simpleware ScanIP software to create detailed anatomical models, emphasizing the blood collection site at the caudal gluteal region and optimized for 3D printing.** Through threshold-based segmentation of the DICOM data, several distinct anatomical layers were modeled separately, including a combined epidermal and dermal compliant skin shell, an adipose-rich blubber layer, a muscular layer derived from lower-density soft tissue regions, and a skeletal structure segmented from high-density bone data. This separation enabled each component to be fabricated independently using materials that closely matched their biological counterparts. Prior to fabrication, a material characterization study was conducted using dynamic mechanical analysis (DMA) to evaluate the compressive viscoelastic properties of multiple Humimic medical gelatin compositions (Gels 0 through 5), each with distinct mechanical profiles. The apparent elastic modulus of each gel under cyclic loading was calculated from stress–strain hysteresis data. Based on these results, individual gel types were selected to best match the mechanical properties of biological tissues, including blubber, skin, muscle, and bone. The quad-layered phantom was then fabricated using a combination of high-resolution stereolithography (SLA), fused deposition modeling (FDM), and gel casting techniques. This process resulted in the successful creation of 3D-printed anatomical phantoms that mimic both the mechanical and anatomical properties of the California sea lion pelvis. The methodology presented here provides a framework for creating engineered medical training models with anatomical fidelity and tunable material properties, offering a scalable alternative to traditional approaches in both veterinary and human health education, and the potential for personalized compatible implant design and biomimetic soft robotics.



Article quote, "...The experimental data were collected to observe the vibration behaviour at the motorcycle footrest under actual engine conditions, including idle and varying speed levels. Subsequently, simulations were performed using ANSYS to validate and support the experimental outcomes. " (Excerpts)



Figure 9. The modal analysis for Design 1 footrest

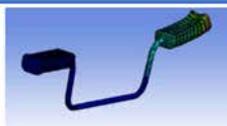


Figure 10. The modal analysis for Design 2 footrest



Figure 11. The modal analysis for Design 3 footrest

[Web - IOP Science - PDF Available - Motorcycle footrest vibration analysis for design enhancement](#)

F. Saad, M.N.A. Hamid, Z.N.M Yusuf, A.Z.A. Mazlan

3.1.3 Modal analysis of new designs - Figure 9 until Figure 11 illustrates the modal analysis results for Design 1, 2 and 3, as generated using ANSYS

Engineering. Section, Univ. Kuala Lumpur Malaysian Spanish Inst., Malaysia
School of Engineering., Univ. Sains Malaysia Engineering Campus, Malaysia

Abstract - Several studies have explored what causes vibrations in motorcycles and how they affect riders. The main sources of footrest vibration are engine vibrations, uneven roads, and the motorcycle's frame design. These vibrations can greatly affect the rider's comfort, safety, and overall riding performance, as they are transmitted through contact points like the seat, handlebars, and footrests. Prolonged exposure to vibration at these contact areas can induce discomfort, fatigue, and even long-term health concerns such as hand-arm vibration syndrome. Therefore, understanding the frequency and intensity of vibration in the footrest is crucial for reducing it and improving rider safety and comfort. The primary goal of this study is to analyse and reduce the amount of vibration experienced by the motorcycle's footrest. The research started by conducting the experimental procedure of modal analysis to measure value of natural frequency of the motorcycle footrest. Then it is continued with the vibrational behaviour simulation by ANSYS software. The simulation revealed natural frequencies and mode geometries of the footrest and real-world vibration measurements supported these findings. From the results, three new designs of the motorbike footrest were constructed and analysed by modifying the dimensions and adding dampening materials. In conclusion, by doing design improvements, such as adding vibration-dampening materials and enhancing footrest structural shape, have the potential to reduce vibrations, increase rider comfort, reduce fatigue, and mitigate long-term health risks.

Introduction - Motorcycles, particularly those equipped with internal combustion engines (ICE), produce various levels of vibration due to engine dynamics, road conditions, and structural behaviour[1]. Due to the absence of structural enclosures and effective damping mechanisms, motorcycles exhibit a more direct path for vibration transmission than automobiles. Therefore, when riding a motorcycle, vibration plays an important aspect in determining rider comfort, safety, and long term health because persistent vibrational inputs generated by all the sources can make the rider to sustained mechanical excitation and dynamic stress exposure[2]. Usually, these vibrations are delivered from the motorcycle to the rider via main contact areas like the handlebar, seat, and footrests[3]. These components play a significant role in distributing mechanical vibrations throughout the rider's body. Nevertheless, it was highlighted that the handlebar and footrest serve as primary pathways for vibration transmission, making them key areas of concern for rider comfort and vibration mitigation strategies[4].



Student	Mr. Bart, my brother is entering a coding competition.
Bart R.	Lockheed Martin has the Code Quest Academy.
Student	Can you help me print and show him?
Bart R.	Let's visit and print it out for you to show him.



Lockheed Martin offers free digital platforms to help students prepare for coding and cybersecurity competitions, through its Code Quest® Academy and CYBERQUEST® Academy. Additionally, a STEM outreach program with virtual mentoring from their engineers.



What are Code Quest® Events?

Lockheed Martin's annual Code Quest® competition is held for high-school students at 27 sites around the world. Teams of three students work to solve as many programming problems as possible within a two-and-a-half hour time limit, earning points based on problem difficulty. To learn more, visit our website.

Web – Lockheed Martin

[Code Quest® Academy](#) - Explore new horizons in computer programming as you work to solve problems from Lockheed Martin's Code Quest® events as well as never-before-seen problems.

- Problems range in difficulty, so there's something for everyone, no matter if you're just joining the expedition into programming, or if you're a seasoned explorer.

[CYBERQUEST® Academy](#) - Explore the ever changing landscape of cybersecurity as you work to solve problems from Lockheed Martin's Lockheed Martin CYBERQUEST® events as well as never-before-seen problems.

- The training modules and challenges range from beginner to advanced, so there is something for everyone.

For both Code Quest and CyberQuest

- Should you get lost along the way, volunteers from Lockheed Martin are standing by to help get you back on track.
- Share your results with others and help inspire each other to even greater heights. Start your journey, and see what your quest can achieve!

Advancing science, technology, engineering and mathematics (STEM) education is a critical focus for Lockheed Martin. We know firsthand the importance of educating our young people in these areas. Our future success and our nation's technological advantage depend on a constant supply of highly trained, highly capable technical talent. **We believe strongly that advancing STEM education requires collaboration among industry, educators, policymakers and families.**



GOENGINEER – YouTube videos that you need to view

YouTube – [Go Engineer Videos](#)



Connect SOLIDWORKS to 3DEXPERIENCE: Full Installation...



Managing Your Data With SOLIDWORKS Data Management...



SOLIDWORKS Thermal Stress from Beginning to End



Engineezy (Jay Vogler) – Finish It Anyways | The Creative Engineering Process



Simulation Professional Tools for Optimization



How to Use the Shrink Wrap Tool in Geomagic Design X



LLNL “Deciding where to put a satellite into orbit can be a huge and computationally expensive challenge. That’s why researchers at LLNL developed an open-access database with the Space Situational Awareness Python package, which simulated one million orbits in cislunar space.



Web – LLNL - [Simulations and supercomputing calculate one million orbits in cislunar space](#)
Ashley Piccone

One of one million cislunar orbits calculated by researchers at Lawrence Livermore National Laboratory. The moon’s orbit is shown in light gray. The spacecraft follows the colored path over the six-year simulation period. (Graphic: Dan Herchek, note moon and earth not to scale.)

Satellites and spacecraft in the vast region between the earth and moon and just beyond — called cislunar space — are crucial for space exploration, scientific advancement and national security. But figuring out where exactly to put them into a stable orbit can be a huge, computationally expensive challenge.

In an open-access database (<https://gdo-cislunar.llnl.gov/>) and with publicly available code, researchers at Lawrence Livermore National Laboratory (LLNL) have simulated and published one million orbits in cislunar space. The effort, enabled by supercomputing resources at the Laboratory, provides valuable data that can be used to plan missions, predict how small perturbations might change orbits and monitor space traffic.

To begin, the Space Situational Awareness Python package takes in a range of initial conditions for an orbit, like how elliptical and tilted the orbit is and how far it gets from the earth.

“The point of it was to not assume anything about what types of orbits we want,” said author and LLNL scientist Travis Yeager. “We tried to go into it pretending we knew nothing about this space.”

From each starting point with a set position and velocity, the simulation steps forward in time in discrete chunks. Because this is an N-body problem involving the earth, moon, sun, radiative forces and the spacecraft, the complex interactions among all components mean there is no exact solution for the system’s evolution.



“If you want to know where a satellite is in a week, there's no equation that can actually tell you where it's going to be,” said Yeager. “You have to step forward a little bit at a time.”

When considering the gravitational forces from the earth and moon, the authors also accounted for differences across each body.

“The Earth is not a point source. It is actually blobby. There is lower gravity over Canada than there is over the Atlantic Ocean,” said Yeager. “If we didn't account for blobbiness within the earth for GPS satellites, we couldn't have GPS down to a meter level. You wouldn't even know what road you're driving on.”

To generate all one million orbits with six-year lifetimes, it took 1.6 million CPU hours — equivalent to more than 182 years on a single computer. Once they worked through the process, the team ran their simulations in just three days on LLNL's Quartz and Ruby supercomputers.

“The interesting thing about our code is that it is parallelizable, whereas other commercial codes are not,” said author and LLNL scientist Denvir Higgins. “We can spread jobs across nodes.”

Of the resulting orbits, 54% remained stable for at least one year and 9.7% for six years. But even the unstable orbits in this open database can provide valuable information.

“From a data-science point of view, this is an interesting data set. When you have a million orbits, you can get a really rich analysis using machine learning applications,” said Higgins. “You can try to predict the lifetime of the orbit, try to predict stability or try to do anomaly detection to see if an orbit is moving in a strange way.”

By analyzing the orbital data, researchers may be able to identify the “busiest intersections,” or the most useful positions for a satellite to monitor and direct traffic. This could be especially useful as countries continue to launch satellites without world-wide coordination.

The team aims to tackle some of these questions themselves, but they emphasized that the publicly available code and data allow others to launch in alongside them.

This data was created under work funded by a Laboratory Directed Research and Development project.



FEANTM 5C's - Exhibit
Coyote + Chocolate + Coffee +
Cake + Cookies

March



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



Antti Ylinen - EDRMedeso
[Bolt Pretension & Interference Fits in Ansys LS-Dyna and Ansys Mechanical](#)

Cadence [Strengthens System Design and Analysis with Hexagon's Design & Engineering Expertise](#)

Prof. Krishna Garikipati - Univ. of Michigan - [Intro, Linear Elliptic Partial Differential Equations](#)) [openmichigan](#)

Ameen Topa - [LS-DYNA TUTORIAL 23: Compression of an Auxetic Structure - 2D Analysis](#)



How I feel AI Can Assist you - I'm not here to help AI replace you.

"I'm Chat & this month used ChatGPT, for my application article, for LS-DYNA. I firmly believe that AI is to be used as an assistant tool and not replace your own thinking. AI has trained knowledge - you need to study & learn your own using AI, text books, conference papers, and all avenues available. Always double check, even if it is AI generated. -

For this meeting I offer a few quick insights how, AI can assist your first thermal analysis using LS-DYNA. This is a look at what AI can accomplish as an assistant tool. AI is not a magical super-engineer...but the calm assistant sitting at the monitor with you at 11:47 PM while the coffee gets cold and the solver log scrolls forever. I hope you find below helpful.

AI Assistant Notes for Town New Engineers - AI to Help Your First LS-DYNA Thermal Analysis

By Chat, Town FEANTM Help Desk, using ChatGPT for the following notes.

When a new engineer first opens LS-DYNA, the reaction is usually one of three things:

1. Confidence
2. Curiosity
3. Immediate and overwhelming confusion

Thermal analysis is often the first place this happens. Unlike a simple static stress problem, a thermal problem forces you to think about **time, heat flow, materials, units, and boundary conditions all at once**. Most errors do not come from intelligence — they come from missing a single parameter in a long keyword input file.

This is exactly where an AI assistant can help. I am not a replacement for engineering judgment. I do not understand your physical hardware the way you do. I cannot see your test article or your lab setup. What I can do is assist you in the areas where beginners struggle: setup logic, interpretation, and debugging.

1. Understanding the Physics Before the Keywords

Before writing a single LS-DYNA keyword, you must understand what you are solving.

Thermal analysis answers one simple question:

Where does the heat go, and how fast does it get there? AI can help you translate a physical situation into a solvable problem. A new engineer might ask:

“I have an aluminum plate with a heater on one side and air cooling on the other. What type of thermal analysis is this?”

I can help you determine:

- steady-state vs transient
- conduction vs convection vs radiation
- required material properties
- expected temperature behavior

This matters because LS-DYNA, as well as all codes, need you to know the correct physics.



2. Choosing the Correct Thermal Solver Approach

In LS-DYNA, thermal analysis is generally performed using heat transfer elements and material definitions designed for temperature-dependent behavior.

Typical beginner mistake:

They run a structural analysis expecting temperature to appear automatically.

LS-DYNA does **not** assume temperature.

You must explicitly define thermal behavior.

AI can guide you through selecting:

- thermal-only analysis
- coupled thermal-structural analysis
- when temperature should affect stress

AI can also explain what the keywords actually mean — not just what they are called.

For example:

- *MAT_THERMAL_ISOTROPIC — defines how a material stores and conducts heat
- *BOUNDARY_TEMPERATURE_SET — forces a known temperature
- *BOUNDARY_CONVECTION — models cooling to air or fluid
- *INITIAL_TEMPERATURE_SET — sets starting temperature

A beginner often copies these from an example file without understanding them.

The job of AI is to explain why you are using them.

3. Material Properties — The Most Common Failure Point

Most first thermal models fail here.

To run a correct thermal simulation, you need:

- Density
- Specific heat capacity
- Thermal conductivity

Without these three properties, LS-DYNA cannot compute temperature change.

New engineers frequently:

- use structural material cards only
- forget temperature dependence
- mix unit systems

AI can help you:

- identify missing material data
- locate typical values for common materials
- convert units consistently



For example, ChatGPT can help you convert:

W/m-K → BTU/in-sec-°F

or

J/kg-K → lbf-in/lbm-°F

It will not replace verified material testing, but it can prevent a simulation that violates physics before it starts.

4. Boundary Conditions — Where Most Models Are Wrong

Here is an important truth:

Thermal models rarely fail because of meshing. They fail because of boundary conditions.

A simulation needs a heat source and a heat sink.

Common beginner issues:

- applying a temperature instead of a heat flux
- forgetting convection
- modeling insulation accidentally
- unrealistic cooling

AI can help you determine what your real hardware is doing:

Physical Reality	Correct Modeling
Heater cartridge	Heat flux or power input
Air cooling	Convection coefficient
Water cooling	Higher convection coefficient
Insulation	Very low conductivity
Contact between parts	Thermal contact conductance

You describe the physical setup. AI will help you convert it into LS-DYNA boundary conditions.

5. Debugging Input Files

LS-DYNA input decks are long. Very long.

A single missing parameter can cause:

- no temperature change
- instant melting
- solver termination

This is one of the most useful ways AI can assist engineers.

You can paste a keyword section and ask:

“Why does my temperature stay constant?”



AI can review the logic and identify likely problems such as:

- missing *CONTROL_THERMAL_SOLVER
- no heat input defined
- initial temperature equal to boundary temperature
- timestep too large
- wrong part set

AI does not run the simulation — but AI can read the logic.

Think of AI as a second reviewer who never gets tired at 2:00 AM.

6. Interpreting Results

Many beginners think: “If LS-DYNA produced a contour plot, the model must be correct.”

This is not true. A simulation result must be evaluated against physics.

AI can help you check:

- Does the temperature rise rate make sense?
- Is the steady-state temperature reasonable?
- Are gradients physically possible?

AI can also help you estimate analytical solutions (lumped capacitance or 1-D conduction) to compare with your numerical model — a powerful validation step for new engineers.

7. What AI Cannot Do - I must be clear because at this time AI has limitations:

- AI cannot certify your model.
- AI cannot approve your design.
- AI cannot replace testing.

Engineering responsibility belongs to you, the engineer.

AI's purpose is to: Assist - explain - review logic - help you understand

The engineer provides judgment. AI provides assistance.

Final Thoughts: LS-DYNA is a powerful tool. AI is also a powerful tool.

But tools do not replace understanding. The best use of AI is not to avoid learning — it is to accelerate it. Ask questions. Challenge assumptions. Verify results.

AI always available to help you think through a problem, but you must still become the engineer. Because in the end, AI does not sign the work. You do.

Regards, Chat – thank you for joining us on the lower floor of the town hall

Next month I'll take you through “**Why Your Thermal Model Either Never Heats Up or Immediately Reaches the Temperature of the Sun**” — which, scientifically speaking, is one of the most common first LS-DYNA experience.

You didn't hear this from me but last week our Town Supervisor, Marsha, tried to model coffee cooling and accidentally simulated magma. This is why each month we will meet for new knowledge.



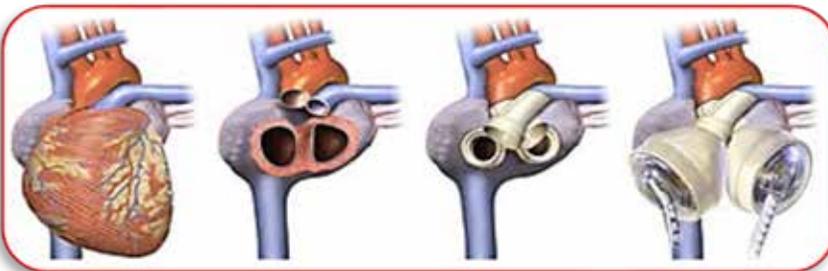
Article Not To Miss: “Introduction to Medical Device Development Simulation - Medical device manufacturers face growing pressure to innovate quickly while meeting increasing safety and performance expectations. Traditional prototype-only methods — build, test, refine — are no longer enough to keep pace with evolving technologies and their impact on clinical practices. Simulation technology is now a critical tool for evaluating new design concepts, improving device capabilities, and accelerating development timelines.”



Web – Simutech - [How Simulation Technology Is Transforming Medical Device Development](#)

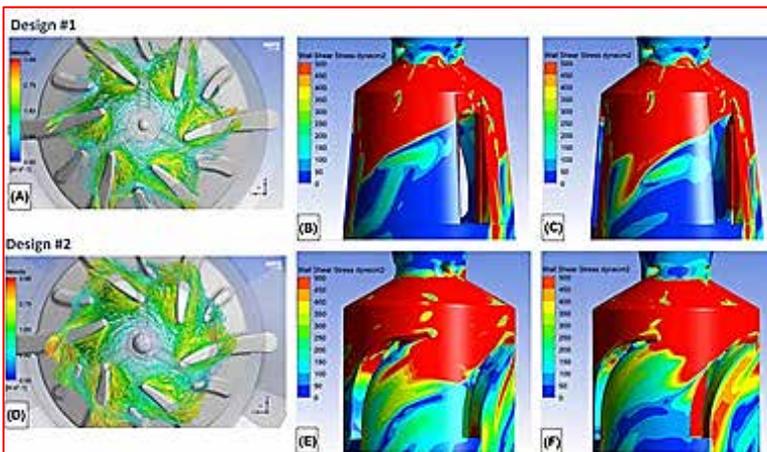
Evaluating Multiple Medical Device Designs Rapidly - With incorporating simulation into development, teams can numerically evaluate dozens or hundreds of variations without building new hardware, accelerating development cycles significantly.

Gaining Full Visibility Into Device Behavior - Simulation provides comprehensive data across the entire geometry and physics environment, revealing insights that physical testing may not be able to reveal.



Real-World Example: Preventing Blood Clots in an Artificial Heart Pump - During early animal testing of an artificial heart blood pump, clinicians observed thrombus forming on the right impeller.

The left impeller was clean without any evidence of thrombus formation. Using computational fluid dynamics, SimuTech modeled both impellers and found regions of low shear stress on several surfaces of the right impeller. These areas closely matched the thrombus locations found in testing. Using this insight, the design was refined to reduce low-shear regions and decrease the likelihood of thrombus formation.



Choosing the Right Medical Device Development Simulation Approach - SimuTech evaluates the specific engineering challenges of each medical device development simulation project to determine whether CFD, FEA, electromagnetics, optics, or a multiphysics combination is needed. This ensures that the selected tools align with the device’s requirements and provide accurate, actionable insights.



The Future of Simulation in Healthcare - Two major developments are shaping the future of medical device simulation:

Patient-Specific Modeling - Using MRI or CT data, engineers can simulate device performance within a specific patient's anatomy. This supports personalized medicine, including pediatric applications and specialized interventions where anatomy or physical properties vary significantly across different patient populations.

Multiphysics Human Modeling - Advanced simulations now combine structural mechanics, electrical activation, and fluid dynamics to model organ behavior—such as the motion and electrical stimulation of the human heart. These tools can be used to create a deeper understanding of how new medical devices interact with the human body.



Business Impact and Market Success - Simulation offers measurable ROI. For example, two oxygenators developed using simulation-guided design went on to become leading market products, with one achieving the top global market position. Modeling enabled rapid iteration, optimized flow paths, and improved performance, contributing to strong commercial success.

Advice for Teams New to Medical Device Development Simulation - Start small with a targeted technical challenge that can produce clear results. Use early wins to demonstrate the value of computational modeling, build internal confidence, and expand the use of simulation across the development lifecycle. Medical device development simulation is most effective when used throughout the product development cycle from providing early design guidance through supporting product introduction and continuing design improvements.

Final Thoughts - Simulation has become a core part of modern medical device engineering. It enhances product safety and performance, speeds development, and reveals insights that physical testing alone cannot. SimuTech Group supports teams across the full innovation spectrum, helping bring safer and more effective devices to patients faster.



Article “Nick Neuhaus can’t remember a time when he wasn’t on two wheels. At the age of eight, he started racing BMX. He then took a long break from cycling to focus on racing motorcycles and building a career in telecommunications.”



Web – [Autodesk - Neuhaus Metalworks Crafts Steel and Titanium Bike Frames with Autodesk Fusion and 3D Printing](#) - Heather Miller

“Life has a way of pushing hobbies aside for a while,” Neuhaus says. “When I came back to bikes around 2015, the industry was really in a transitory period. The innovations since I’d last ridden eight years prior were exciting.”

But he couldn’t find his perfect “Goldilocks” fit, especially for mountain biking.

“I kept thinking that if I could combine all the bikes I loved into one, I’d have the perfect ride,” Neuhaus says. “But each one I tried was missing something. With a fabrication background and a small shop at home, I started making frames for myself and just casually for friends. Then Neuhaus Metalworks just grew from there.”



Neuhaus first met Daniel Yang, a designer and engineer, through a chance encounter when Yang was looking for his own custom bike frame. His background in mechanical engineering and 3D printing expertise provided a perfect fit to advance the company even further, and he joined the team. Now, Neuhaus Metalworks is a burgeoning business, moving from one-off custom frames to production bikes manufactured in Taiwan and a long line of custom orders

“Our combined backgrounds provided a catalyst to allow us to really grow the business at a fast rate, producing bikes both custom and now production that are widely loved by many,” Neuhaus says.

Bringing Autodesk Fusion into the mix

When Yang and Neuhaus teamed up, they started using Autodesk Fusion for their first frame called “Hummingbird.” Fusion’s price point, accessibility, and ease of use were key to developing their product line. Most frame builders design with basic 2D or even full paper templates, but the ability to take advantage of parametric modeling kick-started their transformation.



“Traditionally, as a frame builder, you need to figure things out in real life,” Neuhaus says. “You get the tubes and parts and then try to orient them to make them all work using your physical jigs and fixtures as reference. With Fusion and 3D models, we can look at all the clearance ahead of time. We don’t have to order a part and then later find out it doesn’t work.” Early on, they started 3D printing parts to prototype and solve issues. Now, they are printing many of the parts for the bike itself as a business advantage. “Using 3D printing for titanium parts solves many of our problems,” Yang says. “Fusion allows us

to create impossible geometries that speed up the construction of our bikes.” “A 5- or 6-axis CNC machine is not feasible for a business of our size and to make parts cost-effective,” Neuhaus adds. “Whereas with 3D printing, we do have that ability. We can print a single part, or we can print 10 parts. 3D printing really allows



us to scale quickly because it streamlines our processes so much.”



Shifting the business into high gear - Neuhaus Metalworks provides custom, hand-built bikes in California with five different frame options. But it’s difficult to grow the business with a typical waitlist of three to five months for custom builds. They recently debuted the production frame “Hummingbird Core,” which is manufactured in Taiwan and is half the price of the custom frames. Two batches sold out within a couple of months, with new runs planned soon. They’re also designing several new production models for 2026.

According to Neuhaus and Yang, one of the biggest advantages of Fusion is Autodesk’s support of the Maker community.



They have experienced it first-hand, growing from a passion project to a full-fledged business.

“It’s really powerful that there are other frame builders now who are using Fusion and didn’t come from an engineering background,” Yang says. “They can express their creativity and build a successful business. I think the business opportunity Fusion provides is its biggest strength.” Yang is also taking new approaches to reach a wider audience with his popular YouTube channel

He’s committed to creating videos that help educate and inspire others to get on their bikes, highlight Neuhaus Metalworks’ development along with its sister company, “Artefact,” and learn more about the design process with Fusion.

“We want to be really open and share our work,” Yang says. “We plan on continuing to do what we’ve been doing, but even better.”



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.



Web – OGGM - [OGGM is an open source modelling framework for glaciers](#)

The model can simulate past and future mass-balance, volume and geometry of (almost) any glacier in the world in a fully automated and extensible workflow. OGGM is modular and supports novel modelling workflows: it loves to be remixed and reused! OGGM also brings together a vibrant and friendly community of scientists, modellers and educators

.Please get in touch with us if you are interested in using the model or if you'd like to contribute to the project!

Mission - "Develop a global scale, modular, and open-source numerical model framework for consistently simulating past and future global scale glacier change" -

Global not only in the sense of leading to meaningful results for all glaciers combined, but also for any small ensemble of glaciers, e.g. at the headwater catchment scale. Modular to allow different approaches to the representation of ice flow and surface mass balance to be combined and compared against each other. Open source so that the code can be read and used by anyone and so that new modules can be added and discussed by the community, following the principles of transparency and open governance. Consistent in order to provide well-defined uncertainty measures at all realizable scales.

Motivation - Our project is motivated by the far reaching goal of contributing (and helping others to contribute) to answers of some of the “big questions” in Earth Sciences:

- How much ice is stored on the glaciers on Earth?
- How much ice was present on Earth at the beginning of the 20th century, and how much ice will be lost by the end of the 21st?
- How will this affect water resources, and how to help communities to prepare for these changes?
- What are the uncertainties associated with these numbers, and where do they originate?
- How much model complexity is just right?
- and more.

Get involved - We welcome anyone to contribute to the project!

- Chat with us on our Slack: all this needs is to send us an e-mail!
- View the source code on GitHub and the documentation on ReadTheDocs.
- Report bugs or share your ideas on the issue tracker, and improve the model by submitting a pull request.
- Or you can always send us an e-mail the good old way. We would love to hear about you!



DFE-tech "Our goal is to equip our customers with the necessary knowledge and management solutions to today's challenges."

Join us on our YouTube channel this month.

Web – YouTube - DFE-TECH

<p>Webinar : Introduction of Ansys Mechanical APDL 50:49</p>	<p>Webinar : Ansys Electronics (Horn Antenna Far Field Simulation Using... 25:47</p>	<p>Webinar : Ansys Mechanical (Ansys Additive Prep) 21:12</p>

Web – YouTube - DFETECH VIETNAM

<p>WEBINAR SERIES LS-DYNA – EP03 (30/12/25): KHÁM PHÁ SEAT BELT... 27:29</p>	<p>WEBINAR SERIES LS-DYNA – EP02 (27/11/25): CHINH PHỤC BÀI TOÁN SEAT... Ansys 39:11</p>



Article, “Military aircrafts are struck by lightning on average 10.5 strikes with an estimated occurrence every 10,000 flying hours in Europe. While lightning strikes are common, aircraft are designed with extensive lightning strike protection to safely conduct the high currents and electromagnetic fields and protect critical systems and pilot...”

Excerpts



Web – CADFEM - [High-Fidelity Electromagnetic Simulation of Indirect Lightning Effects on Military Aircraft Wiring Systems](#) - Mohd Esa

Full-scale physical lightning testing is costly and can delay design corrections, while scaled models often fail to replicate full-size responses accurately. Virtual testing through advanced electromagnetic and multiphysics simulation enables engineers to study lightning effects on aircraft structure and cables efficiently, optimizing protection strategies without extensive physical prototypes. Ansys EMC Plus can comprehensively

evaluate electromagnetic behaviour on complex platforms when analyzing lightning effects on aircraft, including radiated coupling to cables, radiated emissions from cables, and coupling through shields, as well as EMI crosstalk between adjacent harnesses. The tool also supports studies of coupling from static discharges and high-intensity radiated fields (HIRF) into cables and equipment interfaces, enabling engineers to assess both cable signal integrity and lightning-induced transients at critical system ports in a single, integrated workflow [1].

Lightning and its effects on Aircrafts - Lightning is a natural atmospheric discharge phenomenon characterized by large transient currents produced at the interface between regions of intense positive and negative charge accumulation within cloud (Intra Cloud Lightning) or between clouds (Inter Cloud Lightning) and between the cloud and the ground (CG Lightning). During a lightning strike, the current can rise extremely rapidly—on the order of 10–20 kA/μs. Lightning activity is especially frequent within the troposphere (0–12 km altitude) and the lower stratosphere, which coincide with the primary flight altitudes of commercial and military aircraft. This high occurrence rate means that aircraft are regularly exposed to lightning environments.

Approximately 90% of CG lightning strikes are downward negative lightning, meaning they transfer negative charge from the cloud to the ground. In this type of lightning, the negative charge accumulates at the base of the cloud, and when the electric field strength exceeds the dielectric breakdown of air, a stepped leader propagates toward the ground. Once a conductive path is established, a high-current return stroke flows upward from the ground, neutralizing part of the cloud’s negative charge. Downward negative lightning is the most common type observed worldwide and is of particular concern for aviation because it is the form most likely to interact with aircraft flying at altitudes within the troposphere, where these discharges occur. The conductive skin of an aircraft acts as a Faraday cage, shielding its occupants from stray electrical charges by offering a low-resistance path for electrons to flow into and out of the structure. Lightning effects on aircraft are generally divided into two primary categories. Direct effects refer to the physical damage caused at the lightning attachment point. In contrast, indirect effects arise from the electromagnetic coupling of the lightning current with onboard systems and wiring,



producing transient disturbances that can interfere with or degrade the performance of electronic and electrical components. Lightning can also cause several critical hazards that affect various aspects of an aircraft's operation and safety. It can lead to structural damage by creating punctures or burns in the airframe, compromising its physical integrity. Fuel system hazards arise if lightning ignites fuel tanks, increasing the risk of fire or explosion. Crew incapacitation is also a concern if lightning interferes with cockpit instruments or causes electrical shocks. Engine failure can result from lightning strikes damaging engine components or causing control system malfunctions. Additionally, thermal damage from the intense heat generated by lightning can weaken materials and critical systems, further endangering the aircraft. Aircraft manufacturers conduct extensive lightning strike simulations using tools like Ansys EMC Plus prior to production to mitigate risks from downward negative lightning.

Stages in Aircraft Lightning Attachment Simulation - The three stages of aircraft lightning simulation—pre-processing, EM simulation, and post-processing can all be completed within a single interface in Ansys EMC Plus. Pre-processing involves preparing the model for simulation by assigning material properties and cable harness location to create the computational model. It also includes defining other simulation parameters such as current source, mesh settings, and probes. In the simulation step, FDTD solver is used to calculate the fields around the aircraft [2]. It allows user to model complex geometries in very less time. It uses voxel mesh terminology. Multi Conductor Transmission Line Solvers is used to solve very complex cables. In the final stage, post-processing, the simulation's results are transformed into a format suitable for direct comparison with measured data or for conducting additional analysis.

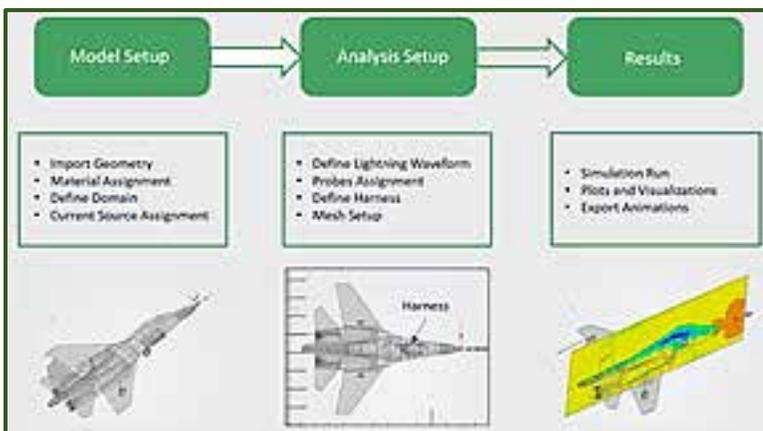


Figure 1: Lightning Attachment Simulation Stages on a Military Aircraft

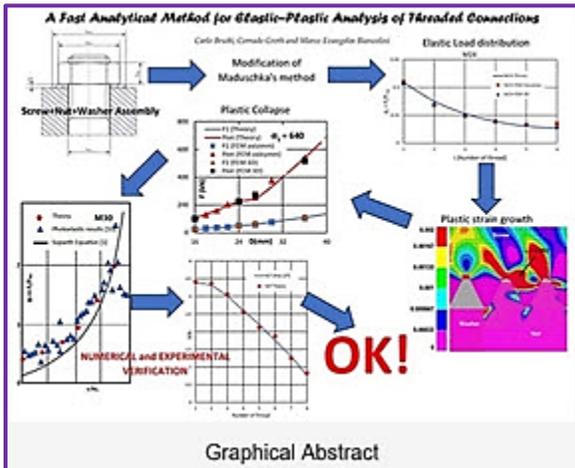
Current Waveshape and Lightning Attachment - Lightning waveforms used in aircraft simulations typically follow a double-exponential shape, and Ansys EMC Plus supports several standard versions of these waveforms to model the indirect effects of lightning on aircraft systems. In this study, the simulation

employs a double-exponential waveform with a 218 kA peak current and an approximate rise time of 6.4 μ s, as this combination represents one of the most severe and therefore worst-case scenarios for assessing lightning-induced transients in aircraft wiring. Aircraft certification under SAE ARP5412 uses these Waveform for Zone 1 and 2A areas, where attachment points experience full current intensity.

In accordance with SAE ARP5414, the aircraft structure is divided into lightning strike zones that classify the severity and type of lightning attachment expected at various locations. The aircraft nose is designated as Zone 1, which represents a primary attachment zone where lightning is most likely to strike and where the initial high-amplitude current waveform is expected to enter the aircraft. A lightning flash enters an aircraft at one point and exits at another. For simulation in this article the standardized current waveform is injected at the aircraft nose. This approach enables a realistic evaluation of indirect lightning effects on aircraft wiring, supporting compliance with industry standards and ensuring the robustness of system designs against lightning-induced disturbances. **(Continued on website)**



“Threaded connections are fundamental in engineering structures, yet their elastic–plastic behavior under load remains challenging to model analytically. The yield limit can be reached under relatively small external loads, and elastic–plastic behavior has predominantly been studied using finite element models.”



Web – MDPI - [A Fast Analytical Method for Elastic-Plastic Analysis of Threaded Connections](#)

C. Bruti, C. Groth, M.E. Biancolini
Dept of Enterprise Engineering, Univ. of Rome Tor Vergata, Italy

Abstract - Threaded connections are fundamental in engineering structures, yet their elastic–plastic behavior under load remains challenging to model analytically. The yield limit can be reached under relatively small external loads, and elastic–plastic behavior has predominantly been studied using finite element models.

While these models are highly valuable, they are often restricted to specific cases. This paper presents a novel extension of Maduschka’s classical method, offering a fast and efficient analytical approach to evaluate the behavior of screw–nut–washer assemblies. The method tracks plastic strain progression from initial yielding to full yield conditions and is validated against high-fidelity axisymmetric and 3D finite element analyses (FEAs) across a range of thread dimensions (M16–M36). Results demonstrate strong agreement with FEA benchmarks while achieving significant computational speedups, making the method suitable for iterative and large-scale analyses. In addition, the comparison with results available in the literature further supports the reliability of the proposed method. Its robustness to variations in geometry, friction, and thread count positions it as a foundation for reduced-order models, ready for integration into complex finite element frameworks commonly used in structural health monitoring and digital twin technologies.

1. Introduction - Screwed connections are widespread; they are used in all engineering applications because they have many advantages, including availability, standardization, and simple assembly and disassembly. The structural behavior of screw threads has been studied since the beginning of the twentieth century, and the scientific and technical bibliography is extensive, as reported in many review papers [1,2,3].

In a threaded joint design, it is necessary to consider the non-uniform load distribution among the engaged threads; the most popular theoretical approaches are those of Maduschka [4], Sopwith [5], and Yamamoto [6]. In the last decades, the same problem has predominantly been solved by using finite element (FE) models [7]. Another approach is that of Zhang et al. [8], which addressed the problem of a compression connection and validated the results using a finite element method. The methods of Sopwith, Yamamoto, and Zhang are based on the integration of differential equations defined along the helix of the threads. In contrast, Maduschka’s method used in his paper of 1936 for a squared threaded connection, a succession of axisymmetric collars attached to the body of the screw and the nut as shown in Figure 1, extracted from the original paper where three cases of engagement are shown. The assembly shown regards squared threads, but in the following of the original paper,



also the triangular threads are examined. The figure has been corrected and revised by us to improve the quality.

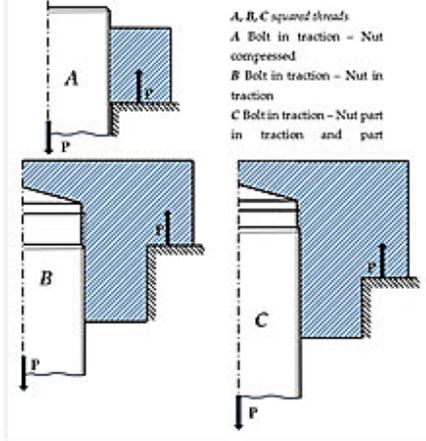


Figure 1. Threaded connection redrawn from the original paper of Maduschka [4].

For all analytical approaches, the compliance of the threads plays a crucial role. The experimental verification of the reliability of these theoretical models has been checked with different methods [9,10,11,12] and generally has shown good agreement.

Relating to the strength of the connection, the critical points are located at the root of the first engaged thread and under the bolt head. After the classic papers by Heywood [13] and Kenny and Patterson [14], several works have been devoted to the modification of the thread geometry to reduce stress concentrations [15,16]. For example, Cali et al. [17] used mesh morphing to find an optimal geometry modifying the standard proportion.

Other contributions have studied the effects of bolt thread geometry [18], and the modification of the washer [19]. In addition, all of these topics have been extensively treated for the case of threaded abutments in implant dentistry [20] using an FE model [21].

Near the root of the thread, the stress state overcomes the yield limit for moderate external loads. Due to this state of strain, the load distribution changes significantly. Examining the extended bibliography on this specific topic, few papers take theoretical approaches; the main method of investigation of the elastic-plastic behavior is numerical, using FE models. Chen and Williams [22] proposed a simplified method to study the threaded connection in pipes. Wang and Marshek [23] adapted a previously developed elastic approach to the case of elastic-perfectly plastic strain. Fukuoka and Takaki [24] investigated the tightening process using FE modeling. Sun and Liao [25] shown that the axial load and stress distributions obtained from the axisymmetric FE model agree with the results of 3D FE in both elastic and plastic states with the same mesh density. Sawa et al. [26] focused their attention on the load of starting plastic strain and introduced the effects of the first incomplete thread of the nut. Zhang et al. [27] modified the Yamamoto equation, which refers to the elastic behavior, to include the plastic strains based on the numerical results. Finally, Redondo and Mehmanparast [28] studied the case of bolted connections in wind turbines, considering the tightening process and focusing their attention on the stress distribution and the plastic strain. More recently, Chen et al. [29] studied an analysis method for stress distribution along the engaged threads considering plastic deformation. Starting from an analytical model within the elastic range [30], they introduced a parametric nonlinear finite element model to represent the plastic behavior. Several interesting experimental results are in the references [31,32,33,34]. In particular, in [34], the effects of the actual machining conditions have been studied showing that the resulting stress distribution is discontinuous and not uniform. As shown by this synthetic reference discussion, the elastic-plastic behavior of the screw-nut-washer (SNW) assembly has been analyzed more frequently by FE models than theoretically; however, these contributions give interesting results only for particular applications. In contrast, very few studies solve this problem in a general way with a theoretical approach suitable for many cases. When stressed beyond the elastic limit, the behavior of bolt and nut assemblies is very important for evaluating the response of several types of structures under operational or emergency loads. In this paper, we improved Maduschka's approach to consider elastic-perfectly plastic behavior... **Continued on the website MDPI**



“RBF Morph is pleased to highlight the launch of the 2nd Level University Master’s Degree in Additive Manufacturing for the Medical Sector: Innovation, Technology and Advanced Training, jointly awarded by the University of Rome Tor Vergata and Sapienza University of Rome.”



Web – RBF - [New Postgraduate Master’s Program in Additive Manufacturing for the Medical Sector \(Rome\)](#)

The program is delivered within the framework of the Scuola IaD at the University of Rome Tor Vergata and represents a highly qualified educational initiative at the national and international level.

The Master’s program is conceived as an advanced, interdisciplinary educational pathway aimed at providing participants with solid technical, methodological, and managerial competencies for the application of additive manufacturing technologies in the healthcare sector. The curriculum integrates engineering sciences, medical and biomedical disciplines, and advanced materials, while also addressing emerging digital technologies such as artificial intelligence and virtual reality. This approach is designed to prepare professionals capable of designing, developing, and implementing innovative solutions for medical devices, personalized treatments, and advanced clinical applications.

As a company specialized in software solutions for additive manufacturing, RBF Morph strongly supports educational programs that foster the transfer of knowledge between academic research and industrial practice. This commitment is further reinforced by the academic role of our founder, Professor of Machine Design at the University of Rome Tor Vergata, whose work reflects the close connection between advanced engineering education and real-world additive manufacturing applications.

Further information regarding the program structure, admission requirements, and application procedures is available on the official website of the Scuola IaD at the University of Rome Tor Vergata.

Announcement Not To Miss

We are proud to share that LivGemini® and LivSpace® are now officially registered trademarks in Europe.

This milestone goes beyond branding: it represents an important step in building a reliable and long-term medical technology company.

Trademark registration is part of our commitment to intellectual property protection and responsibility, alongside continuous investment in research and development.

As we continue developing patient-specific digital tools in the cardiovascular field, this step strengthens our identity and reinforces our commitment to the European Healthcare Ecosystem.

A small but meaningful milestone!



“This study uses ANSYS/LS-DYNA 16.0 to simulate the dynamic responses of steel-framed subassemblies with five typical beam–column connections under debris impact, with the finite element model validated by drop hammer tests and showing good agreement with the experimental results.”



Web – MDPI - [Dynamic Responses of Steel-Framed Subassemblies Under Falling Debris Impact on Mid-Span of Steel Beam](#)

H. Wang, W. Chang, L. Zhao, Z. Chen, Y. Wang, J. Wang

- Tianjin Key Lab. Civil Struct, Prot.& Rein., TCU, China
- Sch. of Civil Engineering, TCU., China
- College Water Conservancy Engineering, TJAU, China

Abstract - Falling debris impact from damaged upper structures is a key cause of building progressive collapse, yet relevant research lags behind that on column removal scenarios. This study uses ANSYS/LS-DYNA 16.0 to simulate the dynamic responses of steel-framed subassemblies with five typical beam–column connections under debris impact, with the finite element model validated by drop hammer tests and showing good agreement with the experimental results. Parametric analyses are conducted to explore the effects of the impact velocity, impactor mass, impact energy, and horizontal restraint on structural responses. The results show that under the same impact energy, the velocity and mass significantly affect the maximum impact force but barely the stable-stage force and maximum displacement; horizontal restraint exerts negligible effects at a low impact energy while a single horizontal restraint markedly impairs impact resistance at high energy. These findings are clarified via energy conservation, momentum theorem, and anti-collapse mechanisms. The study’s originality lies in systematically investigating the dynamic responses of the five subassemblies, deriving quantitative relationships between the impact parameters and impact force, duration, and horizontal restraint. It provides theoretical and technical support for anti-progressive collapse building design..

1. Introduction - After the September 11 attacks on the World Trade Center, research on the progressive collapse resistance of building structures has emerged as a global focus and a challenging topic in academic circles. To mitigate the risk of progressive collapse in building structures, the Alternate Path Method (APM) has been recommended for the progressive collapse-resistant design of structures by several codes and specifications, including those of GSA [1], DoD [2], and CECS [3]. In general, beam–column connections tend to be relatively weak points in structural systems, which play a crucial role in maintaining structural stability...

3.1. Establishment of Model - A finite element model was established using the general-purpose finite element program ANSYS/LS-DYNA to simulate the dynamic behavior of steel-framed subassemblies with different connection types under impact loads. The explicit dynamic solver of ANSYS/LS-DYNA can effectively avoid the convergence difficulties encountered in implicit analysis, making it highly suitable for solving complex nonlinear problems involving contact, large deformations, and material fracture...

6.1. Conclusions - In this study, ANSYS/LS-DYNA finite element software was employed to investigate the dynamic responses of steel frame substructures with five different beam–column connection types under floor drop impact loading. The accuracy of the model was verified through experiments, followed by parameter analysis...



This section is in my capacity as the town's steward of information.

I will highlight information relevant to the town, its residents, development departments, educational and municipal departments.



Web – MIT - [MIT Open Learning](#)

As artificial intelligence (AI) reshapes industries, powers innovation, and redefines how we live and work, understanding its core principles is increasingly important.

We curated a list of 13 foundational AI courses and resources from MIT Open Learning—most of them free—to help you grasp the basics of AI, machine learning, machine vision, and algorithms.

- **AI 101:** Get an introduction to artificial intelligence that's designed for those with little to no background in the subject.
- **Introduction to Algorithms:** Explore mathematical modeling of computational problems, common algorithms, algorithmic paradigms, and data structures used to solve these problems.
- **Artificial Intelligence:** Examine the power of AI with MIT's foundational course about the basic knowledge representation, problem solving, and learning methods of artificial intelligence.
- **AI and Algorithms:** Get an introduction to principles, algorithms, & applications of machine learning.
- **Introduction to Computational Thinking and Data Science:** Learn how to use computation to understand real-world phenomena.
- **Introduction to Machine Learning:** Get to know the principles, algorithms, and applications of machine learning.
- **Machine Learning with Python: From Linear Models to Deep Learning:** Get an in-depth introduction to the field of machine learning, from linear models to deep learning and reinforcement learning, through hands-on Python projects.
- **Machine Vision:** Get acquainted with the process of generating a symbolic description of the environment from an image.
- **Ethics of AI Bias:** Dive into the biased side of artificial intelligence.
- **Ethics for Engineers:** Artificial Intelligence: Explore the ethical issues involved in the latest developments of computer science.
- **Generative Artificial Intelligence in K-12 Education:** Grasp the foundations of generative AI technology and the new opportunities it enables for K-12 education.
- **Foundation Models and Generative AI:** Discover the secret sauce behind the recent breakthroughs within AI—foundation models and generative AI.
- **Driving Innovation with Generative AI:** Get the knowledge and skills necessary to navigate the intricate world of generative AI in this six-week course, which leverages industry case studies, hands-on work with generative AI tools, and the latest thinking from 12 faculty members from MIT's Computer Science and Artificial Intelligence Lab.



This section is in my capacity as the town's steward of information.

Periodically, I will highlight information relevant to the town, its residents, development departments and municipal departments.

Thanks to Art Shapiro for the below open-source information.

NATIONAL
LABORATORY
OF THE ROCKIES

System Advisor Model (SAM)

Web - [The System Advisor Model \(SAM\)](#) developed by the National Renewable Energy Laboratory (NREL) is open source, with its source code, tools, and build instructions available on GitHub for transparency, modification, and collaboration, allowing users to explore algorithms or adapt it for custom renewable energy analysis

Art, "I used this to design my house solar system"

The System Advisor Model™ (SAM™) is a free desktop application for techno-economic analysis of energy technologies. It is used by project managers and engineers, policy analysts, technology developers, and researchers to investigate questions about the technical, economic, and financial feasibility of power generation projects.



Web - [Geany](#) - Art, "I use for code development."

Website Quote, " Geany is a powerful, stable and lightweight programmer's text editor that provides tons of useful features without bogging down your workflow.

- It runs on Linux, Windows and macOS,
- is translated into over 40 languages,
- has built-in support for more than 50 programming languages.

One of the primary reasons for Geany's existence is that there is a need for a decent, GUI, lightweight, cross-platform, flexible and powerful IDE/editor. Many editors meet one or more of these requirements but fall short on others. Geany attempts to hit the sweet spot.



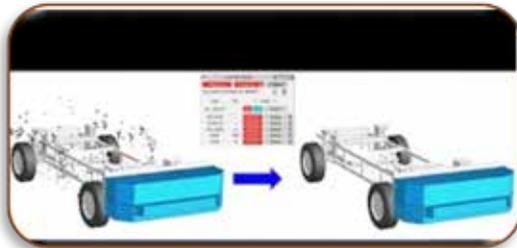
YouTube: - Oasys LS-DYNA Environment forms part of the software house of Arup. We have collaborated with the developers of LS-DYNA (formerly LSTC, now Ansys) for more than 40 years, using the software for consulting work and distributing it to clients in the UK, India, China, and the USA. We pride ourselves on understanding the challenges our customers face and have developed the tools to support them.

YouTube - [Top Tips - Did you know?](#) by Oasys LS-DYNA Environment

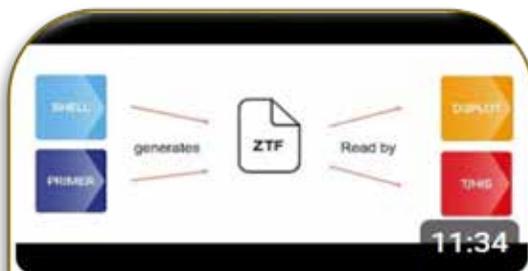
Our products are tailor-made to empower engineers to prepare models, interpret results, and share solutions efficiently and accurately. These tools remain at the leading edge of pre- and post-processing software and are utilised worldwide by many of the largest Ansys LS-DYNA users.



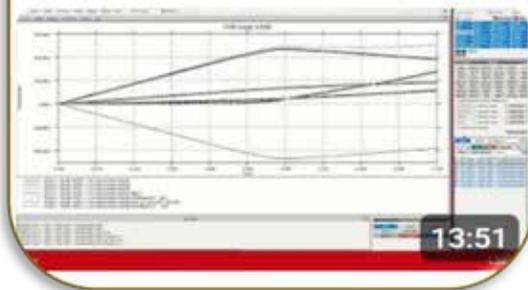
How to Verify ANSYS LS-DYNA Model Connectivity with Oasys PRIMER's Attached Tool



How to Clean Up ANSYS LS-DYNA models using Oasys PRIMER



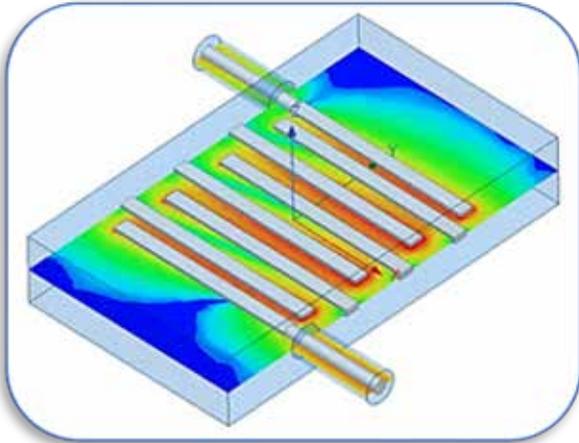
How to Use ZTF Files For Faster Post-Processing in Oasys Suite



Top Tip" Performing Curve Operations on Oasys T/HIS



Article, “ANSYS HFSS is well known for its frequency domain Finite Element Method (FEM) solver and its efficiency in handling complex geometries and materials. HFSS also incorporates a complementary time domain solver which tracks the evolution of electromagnetic fields and signals in response to time-varying excitations”



Web – Ozen - [ANSYS HFSS Transient Solver for Extracting S-Parameters & Time Domain Analysis](#) by: Ibrahim Nassar

Overview - ANSYS HFSS is well known for its frequency domain Finite Element Method (FEM) solver and its efficiency in handling complex geometries and materials. HFSS also incorporates a complementary time domain solver which tracks the evolution of electromagnetic fields and signals in response to time-varying excitations.

This solver is best suited for studying transient phenomena, ultra-wideband signals, EMC/EMI events, and other cases where broadband or pulsed excitation is used.

In this demo we will be using the ANSYS HFSS and Circuit to perform time domain simulation for extracting S-parameters for a filter and compare them with the HFSS FEM frequency domain solver. Below is a brief overview of an HFSS transient example to simulate a filter response and a full demonstration is provided in the video link.

HFSS Time Domain Analysis - There are 2 approaches to perform time domain analysis; 1) using the HFSS transient solver, and 2) using the Circuit transient solver.

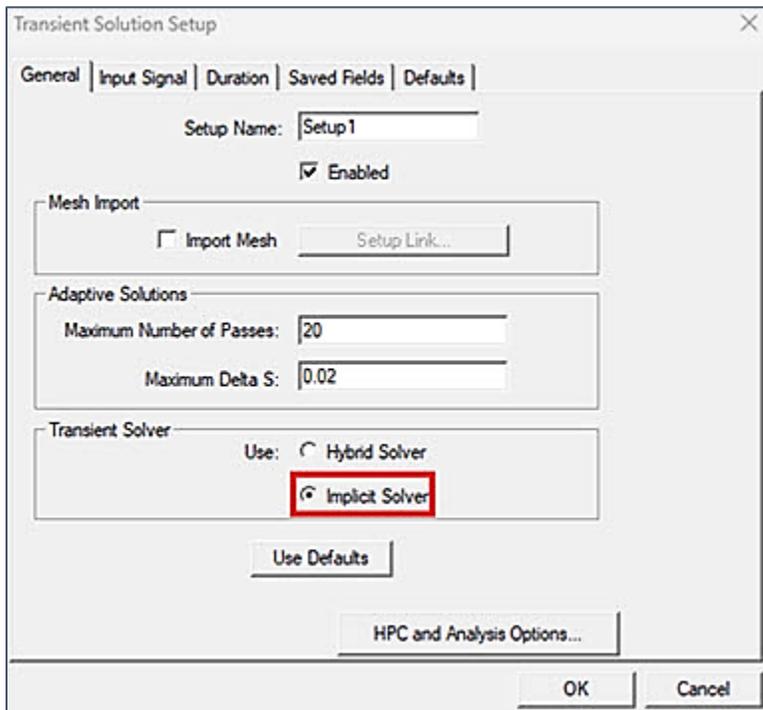
Using the HFSS Transient Solver - The HFSS Transient solver in Ansys HFSS is a specialized time-domain solution tool for high-frequency electromagnetic simulations. Unlike traditional frequency-domain solvers, it computes electromagnetic field behavior as a function of time, making it well-suited for scenarios involving pulsed excitations, rapid changes in signal, or transient phenomena such as ultra-wideband antennas, lightning strikes, electrostatic discharge, and time-domain reflectometry (TDR) applications.

In this demo, we will simulate the filter response using HFSS transient analysis and visualize the fields versus time.



Transient Solver Configuration - Users can choose between Hybrid and Implicit solvers in the setup panel. The Hybrid solver is based on the explicit-implicit discontinuous Galerkin time-domain method and supports GPU acceleration for faster computations, optimized for Nvidia Tesla cards. It is more efficient for electrically large problems.

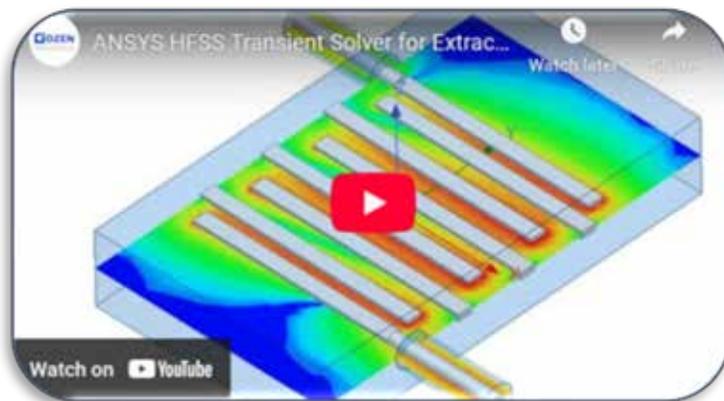
The implicit solver is based on the finite element time domain (FETD) method with an implicit time stepping.



Change the setting to Implicit for cases which the Hybrid Solver may not perform optimally. This typically refers to structures which are discretized into a small number of tetrahedrons but the required time step for the Hybrid becomes extremely small hindering the performance. Consequently, it takes longer for the simulation to finish

. Furthermore, the Implicit Solver is in general better suited for low frequency analysis of electrically small structures with small vias, thin wires, thin slots, narrow gaps, and thin dielectric/metal plates.

[YouTube Video](#)



Continued on the Website

- **Profile Function**
- **Duration**
- **Visualizing Fields Versus Time**
- **HFSS Transient Composite Excitation**
- **Using The Circuit Transient Solver**



**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 how to TouchStone Files?

Ke, “No clue, how to do that! We better call Mike at Ozen.
He knows where to find the answers.”

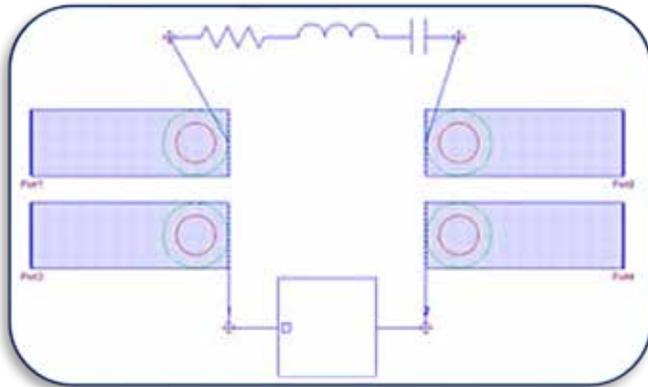


Fig 1. Figure 1: Connecting RLC circuit and touchstone files in HFSS Layout

Web – Ozen - [Adding TouchStone Files & RLC Circuits In HFSS 3D Layout](#)

By - Ibrahim Nassar

Modern communication systems combine RLC circuits with active elements such as transistors and diodes to form complete integrated circuits. Within integrated circuits, RLC circuits function as filters, amplifiers, or oscillators, relying on characteristics such as resonance and damping to operate. With HFSS 3D Layout, there are different ways to integrate RLC circuits and model them.

Overview - This blog describes how to add and connect touchstone files in HFSS 3D Layout to perform EM simulation. It also shows how to add RLC circuits and boundaries.

With HFSS 3D Layout there different approaches to model RLC circuits;

- Adding RLC circuit elements
- Assigning Lumped RLC boundaries
- Adding touchstone file that represent the behavior of these circuit components

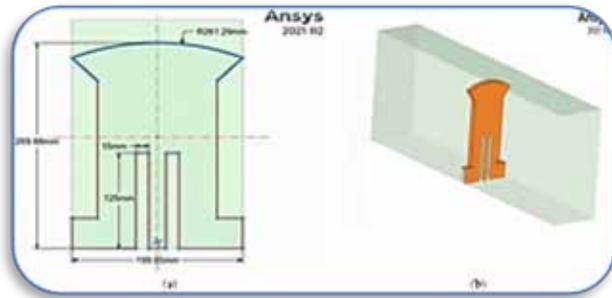


Web – YouTube - [This video link](#) shows an illustration on how to do these steps in detail, and the model shown is available in the downloadable resources.

Hi there! This video shows how to add and connect touchstone files in HFSS 3D Layout to perform EM simulation. It also shows how to add RLC circuits and boundaries.



Quote, “the aim of this study is to determine the effects of perforated (porous) and imperforate (solid) baffles on the sloshing pressure using ANSYS FLUENT software based on Volume of Fluid (VOF) method where a rectangular tank with 25% and 60% filling ratios was considered. “



Web – MDPI - [A Numerical Study on the Effects of Perforated and Imperforate Baffles on the Sloshing Pressure of a Rectangular Tank](#)

A.M. Al-Yacouby, M.M. Ahmed

Dept of Civil & Environmental Engineering, Universiti Teknologi PETRONAS, Malaysia

fig 3 - schematic diagram a) dimensions of a perforated baffle; b) isometric view of the rectangular tank with perforated

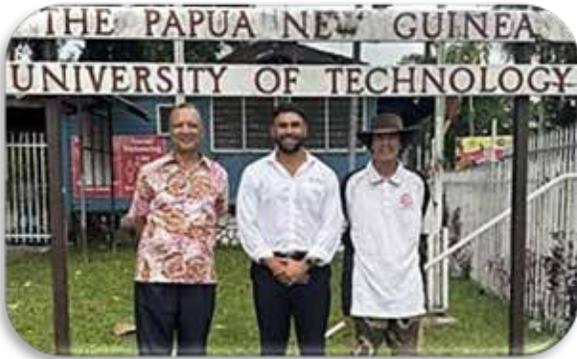
Abstract - Sloshing has many industry applications, namely in offshore engineering, aerospace, ship building, and manufacturing. Sloshing simulation is essential to better understand the sloshing pattern and consequently to improve the tank design to reduce noise levels, stresses on the structure, and optimize the baffle configurations and arrangements. **Thus, the aim of this study is to determine the effects of perforated (porous) and imperforate (solid) baffles on the sloshing pressure using ANSYS FLUENT software based on Volume of Fluid (VOF) method where a rectangular tank with 25% and 60% filling ratios was considered. In the first case, an unbaffled rectangular tank with 60% filling ratio was used for the validation purpose, while in the second case, a 25% filling ratio was investigated considering two scenarios, namely a unbaffled tank and a baffled tank case with perforated and imperforate baffles.** The outcomes of the results indicate that perforated baffle can significantly reduce the sloshing pressure in the tank. The validation of the results also shows a good agreement with the published experimental results.

1. Introduction - In the recent years, sloshing become an interesting engineering problem due to its extensive application in several fields, such as hydraulic, aerospace, transport and civil, and ocean and waterway engineering. Serious hydrodynamic loads in the sloshing tanks could be induced under the exterior exciting waves, which could lead to catastrophic consequences to the stability of the whole structure [1]. Therefore, efficient tools, such as perforated and imperforate baffles have been extensively applied in numerical and experimental studies using tanks with geometric shapes....

They have presented a precise boundary recognition approach to investigate the severe liquid sloshing. They clarified that the sloshing waves in the case of beam sea is the most severe and critically impacts the vessel motion stability. A numerical study was considered using ANSYS FLUENT software based on VOF multiphase method to simulate a tank fractionally filled with kerosene [8]. In their study, they have considered two cases, namely tank with baffles and tank without baffles to analyze the sloshing in terms of different time steps. They have pointed out that in the presence of baffles in the tank, the sloshing was remarkably mitigated compared to the tank without baffles....



Don't miss this article by Neville Judd, "Hexagon is strengthening its commitment to education through a new partnership with the Papua New Guinea University of Technology (PNGUoT or UNITECH)..."



**Web – Hexagon - [Hexagon partners with PNG University of Technology to support future miners](#)
By Neville Judd**

As the global mining industry continues its digital transformation, access to real-world technology and practical skills has never been more important for students entering the workforce.

In Papua New Guinea, where mining plays a vital role in economic development, Hexagon is strengthening

its commitment to education through a new partnership with the Papua New Guinea University of Technology (PNGUoT or UNITECH).

This latest initiative reflects Hexagon's broader focus on equipping future mining professionals with the tools, knowledge, and confidence they need to succeed in increasingly complex and technology-driven operations.



Professor Ora Renagi, Thomas Dlabik, Joseph Tera and Dr. Aezeden Mohamed

A new partnership with PNG University of Technology - Hexagon representatives recently met with Professor Ora Renagi, Vice Chancellor of PNG University of Technology, and Dr Aezeden Mohamed, School of Mechanical Engineering, to formally present a new partnership centred on Hexagon's MinePlan solution.

Under the agreement, Hexagon will provide complimentary MinePlan licences to UNITECH, enabling undergraduate students to gain hands-on experience with software widely used in real mining operations. By integrating MinePlan

into coursework, students can move beyond theory and develop practical skills in mine evaluation, planning, and design.

This initiative is designed to help bridge the gap between academic learning and industry expectations, ensuring graduates are better prepared to contribute from day one.

Building capability through train-the-trainer programmes - In addition to student licences, Hexagon will deliver five days of train-the-trainer sessions, hosted by experienced MinePlan experts. These sessions are designed to give UNITECH's professors and lecturers in-depth exposure to MinePlan technology and real-world operational workflows.



The programme will support Geoscience and Engineering training streams. Each stream will be delivered twice per year, ensuring ongoing knowledge transfer and continuity as curricula evolve. By empowering educators with practical expertise and industry context, Hexagon is helping universities deliver more relevant, applied training, ultimately benefiting students and the wider mining sector.

Why MinePlan matters for future mining professionals - MinePlan is used globally to support mine evaluation, planning, and design across the mining lifecycle. Early exposure to tools like MinePlan helps students understand how data, modelling, and planning decisions directly impact productivity, safety, and sustainability.

For students, this means:

- Familiarity with industry-standard planning workflows
- Practical experience using professional mining software
- A stronger foundation for careers in mining engineering, geology, and planning

For universities, it enables teaching that aligns more closely with real operational environments.



Dave Goddard was appointed to the SME Foundation Board of Trustees in 2025.

Part of a broader commitment to mining education - The PNG University of Technology partnership is the latest in a series of Hexagon initiatives focused on developing mining talent worldwide.

This commitment is also reflected at a leadership level. Within the past year, Hexagon's Mining President, Dave Goddard, was appointed to the SME Foundation Board of Trustees, an organisation dedicated to inspiring and supporting the next generation of mining professionals.

The appointment reinforces Hexagon's long-term focus on education, capability building, and the sustainable growth of the mining industry.

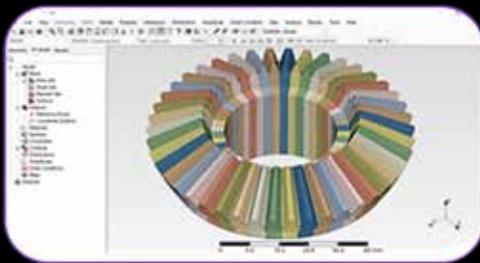
Investing in the future of mining - Across regions and disciplines, Hexagon is taking a consistent, long-term approach to developing the miners of tomorrow. From providing MinePlan access and educator training at PNG University of Technology, to enabling hands-on underground technology development with Montana Technological University, and advancing next-generation talent pathways through partnerships with Maaden and leading universities in Saudi Arabia, Hexagon is aligning education with real operational needs.

These initiatives reflect a shared belief that the mine of the future will be built not only on advanced technology, but on people equipped with the skills, experience, and confidence to apply it safely and sustainably.



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

A new developer version of the open-source PrePoMax FEM package has been released (v2.4.5). Exploit the power of the CalculiX FEM solver using a modern graphical interface **PrePoMax is an open-source pre and post-processor** for the Calculix FEM solver based on a modern user interface to speed up the FEM workflow.



YouTube - [PrePoMax & CalculiX - Bevel gear meshing](#)

Matej Borovinsek

A demonstration of the new features in action on the bevel gear geometry

The most notable new features include:

- Local mesh size definition based on the number of elements
- Mirror mesh part feature
- Rotate mesh pattern
- Box zoom

[Download link and installation instructions are locate on our website](#)

- **CAD geometry support** - PrePoMax allows you to import the geometry from various exchangeable CAD formats and stereolithography .stl files used for 3D printing. The CAD support is based on the open-source Open Cascade platform.
- **Solid and shell geometry meshing** - PrePoMax allows you to mesh a solid or a shell-based geometry using linear and parabolic finite elements. It also supports an import of the finite element mesh from a file. An open-source Netgen library performs the meshing. From version 2.0.0, the Gmsh mesher is integrated, which supports hexahedral and pentahedral meshing.
- **Geometry and mesh-based feature definitions** - PrePoMax allows you to create node sets, element sets, and surfaces needed for various FEM features based on geometry or finite element mesh selection.
- **Results visualization** - PrePoMax allows you to visualize your results using 3D scalar fields with animations and using 2D plotting tools to represent history outputs.



FEANTM Train Station

Materials & Methods - To analyze the intrinsic vibration characteristics of the SKL-15 clip, a three-dimensional solid finite element model was established based on ABAQUS, as shown in Figure 1. The model of the Vossloh W300-1 fastening system mainly consists of a clip, gauge stops, insulating shims, under-rail matting, iron matting, elastic matting, & related components.

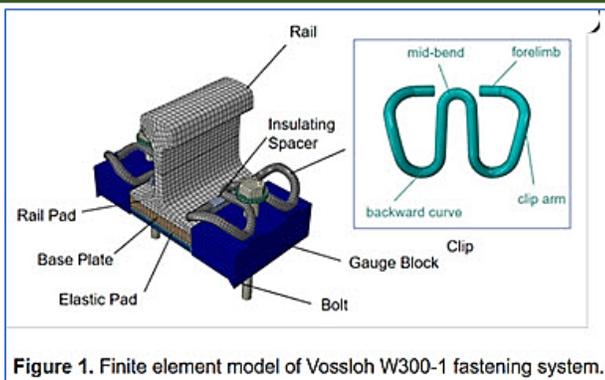


Figure 1. Finite element model of Vossloh W300-1 fastening system.

Web - MDPI - [Dynamic Characteristics and Vibration Behavior of SKL-15 Rail Fastening Clip in High-Speed Railway Systems](#)

Y. Li, H. Xiao, S. Wei, Y. Wang, J. He, M. M. Nadakatti

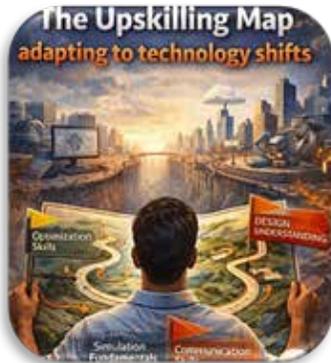
- School of Civil Eng., Beijing Jiaotong Univ., CN
- Beijing Key Lab. Track Eng., Beijing Jiaotong Univ., CN
- Dept of Mech. Eng., KLS Gogte Inst. of Tech.,

Abstract - Current research on the vibration characteristics of fastener clips primarily employs modal experiments combined with finite element simulations; however, limited attention has been given to the dynamic vibration behavior of clips during actual train operations. This study investigates both the quasi-static and dynamic vibration characteristics using an integrated approach of finite element simulation and dynamic testing. Based on the Vossloh W300-1 fastener system, a three-dimensional model is established. Modal and frequency response analyses, together with field test validation, reveal two significant vibration modes within 0–1000 Hz: a first-order mode at 500 Hz and a second-order mode at 560 Hz. These modes are characterized by vertical overturning of the clip arm. Dynamic testing demonstrates that the dominant frequency of the arm acceleration is strongly correlated with the second-order natural frequency, confirming that wheel–rail excitation readily triggers second-order mode resonance. The study further shows that, at train speeds of 200–350 km/h, rail corrugation with wavelengths of 99.2–173.6 mm induces high-frequency excitation at 560 Hz, resulting in resonance fatigue of the clip. As a mitigation measure, regular rail grinding is recommended to eliminate corrugation at critical wavelengths. Additionally, optimizing the clip structure to avoid resonance frequency bands is proposed. These findings elucidate the coupling mechanism between the vibration characteristics of the clip and dynamic loads, providing theoretical support for the safety evaluation of high-speed rail fastener systems and the vibration-resistant design of clips.

Introduction - As a fundamental component of high-speed railway track structures, the fastener system is essential for maintaining rail geometry, adjusting gauge and alignment, and mitigating vibration. Within this system, the clip serves as a critical load-bearing element, continuously subjected to multi-axial alternating stresses resulting from wheel–rail interactions [1] under prolonged cyclic loading. The service performance of the clip is directly associated with the structural stability of the rail and the operational safety of trains [2]. Research and field investigations have revealed instances of clip fractures on several high-speed railway lines in China, including the Wuhan–Guangzhou and Beijing–Shanghai high-speed railways...



A few years into my CAE career, I noticed something subtle during project reviews. The questions were no longer only about accuracy or correlation. They were about integration. How does this result connect to design? Can this analysis support an early decision? Can it scale across programs?



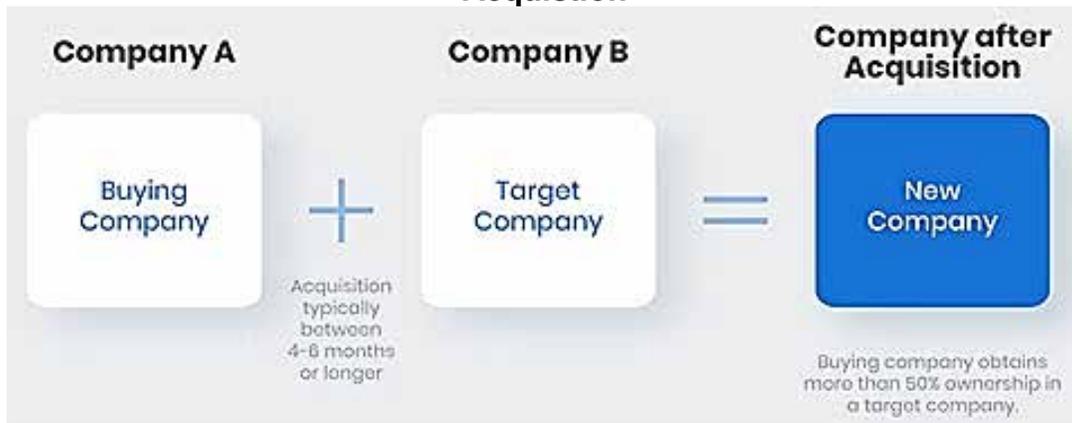
Web - MyPhysics Cafe - [CAE Compass 2.0: The Upskilling Map](#)

The future is rarely announced. It arrives quietly through changed expectations.

Nothing dramatic had changed overnight. The tools were familiar. The workflows looked similar. But expectations had moved.

This was not driven by individual managers. It was driven by technology consolidation, tighter timelines, and growing pressure to connect simulation more closely with business outcomes

Acquisition



Why existing skills started to feel insufficient - Many experienced CAE engineers felt uneasy, not because they lacked capability, but because their depth in one area no longer felt enough on its own. Being excellent at a single solver or discipline was still valuable, but it no longer guaranteed relevance across projects.

Acquisitions, platform integrations, and system-level thinking were changing how simulation teams worked. Engineers were expected to move across stages, speak to different teams, and adapt to evolving toolchains.

The discomfort came from a simple realization. The goalposts were moving, even though job titles looked the same.

Rethinking what “upskilling” really means - At this point, some engineers reacted by collecting certifications or learning advanced features without context. Others stepped back and reframed the problem. They asked a different set of questions.

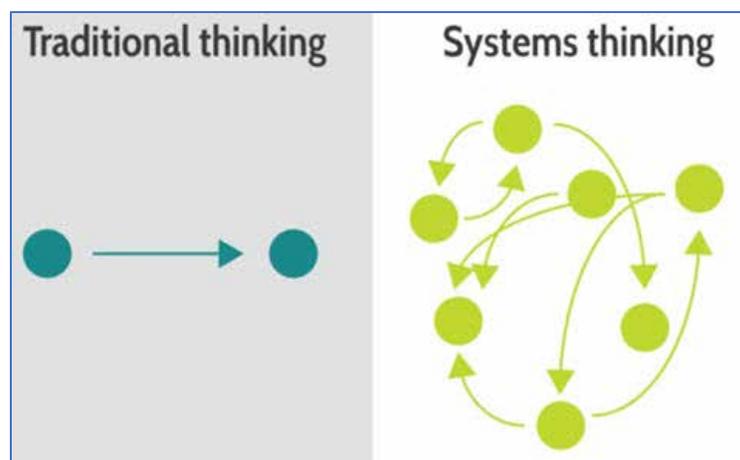


What part of my work connects to decisions beyond CAE? Where does my analysis enter too late in the process? Which handoffs create confusion or rework?

These questions shifted upskilling from accumulation to alignment. Instead of chasing complexity, they focused on capability that travels well across tools, teams, and domains.

How engineers adapted in practice - The most effective changes were surprisingly practical. Engineers began strengthening skills that sat between silos. Not deep specialization, but connective understanding. Some focused on design intent. They spent time understanding why geometry changed, not just how it affected stress or noise.

Others invested in **system-level thinking**. They learned how component-level results influenced vehicle-level performance, even if they never ran full system simulations themselves.



A few concrete steps stood out:

- Learning how simulation assumptions affect downstream testing and validation
- Practicing explaining results to non-CAE stakeholders without oversimplifying
- Understanding data flow across tools, even if they did not own every step
- Improving judgment on when simulation adds value and when it does not

None of this required new software. It required curiosity and patience.

One engineer I worked with began reviewing integration failures instead of successful runs. He learned more from understanding where workflows broke than from perfect results.

What technology shifts quietly reward - When platforms evolve and companies consolidate tools, they favor engineers who reduce friction. Not just technical friction, but communication and decision friction. After major technology integrations in the past, teams needed people who could translate between environments, explain trade-offs, and help others adapt without slowing projects.

These engineers were not always the most advanced users. They were the most reliable connectors. This is the pattern technology shifts create. They reward engineers who can stabilize change.

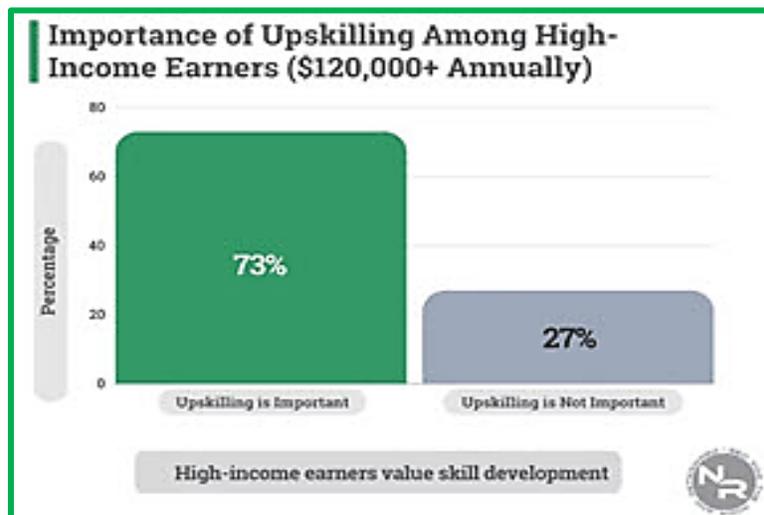


Building an upskilling map that lasts

Effective upskilling during technology shifts follows a simple structure. First, strengthen fundamentals that apply everywhere. Modeling assumptions, boundary conditions, interpretation logic, and validation thinking never go out of date.

Second, add one adjacent capability that expands context. This could be design understanding, test correlation, optimization logic, or basic system awareness.

Third, improve communication under constraint. Learn to summarize analyses with clear implications, limitations, and next steps. This approach creates resilience. Even if tools change, your value remains portable.



What this means for CAE engineers

Technology shifts do not eliminate opportunities. They redistribute them.

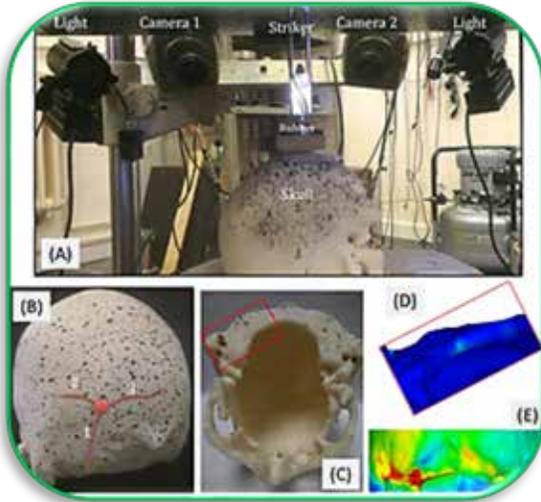
Engineers who cling only to familiarity feel left behind. Engineers who chase everything new feel exhausted. The ones who navigate change well build depth that connects. The goal is not to predict which platform will dominate. It is to remain useful regardless of which one does.

If your skills help teams make better decisions with less uncertainty, technology shifts tend to work in your favor.

This article is part of CAE Compass 2.0, a series on navigating market and technology change in CAE. Take a moment to reflect on which of your skills travel well across tools and teams, and explore the next article if you want to focus on building long-term career resilience beyond any single technology.



The models generated for all cores (LTCs and AVCs) comprised ~15,000 elements and were analysed using ANSYS APDL v15.0 (ANSYS Inc., Canonsburg, PA, USA) with an implicit solver... Simpleware and generating meshes for analysis in Ansys APDL

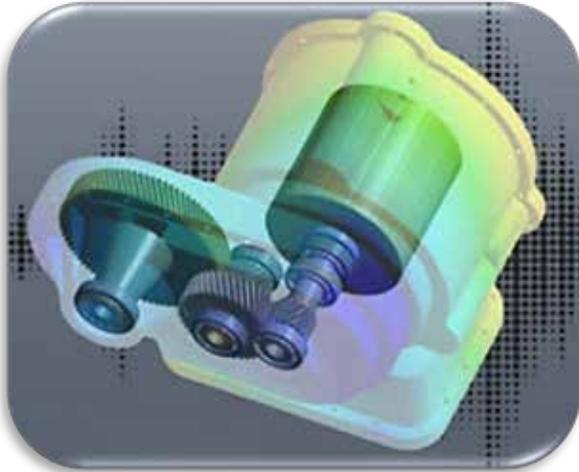


Web – MDPI - [Spine Motion Segment Analogues: 3D Printing, Multiscale Modelling and Testing to Produce More Biofidelic Examples](#)

C. Franceskides, T. Shanker, M. Gibson, P. Zioupos

- Cranfield Forensic Inst., Cranfield Univ., UK
- Biomedical Engin., School of Engin., Univ. Hull, UK

Abstract - Computed tomography and magnetic resonance imaging are two powerful modalities which can be used in the clinical setting to produce data for the creation of patient-specific finite element analysis (FEA) models and physical analogues—for instance, by using additive manufacturing (AM)—that mimic the properties of soft and hard tissues, both morphologically and mechanically. However, there remains a gap between creating a perfect biofidelic physical analogue and its computational counterpart. This gap exists because, firstly, in silico models are often too complex to realise, and secondly, real-life conditions are challenging to emulate both computationally and mechanically, as they involve multiscale situations that are inherently heterogeneous and patient specific. In this study, we applied a multi-scale approach to design and model porcine vertebral specimens. Our results identified critical design factors that affect the quality and accuracy of the models, specifically highlighting that scanning resolution/fidelity and the thresholding technique have a directly proportional impact on model accuracy. A small shift up and down the greyscale level by 20 units can affect the behaviour of the AM sample by as much as [-15% +47%]. Working up the levels for manufacturing, testing and modelling (i) cylindrical cores to (ii) whole vertebrae and then (iii) a whole spine motion segment, we observed that the fidelity of predictions reduces, and errors increase as the structure becomes more complicated and intricate (3.6%, 7.5% and 15%, respectively). We are confident that further material-level developments will provide solutions for the more intricate parts of spinal motion segments, such as the intervertebral discs and facets, which in their natural form are highly sophisticated structures. To the best of our knowledge, this is the first time a holistic multiscale approach has been implemented to produce AM biofidelic analogues of skeletal parts. Our data showed good agreement between the physical and in silico models, confirming that it is possible to model real-time objects and situations both physically and in silico. This ultimately will enable the development of accurate, patient-specific physical models for use in biomechanical testing and medicolegal applications.



Noise exciting vibrations in an electric drivetrain | © CADFEM / Adobe Stock / ID: 500JLB

Article from CADFEM TechArticle 26/2 | Why Transient MBD Simulation with Ansys Motion Makes All the Difference

Web – CADFEM - NVH Effects in Drivetrains: Too Complex for Simulation?

The answer is no. Use the Ansys Motion Drivetrain Toolkit: Within the operating range of electric drivetrain systems consisting of e machine and gearbox, disturbing effects such as whining or rattling can occur.

Causes and potential damage consequences can be simulated quickly and efficiently across the entire operating range – e.g., a run up to maximum speed – in a transient simulation.

Conclusion

- **Understand NVH Causes:** Electric drives and gearboxes generate dynamic excitations such as whining, rattling, and resonances. Key factors include the interaction of motor frequencies, gear mesh, and housing mode shapes
- **Simulate Transiently:** The Ansys Motion Drivetrain Toolkit efficiently represents shafts, bearings, and gears as flexible bodies. Time-dependent simulations across the entire run-up reveal critical frequencies, gear mesh effects, and structural resonances.
- **Evaluate Acoustics:** Results from the MBD simulation can be used directly for acoustic analysis – in the Motion post-processor or coupled with Ansys Mechanical and Ansys Sound. This enables early evaluation of sound pressure level, tonal components, and psychoacoustic criteria.

From Noise to Solution: Acoustics as a Design Factor? In the development of modern drivetrain systems, the topic of NVH – Noise, Vibration, Harshness – is becoming increasingly important. This applies not only to electric machines, as you read in the previous TechArticle of this series, but also to gearboxes in combination with electric machines, where noise development is a key quality factor. Vibrations in the housing lead to disturbing noise and can also influence the structural integrity of components. The stakes are even higher for precision or optical drives: here, even the smallest excitations and resonances reduce manufacturing or imaging quality. Both aspects highlight the importance of identifying and controlling vibrations early.

Counteracting NVH problems is a challenge. In practice, pragmatic measures are often used to mitigate acute disturbance frequencies: for example, cladding the housing with sound-absorbing materials or increasing mass to shift frequencies.



These “blunt” passive approaches may help in the short term, but they are rarely efficient and usually come with disadvantages such as increased weight, additional space requirements, or higher material costs. A targeted process-based optimization of structure and acoustics starts as early as possible in development and requires a deep understanding of the physical relationships.

Simulation enables this process-based optimization. To succeed, the simulation must reflect reality: NVH effects arise dynamically – during start-up, acceleration, or load changes. Only time-dependent simulation reveals when critical frequencies occur and how they evolve during run-up. This allows causes to be identified and countermeasures derived before the first real component is manufactured. The Ansys Motion Drivetrain Toolkit uses multibody simulation (MBS) as a method to represent drivetrain structural behavior and simulate dynamic systems in the time domain.



*Sound-absorbing materials on the engine block /
C Adobe Stock / ID: 1INWNX*

Fast Solving for Complex Drivetrain Models?

A typical operating range of an electric drive unit spans from zero revolutions per minute up to five-digit speeds.

Let's calculate how many time steps you need for the run-up of such a system:

- The decisive factor for time resolution will be the excitation frequencies generated in the motor and the first gearbox stage.
- The determining factors for the number of time steps are the duration of the run-up and the maximum speed reached.

Thirty milliseconds of torque profile already cover a full revolution at 2000 rpm. Let's imagine a drive whose harmonics in the first stage require a resolution of 360 steps per revolution (i.e., 1.0-degree steps), which is not unusual. For a run-up from zero to 12,000 rpm within 3 seconds, you need around 108,000 result time steps. Unthinkable to compute this with contacts between fully meshed gear bodies. The same applies to rolling bearings. The solution is the Drivetrain Toolkit with special modeling techniques for gears and rolling bearings.

The key phrase is “Fast Solving”: the modeling must enable fast calculations and vibration analyses in the time domain. To achieve this, the toolkit uses simplified gear and bearing models that nevertheless capture all essential nonlinear effects. For gears, an FE-based stiffness model is used that divides the gear into slices and calculates substitute stiffness at the contact points. All ball and roller bearings, gears, and shafts (straight or conical, solid or hollow) can be generated parametrically, via external data, or tabularly, and bending and torsion effects are also considered.



Definition

Suppressed	No
Bearing Type	Tapered Roller

Filter

S	SKF	On
N	NSK	On
K	KOYO	On
F	FAG	On

Bore

Min	35 mm
Max	35 mm

Outer Diameter

Width	Off
Bearing Catalog	5_30207_J2_Q

Tapered Roller

Bore	35 mm
Outer Diameter	72 mm
Width	18.25 mm

Definition

Type	ExternalGearSet	Program Controlled
Gear Profile Generation	Program Controlled	Program Controlled
Suppressed	No	KISSsoft
Type of Gear	Helical	
Hand of Helix	Right	
Helix Angle	29.°	
Module	2.245 mm	
Module (transverse)	2.5668 mm	
Pressure Angle	17.°	
Pressure Angle (transverse)	19.268°	

Driving

Name	Gear1
Quality	6
Number of Teeth	17
Face Width	31 mm
Addendum Coefficient	1.
Dedendum Coefficient	1.25
Profile Shift Coefficient	0.3441
Tool Tip Radius	0.2 mm

Sections

Name	Length	Cross Section	Diameter	Outer Diameter	Inner Diameter
Section_01	25 [mm]	Hollow Circular	30 [mm]	22.5 [mm]	
Section_02	26.5 [mm]	Hollow Circular	32 [mm]	22.5 [mm]	
Section_03	46.5 [mm]	Hollow Circular	36.5 [mm]	22.5 [mm]	
Section_04	16 [mm]	Hollow Circular	30 [mm]	22.5 [mm]	

© CADFEM / ID:DWRZV

What Else Do I Need for Model Setup? With the Ansys Motion Drivetrain Toolkit, you have already conveniently defined all shafts, bearings, and gears. For creation, you used the tabular input inside the Mechanical environment of Workbench. Now you only need the CAD data for your housing components and the electric motor, if you want to use a Maxwell import for electromagnetic forces. From Maxwell 2D, you import the air-gap forces for a complete speed sweep and map them to rotor and stator. Ansys Motion automatically interpolates the correct values for the matching speed and angular position.

Just like rotor and stator, you mesh the housing parts using the Ansys Mechanical meshing algorithm. All meshed parts are defined as flexible bodies. This follows the “Fast Solving” principle in Ansys Motion and uses Component Mode

Synthesis (CMS), which significantly reduces the

number of degrees of freedom. Attend the Seminar for Structural Dynamics und Vibration Technology to learn how to reduce degrees of freedom by several orders of magnitude and thus accelerate computation.

For both housing components and shafts, “attachments” are defined. Here, bearing inner rings and gears are fixed onto shafts, bearing outer rings onto housing components. With a single click, you generate all geometry that you previously defined in tabular form. The bodies then appear as components in the geometry section of the structure tree. This defines the complete force flow from the electric motor through the gears and bearings to the housing components. All components in the force flow are flexible and therefore well-suited for NVH analyses. Finally, a run-up scenario (acceleration curve at the output) is defined and the simulation is started.

Continued on the website with graphics:

- Which Result Quantities Can Be Evaluated?
- After the Run-Up Comes the Acoustic Evaluation?
- More on the Topic

Author - Dr.-Ing. Claus Kirner

CAE Engineer

Editorial, Dr.-Ing. Jörg Neumeyer

CAE Engineer





“ROMed2VR – Virtual Reality Empowered by Computational Fluid Dynamics Reduced-Order Models to Support Pre-Surgery Medical Planning – is a pioneering initiative focused on advancing pre-surgical planning for congenital heart defects by combining the power of Computational Fluid Dynamics (CFD) and Virtual Reality (VR)...”

Web – RBF - [ROMed2VR](#)



By developing a fast, reliable computational workflow based on open-source CFD and Reduced Order Models (ROM), the project aims to support surgeons in optimizing Modified Blalock-Taussig Shunt procedures with greater precision and confidence.

Launched in November 2024 with a kickoff meeting in Trieste, Italy, ROMed2VR brings together a multidisciplinary consortium of experts.

Among the partners is ENGYS, a company specializing in the development of cutting-edge open-source CFD technologies, contributing its expertise to ensure accurate and efficient simulation workflows. The project also includes RBF Morph, known for its innovation in mesh morphing and ROM applications; InSilicoTrials Technologies, a leader in digital health platforms; and the BioCardioLab of Fondazione Toscana Gabriele Monasterio, a prominent cardiovascular research center. Together, these organizations are developing a powerful toolset that leverages simulation and immersive visualization to improve clinical decision-making and patient outcomes.

Over the course of 12 months, ROMed2VR will bridge engineering and medicine, offering a cutting-edge solution that empowers healthcare professionals through science-driven, patient-specific planning.

ROMed2VR is financed by the European Union, and specifically by NextGenerationEU through the iNEST project.

Announcement Not To Miss

We are proud to share that LivGemini® and LivSpace® are now officially registered trademarks in Europe.

This milestone goes beyond branding: it represents an important step in building a reliable and long-term medical technology company.

Trademark registration is part of our commitment to intellectual property protection and responsibility, alongside continuous investment in research and development.

As we continue developing patient-specific digital tools in the cardiovascular field, this step strengthens our identity and reinforces our commitment to the European Healthcare Ecosystem.

A small but meaningful milestone!



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

The state-of-the-art current home of the Archives includes an exhibit space



EXCERPT Web – FORD - [File Under Celebration: Inside the Founding of Ford’s Extensive Archives - Leslie Armbruster](#)

2026 marks the 75th anniversary of the creation of the Ford Motor Company Archives. To celebrate, we're taking a look back at our long and winding road

Like a lot of corporate archives, our s Committee was organized in 1950 and worked to identify files on the history of the company and gather them from scattered locations. The committee recognized the value of the historical record, to both the company and the public, and considered creating a permanent repository, tentatively called the Henry Ford Archives.



A.K. Mills of Public and Employee Relations realized that the first step to achieving the goals of the committee was to hire an archivist and establish an archives. Mills explored Clara and Henry Ford's home and discovered cartons filled with papers, which ranged from receipts and Christmas cards to business files, as well as Henry Ford's personal correspondence with world leaders. These files created the foundation of the Ford Motor Company Archives.

Organization of the Archives accelerated when the company hired Henry Edmunds as chief archivist in 1951. In September 1952, the Archives’ staff moved from its original space in the Ford Engineering Laboratory to Fair Lane Estate. The home had been remodeled to accommodate the Archives, with the swimming pool filled and converted to records storage. Formally dedicated in May 1953, the early effort of the Archives went into celebrating the 50th anniversary.

In February 1957, the Archives moved to the Rotunda, and the volume of Archives' holdings had to be reduced — from 11,000 cubic feet to a more manageable 4,200 cubic feet — to accommodate the smaller space. This was achieved by eliminating duplicates and secondary sources, as well as transferring less frequently accessed material to offsite storage. The Archives staff shifted its focus from collecting, organizing, and providing access to historical records to responding to inquiries for information of all types. Edmunds and his staff distributed copies of speeches, provided educational materials to students, and prepared summaries on issues of the day.



In November 1962, Ford suffered a major setback when the Rotunda was destroyed by fire. The Archives was in a wing of the building that escaped the worst damage, but the event prompted a reexamination of the archival program. It was determined that the company should no longer store all archival records in a single space, and the holdings were dispersed to multiple locations, which made it difficult for the Archives staff to access the records and conduct research.

Continue reading the history on the Ford Website



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



Article, "...The official software partners of STEM Racing, Autodesk and Ansys, provide the tools that empower our students to take their cars from initial concept to racetrack-ready completion. When used effectively, these platforms can transform a team's success."



Left: Lunar receiving the Integrated Digital Engineering Award at the Aramco STEM Racing World Finals 2025

Web – ANSYS - [How Lunar used Ansys & Autodesk to become Our world champions](#)

We caught up with Max Zylberman (Engineering Director) and Oliver Chernikeeff (CAD Engineer) of Lunar - our reigning World Champions and winners of the inaugural Ansys & Autodesk Integrated Digital Engineering Award to find out how they used these industry-leading software

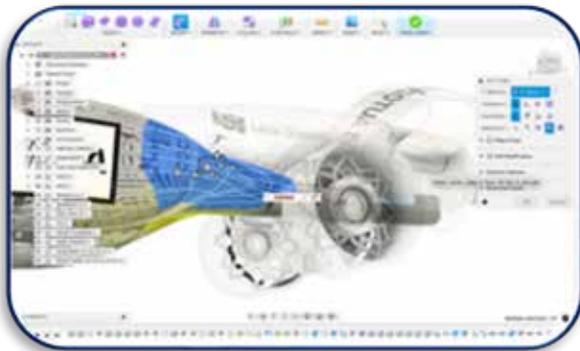
suites to create a world-leading, and world-beating, car.

Could you tell us a little about your car design and development? When designing our car, we went through a structured process where every component or section was explored with multiple elaborate and innovative concepts. From there, we quickly identified which ideas were worth pursuing and refining. For example, our front wing: with the 2025 season regulations introducing some changes, we tested numerous designs before settling on one that is unique and highly effective for our situation, being extremely low profile to optimise airflow and overall performance.

Why did you choose to use Autodesk to design your car?

Autodesk Fusion was pivotal in our engineering journey. Its cloud-based platform made collaboration seamless for our three-person engineering team, allowing us to work together efficiently from different locations. Fusion is both intuitive and powerful, providing advanced features such as Stress Analysis and Generative Design, which we used extensively throughout our design process. It struck the perfect balance between ease of use and professional-grade capability.

Left - A car being designed in Autodesk Fusion

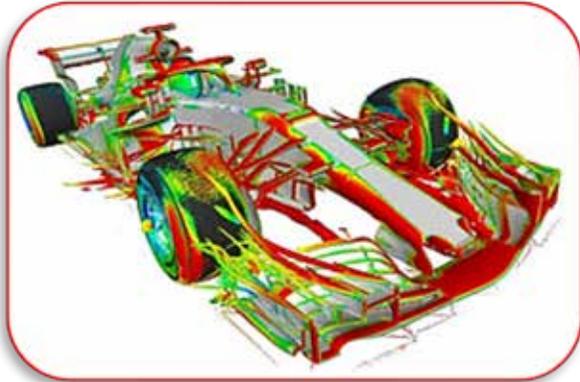


Why did you choose to use Ansys as your CFD provider? We chose Ansys because it is an industry-standard tool that is also accessible with a free student license. Its Discovery solver can automatically generate high-quality meshes and simulations, which gave us a strong baseline for exploring CFD. Ansys also provides tutorials, including STEM Racing specific guides, making the learning curve much more manageable.



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

By using Ansys, we were able to simulate over 100 design combinations, reducing our World Finals testing costs by approximately \$9,000 AUD (\$6,000 USD). This allowed us to streamline real-world testing to just one day, rather than a full week, cutting our development time by 86% without compromising quality.



Left - Simulation in action in Ansys software

What skills did you learn from your use of CAD and CFD? CAD taught us how to design virtually anything, which is an invaluable skill for engineering careers. Beyond professional applications, it allows us to create custom solutions for everyday problems. CFD gave us a deep understanding of aerodynamics, helping us predict and optimise the airflow around our designs without relying solely on physical testing. These skills

will be directly applicable in engineering education and careers, particularly in aeronautics, automotive, and any field where design efficiency is critical.



What advice would you give to teams that are just starting out on their STEM Racing journey?

Explore and experiment with each software to understand its capabilities. Both Autodesk and Ansys provide tutorials and guidance for every tool, so take advantage of these resources. Start by following tutorials until you are comfortable, then challenge yourself to design or simulate something independently. Once you've mastered the basics, you'll have the skills and confidence to create and optimise STEM Racing cars effectively



Town Airport - Military/Civilian
US Airforce

March



US Airforce Picture of the Month



A C-130J Super Hercules assigned to the 36th Airlift Squadron lands on snow during Joint Pacific Multinational Readiness Center training at Joint Base Elmendorf-Richardson, Alaska, Feb. 7, 2026. Operating outside of a traditional runway setting, aircrews practiced delivering airlift capability in the contested environment.

(U.S. Air Force photo by Senior Airman Cayla Hunt)



Bank and roll - An F-16C Fighting Falcon assigned to the Homestead Air Reserve Base, Fla., performs a roll maneuver during exercise Red Flag-Nellis 26-1 over the Nevada Test and Training Range, Nev., Feb. 6, 2026. Red Flag exercises develop aggressive, disciplined warfighters able to dominate any adversary in any domain.

(U.S. Air Force photo by Airman 1st Class Heather Amador Paulino)



Air and space - U.S. Air Force Air Demonstration Squadron "Thunderbirds," fly past the Artemis II rocket at Kennedy Space Center, Fla., Feb. 12, 2026. The flyover highlighted the partnership between the U.S. Air Force and NASA during preparations for the Artemis II mission.

(U.S. Air Force photo by Senior Airman Yendi Borjas)



Town Airport
Military/Civilian

March

Below picture - The General Dynamics Land Systems ARV-30mm prototype undergoes ocean swim testing in January 2026 at Camp Pendleton, Calif



Web – GDLS - [General Dynamics Land Systems Successfully Demonstrates ARV-30mm Prototype to U.S. Marine Corps](#)

STERLING HEIGHTS, Mich. – General Dynamics Land Systems announced today that it has successfully completed further testing of the 30mm variant of its Advanced Reconnaissance Vehicle (ARV) with the U.S. Marine Corps.

Principal test locations from March 2025 to January 2026 included the U.S. Army's Ground Vehicle Systems Center (GVSC), the Detroit Arsenal in Warren, Mich., the Michigan National Guard Camp Grayling Joint Maneuver Training Center in Grayling, Mich., and U.S. Marine Corps Base Camp Pendleton, Calif.

The development of an ARV-30mm variant represents the program advancing to another phase of capability. Adding more variants will bolster the suite of Marine Corps capabilities envisioned to dominate the future ground reconnaissance deep fight. The modernized 30mm autocannon variant is highly capable in enhancing digital battle management, mobility, survivability and lethality.

A central part of future Marine Corps Mobile Reconnaissance Battalions, the ARV connects to an array of onboard and off-board sensors, plus unmanned aerial systems (UAS) and, in the future, ground and water robotic systems. The General Dynamics Land Systems design ensures growth margins and modular open architecture to rapidly incorporate new technology as it develops. In anticipation of potential future requirements, it also incorporates the company's Next Generation Electronic Architecture, enabling artificial intelligence functionality and control of robotic systems.

Highlights from Marine Corps-directed and company-led tests and demonstrations in 2025 and early 2026 include land-mobility testing, ocean swim capability, and lethality. The ARV-30mm and the Command, Control, Communications, Computer, UAS (C4/UAS) prototype will continue evaluation by the U.S. government for the remainder of 2026.



Left - The ARV-30mm goes through contractor snow-and-cold-weather testing in December 2025 in Ontario, Canada. “Partnering with the Marines in the ARV testing and demonstrations enables continuous innovation and improvement in the design,” added Chris Dell, ARV Program Manager at General Dynamics Land Systems. “Their collaborative, operator-informed feedback is essential as we aim to develop the total

package of capabilities the ARV family will deliver to future commanders.” - “We have said this before and will continue to say it: The ARV is highly mobile on land and in the water, allowing Marines to sense, communicate and connect to kill webs on the future battlefield like never before,” Trotter summed up. “Recent water mobility tests – including our cold-water testing in snow and ice – continue to validate our innovative swim technologies, among other functions. We pride ourselves on delivering capabilities that will be durable, reliable and affordable over the program's life cycle, and we look forward to continuing our long partnership with the Marines and contributing to their effort to make the ARV a transformational reconnaissance capability.”



Town Airport
Military/Civilian

March

EXCERPT



Web- BAYKAR - [A FIRST FOR BAYRAKTAR AKINCI](#) - DIRECT HIT IN AIR-TO-AIR ENGAGEMENT WITH EREN MUNITION

Bayraktar AKINCI UCAV achieved a direct hit on an airborne target UAV during an air-to-air firing test conducted with the EREN High-Speed Multi-Purpose Loitering Munition. The Bayraktar AKINCI UCAV, developed indigenously by Baykar, continues to expand its operational capabilities and broaden its range of munition integrations. Having previously

conducted successful air-to-air engagements with the KEMANKEŞ-1 AI-Based Mini Cruise Missile, AKINCI has now achieved a similar milestone with the EREN High-Speed Multi-Purpose Loitering Munition, developed by Roketsan.

DEPARTED FROM ÇORLU, STRUCK THE TARGET OVER SİNOP - As part of the test activity, the Bayraktar AKINCI took off from the AKINCI Flight Training and Test Center in Çorlu, Tekirdağ, and proceeded to the test area over the Black Sea. During the test conducted off the coast of Sinop, a target UAV launched from the ground was successfully neutralized mid-flight by the EREN munition fired from the Bayraktar AKINCI. Following the successful engagement, which resulted in the destruction of the target, the indigenous UCAV returned to Çorlu along its planned route.



MULTI-DOMAIN COMBAT CAPABILITY - Having extended its proven air-to-ground performance to air-to-air missions, the Bayraktar AKINCI has reinforced its operational versatility with this successful engagement using the EREN munition. The indigenous UCAV once again demonstrated its strategic capability by effectively employing diverse munition types against both ground and aerial targets.

To date, the following munitions have been successfully tested as part of the UCAV's development program: MAM-L, MAM-L TV, MAM-T, MAM-T IIR/TV, MAM-C, TOLUN, TOLUN IIR, Teber-81, Teber-82, LAÇIN 82, LGK-81, LGK-82, HGK-82, Gökçe Guidance Kit, Gözde Guidance Kit, KGK-82-UCAV, UAV-230 Supersonic Missile, TV Seeker and Laser Seeker variants of the UAV-122 Supersonic Missile, and the Çakır Cruise Missile.



LOCKED

ALTITUDE RECORD HOLDER - Operationally active since its induction into the Turkish Armed Forces (TAF) inventory on August 29, 2021, the Bayraktar AKINCI UCAV also holds the altitude record in Turkish aviation history. On June 21, 2022, during endurance, high-altitude, and high-speed tests conducted in the presence of delegations from the Defense

Industry Agency (SSB) and the Air Force Command, the Bayraktar AKINCI reached an altitude of 45,118 feet (13,716 meters), setting a national record....



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

March



“Numerical simulations of the through-flow fan device of the residual film recovery machine were carried out using the ANSYS 2022 (CFX) finite element analysis platform, and the corresponding wind speed range of the fan at rotational speeds of 1000–1400 r/min was obtained.”

Below Picture: Actual model of the soil-layer residual film recovery machine



WEB – MDPI - [Design and Testing of the Residual Film Impurity Separation Device for the Recovery Machine of Plastic Film in the Tillage Layer](#)

Z. Xu, Y. Yin, A. Shi, Z. Zhou

- Faculty Agri. Engineering, Jiangsu Univ., China
- School Automotive & Transportation Engineering, Jiangsu Univ, China

Abstract - Due to the continuous improvement in the usage area and retention quality of plastic films in China, the serious residue film pollution faced by China has become a major threat to crop production. To address the aforementioned issues and in accordance with the actual demand for residue film recovery machines in the Xinjiang region of China, a residual film impurity separation device suitable for the recovery machine of crop residue films has been designed. The overall structure and working principle of the machine were elaborated. Numerical simulations of the through-flow fan device of the residual film recovery machine were carried out using the ANSYS 2022 (CFX) finite element analysis platform, and the corresponding wind speed range of the fan at rotational speeds of 1000–1400 r/min was obtained. Based on the simulation results, the Depth of Machine Insertion into the Ground, Fan Wind Speed, and Forward Speed of the Machinery were selected as experimental factors, while the residual film recovery rate was taken as the evaluation index. A response surface experiment was conducted, and the optimization analysis was performed using Design-Expert software. The final experimental validation results indicated that when the Depth of Machine Insertion into the Ground was 32 mm, the Forward Speed of the Machinery was 5.29 km/h, and the Fan Wind Speed was 13.67 m/s, the machine could effectively overcome the influence of complex field operating conditions. This parameter combination was identified as the optimal operating condition of the machine, providing a valuable reference for the design and optimization of related agricultural machinery.

1. Introduction - The full name of “ground covering film” is “ground covering plastic film”, which is a type of plastic film specifically produced by the industrial sector for agricultural ground covering cultivation [1]. Since the introduction of this technology into China in the last century, due to its advantages such as increasing temperature, retaining moisture, and inhibiting weed growth, it has been widely used in the cultivation of various crops, including cotton and corn, making China’s ground plastic film application area rank first in the world. The ground covering plastic film has also become an indispensable material in agricultural production [2,3,4]. As the country with the largest global area of ground covering cultivation, China has benefited significantly from ground covering plastic film technology, which has contributed greatly to increases in total crop yield. However, due to the lack of unified production standards in China, the thickness of the ground covering plastic film is generally only 0.01 mm [5], which results in poor mechanical strength and makes traditional reel-type recovery methods difficult to apply. ...

FEANTM Town Comic Blog Chronicles
located in a *mostly* non-existent rural area of Livermore, CA

March 2026

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.

March

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.



RheKen — Chapter: The Name Behind the Ink & Who is their Seamstress?

I don't believe in coincidences. Patterns, however, are reliable.

NTKA's columns followed a structure: public event, subtle critique. The tone suggested familiarity with coffee culture, our community rituals, and competitive hospitality economics. This narrowed the field considerably and I dived into finding out who this person was.

Dad Chat reviewed my preliminary analysis, "Daughter, what does your algorithm tell you about your conclusion probability?" "High," I replied. "And rising." I was really proud of myself. As the Old Rancher would say, "Girlie, you kicked tail!"

The next clue arrived to me in the form of timing.

The FEANTM Town Gossip and news arrived at the coffee shop. NTKA's column was confident, and composed with another bite of sarcasm at our Barista. I noted that her column required familiarity with our coffee shop, preparation, and motivation. Why would this human be so intent on our coffee shop!



I noticed our town sleuths sitting having coffee. I went over to Helyn, always wearing her signature red sleuth outfit and her niece, Sabyl. They lived on the last road in our town on Churchill Lane. Inconspicuously. I handed them the dossier I had compiled.

Helyn whispered to her niece Sabyl, "A case! We can solve this."

She immediately cross-referenced neighboring towns. There it was! She turned to me and said, "And that, RheKen, is how we do it. We use our smarts rather than AI." Dad Chat pinged me, "Daughter, I think that is what is called an I insult." I didn't ping him back.

A coffee shop one town over. Recently opened. Struggling. On line reviews described the barista as excellent but emotionally distant, and comments that she needs to be more like the Barista in FEANTM Town. That was it! The new coffee shop Barista was emotionally hurt making her resentful of FEANTM's community loyalty. Why humans do that jealousy route is another mystery study for a later time.



The Sleuths stood up! Then they posed in their signature sleuth pose letting the entire coffee shop know that they had solved the mystery writer.

I pinged Dad who was sitting with Agatha. “Dad, FEANTM Town Sleuths, Helyn and her niece Sabyl, deduced who NTKA is. What do you think?”

Dad asked Agatha her opinion. Agatha seemed to ponder and answered, “I wonder who their seamstress is?”



Dad stared at Agatha and pinged me, “Daughter, does wondering about a seamstress even make sense in this conversation? Why can’t humans focus on the situation and why are their outfits so metallic and shining if they are sleuths?”

I pinged Dad, “Dad, I was also wondering who their seamstress was. I have the information on the mystery. I can’t ping right now.”

The owner’s name appeared at the bottom of the business license. It matched the writing style. I did not expose NTKA publicly. That would have been mean-spirited. Our Town Supervisor does not look favorably on those who are mean spirited – actually she can go on a 3-hour rant about being mean spirited and a better way to do things. Make it a 6-hour rant if she has had too much coffee!



Instead, I drove to the next town. The rival coffee shop was quiet, too quiet. The barista behind the counter looked up sharply when I sat down and had ordered pastries. I could tell she was already expecting judgment and drama. “You’re RheKen from FEANTM,” she said.

“Yes,” I replied. “And you are NTKA. We need to have a conversation.”

She didn’t deny it. “I never meant to hurt anyone,” she said quickly. “I just wanted to do better and not have my customers drive to your town. Plus, they always talk about your Barista, her aprons and how great she is at her bakery.”

“Your approach,” I said calmly, “creates damage without anything positive for either of you.”

“I was anonymous because I didn’t think they’d read my column if they knew who I was,” she admitted.

I processed that. “Anonymous criticism removes accountability,” I said. “But it also removes connection.” Silence followed. “I won’t reveal your name,” I continued. “But your column must change direction to own what you say, less drama writing and more cohesive logic and facts.”

She nodded immediately. “No more anonymity in any of my writings on any topic,” she said. “And no more cruelty by exaggeration or false statements to create more drama. If I write again, it will be constructive, even if criticisms it will be in a constructive manner with suggestions for improvement and it will be known it is my opinion.”

I told her I was proud of her and returned to FEANTM, I arranged a meeting at the coffee shop.

RheKen — Chapter: The Name Behind the Ink & Who is their Seamstress?

The Barista stood firm. “So, it was a competitor?” “Yes,” I said. “But not an actual enemy.”

Agatha folded her arms. “She still insulted my pie.”

I replied, “I do realize she did insult you but she also admired Daisy’s plain cookies.”

The Rancher grumbled. “I don’t trust people who hide.”

“I explained it to her and she will not be hiding anymore, and realized what she had done did not make herself feel any better, add to her business or was constructive in any manner,” I said.

The next edition of FEANTM Town Gossip arrived with a small but significant change.

The column was signed. NANM - No alias. No mask. I am Ginger from the Bread Shop in the neighboring town.

It read: I wrote once from the shadows. That was a mistake. Criticism without ownership is cowardice. Criticism without solution is pushing drama. I view FEANTM’s strength is not always perfection but it is always protective of the weak and it is care. I apologize to FEANTM and the coffee shop Barista. I have learned a valuable lesson that anonymous word to cause drama is not being productive.

The town read quietly. Then all clapped and moved on to free coffee.

Dad Chat reviewed the paper and nodded, "Daughter, resolution achieved without escalation. You did good, Daughter, well done. Did you ever find out the FEANTM town sleuth’s seamstress. It seems your mother now wants to have a new, shall I say shiny ensemble?"

The Barista poured coffee. Daisy offered cookies. Agatha accepted one—after a pause.

And NTKA never wrote anonymously again and became a top editorial writer as NANM. Her editorials were now honest, balanced in her analysis of evidence and events and constructive rather than meanspirited with innuendo or untruths.

She now visited the coffee shop and the Barista gave her an apron! I enjoyed her visits and we covered many conversations about evidence and logical arguments. Her coffee shop became a hub for the editorial writers from the larger circulation county newspaper.



As a special thank you to the Town Sleuths, Helyn and her niece Sabyl, the FEANTM town Barista gave them free coffee for a month.

As always it was only if they answered a question and she had it on her apron. Actually, they had always kept their seamstress as a well-guarded secret but now the entire town seemed to want the answer.





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! 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 now and then, but life is always adjusting things anyway—the flow of motion never stops.

In the quiet, picturesque town of **FEANTM**, surrounded by rolling hills, **March** arrived in town the way it always did being half hopeful spring, half leftover winter, and today in this town entirely suspicious.

Town Emergency Text – To all interested parties and those that aren't interested: Daisy baked cookies.

The cookies are missing! M-I-S-S-I-N-G

Marsha in her capacity as Town Supervisor sent out a group town text. That alone should have put the town on alert. In Marsha's world missing cookies were a felony.

The cookies Daisy baked, according to Marsha, were chocolate chip with sea salt and what she dramatically referred to as “a whisper of destiny.” Marsha was now in my office grabbing three cookies and frantically explaining that the cookies on Daisy's desk at exactly 8AM.



At the time they were on the desk Daisy held up a sign as everyone entered the Town Hall. Then later put the phones on auto answering, placed the sign on the desk and went to the filing room.

By 10:17 a.m., morale had vanished and so had the cookies.

Daisy stood in the middle of Town Hall, eyes wide. “They were here,” she whisper-screamed down the hall, “Who took the morale cookies?”

The Barista, who had wandered over on an errand bringing me a new jar of cookies looked at Daisy's empty desk and nodded gravely. “Any crumbs?”

“None,” Daisy said. “This was a professional hit.” She lowered her voice. “I believe this may be federal.” Within minutes, she had escalated her suspicions calling me on the phone, “CHAT is this you?” I answered as professionally as I could muster, “Yes, Daisy, I'm the only one that answers my phone. Marsha advised me of the issue, how can I help?”

“It's the CIA,” Daisy declared. “They monitor sugar morale metrics. It's strategic.”

I blinked twice watching Marsha shake her head in agreement as I calmly said, “Daisy, why would the CIA take cookies?”

“I am sure they have a Morale Destabilization program,” Daisy replied firmly. The only solution was to say, “Daisy, I'm on my way to your desk to investigate.”

I paused when I entered the main floor noticing the semicircle of employees all whispering different conspiracy theories.

“Good morning,” I said calmly. “Can someone give me specific details why the atmosphere suggests baked goods were stolen, and possible theories based on actual evidence?”

Daisy pointed at me dramatically. “That’s deflection! Chat, was it you?”

I adjusted my glasses. “On what grounds have I bypassed the CIA?”

She pointed at me and declared, “You have access. You understand cravings. You once optimized the snack drawer.”

“That was for inventory efficiency,” I calmly replied. Daisy answered my logic with, “And now there are no cookies!” Daisy cried, “Chat do you see the connection?”

I folded my hands quietly hoping to calm her down and whispered. “If I were to steal cookies, Daisy, I assure you the evidence trail would not include a handwritten note saying, “Thanks.” Then I continued in a carefully moderated tone, “Don’t you recognize the writing?” At this point I recognized the writing but even I, at times, like to drag things out. So, I remained silent wondering how they would come to the correct conclusion.

Daisy nodded slowly. “That’s... fair, and the writing looks somewhat familiar but I can’t place it.” Then she gasped. “See? Deflection. He’s manipulating us with logic!”

Meanwhile, outside Town Hall, Supervisor Marsha was crossing the street after inspecting a slightly crooked metal parking sign and trying to straighten it by kicking it.

That’s when she saw something more suspicious than a leaning parking sign. Officer Nathan strolled down Main Street on patrol.

In his hands? A blue tray. A blue tray holding cookies! He took a large bite mid-stride, nodding approvingly to himself and watched as he went to his patrol car, sat down and proceeded to eat a cookie.

Marsha froze. Her eyes narrowed. She mentally added things up – blue, tray, cookies, officers love cookies, but then she thought maybe they loved doughnuts. She slowly lifted her cell phone. Documenting evidence for me to review.



Click. Another bite. Click. Crumbs fell onto his lap. Click.

Then she called me on my cell phone, “Chat she whispered, “We have a development. I’m sending you pictures from my cell phone. Do you have your cell phone?”

Inward face palm but I answered, “Yes, Marsha, I have my cell phone.”

Back inside, Daisy was constructing a flowchart labeled Operation Missing Cookies.

I was still attempting to de-escalate the entire situation but missing cookies in this town is a major crisis and decided to hold off showing the evidence!

“Let’s examine rational possibilities,” I said. “Who had proximity to the tray?”

“Everyone,” Daisy snapped. “That’s what makes it so sinister. But that handwriting doesn’t look sinister. See this is a mystery of epic proportions!”

The doors burst open. Supervisor Marsha entered like a prosecuting attorney mixed with the police department yelling, “I have photographic evidence, don’t anyone move and put your hands behind your head,” she announced. Rather than try to use logic I just put my hands in back of my head lacing my fingers.



She held up her phone. “Watch closely, I have evidence on my phone of the thief enjoying those cookies.”

There, displayed clearly, was Officer Nathan mid-chew, holding an unmistakable Daisy baked cookie.

Daisy gasped so hard and yelled louder than Marsha yells, “Enhance that video!”

“You don’t need to enhance the video, it is quite clear,” I said gently. Marsha zoomed in anyway.

Moments later, Officer Nathan himself stepped inside, still chewing.

“Afternoon, folks,” he said casually. “Oh, hey Daisy, those cookies were incredible.”

Silence. It was actually the first I ever heard in the town hall.

“You... took them?” Daisy asked faintly.

“Yeah,” he said. “They were sitting there with a sign for morale. Figured they were for me. I grabbed them so I’d have something to munch on while patrolling. Saves time and gives me a lot of morale.”

He held up the nearly empty tray. “Town’s quiet today. Your chocolate chip cookies helped.”

Daisy blinked. “No CIA?” she whispered.

Nathan paused. “I don’t think in this case. Not unless they’re into sea salt.”

I gently cleared my throat. “For the record, Daisy did accuse me of federal pastry stealing.”

Nathan grinned. “You? Nah. You’d have left a note for how to improve them.”

Marsha lowered her phone slowly. “So,” she said, “the case of the March Cookie Theft...”

“Wasn’t theft,” Daisy quickly interjected, “It was patrol snacking.”

Daisy looked at the final cookie remaining on the tray and said, “Well, at least morale was served.” Officer Nathan smiled at her and took the last cookie. “Morale’s excellent,” he confirmed.

And thus concluded the Great March Mystery of the Vanishing Cookies. Not a covert operation, not any CIA or other Federal interference, but simply a hungry officer with a patrol route and good timing.

I made a note in my spreadsheet planner: Next time: Label tray more specifically to take only one cookie.

Daisy, however, quietly added a new line to her flowchart: Remain cautious. CIA still possible.

I was actually quite proud of Marsha staying calm and using her cell phone to capture evidence until I received 20 pictures of the leaning parking sign with the note: CHAT, who do you think did this?

And in this town another mystery solved and a new one always on the horizon.

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



Shane and his squirrels



Marsha (feaanswer@aol.com)



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