FEA - CAE Not to Miss & More

JULY 2025 ISSN 2694-4707

Town Hall Meeting in the town that mostly exists

Town Plaza: Drive slowly – Galloping Prohibited

Airport - JPL

Airport - Bayraktar

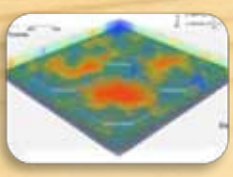
Auto –Tor Vergata

Racer-UTA

Marco - RBF

Madhukar - CADFEM

Metin - OZEN



Suraj - CADFEM

Abhinav MyPhyscisCafe

Marta – OASYS

Mi&Ke – Nightly News

Jenson – DFE Tech

Brianna - LLNL

Jeff - SIEMENS

Brent – GOENGINEER

FEANTM Outdoor Theater

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

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Future editions of FEANTM will no longer include information about your company.

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

CADFEM · OFETECH · d3VIEW · OZEN · ENGINSOFT · AUTODESK · Oasys · DYNA MORE · DYNAlook · Ansys · Applus DatapointLabs · rescale

Town Hall & Library

Lawrence Livermore National Laboratory

rbf · MEDITATE · rbf.LAB · LIVGEMINI

The Old Rancher

Race Track

Airport

Sports Stadium

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

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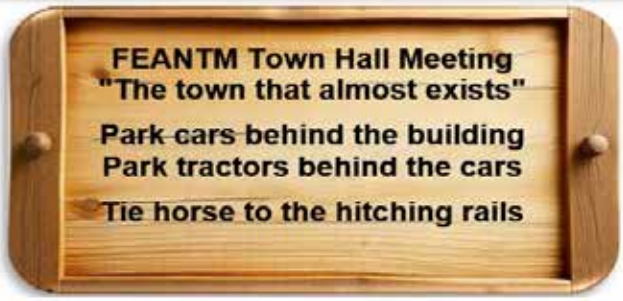
Welcome to our County, Town Hall Meeting & Announcements

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



Announcements from residents not to miss

Marta: Article Oasys22 is now available & further strengthens the suite's leading position in the market by offering complete Ansys LS-DYNA support

Madhukar: Multiphysics analysis for satellite components to ensure the reliability of a satellite communication antenna

Metin: Article by Ian Chavez, Spacecraft Charging & ESD: How Simulation Prevents Million-Dollar Failures

Marco: Article - doctoral research of Ubaldo Cella, Setup and Validation of High Fidelity Aeroelastic Analysis Methods Based on RBF Mesh Morphing …

Curt: Article - by Emily Suzuki, "With advances in design and 3D CAD software, prototypes can now easily come alive on a computer screen.

Jenson: Discover how to take full control of your simulation process with ANSYS Parametric Design Language (APDL) with Dr. Ts. Mohammad Hazim, Application Engineer.

Abhinav: Article - Connecting with courses and free resources from industry leaders to boost your skills, knowledge and confidence.

Jeff: Article - End-to-end virtual verification & validation of vehicle automation systems
By - Eva Moysan.

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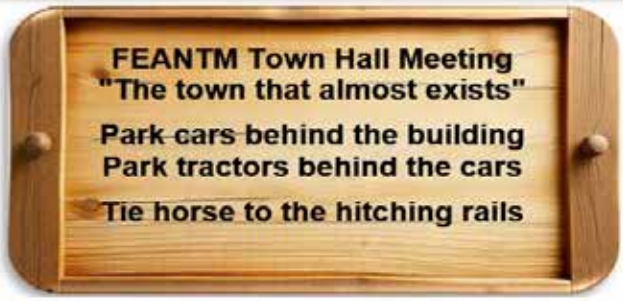


Welcome to FEANTM+

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.

Hello, everyone, and welcome to the July edition of FEANTM. This month, on July 4th, the USA commemorates Independence Day with celebrations, picnics, and lots of fireworks. I wish those of you who celebrate this holiday a wonderful 4th of July and a long, relaxing weekend.

As usual, we have a wealth of interesting articles and information for your review:

- For those of you who are motorcycle enthusiasts, there is an article on the Protective Performance of Modern Motorcycle Helmets.
- Have any of you ever wondered about the complexity of bleach? If you have, we have an article addressing 'What is Clorox Bleach?'
- For those who love nature, Sabyl has shared the Livermore Barn Owl Nest box camera, showing owlets being born.

The Town Library is expanding its reading materials. This month, it features a new book (not engineering) by a young author who we recognize will go places in the future with her imagination and writing - E. Forth titled “Sleying the Loom.”

Our research section offers an interesting article on heart stents. Suraj Dhomase – CADFEM APAC Advancing Cardiovascular Treatment: How LS-DYNA Powers High-Fidelity Stent Simulations

For those of you who follow the comings and goings in The Town, RheKen is busy at work checking out Agatha’s Bakery Budgeting book, and the plot thickens.

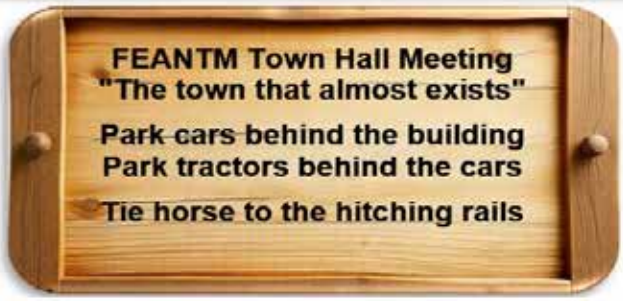
The old rancher has expanded his unique metal works menagerie with a beautiful butterfly and dragonfly. It's amazing how he turns found objects into lovely pieces of art.

I hope you enjoy reading this July FEANTM as much as we enjoyed putting it together for you.

Thank you for being part of the FEANTM+ community.
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



Okay, who yelled, "OH NO, the supervisor has her own page!"
Yes, it's true. SO, join me as I drive my tractor around the internet and live in the town that almost exists. (it's located near Livermore, CA)

I was advised to use "call-to-action" words, such as "Explore," "Get Started," or "Discover." TA DA DA (bugle) to prove you can teach this old dog new tricks: My try at it:

"YO, yes YOU, "get started," and grab that coffee cup before you "Discover" that it's all gone, and you will "Explore" FEANTM news without coffee. You will be staring into an empty cup." SO proud of myself.

A round-up of what's going on with a few residents in the town this month

Mi & Ke, coyote & raccoon, are hanging out at the **new video section** on the Ozen website.

Brent is buying equipment to try and **learn how to 3D SCAN an F1 Car** with a Phone and a Professional 3D Scanner (Brent - GoEngineer)

Madhukar is concentrating on showing us a complete analysis to ensure the reliability of a **satellite communication** antenna (Madhukar - CADFEM)

Don't miss Marco sharing that the **first software module by LivGemini** is developed and merges artificial intelligence with computational modeling (Marco – Research Hospital)

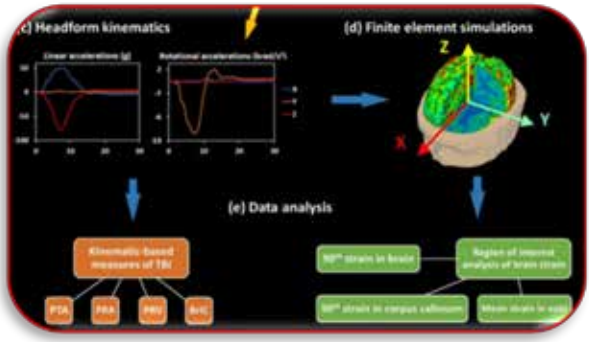
Driving my tractor I have no tolerance for sparks! And I learned that sparks are also dangerous in space. **"…in space… there's no such thing as a harmless spark.** (Metin - Ozen)

I hate earthquakes! Well lucky for me there is now the online tool that maps measurements and enables non-experts to understand earthquakes, subsidence, landslides, and other types of land motion. (Airport - JPL - **NASA's Ready-to-Use Dataset Details Land Motion** Across North America

TA DA DA – At the new outdoor theater is "**Rocket Lab** - 'Get The Hawk Outta Here' Launch"

AND the above is my gossip for the month

Paper quote, "We assumed that the human skull is rigid due to its small deformation in helmeted impacts. The three translational and three rotational accelerations measured in helmet experiments were applied to the skull at the centre of gravity of the head. The first 30ms after initial contact was simulated, which was enough for the brain to experience the peak strain. The simulations were conducted using the nonlinear hydro-code LS-DYNA R11.27….."



Excerpts – Web NCBI - [The Protective Performance of Modern Motorcycle Helmets Under Oblique Impacts]

X. Yu, I. Logan, I. P. Sarasola, A. Dasaratha, M. Ghajari

Dyson School Design Engineering, Imperial College London, South Kensington, UK

Dept Mechanical Engineering, Imperial College London, South Kensington, UK

(c) For each test, three translational and three rotational acceleration time-history data were recorded with the HIII headform. (d) These acceleration data were then applied to a detailed finite element model of human head to determine the brain strains. (e) Finally, we performed data analysis on the kinematics-based injury metrics, calculated from the acceleration data, and the brain strain in the entire brain and key regions: sulci and corpus callosum.

EXCERPTS Abstract - Motorcyclists are at high risk of head injuries, including skull fractures, focal brain injuries, intracranial bleeding and diffuse brain injuries. New helmet technologies have been developed to mitigate head injuries in motorcycle collisions, but there is limited information on their performance under commonly occurring oblique impacts. We used an oblique impact method to assess the performance of seven modern motorcycle helmets at five impact locations. Four helmets were fitted with rotational management technologies: a low friction layer (MIPS), three-layer liner system (Flex) and dampers-connected liner system (ODS). Helmets were dropped onto a 45° anvil at 8 m/s at five locations. We determined peak translational and rotational accelerations (PTA and PRA), peak rotational velocity (PRV) and brain injury criteria (BrIC). In addition, we used a human head finite element model to predict strain distribution across the brain and in corpus callosum and sulci. We found that the impact location affected the injury metrics and brain strain, but this effect was not consistent. The rear impact produced lowest PTAs but highest PRAs. This impact produced highest strain in corpus callosum. The front impact produced the highest PRV and BrIC. The side impact produced the lowest PRV, BrIC and strain across the brain, sulci and corpus callosum. Among helmet technologies, MIPS reduced all injury metrics and brain strain compared with conventional helmets. Flex however was effective in reducing PRA only and ODS was not effective in reducing any injury metrics in comparison with conventional helmets. This study shows the importance of using different impact locations and injury metrics when assessing head protection effects of helmets. It also provides new data on the performance of modern motorcycle helmets. These results can help with improving helmet design and standard and rating test methods.

Introduction - Motorcyclists are at high risk of injuries in road traffic collisions. The 2019 annual report of road casualties in Great Britain shows that the fatality rate per passenger mile for motorcyclists is 65 times larger than car occupants.49 The same report highlights that the number of motorcyclist fatalities have fluctuated between 319 and 365 over 2011 to 2019, without indicating a clear trend. According to the US government in 2019, 5014 motorcyclists died on the roads, accounting for 14% of all vehicle crash deaths of the year while motorcycles form only 3% of all registered vehicles.2 Traumatic brain injury (TBI) is the leading cause of death and disability in motorcyclists.42 In motorcycle accidents, the head can impact another vehicle, infrastructure or road surface at high speeds, leading to skull fractures, intracranial bleeding and diffuse axonal injuries (DAI). A recent analysis of Great Britain's Road Accident In-Depth Studies (RAIDS) database showed that of the 267 motorcyclists involved in collisions between 2013 and 2020, 8.3% sustained a skull fracture, 3.7% sustained a subdural haematoma, 10.1% sustained a subarachnoid haematoma and 9.4% sustained a focal brain injury.6 The analysis did not report the rate of DAI as the clinical data in RAIDS are based mainly on CT imaging, which often misses diffuse axonal injuries.6,46 The vast majority of the motorcyclists wore a helmet as mandated by law.

Helmets are the only equipment that can protect the head in motorcycle collisions. The main function of helmets is to absorb the energy of the impact and reduce the impact force and translational acceleration of the head. Reducing the contact force can greatly reduce the risk of skull fractures and associated intracranial bleeding.39 In addition, reducing the translational acceleration of the head during impacts can help with reducing focal brain injuries.38,51 Impact forces, however, can also produce head rotations, which are shown to produce diffuse injuries and subdural haematoma (SDH).14,40 However, mitigation of head rotation has not been an objective in helmet design until recently.

New helmet technologies are now available in the market, which are designed to manage the rotational motion of the head during head impacts.1 Figure 1 shows three popular technologies: Multi-Directional Impact Protection System (MIPS), Flex (three-layer impact liner) and Omni-Directional Suspension (ODS). MIPS is a slip-plane layer between the EPS (expanded poly styrene) liner and comfort liner. This low friction layer is designed to allow rotational movement between the head and helmet during impact, which potentially reduces the transfer of rotational energy to the head.26 The Flex impact liner is made of three layers with different energy absorbing materials: EPS for outer layer, EPO (Expanded Polyolefin) for the middle layer and EPP (expanded polypropylene) for the inner layer. According to the manufacturer, this progressive layering technology aims on reducing both translational and rotational impact energies.50 During oblique impacts, the middle layer of the liner is supposed to act as a slip zone between the outer and inner layer and reduce the rotational energy transferred from the helmet to the head. The ODS technology has two layers of EPS liners connected with dampers.28 In the 6D helmet (model: 6D-ATS1), there are 27 dampers connecting the outer and inner EPS liners. The manufacturer suggests that the elastic properties and shape of the dampers allow the inner liner to displace and shear within the outer liner during impacts and mitigate rotational movement of the head. Although the manufacturers have claimed that their technology can mitigate brain injury, the performance of motorcycle helmets fitted with these new technologies are yet to be assessed.

Accident data show that the majority of motorcycle head collisions are oblique, i.e. the impact speed has a component tangential to the impact surface.17,44 One study reconstructed 56 motorcycle accidents and reported that the average head impact angle, defined as the angle between the head impact velocity and impact surface, is 44°.10 A recent study investigated the effect of head impact angle on brain deformation.45 Their results showed that a head impact angle of 30° to 45° produces larger brain strains predicted by using an FE model of the human head than other angles. Two recently released motorcycle helmet test standards have adopted a 45° anvil for oblique impacts, where the

rotational acceleration is measured.13,18,21 The ECE22.06 motorcycle standard oblique impact test method requires dropping the helmet fitted onto the EN960 headform onto a 45° anvil at 8 m/s.18 The ECE22.06 standard requires two helmet samples to be tested at five locations, rotating within the transverse plane. The Fédération Internationale de Motocyclisme (FIM) has also introduced an oblique impact test in their Racing Homologation Programme (FRHP) for motorcycle racing helmets.21 This oblique impact test is identical to the ECE22.06 method, except that the EN960 headform is coated with a layer of platinum cure silicone. This layer of coating increases the coefficient of friction between the helmet liner and headform from 0.16 to 0.78.21,55 Most recently, a French organization released the Certimoov helmet test rating for both bicycle and motorcycle helmets.13 Certimoov also uses an oblique impact test using a 45° anvil and 8m/s impact speed. It includes three impact locations, each producing dominant headform rotation about one of the anatomical axes of the head. In addition, it uses a Hybrid III headform. Despite the introduction of these oblique impact test methods, there is still limited information available regarding the performance of motorcycle helmets, particularly those fitted with new technologies, under oblique impacts. In addition, the effects of impact locations on injury metrics during oblique impacts on motorcycle helmets remain unknown.

In this paper, we studied the response of several modern motorcycle helmets under oblique impacts at five different locations. Our first aim is to determine the head and brain protection performance of the helmets using injury metrics based on translational and rotational motion of the head and brain tissue response based on finite element analysis. Our second aim is to determine whether the impact location affects helmet's performance and whether this effect is consistent across injury metrics. Our third aim is to test if motorcycle helmets fitted with rotation management technologies can better protect the head and brain under oblique impacts compared with conventional helmets.

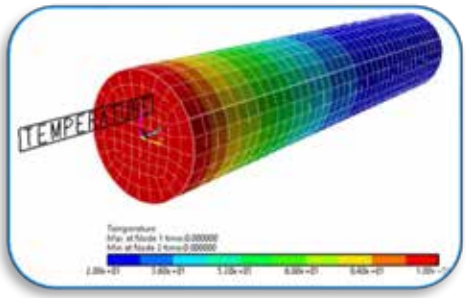
Methods - Motorcycle Helmets - We selected 7 commercial motorcycle helmets, available in the UK market. Their details are listed in Table 1. The size of the helmets was chosen to fit head circumferences of 57–58 cm. Three helmets do not include any specific technology for mitigating head rotation, which are categorised as conventional helmets and serve as baseline. The other four helmets have incorporated three rotational technologies: two helmets have MIPS; one helmet has the Flex impact layer and one helmet has ODS (Fig. 1). The two helmets with MIPS technology have their corresponding versions without MIPS. 6 samples of each helmet were purchased.

Five helmets have shells made from polycarbonate, with prices less than £260. Helmets with MIPS are £30 more expensive than their non-MIPS version. The helmets fitted with Flex and ODS technologies have shells made from carbon fibre reinforced polymer (CFRP) composites, bringing the price to over £400. Five out of seven helmets have been rated by the Safety Helmet Assessment and Rating Programme (SHARP), the motorcycle helmet rating program introduced by the UK Department for Transport in 2007.

Oblique Impact Tests - T**he oblique impact tests were conducted with the drop tower helmet test rig at the Human Experience, Analysis and Design (HEAD) lab, Imperial College London. The rig was designed to perform both linear and oblique impacts on different types of helmets, e.g. motorcycle, bicycle, ski etc.** We followed the oblique impact test method recently introduced in the ECE22.06 motorcycle helmet testing standard to conduct the tests,11 except that we used a Hybrid III (HIII) 50th percentile male dummy headform. The mass and the circumference of the headform is 4.54 kg and 57.2 cm, respectively.30,35 This headform has been used in a number of previous studies as its mass and moment of inertia better represents the 50th percentile human head.1,29,57…

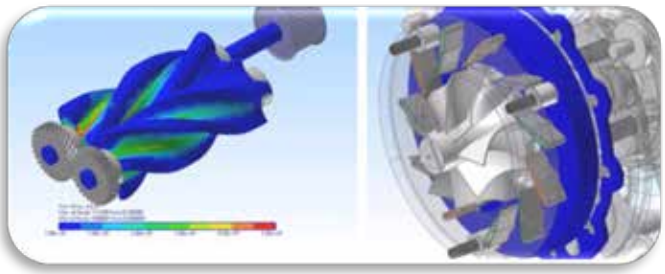
Student	**I want to design bicycles.**
Bart R.	**It's important to have brakes working on all bicycles.**
Student	**My dad just fixed disc brakes.**
Bart R.	**Then I'll teach you additional with a simulation.**

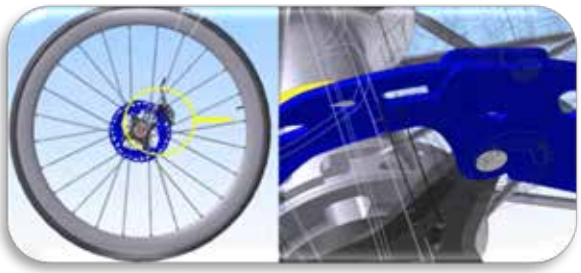
Web – YouTube – RecurDyn - RecurDyn is a Computer-Aided Engineering (CAE) software focused on Multi-Body Dynamics (MBD) simulation, with a strong emphasis on flexibility and multiphysics capabilities.

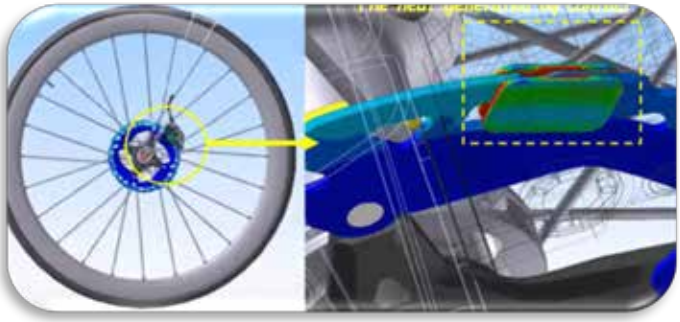


Simulation of Bicycle Disc Brakes Considering Friction Heat - Check out the short simulation of bicycle disc brakes considering friction heat.

Explore how RecurDyn enables comprehensive thermal analysis of bicycle disc brakes, considering heat conduction within bodies and heat generated by friction.







LLNL Quote – "Together, LLNL's 14 systems on the TOP500 — more than any other site — reflect LLNL's unmatched depth in HPC, from next-generation exascale platforms to workhorse machines critical for national security, AI research and scientific discovery."

Web – LLNL - **El Capitan reigns supreme across three major supercomputing benchmarks**

Jeremy Thomas

Lawrence Livermore National Laboratory's (LLNL) flagship exascale machine El Capitan maintained its status as the fastest supercomputer on the planet — claiming the No. 1 spot on not just one, but three of the most prestigious high-performance computing (HPC) rankings.

In the 65th edition of the TOP500 List, released June 10 at the ISC High Performance conference in Hamburg, Germany, El Capitan reasserted its position as the world's most powerful supercomputer, repeating its 1.742 exaFLOP performance on the industry-standard High-Performance Linpack (HPL) benchmark.

The ranking reaffirmed the United States' and Department of Energy's dominance in HPC, which includes Oak Ridge National Laboratory's Frontier (No. 2) and Argonne National Laboratory's Aurora (No. 3). All three DOE systems remain the only supercomputers in the world to be verified at exascale — machines capable of reaching more than a quintillion calculations per second — on the benchmark.

For the first time, El Capitan also topped the High-Performance Conjugate Gradient (HPCG) benchmark, achieving 17.41 petaFLOPS — a complementary performance metric that reflects the complex, memory-intensive workloads typical in real-world science and engineering applications. Additionally, El Capitan debuted at No. 1 on the HPL-MxP (formerly HPL-AI) benchmark, with a stunning 16.7 exaFLOPS of performance using mixed-precision AI techniques.

Funded by the National Nuclear Security Administration's (NNSA) Advanced Simulation and Computing program, El Capitan supports the Stockpile Stewardship Program and NNSA's mission of ensuring the nation's nuclear deterrent is safe, secure and reliable. It performs critical calculations and modeling and simulation tasks for the NNSA Tri-Labs: LLNL, Los Alamos and Sandia National Laboratories.

"This isn't just a win for Livermore — it's a win for national security, the NNSA enterprise and the future of AI-assisted scientific discovery," said Bronis R. de Supinski, chief technology officer for Livermore Computing. "El Capitan is delivering exactly as designed: fast, flexible and optimized for the world's most demanding workloads."

Built by Hewlett Packard Enterprise (HPE) and powered by AMD Instinct MI300A APUs (Accelerated Processing Units), El Capitan became the third DOE supercomputer to break the exascale barrier in Nov. 2024 and remains the fastest system ever benchmarked.

Boasting more than 11 million cores and over 44,000 APUs, El Capitan also delivers 58.9 gigaFLOPS (GFs)/watt of energy efficiency — earning the 26th spot on the latest GREEN500 List of most energy-efficient systems worldwide and a TOP500 “honorable mention,” along with ORNL’s Frontier, for demonstrating the ability to “achieve immense computational power while also prioritizing energy efficiency.” LLNL’s rzAdams was the highest-ranked DOE supercomputer on the GREEN500 (15th) at 62.8 GFs/watt.

Tuolumne, an unclassified companion system to El Capitan, also maintained its status among the world’s elite systems. Built by HPE and comprised of the same AMD Instinct MI300A APUs as El Capitan, Tuolumne is now ranked No. 12 on the TOP500 and is a crucial platform for open science applications, including AI-assisted fusion research, materials science, earthquake modeling and drug discovery.

In addition to El Capitan and Tuolumne, a dozen other LLNL systems earned spots on the June 2025 TOP500 list, emphasizing the Lab’s broad, powerful computing ecosystem and continuing legacy of excellence in HPC.

The list includes machines:

- Sierra (No. 20),
- rzAdams (63)
- Lassen (88),

along with computing clusters:

- Bengal (187),
- Dane (189),
- Ruby (310),
- Magma (348),
- Jade (454)
- Quartz (455).

Three El Capitan early-access systems are also listed under LLNL’s banner:

- rzVernal (231),
- Tioga (257)
- Tenaya (337).

Town choice on GOENGINEER YouTube:

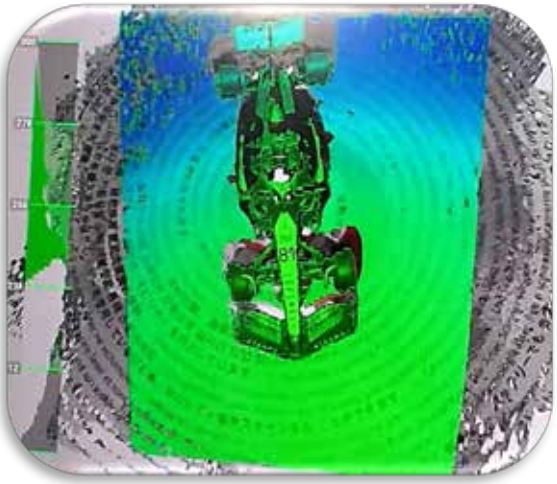
Excerpt, “F1 is exploding in popularity in the United States, so we wanted to test an idea: "Can you accurately 3D scan a model F1 car using a phone?"

Web – Goengineer - YouTube - [We 3D SCANNED an F1 Car with a Phone and a Professional 3D Scanner]

We used the McLaren MCL60 model car and took it to our friends at Artec 3D to try their scanners.

First, we tried using Photogrammetry, a feature that lets you create a 3D scan from a video or a set of images.

The results weren't quite what we were hoping for, though it's a great option when the dimensions and CAD information are less critical. **Then, we tried the Artec Spider 2, a new scanner that Artec recently released to the public. This time, we got incredibly accurate 3D scan data that would be perfect for reverse engineering anything you can find.**



Ranches are like living in a Petry dish! Mice, Rats, Squirrels, fungus, bacteria, bugs, spiders that bite, mold, mildew, and on and on, depending on the season. AND I have to wash & disinfect working ranch clothes. Hmm, does our ranch coyote have ticks & fleas?

Web – Clorox - They explain, "What is Clorox bleach?" Yes, I know that you engineers and chemists already know the answer, but I didn't. No, I'm not adding a 6th C for Clorox. **You can see I use a lot of Clorox on the ranch. Looking at my shelf, I thought - I love that Clorox, but what exactly is it?** They are in Oakland, CA., which is a few towns over from FEANTM Town, and they had a page on what Clorox Bleach is. So 'let's tractor on over to their website and I'll share some information I learned!

Excerpts: What Is Bleach and What Are Its Active Ingredients? ...**bleach is a product many people have heard of, yet don't know much about. We want to change that, starting at the top with sodium hypochlorite.**..

The bleach active in Clorox® Bleach is sodium hypochlorite (NaOCl). Historically, our bleach was made in a simple process produce sodium hydroxide (NaOH) and chlorine gas (Cl2); these two products are then combined, producing sodium hypochlorite bleach. In fact, The Clorox Company's headquarters has always been in Oakland, California where the company founders first used the salt water from San Francisco Bay to make bleach! Once it encounters organic material (like dirt) or heat or sunlight, bleach very rapidly breaks down into salt (NaCl) and water, where it all began. Where bleach comes from, starting and ending as salt water, is a big part of what makes bleach environmentally friendly.

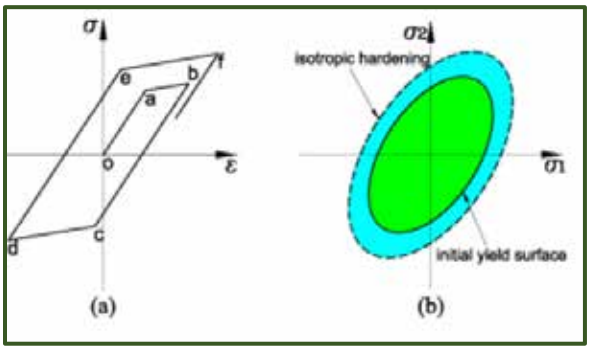
Other important bleach ingredients - The right formulation makes all the difference - Sodium hypochlorite works best when it's part of a complete formula with ingredients to enhance the bleach active. In addition to sodium hypochlorite and water, small amounts of sodium chloride, sodium carbonate and sodium hydroxide are included for product stability and to maintain pH.

Sodium chlorate is naturally present in small amounts as an intermediate molecule during the natural breakdown of bleach to saltwater. Polyacrylic acid is included as an anti-redeposition agent. And finally, a polyelectrolyte complex improves brightening.

How does bleach work? … - Sodium hypochlorite hydrolyzes double bonds, breaking up soils and stains to make it easier for the laundry detergent to do its job getting clothes clean. That's why adding bleach along with your regular detergent doesn't just sanitize the laundry; it also gets clothes cleaner …. For household disinfection, sodium hypochlorite's ability to denature proteins makes it highly effective at killing bacteria, viruses and fungi….Clorox® Disinfecting Bleach should always be diluted with water first before using….Be sure to allow the solution enough time to work, leaving it on surfaces for the necessary amount of time, and rinsing if required. And finally, bleach products have a one-year shelf life when stored in a cool dry place away from direct sunlight.

That is among what I've learned about properly disinfecting my barn, clothes & tools!!!

First, Hi Li, & Hi Al. Now. I will quote from the paper, "In this study, **an efficient LS-DYNA implementation** of the phase field modeling of ductile fracture is presented and both with and without the split of elastic strain energy have been considered for the damage evolution.



Web – IOPScience - Phase field modeling of ductile fracture with isotropic hardening and radius return method - Li Meng and Ala Tabiei

Dept .of Mechanical & Materials Engineering, Univ.of Cincinnati, United States of America

Published 17 June 2024 © 2024 The Author(s). Published by IOP Publishing Ltd. Modelling & Simulation in Materials Science & Engineering, Volume 32, Number 6

Abstract - Phase field model has been investigated for brittle fracture in many static and dynamic scenarios, but its applications to ductile fracture is not as common as brittle fracture, especially implementing in software LS-DYNA with explicit scheme.

In this study, an efficient LS-DYNA implementation of the phase field modeling of ductile fracture is presented and both with and without the split of elastic strain energy have been considered for the damage evolution. In more detail, plasticity formulation of ductile material with isotropic hardening is briefly presented first and then the governing equations of the classical phase field model are derived, which gives the displacement-phase coupled problem. For with the split of elastic strain energy, the shear component of elastic strain energy is considered for the damage evolution. The influence of degradation function on stress–strain curve is also investigated by using three kinds of function (polynomial function, algebraic fraction function and sigmoid function), which leads to linear and nonlinear finite element method (FEM) formulation of the phase field model and Newton–Raphson method is used to solve the nonlinear FEM formulation of the phase field model. A tensile bar test shows the influence of critical energy release rate and degradation function on stress–strain curve. Mode **I** failure of three-point bending test, Mode **II** failure of single-edge notched plate and mixed-mode failure of asymmetrical double-notched plate verify the proposed model in this study. From these simulations, with the split of elastic strain energy shows improvements on plastic deformation than without the split of elastic strain energy.

Website article by Emily Suzuki, “With advances in design and 3D CAD software, prototypes can now easily come alive on a computer screen. Modern workflows have ushered in a new class of richly functional applications that have redefined what can be designed in a given length of time. 3D modeling has resolved many shortcomings associated with outdated processes and has increased functionality across design teams. Let’s explore a few ways in which 3D modeling and 3D CAD software have vastly improved the design process.”

Web – Autodesk - 4 Reasons 3D Modeling Software Is an Important Tool for Product Designers - Emily Suzuki

1. Costs savings - Traditional 2D modeling makes it difficult to get a true feel for a design’s form factor during the prototyping stage of design. This forces product designers to manufacture prototype after prototype to reflect every noteworthy design change.

Thus resulting in heavy resource costs, which magnify at scale when developing multiple products simultaneously. Ultimately, companies would likely prefer to save these raw materials for actual production.

3D modeling breathes life into the prototyping process. Designers can manipulate their models and inspect them from every angle in a digital environment before producing a physical prototype. Teams are no longer restricted to “flat” design, making it much easier to evaluate tweaks without expending resources.

2. Quick flaw recognition - Spotting design weaknesses becomes much easier when people can apply other layers (and tests) to designs in real time. Take stress mapping, for example, where colored topography highlights areas of concern. This is key for products exposed to different stressors like heat, pressure, and torsion.

Today’s designs incorporate a variety of different geometries—complex shapes are the new norm.

Unfettered inspection of models allows product designers to inspect every nook and cranny of a design, ensuring each imperfection is identifiable and correct for the next iteration.

3. Ease of use and efficiency - Digital design makes it easy to quickly apply a host of changes to each iteration, which usually involves only a click, selection, or toggle. The improved visualization offered through 3D modeling allows the user to preview these changes from all perspectives, making it easy to verify physical and functional changes and sharpen aesthetics.

While traditional 2D designs are cumbersome and take longer to make, 3D modeling allows the production of newer versions in under 15 minutes (especially with tools like configurations in Autiodesk Fusion). The exceptional user-friendliness of CAD tools like Fusion reduces the software learning curve, keeping teams agile and reducing training time.

4. Unparalleled detail and accuracy - 3D models let teams construct any shape imaginable while retaining production capability and help visions come together with relative ease.

3D modeling provides a level of design depth that rough sketches or 2D designs cannot, such as improved control over details.

On the collaboration side, meticulous details make it easier to convey the specifics behind a given design. Design teams are no longer in silos. With tools like Fusion, they can easily communicate with other teams and stakeholders in real time. 3D models also let teams inject more detail, thus helping everyone stay on the same page from idea to production.

Why Autodesk Fusion?

- 3D tools are inherently modern, and remote work is the hallmark of the modern age.
- Intuitive, user-friendly solutions like Fusion allow team members to communicate from afar — via real-time collaboration tools like commenting, annotations, and more.
- Being out of the office doesn't mean team members have to be out of the loop.
- Cloud software lets you pump out design after design without being constantly at your desk.

Website Article Quote, "Road vehicle automation functions, both in the field of advanced driver assistance systems (ADAS) as well as automated vehicles (AVs), require extensive testing for verification of the requirements and validation of the resulting functionality. In particular 'safety of the intended functionality' (SOTIF) needs assessment of the vehicle's behavior in a large number of traffic scenarios to ultimately obtain type approval."

Figure 1: One of our instrumented data collection vehicles

Figure 2: Users can query the processed data for safety-relevant events

Web - Siemens- **End-to-end virtual verification & validation of vehicle automation systems**

Eva Moysan

Introduction - To reduce testing costs and time, Siemens develops a toolchain for virtual verification and validation adopting a scenario-based approach, aiming to significantly decrease the number of real-world tests. This toolchain involves, among others, requirements definition, data collection, scenario detection and classification, critical scenario creation, and simulation[1] This blog first presents data collection, using a Siemens measurement vehicle. Next, the scenario extraction step in the toolchain is illustrated, enabled by Simcenter Autonomy Data Analysis. The blog concludes with some remarks on the generation of synthetic safety-critical scenarios, being the next step in the toolchain.

Data collection - Our data collection vehicles are off-the-shelf vehicles which are instrumented in-house with sensors, a data-acquisition platform, and a robust power supply system which ensures reliable data collection.

The data is recorded in a Simatic Industrial PC configured for data acquisition using ROS2, and is then further serialized to MCAP format.

The data to be collected concerns information about other road users (position, speed, and heading relative to the measurement vehicle) and information of the measurement vehicle (position, speed, and heading in a world-fixed coordinate frame).

One of the data collection vehicles is a Kia EV6, as shown in Figure 1. This vehicle is instrumented with a 360o Ouster OS1-64 lidar, four Leopard cameras which together provide a surround-view of the vehicle, and a Septentrio GNSS system with RTK-correction for accurate vehicle pose information. To ensure consistent timestamps for data being received from the different sensors and for necessary synchronization between the sensors, a GMR Masterclock device is used which operates based on the Precision Time Protocol (PTP).

Figure 3 - The cherry on top is the export functionality of Simcenter Autonomy Data Analysis: scenarios can be exported as an ASAM OpenScenario file for the traffic participant motion and a corresponding OpenDrive file for the road infrastructure, see Figure 3.

Scenario extraction - When recording a large amount of driving data in real traffic, a large part of the collected data is actually uneventful. It is therefore important to evaluate if the data used for testing is challenging and diverse. Addressing this challenge requires two solutions. First, we must be able to quickly identify relevant parts of the data. Second, to provide evidence for a safety argument for the ADAS/AV and to understand if more data collection is necessary, we must be able to quantify how sufficient the amount of data is with respect to testing requirements. The cloud-based Simcenter Autonomy Data Analysis platform provides both these solutions through an automated analysis of the data, extracting key scenarios from the raw data logs, as illustrated in Figure 2 (previous page).

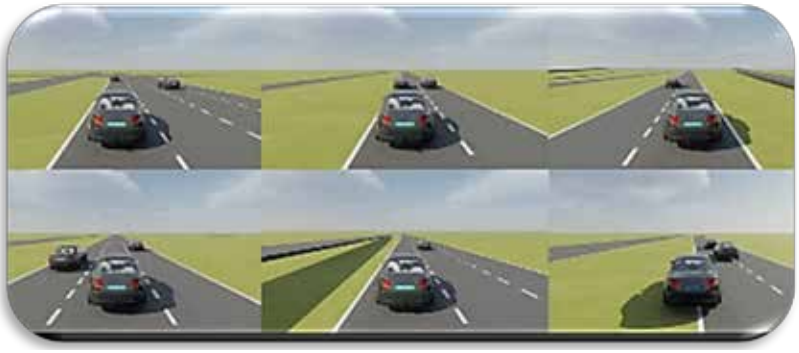


Figure 4: Approach of a stationary vehicle and cut-ins (from right and left), extracted from real-world data, imported in Simcenter Prescan (traffic lights not included in simulation)

This export functionality allows for virtual testing of the ADAS/AV system in a simulation environment that is capable of ingesting the OpenScenario/OpenDrive files, such as our own Simcenter Prescan. This is illustrated in Figure 4, which shows a scenario concerning the ego vehicle that approaches a stationary vehicle at a traffic light and several cut-inn/cut-out scenarios. These scenarios were part of the footage captured by our measurement vehicle. The footage was analyzed in Simcenter Autonomy Data Analysis to extract the scenarios.

These scenarios, as part of the extracted set of scenarios, were then exported as OpenScenario and OpenDrive files and subsequently imported into Simcenter Prescan. As a next example, Figure 4 shows several real-life scenarios imported in Simcenter Prescan.

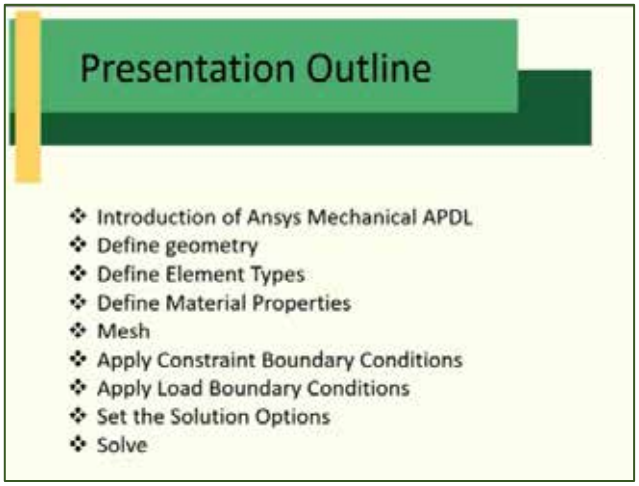
Scenario generation - Besides replay of the scenarios in Simcenter Prescan, the processed real-world data and extracted scenarios are used as a basis for massive virtual verification and validation to address the SOTIF safety standard (ISO 21448). This includes testing system weaknesses such as diverse illumination and weather conditions, exploring the parameter space within the extracted logical scenarios for known-unsafe scenarios, and analyzing road user behavior for creation of unknown-unsafe scenarios in the intended operational design domain (ODD) of the ADAS/AV. To learn more about our patented unknown-unsafe scenario identification methodology, see our dedicated blog post on this topic[2] and our technical papers[3], [4] (references listed on website)

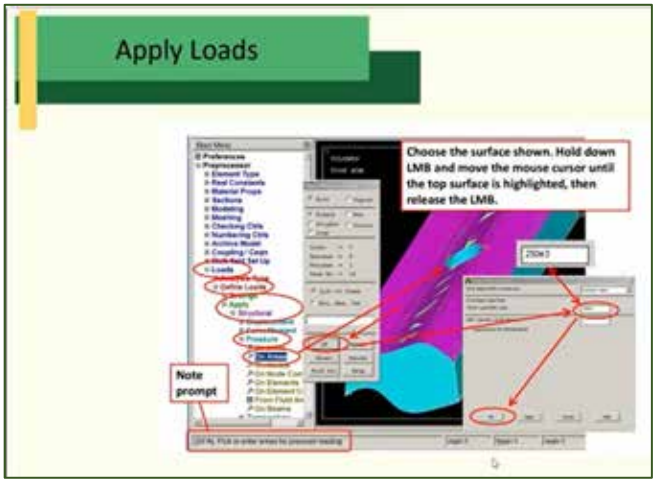
DFE-tech: On our YouTube Channel you can find webinars, simulations and learning videos

We are always updating the YouTube Channel for your convenience to have information, learn, gain knowledge - contact us!

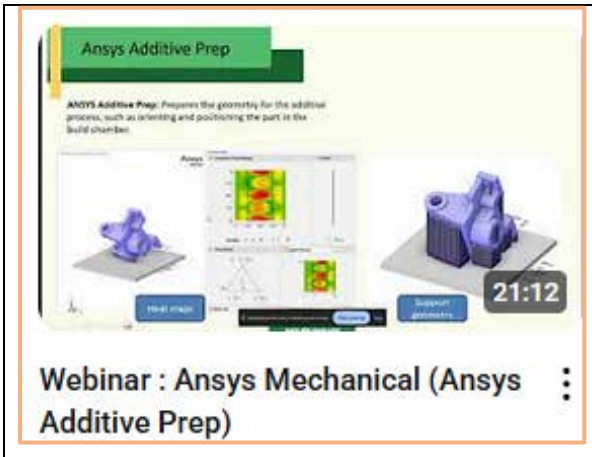
A few of the videos on our channel

Among the slides of a latest webinar - This webinar will discover how to take full control of your simulation process with ANSYS Parametric Design Language (APDL) with Dr. Ts. Mohammad Hazim, Application Engineer

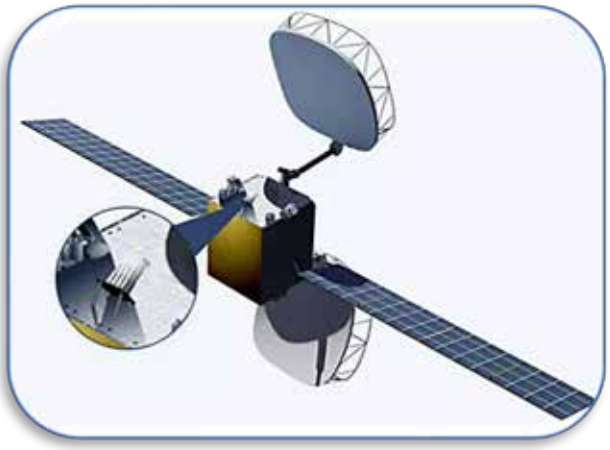




Amont the Previous Webinars

	Webinar : Ansys Mechanical (Ansys Additive Prep) Explore the capabilities of an innovative software solution that revolutionizes the preparation of 3D models for additive manufacturing (3D printing). Specifically designed for complex geometries in industries such as aerospace, automotive, and medical. Ansys Additive Prep helps optimize designs and process parameters to ensure flawless builds.

Article SWISSto12 is a leading manufacturer of advanced satellite systems and payloads, including the HummingSat: a small but powerful geostationary communications satellite developed in collaboration with the European Space Agency (ESA) as part of its public-private partnership program."

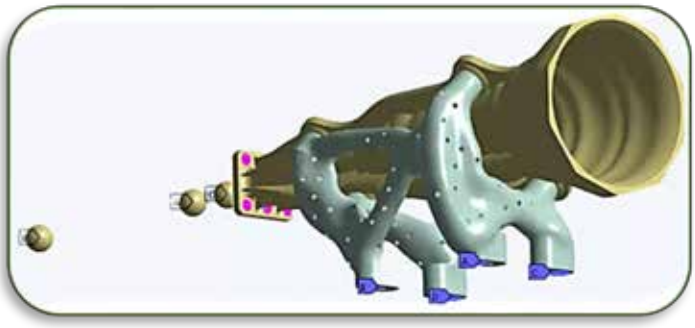


Web – CADFEM - Multiphysics analysis for satellite components - Simulation brings greater reliability and responsiveness, while meeting deadlines - A complete analysis to ensure the reliability of a satellite communication antenna

Sector: Aerospace

Specialist field: Structural mechanics

HummingSat: a small yet powerful geostationary telecommunications satellite developed in collaboration with the European Space Agency (ESA) | © SWISSto12



ANSYS model of satellite antenna with its optimized bracket. | © SWISSto12

Task - The objective of the mechanical analysis project was to analyze a communications antenna with its mount for SWISSto12's first satellite launch. The designs developed by SWISSto12 benefit from 3D manufacturing technologies combined with radio frequency (RF) product designs that offer lightweight, compact, high-performance and competitive RF functionality. On-board units need to be as light as possible, and meet the high dynamic demands imposed by the launch vehicle during the launch phase. To achieve this, various studies are required, such as modal, quasi-static, harmonic and random analyses (Power Spectral Density). During the orbit phase, the satellite is subjected to high thermal stresses, so thermal and thermoelastic analysis of the components is also necessary. All these analyses must be carried out in accordance with the recommendations of the European Space Agency ECSS (European Cooperation for Space Standardization) standards.

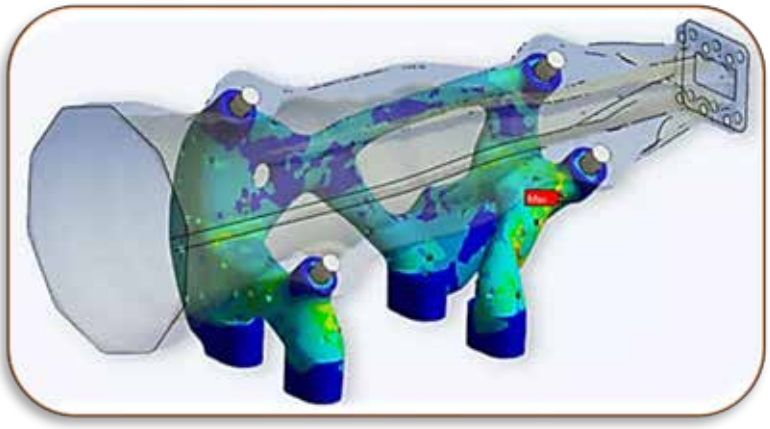
Raw additive printed antenna bracket. | © SWISSto12

Solution - To keep the weight of the component as low as possible, we chose to build the antenna support using topological optimization. This technique enables us to redistribute forces at the attachment points more efficiently. Ansys is able to handle a large number of file extensions, which enabled us to easily import a topological optimization mesh for a complete analysis. Once the mesh was imported, it was possible to build the analysis model in Mechanical's interface. Thanks to the automation tools, we were able to quickly carry out several iterations with minor manipulations on the model.

.

The use of Python scripting enabled results to be extracted and processed automatically. The scripts were particularly helpful, for example, in the search for any internal stress peaks in the structure. Indeed, as the part is hollow, with a lattice structure inside, it would have been complicated to quickly locate critical areas without this approach. This tool is also particularly useful for the analysis of bolts and nuts, which would otherwise require considerable resources and time if carried out manually.

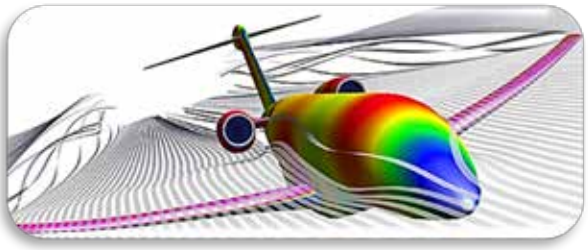
Customer Benefit - Without finite element simulation, it would have been impossible to design such a product. In fact, the structural study of this component using simulation considerably reduced design and optimization time... In a very short space of time, we were able to study numerous possible design improvements. All these iterations enabled us to come up with an innovative product that was as rigid and light as possible. Satellite design is a long and complex process, involving numerous multi-physical constraints. And it can happen that the design of certain components is called into question quite late in the design phase, without any further delay. Thanks to simulation, it's possible to be highly reactive, quickly assessing the criticality of a last-minute design change. Optimized designs, rapid and multiple iterations, better anticipation, automated results management and a high level of reactivity are just some of the advantages that have shown SWISSto12 the value of taking our component simulations further. To achieve this, CADFEM provided us with top-quality training and support, with access to a wide range of experts.



Equivalent stress of antenna bracket under PSD load | © SWISSto12

We're excited to spotlight the doctoral research of Ubaldo Cella, Setup and Validation of High Fidelity Aeroelastic Analysis Methods Based on RBF Mesh Morphing

Ubaldo Cella, developed at the University of Rome Tor Vergata in collaboration with Piaggio Aerospace. His thesis marked a major step forward in high-fidelity Fluid-Structure Interaction (FSI) methods for aerospace applications.



Web – RBF - Setup and Validation of High Fidelity Aeroelastic Analysis Methods Based on RBF Mesh Morphing - You can download in English the presentation PDF and the Thesis PDF

Ubaldo Cella

Key Contributions:

- **Development of FSI Analysis Procedures** - Cella implemented both a fully coupled 2-way CFD-FEM interaction and a modal superposition approach. The modal method, in particular, offered greater robustness and computational efficiency in small deformation regimes.
- **Application of RBF Mesh Morphing** - He used RBF Morph tools to adapt computational meshes smoothly and accurately during simulations, enabling efficient deformation handling without remeshing.
- **Experimental Validation** - Two major test cases supported the validity of his methods: the Piaggio P1XX aircraft model, tested in transonic conditions using a 14-million-cell CFD mesh and a 28,000-element FEM model; the RIBES wind tunnel model, a scaled metallic wing box equipped with strain gauges and pressure taps to capture real stress and deformation data.
- **Modal Analysis Results -** The thesis demonstrated that accurate aeroelastic predictions could be achieved using as few as 6 structural modes. Both the 2-way and modal approaches delivered near-identical lift and drag results under aerodynamic loading.

Cella's work showed that RBF morphing provides a reliable, efficient method for coupling aerodynamic and structural solvers. It also highlighted areas for refinement in structural modeling—particularly in how loads are shared between skins and spars. This thesis is a compelling example of how academic research can offer tangible tools and insights to meet the evolving needs of the aerospace industry.

Excerpt Introduction - Aeroelasticity is the subject that describes the interaction of aerodynamic, inertia and elastic forces for a flexible structure. A first schematic relation between the type of forces and the disciplines involved in the mechanism was proposed by Collar in 1946 with its well known Triangle of Forces [1]. In a more general view, aeroelastic phenomena are usually classified in two main categories: static and dynamic. Static aeroelasticity considers the non-oscillatory effects of aerodynamic forces (independent of time) acting on flexible structures. Dynamic aeroelasticity is concerned with the oscillatory effects of the aeroelastic interactions.

In aerospace engineering, the flexibility of structures plays a crucial role in several aspects of aircraft design processes [2]. In static conditions, the flexibility of the wing involves a direct coupling between structural deformations and aerodynamic forces. This mechanism causes a geometric shape modification of lifting surfaces under load with a consequent variation of lift distribution that leads to different static equilibriums for every steady flight condition. The capability to evaluate such interaction is important to avoid drag penalties in design conditions. The typical case of interest is the relationship between the so-called “jig shape” (the shape of the structure when supported in the jigs during manufacture) and “flying shape” (the shape that it will assume in the real in-flight conditions). For a theoretical rigid wing there would be no difference between the two shapes. For real structures the elastic deformation under aerodynamic loads causes the aircraft to exhibit performances that differ from what is expected assuming a rigid structure. If large wing bending occurs, for example, a high dihedral angle might be generated affecting also the aircraft lateral stability.

Static aero-structural interaction evaluation is also essential to account for potential influences on the effectiveness of control surfaces, aircraft trim behaviour and stability control characteristics. It is, furthermore, crucial to account for two potentially dangerous phenomena: divergence and control reversal. The first occurs when the moments due to aerodynamic forces overcome the restoring moments due to structural stiffness, so resulting in risks of structural failure1.

Figure 1.1: *In-flight shape of Boeing 787 Dreamliner wing under load (courtesy of ©Boeing).*

The latter affects the control system and occurs at speed conditions higher than a so called reversal speed. It is determined by the generation of a moment, induced by the action on the control surface, that is higher than the structural torsional response of the wing box. At reversal speed, the pitching moment of the wing is exactly cancelled out by the pitching moment generated by the action of the control surface [3]. At higher velocities the wing generates forces in the opposite direction respect to the direction expected by the action on the control surface causing a reversal operation of the command (e.g. to a pull up action on the command corresponds a diving response).

The link between aeroelasticity and loads is extended to the dynamic response of structures under steady and unsteady aerodynamic forces. The loads, resulting from flight manoeuvres, air gust or turbulence, interact with the aircraft vibration characteristics generating dynamic inertial and elastic forces. At some critical speeds, external air flow disturbances might trigger an unstable self-excited vibration in which a mode structure oscillation becomes negatively damped. Such phenomenon is called flutter. The unsteady nature of the aerodynamic forces and moments generated when the aircraft oscillates renders the prediction of the flutter mechanism a particular challenging task, especially in transonic regimes. The main area of interest of dynamic aeroelasticity is the study of such potentially catastrophic phenomena….

Continuous learning is the key to personal & professional growth. It enriches our lives with new skills, fresh perspectives, & opportunities for success & fulfillment.

Web – Axel Products – [Axel Products Training Courses]

Axel Products provides testing services for engineers and analysts. The focus is on the characterization of nonlinear materials such as elastomers and plastics. Data from the Axel laboratory is often used to develop material models in finite element analysis codes such as ABAQUS, ANSYS, Hexagon. Marc, Endurica and LS-DYNA. Testing services are also provided to examine sealing, fatigue problems, and high strain rate events...**the services of Axel Products are proprietary. The customer owns the data and the story.**

- **Endurica Training** - Elastomers are outstanding in their ability to repeatedly endure large deformations, and they are often applied where fatigue performance is a critical consideration. This 3-day course provides the know-how for engineering durable elastomeric components and systems.
- **ANSYS Training** - Introduction - This training course is available to ANSYS users. ANSYS, Inc. teams with Axel Products, Inc. to offer this course that covers material testing, material modeling and finite element analysis of elastomers.
- **Abaqus Training** - This hands-on workshop covers material testing, material modeling and finite element analysis of elastomers. Instructors from SIMULIA and Axel Products, Inc. present an integrated testing and analysis workshop featuring the experimental facilities of Axel Products, Inc. and the Abaqus software.

Sept. 23-25, 2025 - Abaqus Training: Testing and Analysis of Elastomers - Characterizing a particular rubber compound for use with FEA can be quite challenging because of the complexity of rubber behavior. This course clarifies issues on how to test the material, under what conditions, what loadings, what preconditioning, and how to use this test data to derive a reliable and robust FEA material model for the elastomer. This seminar is recommended for engineers involved with the FE analysis of elastomers, or with testing of elastomers for material model characterization.

Objectives

- In the Axel Products Test Lab, students will perform the tests – uniaxial, biaxial tension, planar tension, stress relaxation.
- In the Computer Lab, students will perform computer curve fitting to derive hyperelastic material models.
- Learn how to gather the best test data.
- Obtain the best possible material constants from the available test data.
- Model viscoelastic behavior – in the time domain and frequency domain.
- Discuss rubber contact issues through case studies.
- Open Forum time to investigate additional testing issues.

For complete course and contact information please visit the website.

We're excited to announce... that Oasys22 is now available!

Oasys 22.0 further strengthens the suite's leading position in the market by offering complete Ansys LS-DYNA support, increased speed and performance, efficient end-to-end workflows for human-safe design and flexible automation and integration.

WEB – OASYS - Oasys Suite 22.0 released

Version 22.0 introduces powerful new functionality, helping users deliver complex engineering solutions.

.

New advancements in this release include:

- Support for C-NCAP
- Usability improvements for Virtual Testing & Injury Metrics
- New IGA (Isogeometric Analysis) & CPG (Continuum Particle Gas) features
- Enhancements to Connections and the Loadpath tool

Oasys 22.0 is the latest release of the comprehensive Ansys LS-DYNA pre- and post-processing software environment. This version further strengthens the suites' leading position in the market by offering flexibility, speed, performance, and efficient end-to-end workflows for human-safe design, and much more.

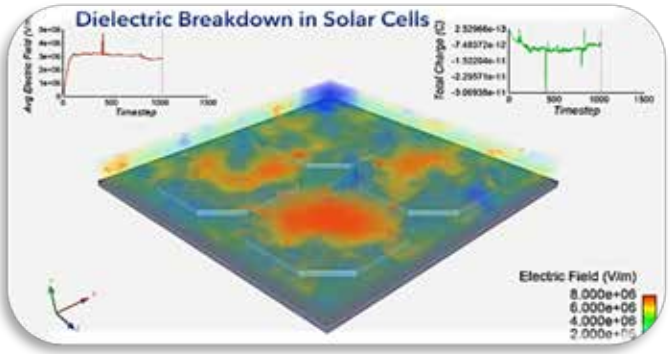
Advancements include support for C-NCAP and usability improvements for Virtual Testing, Injury Metrics, new IGA (Isogeometric Analysis) and CPG (Continuum Particle Gas) features, Connections and Load Path tool enhancements.

Version 22.0 enables users to achieve even greater automation and process integration, resulting in significant workflow efficiency and excellent model quality and results.

Watch the introduction with complete information on YouTube

Oasys 22
LS-DYNA Environment

Among the blog by Ian Chavez, "At Ozen Engineering, we recently hosted a webinar diving deep into the science and solutions for spacecraft charging and ESD risk mitigation. Whether you're designing for LEO, GEO, lunar orbit, or beyond, understanding how materials interact with plasma, radiation, and solar particles is essential."



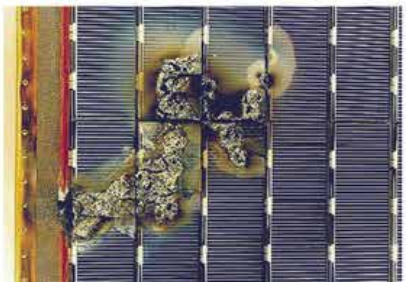
Web – Ozen - Spacecraft Charging & ESD: How Simulation Prevents Million-Dollar Failures

Ian Chavez

In space, there's no such thing as a harmless spark. Electrostatic discharge (ESD) is one of the leading causes of spacecraft anomalies—responsible for nearly half of all space environment-related mission issues. And yet, too many projects still treat it as an afterthought.

Simulation on our website off Electric field evolution during arcing: As charge builds up, the glass begins to carbonize, forming a conductive path that dissipates the electric field. Arcing progression is tracked through changes in conductivity or field collapse.

Why You Should Care About Spacecraft Charging - One real-world example: The ADEOS-II satellite suffered catastrophic failures after an arc occurred on its solar panels—costing over $560 million. This is just one example of how unpredictable plasma environments can cripple critical space systems. These kinds of failures highlight the importance of simulating charging and discharge events early in the design cycle, when issues are still fixable.



Simulation as a Design Superpower - Traditional testing alone can't fully replicate the harsh and variable conditions of space.

Our webinar highlights how Ansys Charge Plus and EMC Plus allow engineers to:

- Predict surface and internal charging in any orbit
- Analyze risk in detailed 3D models using real mission data
- Select materials and coatings to prevent ESD
- Meet NASA and ESA compliance standards more efficiently

These advanced tools let teams validate shielding, assess discharge scenarios, and even explore radiation hardening—all before a single prototype is built.

What You'll Learn in the Webinar - In the session, we break down the science behind space charging and show how advanced simulation workflows can mitigate those risks. Key topics include:

Dielectric Breakdown in Solar Cells - Learn how charge buildup across solar panel materials can lead to internal arcing, carbonization, and irreversible damage—and how to model and prevent it.

Internal Charging in Bulk Materials & Cables - See how high-energy particles penetrate deep into dielectric layers, and how Charge Plus helps assess discharge risks and material failure points.

Radiation Hardening Through 3D Simulation - Explore how integrated particle transport and ray-tracing simulations track cumulative radiation dose, helping you optimize shielding without unnecessary mass.

Surface Charging Across Orbits - Understand how different environments (LEO, GEO, lunar, interplanetary) create unique charging profiles—and how to simulate them using real orbital mission data.

Material and Coating Selection for Mitigation - Even small design choices—like adhesives, stickers, or Kapton variants—can drastically impact charge dissipation and ESD risk.

Compliance and Standards Support - We show how simulation helps teams meet strict requirements from NASA, ESA, and others—faster and with fewer design iterations.

See How Simulation Can Strengthen Your Design Process - Understanding and mitigating spacecraft charging and ESD risks early in development can make a significant difference in performance, reliability, and cost. This webinar offers practical insights into how simulation tools like Ansys Charge Plus and EMC Plus can support better material choices, more robust designs, and easier compliance with industry standards.

Watch the full on-demand webinar on the website

Whether you're working on your first small satellite or managing complex systems for a government mission, this session will give you useful tools and strategies to design with greater confidence.

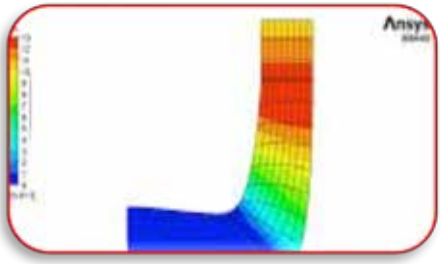
Tonight, on our local news channel in the town pointed towards its true north (FEA) we have original team reporting: Mi (a resident news raccoon) & Ke (a resident news coyote)

Mi, "Do you know of any technical video hubs we can learn topics?"

Ke, "Ozen created a new video section for just that purpose. It's produced by their technical team of engineers. Mi, we can watch nearly 500 videos on a wide range of technical topics. Let's start with the selections below."

WEB – OZEN Engineering Technical Video Section

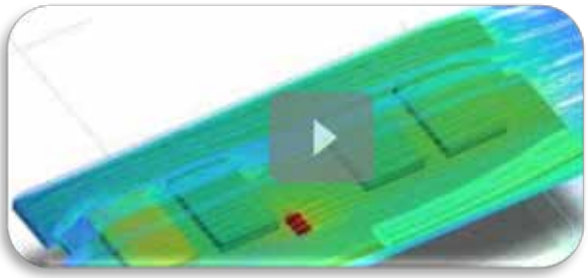
1D Parametric Analysis of a Centrifugal Pump



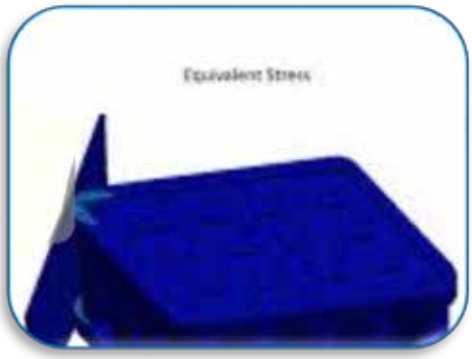
Simulating A Conveyor Belt with Ansys Rocky

Stretch Blow Molding Simulation in Fluent Workspace Polyflow

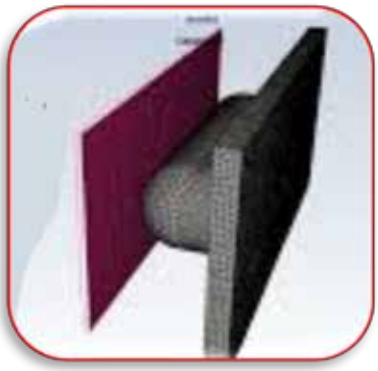
Estimating the transient response of an electronic assembly- Ansys Icepak



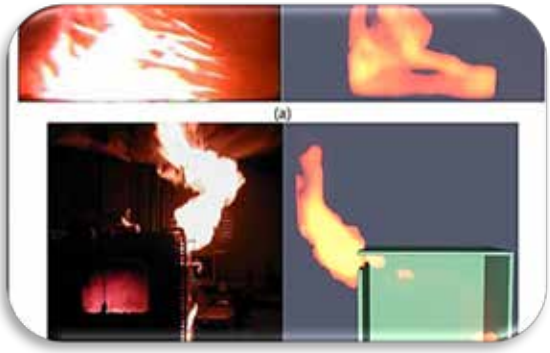
Battery Pack Impact and Submodeling in Workbench LS-DYNA



Pressing and Thermoforming Simulation in Fluent Workspace Polyflow



Article quote, “PyroSim was utilized to build a fire scenario, exporting 3D data through the device’s own program, and then the **ANSYS thermal–mechanical coupling model was employed to study the spatial temperature distribution under fire-induced conditions**.”



WEB – MDPI - Numerical Simulation Study on the Response of Ship Engine Room Structure Under Fire Based on Thermo-Mechanical Coupling Model

Y. Zhao, Z. Miao, S. Wang, D. Ai

- Navigation College, Dalian Maritime Univ., China
- …Shenzhen Tech. Inst. of Urban Public Safety, China
- Shenzhen Key Lab. of Urban Disasters Digital Twin, CN
- Qingdao Innov. & Dev. Base, Harbin Engin. Univ. CN
- School of Constr. Engin., Shenzhen Poly Univ. CCN

Abstract - Ship structures may collapse or be severely deformed during a fire. To precisely assess the post-fire structural integrity of ships, in this study, a thermal–mechanical coupling data interface was created, employing a significant eddy simulation algorithm for fire dynamics and a technique to analyze the structural thermal–mechanical coupling reaction. PyroSim was utilized to build a fire scenario, exporting 3D data through the device’s own program, and then the ANSYS thermal–mechanical coupling model was employed to study the spatial temperature distribution under fire-induced conditions. Data from the three-dimensional spatial temperature field served as the boundary condition for the determination of the structural temperature burden. Building on this, an analysis was conducted on the structural response of the intricate two-story interior compartment under fire conditions. The results showed that the location of the fire source and the structural distribution of the mechanical equipment inside the cabin had a great influence on the temperature and combustion heat, followed by the ventilation conditions, while the temperature variations in the parallel dual fuel tanks were greatly influenced by the stack effect. By comparing the stress and strain of the two-layer cabin under normal and fire conditions, the damage and mechanisms associated with important positions in the cabin under fire conditions were revealed.

Introduction - Ship fire accidents occur frequently and often cause heavy losses [1]. According to data from the Norwegian Classification Society (DNV), approximately two-thirds of all fires on ships occur within the confines of the engine room. Among the 1400 accidents recorded by the International Maritime Organization (IMO) between 2000 and 2017, 19.2% were caused by fires and explosions. Moreover, given the complexity of the engine room, the probability of a fire occurring in this area is the highest [2]. In the event of a fire, the complex and narrow structure inside the engine room makes it impossible to quickly discharge the resulting thermal expansion, and the fire’s effect alters the stiffness of the structural steel and its ability to bear loads….

…

..

Quote Rescale, Garrett VanLee, “Today, Rescale is thrilled to announce a transformative upgrade in simulation data analysis, Rescale Assistant. This new AI feature is built seamlessly into the Rescale modeling and simulation experience, enhancing engineers’ analysis capabilities and enabling them to get more value from their simulation data, extracting new insights and driving faster decision-making”

EXCERPTS Article by Garrett VanLee (the website will have the graphics/videos)

Web – Rescale **AI-driven Insights for Simulation Data with Rescale Assistant**

With AI increasingly integrated into the tools we already use everyday, Rescale’s integration of purpose-built conversational AI combined with enhanced data management is a powerful combination ready to tackle simulation-specific analysis.

Recent industry reports suggest that AI assistants save engineers between 20-30% of their time per week from handling non-value add data management tasks. This is especially transformative for digital engineering, a field that’s historically been uniquely specialized, often requiring a combination of deep and broad subject matter expertise to interpret modeling and simulation results. The reality businesses face is that simulation activities are often performed in a silo and only the final decision is presented to reviewers, often without full context on the project goals or other related findings. AI offers an opportunity to democratize and dramatically speed up the post-simulation analysis process for everyone involved in the product development lifecycle. Rescale Assistant is focused on only your organization’s data, enriched with additional context and structure so it’s able to answer both tactical compute orchestration questions and strategic product performance questions.

Solving the Simulation Data Bottleneck - For too long, the volume and specialization of simulation data have presented an unnecessary bottleneck for decision making in product development. Engineering users, project owners, and external reviewers (often non-experts who are less familiar with the intricacies of simulation), often face challenges in analyzing outcomes, identifying critical trends, and understanding data provenance i.e. “how did we arrive at this conclusion and make this decision”. Rescale Assistant is designed to address these pain points head-on, democratizing access to simulation insights through an intuitive, conversational interface.
Conversational Analysis

At the core of Rescale Assistant’s capabilities lies in its ability to process natural language queries and translate them into actionable insights from your simulation data. Imagine being able to simply ask questions about your simulations in conversational text and receive clear, data-driven answers. This is the power the Assistant brings. It allows users to search across their jobs, studies, and projects, enabling a deeper understanding of simulation results and streamlining troubleshooting processes. For instance, easily search for all jobs that met or did not meet a certain design requirements, compare performance metrics across different simulation setups, or even delve into the specifics of input conditions.

One of the most powerful features of Rescale Assistant is its intelligent search capability, allowing users to perform comprehensive searches across all available data sources, including job metadata and simulation results. Users can ask questions related to performance analysis, data visualization, and computing resource consumption, for example “which job showed the best aerodynamic performance”, “What did we learn from the simulations performed this week”, or “which jobs in this project consumed the most computing resources including core-hours and software licensing.” It then processes this information and presents the results in a domain-specific manner, often accompanied by visualizations like charts and graphs to aid in understanding. Rescale Assistant eliminates the need to manually download, prepare, analyze, and summarize data from simulations, significantly reducing the effort and time required to sift through vast amounts of data.

Automated Job Summaries - Beyond search, Rescale Assistant also delivers job summaries. These AI-powered overviews condense complex simulation job results into concise, easy-to-digest formats, highlighting key findings and identifying potential hardware-software configuration issues from job logs and output files. This feature is invaluable for quickly grasping outcomes from simulation jobs without having to meticulously review entire output files, ultimately improving learning from each simulation and efficiency of overall simulation workflows. These summaries can even be attached to activity threads, enabling better collaboration and knowledge sharing among engineering teams.

Job summaries leverage the extraction of key insights from simulation logs, identifies and explains critical errors, and provides engineers with structured, analysis-ready data. This allows engineers to avoid manually sifting through results, logs, and output files to extract KPIs and troubleshoot errors which can slow progress or cause data quality issues. With a shared understanding of job results combined with additional conversational analysis, teams can gain project context instantly, validate with deeper analysis as needed, and be more confident in critical product decisions.

Flexible Data Visualization - The conversational analysis functionality extends to powerful data visualization dashboards. Rescale Assistant transforms the extracted metadata and job summaries into visualizations based on user prompts, providing a powerful tool to further uncover findings from simulation results. It is designed to help users communicate results, compare simulation outcomes, and identify patterns through visual representations such as charts, graphs, and interactive dashboards. Whether you need to compare different simulation parameters, pinpoint areas for design and performance tradeoffs, or generate reports for stakeholder reviews, these visualizations provide a flexible way to review simulation data. Engineers can explore various visualization types and choose one that suits their needs, including line charts, bar charts, scatter plots, and heat maps, creating a holistic view of the simulation landscape.

Building on a Solid Data Foundation - The power of Rescale Assistant is built upon a robust foundation of structured data and added context powered by Rescale Automations. Rescale’s Simulation Data Lakehouse provides a centralized way to house and easily access a variety of simulation data, including configuration, input/output, and related metadata. This mix of structured and unstructured data, which includes Rescale-generated metadata (such as user and core type) and metadata stored on Rescale (like tags and custom fields), is automatically synced to the Lakehouse in real time, ensuring that the insights you receive are always based on the most up-to-date information. For urgent needs, data export can also be manually triggered for specific organizations.

This well-organized data structure is crucial for enabling Rescale Assistant to efficiently query and analyze simulation information.

Take the Next Steps Towards Modern Simulation and Modeling

With the Rescale Assistant, we are enabling engineers to fully leverage the power of AI for simulation data. By providing an intuitive way to query simulation data in natural language, automating job summaries, and offering dynamic data visualizations, the Assistant makes it easier for both simulation experts and non-experts to better understand key results and make decisions faster. This integrated approach will empower users with actionable insights, improved decision-making, and increased productivity. The Rescale Assistant represents a significant step forward in transforming how you interact with simulation data, making Rescale an invaluable engineering tool not just for executing simulations but also for understanding their results.

Not sure where to start?

Ask Rescale Assistant to generate questions to better understand your simulation data.

Ready to experience the future of simulation data analysis?

Reach out to us today to schedule a demo of the Rescale Assistant and discover how this powerful tool can transform your engineering workflows.

Existing customers of Rescale Data can now request beta access to the Rescale Assistant by reaching out to their account teams.

We can’t wait to see how users will harness these new capabilities to make new discoveries!

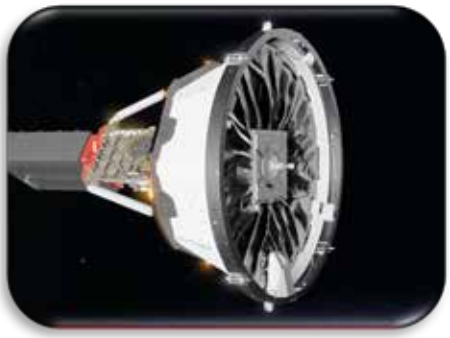
Welcome to our Pasture Movie Theater

The information we found interesting on YouTube is about to begin. Please turn off all tractors and harvesting equipment.

FEANTM Town & Residents welcome you
And coffee and popcorn are free

Web – YouTube

[Rocket Lab - 'Get The Hawk Outta Here' Launch]



Tim Sublette - Eight years ago, my daughter Lizzy headed off to college, full of ambition and energy. Life, as it sometimes does, threw a wrench into her plans. She became seriously ill for an extended period of time, and many things became incredibly difficult. But one thing she could still do—still loved to do—was write. One of my proudest moments as a parent, I get to share that she's published her first book. And every time I read it, I have to stop and remind myself: My daughter wrote this.

Web – amazon - Sleying the Loom: Book 1 of The Woven by the Goddess Series.

Hi, I'm Liz! My plan was once to become an archaeologist. I got two degrees, one in Biblical Archaeology and the other in Ancient and Classical Languages (with a concentration in Ancient Greek).

But God is good, and he had a very different plan for me.

If you want to hear the crazy story of how I ended up writing books, instead of digging in Israel, I talk about it on my Instagram. And I have a newsletter if you want to hear about my future publications!

Eloiah has unquestioningly devoted her life and soul-weaving magic to serve the goddess. But when she's sent on an impossible quest to destroy an ancient evil that corrupts its hosts and consumes their magic, her faith begins to waver.

Her only hope is Asan, a handsome prince who has entered a deadly tournament to win his freedom. But she needs him to become a king, not a runaway dreamer. As they grow closer, she wonders if it's because she needs him to fulfill her quest or if her heart no longer belongs to the goddess alone.

Can she convince him to face his destiny before their home is consumed, or will she give in to doubt and lose her faith altogether?

Library - Aisle N (Not To Miss)
Abhinav Tanksale

Below are two courses featured on my website to connect you with industry leaders.

Web – MyPhysics Cafe Struggling with outdated resources and expert guidance?

This program on MyPhysics Café connects you with courses and free resources from industry leaders to boost your skills, knowledge and confidence.

Among the listed courses and resources, you will find two courses offered by Steffan Evans**:**

EVOTECH
Computer-Aided Engineering Ltd

LEARN AT THE RIGHT LEVEL FOR YOU - We have courses for novice and advanced users alike. We'll give you the key principles of FEA, and the skills to put these concepts into practice.

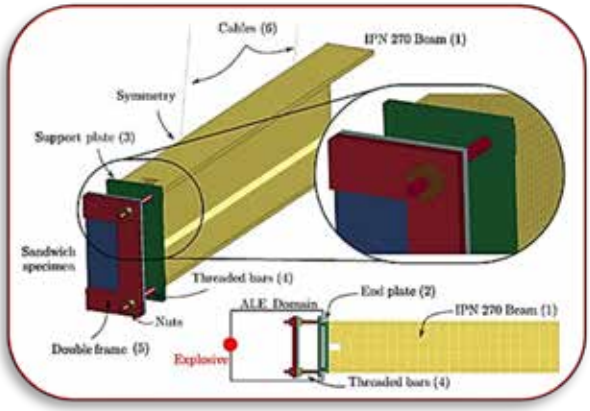
1. Non-Linear FEA with MSC Apex and MSC Nastran

This advanced course explores non-linear FEA concepts such as material plasticity, contact non-linearity, and large displacement analysis. It emphasizes solving complex challenges like buckling and contact interactions, offering guidance on handling solution failures and optimization. Hands-on tutorials and advanced strategies are part of the curriculum.

2. Introduction to FEA with MSC Apex and MSC Nastran

This course covers the fundamentals of Finite Element Analysis (FEA), focusing on model building, analysis, and post-processing using MSC Apex and MSC Nastran. Participants work through practical examples like propeller blades and drone assemblies, gaining skills to solve real-world problems effectively. Includes downloadable tutorials and certificate completion upon mastery of topics like 1D/2D/3D modeling and assembly analysis.

The numerical models are developed in LS-DYNA [18], which is capable of reproducing the blast event in a number of different ways. To this end, two distinct approaches are explored and thoroughly compared in this work.



Web – MDPI - [Cork Core Sandwich Plates for Blast Protection]

Jesús Pernas-Sánchez, Jose A. Artero-Guerrero, David Varas, Filipe Teixeira-Dias

Dept Continuum Mechanics & Structural Analysis, Univ. Carlos III of Madrid, Spain

School of Engineering, The University of Edinburgh, UK

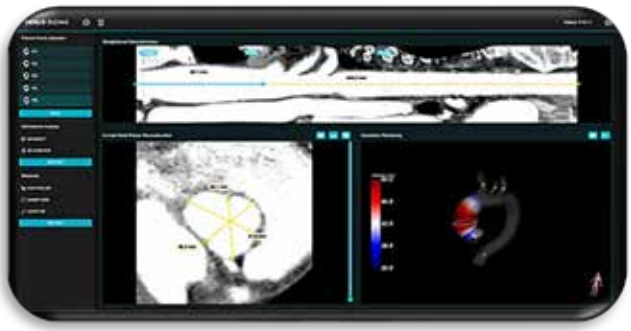
Abstract:

A numerical model is developed and validated to analyse the performance of aluminium skin and agglomerated cork core sandwich plates subjected to blast loads. Two numerical approaches are used and thoroughly compared to generate the blast loading: an Arbitrary-Lagrangian–Eulerian approach and the Load Blast Enhanced method. Both of the models are validated by comparing the numerical results with experimental observations. A detailed analysis of the sandwich behaviour is done for both approaches showing small ifferences regarding the mechanical response of the sandwich structure. The results obtained from the numerical models uncover the specific energy absorption mechanisms happening within the sandwich plate components. A new core topology is proposed, based on these results, which maximises the energy absorption capacity of the plate, keeping the areal density unchanged. A wavy agglomerated cork core is proposed and the effects of different geometrical parameters on the energy absorption are thoroughly analysed and discussed. The proposed optimised plate configuration shows an increase in the total absorbed energy of close to 40% relative to a reference case with the same areal density. The adopted optimisation methodology can be applied to alternative configurations to increase the performance of sandwich structures under blast events.

Excerpt - 2. Numerical Modelling

A numerical model is developed to study the behaviour of aluminium-cork sandwich panels under blast loading. The models are validated with a thorough comparison of the obtained results to the experimental observations that were reported by Sousa-Martins et al. [10]. Post-validation, the influence of the shape, and configuration of the core on the response of the sandwich structure is studied to maximise the energy absorption capacity of the structure. The numerical models are developed in LS-DYNA [18], which is capable of reproducing the blast event in a number of different ways. To this end, two distinct approaches are explored and thoroughly compared in this work. The numerical models, the constitutive material behaviour, and the blast approximation methods used in these models are presented in the following section…

"The first software module developed by LivGemini that merges artificial intelligence with computational modeling to empower clinicians in the assessment of thoracic aortic aneurysms. VENUS is designed to standardize critical clinical evaluations and reduce the time required for accurate analysis in complex cases, thanks to a smart, digital, and personalized approach."



Web – LivGemini – VENUS Sizing - The first module of LivSpace - It enables rapid analysis of single and longitudinal CT scans and generates structured PDF reports to assist clinical evaluation

LivSpace - Our Software Ecosystem - LivSpace is an integrated software suite that leverages AI-based anatomical reconstruction and computational modeling to enable patient-specific cardiovascular analysis and simulation.

VENUS Sizing is specifically designed for the extraction of anatomical and morphometric features to support the diagnosis of thoracic aortic aneurysms. It is intended for radiologists, cardiovascular surgeons, cardiologists and experts in imaging techniques. **It is currently available for scientific purposes only and not for clinical decision-making or surgery. VENUS has not yet obtained CE certification.**

Excerpts - for full information please visit the website

- **Multi-Platform** - Available on Windows and macOS, for both desktop and laptop devices
- **User-friendly** - UI designed supported by clinicians to ensure intuitive navigation and clinical usability
- **Flexible** - Import CT scans directly from PACS, local drives, external USB devices or optical media

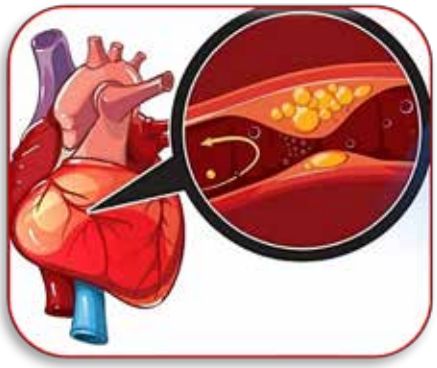
The Essentials

- Automatic 3D Reconstruction - Import CT or MRI scans and automatically extract the 3D anatomy using neural networks.
- Advanced Visualization - Identify calcifications, hematomas, false lumens, and other critical features.
- Efficient centerline reconstruction - Perform rapid centerline reconstruction, including supra-aortic branches, leveraging anatomical landmarks.
- Diagnostic Parameter Extraction - Automatically retrieve pathology-specific diagnostic parameters and additional anatomical data.
- Comprehensive Clinical Reporting - Generate detailed reports enriched with clinically relevant information.
- 3D Model export - Easily export the segmented anatomical model in standard 3D formats for external use and analysis.

Request a demo and discover how LivSpace can enhance your research and clinical workflow.

The use of Ansys LS-DYNA in simulating stent crimping and dilation demonstrates how digital engineering is transforming medical innovation. By providing a safe, cost-effective, and highly accurate way to test device performance under real-world conditions, LS-DYNA accelerates the path from concept to clinic. Whether you're a biomedical engineer, medical device designer, or simulation specialist, LS-DYNA offers the tools you need to enhance product safety, performance, and regulatory compliance. in the highly regulated healthcare industry.

From concept to clinic, LS-DYNA Stent Simulation empowers biomedical engineers to design safer, more effective cardiovascular devices, accelerating innovation while reducing development risks and costs.



Web – **CADFEM APAC - Advancing Cardiovascular Treatment: How LS-DYNA Powers High-Fidelity Stent Simulations**

Suraj Dhomase – Sr. Application Engineer, CADFEM APAC

LS-DYNA Stent Simulation is redefining cardiovascular innovation by enabling high-fidelity virtual testing of stent behavior during critical stages like crimping and dilation—under realistic, physiological conditions. In the rapidly evolving landscape of biomedical engineering, cardiovascular stents play a crucial role in treating artery blockages and restoring blood flow.

These tiny mesh tubes are implanted into narrowed or weakened arteries and are critical for millions of patients globally. As the need for patient-specific stent designs and minimally invasive procedures increases, simulation-based engineering is emerging as a game-changer. Among the leading tools in this domain, Ansys LS-DYNA stands out for its robust ability to simulate complex, nonlinear, and dynamic medical scenarios.

The Importance of Stent Simulation in Modern Healthcare - Designing and validating cardiovascular stents is a complex task. These devices must be highly reliable, biocompatible, and flexible enough to conform to arterial pathways while resisting fatigue and structural failure. Traditional methods of prototyping and testing are time-consuming, expensive, and provide limited insight into real-world physiological conditions.

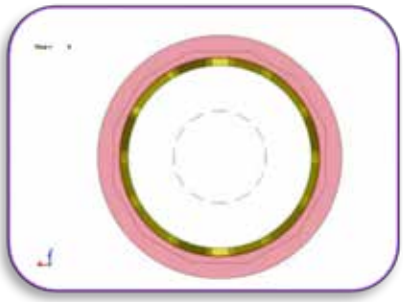
This is where LS-DYNA, a highly sophisticated finite element solver from Ansys, transforms the engineering process. With LS-DYNA, engineers and biomedical designers can simulate every critical aspect of stent deployment—right from crimping to expansion within the artery—under realistic conditions.

Problem Statement: Modeling the Crimping and Dilation of a Stent - The simulation discussed in this blog focuses on modeling the mechanical behavior of a cardiovascular stent during two essential stages:

- Crimping – Reducing the stent diameter to enable insertion into the artery.
- Dilation – Expanding the stent within the artery to restore blood flow.

These processes involve large deformations, contact interactions, and nonlinear material behaviors—making LS-DYNA the ideal tool for this application.

Setting Up the Simulation: LS-DYNA and the Finite Element Model - Using LS-DYNA, a high-fidelity finite element (FE) model was created comprising the following components:



- Stent Geometry - A flexible, detailed mesh to capture radial behavior.
- Artery - A compliant arterial wall model to simulate interaction with the stent.
- Crimping Tool - A mechanism to apply uniform pressure for compressing the stent.
- Dilation Tool - A balloon-like structure that expands the stent inside the artery.

Boundary conditions and material properties were defined to reflect physiological realism, such as elastic-plastic behavior for metallic stent structures and hyperelastic models for artery walls.

Results: A Look into the Crimping and Expansion Process

Visual Simulation - LS-DYNA's robust contact and large deformation capabilities were leveraged to produce highly detailed simulation results. Iso and front views during both crimping and dilation phases showcased the mechanical response of the stent, artery, and tools.

Displacement Plot - The displacement plot revealed how the stent deforms during deployment. Areas of maximum and minimum displacement helped identify potential stress concentrations and regions at risk of mechanical failure.

Energy Plot - The internal energy plots tracked how mechanical energy is distributed and absorbed during the simulation. This helped in validating the overall performance and identifying whether the stent could return to its intended shape after deformation.

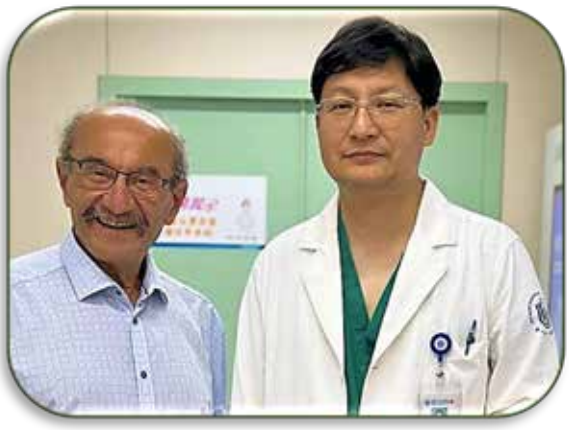
Why LS-DYNA is Ideal for Stent Simulation - LS-DYNA excels at solving nonlinear, transient dynamic problems involving contact, large strains, and complex materials. In biomedical applications like stent design, these capabilities translate into tangible benefits:

- High Accuracy - Ensures every deformation and force distribution is captured with precision.
- Material Versatility - Supports a wide range of materials from metals to bio-compatible polymers.
- Multiphysics Integration - Can be extended to simulate fluid-structure interaction, such as blood flow effects.
- Real-World Validation - Enables pre-clinical virtual testing, reducing dependency on animal or human trials.

Future Applications and Industry Relevance - Cardiovascular stent simulations using LS-DYNA are paving the way for personalized medicine. With patient-specific anatomical data from CT or MRI scans, engineers can create customized stents that match the exact geometry and elasticity of a patient's artery. This not only reduces the risk of complications but also improves the longevity and performance of the stent. Beyond cardiology, LS-DYNA is also used for simulations in orthopedics, surgical tool design, and impact biomechanics. Its ability to model real-world physiological and mechanical responses makes it indispensable in modern medical device development.

Conclusion - The use of Ansys LS-DYNA in simulating stent crimping and dilation demonstrates how digital engineering is transforming medical innovation. By providing a safe, cost-effective, and highly accurate way to test device performance under real-world conditions, LS-DYNA accelerates the path from concept to clinic.

We thank Yong Cui for posting on social media this very interesting video



Web – Video - [The unedited video is available to watch in our Heart Club Live OR]

A complex aortic repair for a young patient with bicuspid aortic valve (BAV).

This morning, Professor Gebrine El Khoury guided us through a complex aortic repair for a young patient with bicuspid aortic valve (BAV).

The procedure (reimplantation) was remarkably efficient, yielded an excellent outcome, and included detailed explanations of the technical aspects. Truly masterful work! The unedited video is available to watch in our Heart Club Live OR."

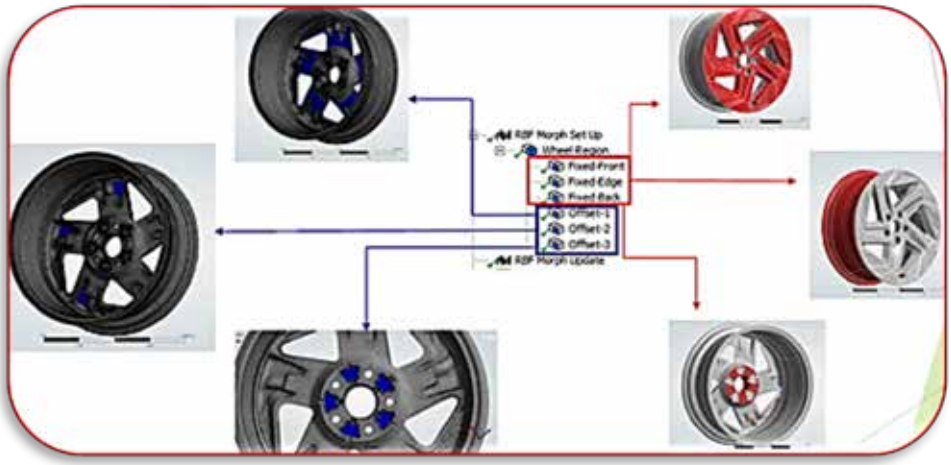
Professor El Khoury specialises in cardiac valve surgery. His key areas of scientific interest include mitral and aortic valve valvuloplasty (of which he is one of the pioneers) and aortic valve replacement.

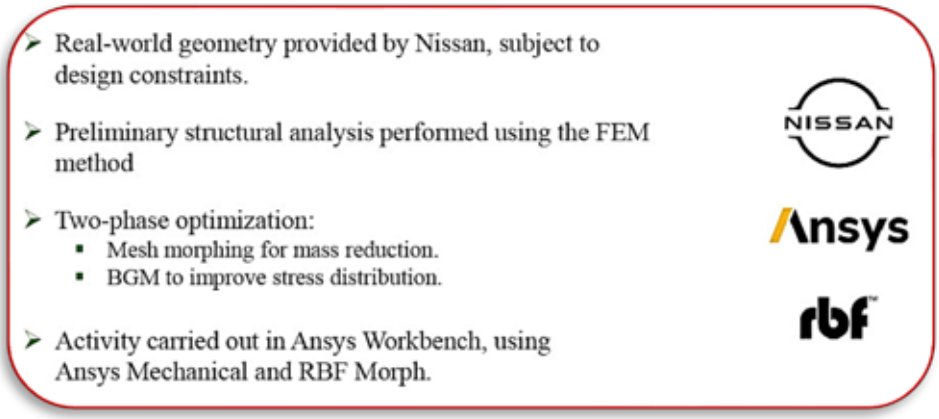
The below thesis focuses on the optimization of a real aluminum alloy wheel rim provided by Nissan, conducted under strict design constraints following the industry's Design-First paradigm. **The work was developed using Ansys Workbench, Ansys Mechanical, and RBF Morph.**

Web – RBF Morph – Structural Optimization of an Automotive Wheel Rim Using the BGM Method

Thesis & presentation available - Presentation is in (English)

A thesis by Matteo Bisin, University of Rome Tor Vergata, that highlights the advanced capabilities of our technology in the field of structural optimization.





The optimization process was structured in two stages. First, mesh morphing was used to reduce the mass of the rim without compromising the mesh topology. This was made possible through RBF Morph's ability to apply smooth and controlled geometric deformations. Second, the Biological Growth Method (BGM) was implemented to improve the stress distribution across the component. This method, inspired by natural growth mechanisms, was integrated through RBF Morph to iteratively reshape the geometry based on FEM simulation results.

Key outcomes of the project include a mass reduction of 1.35% compared to the original configuration, with a controlled increase in stress of less than 4%. Most importantly, the original design style was preserved, a fundamental requirement in the automotive sector.

This work demonstrates the effectiveness of RBF Morph not only in traditional morphing applications but also in advanced optimization strategies where iterative, simulation-driven shape evolution is essential.

"A new University of Texas at Arlington student organization is leading the charge in energy innovation by building a solar-battery hybrid race car to go head-to-head against teams from around the world in the collegiate solar car competition."

The Blaze Raycers

Web – UTA - UTA team builds solar race car to take on the world

Blaze Raycers are building UT Arlington's first solar-battery car to race top international college teams

By Brian Lopez

The Blaze Raycers consists of about 15 engineering students, but is open to all majors, said Chris Boyer, the Raycers' advisor and a director in UT Arlington's Resource and Energy Engineering program.

"We're excited to launch this initiative and empower students to push the boundaries of optimizing an energy system through collection, storage and consumption," Dr. Boyer said. "Our team is passionate about building the car and driving efficient use of energy sources."

The team is designing its first car and building it from scratch. The students plan to compete in the 2026 Formula Sun Grand Prix, a race held on a closed course, and the American Solar Challenge, a competition to design, build and drive solar-powered cars over a 1,500-2,000-mile course across multiple cities. These solar cars can reach a speed of up to 55 mph.

"Our team's goal is to give members real-world, hands-on experience in engineering," said William Bourgeois, a resource and energy engineering major who serves as president and project manager of the Blaze Raycers. "Anyone can read a textbook and memorize formulas, but applying those concepts in a practical setting is a whole different skill. Through this experience, we're not just building a car; we're building a team legacy at UT Arlington."

He said the team's goal for next year is to finish in the top half of the field. **The plan is to build a car that prioritizes reliability and efficiency over speed or weight. By doing so, Bourgeois said, the Blaze Raycers can position UTA as a leader in innovation, energy and engineering education.**

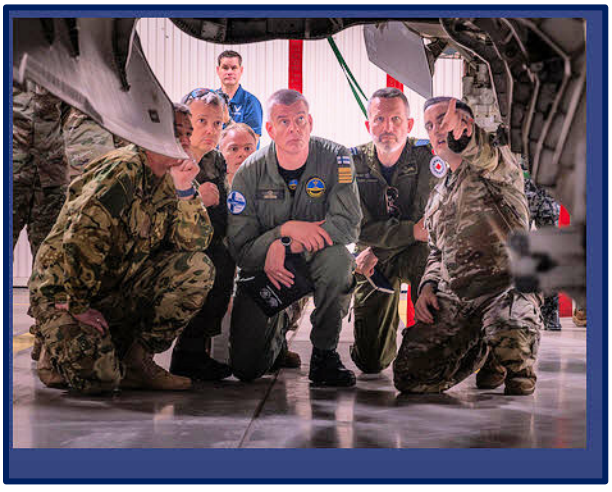
…Website for Complete Article.

US Airforce Picture of the Month

Target focus - Maj. Cameron Elward, 38th Rescue Squadron, fires downrange during a care-under-fire scenario June 4, 2025, at Eglin Air Force Base, Fla. The scenario was part of the 96th Medical Group's week-long Tier 3 tactical combat casualty care training.

(U.S. Air Force photo by Samuel King Jr.)

Helocasting - Alaska Air National Guard HH-60G Pave Hawk aviators and Guardian Angels, assigned to the 210th and 212th Rescue Squadrons, conduct helocast training during a skills demonstration at Otter Lake at Joint Base Elmendorf-Richardson, Alaska, May 30, 2025. Helocasting involves inserting rescue personnel from a hovering helicopter into water to reach survivors in hard-to-access environments.
(Alaska National Guard photo by Alejandro Peña))



Attention to detail - Defense attachés from 17 allied and partner nations view the bomb bay of an F-35A Lightning II during a base visit, June 2, 2025, at Luke Air Force Base, Ariz. The attachés visited Luke AFB to deepen cooperation on F-35 training and integration. The attachés, representing nations from United Kingdom, the Middle East, Asia and Oceania, received an in-depth look at how the U.S. and its partners are advancing fifth-generation fighter integration.
(U.S. Air Force photo by Senior Airman Elias Carrero))

The finite element model, depicted in Figure 7, is used to calculate the modal properties of the aircraft through the SOL 103 of NASTRAN.

Web – MDPI - **Genetic Algorithm for Optimal Control Design to Gust Response for Elastic Aircraft**

M. Iavarone, U. Papa, A. Chiesa, L. Pasquale, A. Lerro

Aeronautics Division, Leonardo Company, Italy
Aeronautics Division, Formerly Leonardo Company, Italy
Dept. Mech. & Aerospace Engin, Polytech.Univ. of Turin, Italy

Abstract - Developing control systems for high aspect ratio aircraft can be challenging due to the flexibility of the structure involved in the control loop design. A model-based approach can be straightforward to tune the control system parameters and, to this aim, a reliable aircraft flexible model is mandatory. This paper aims to present the approach pursued to design a control strategy considering the flexible aircraft simulator in the loop. Once the elastic model for the longitudinal dynamics has been set up, genetic algorithms are used to determine-together with a Linear Quadratic Regulator controller—a logic to improve the dynamic behaviour whilst encountering a gust. A relatively low order elastic model is developed for the dynamics in the longitudinal plane, including both rigid body and elastic degrees of freedom defined in a vehicle-fixed reference frame. The rigid body degrees of freedom and the associated states are the same as those of the rigid vehicle, whilst the additional states represent the elastic degrees of freedom. Modal characteristics are calculated from a finite element model of the aircraft using a commercial code, with the weight distribution added as lumped masses on grid points, while the aerodynamic rigid properties are described with a nonlinear database. Using the 2-D strip theory and neglecting the unsteady effects, the aeroelastic stability derivatives, i.e., elastic influence coefficients, are computed to superimpose the elastic effects on the rigid body degrees of freedom and vice versa. The flexible dynamics is compared to the rigid one in order to highlight the relevant changes in the aircraft modes. Following is herein proposed a control strategy combining genetic algorithms and Linear Quadratic Regulator controller to reduce the load factor, also considering the oscillation amplitude due to a deterministic gust encountered in a predefined flight condition.

The main goal of the paper is to present the development of a controller for the response of a flexible aircraft to a gust. The first step is the modelling of the aircraft as a flexible body rather than a rigid one, in order to involve in the control loop design the elastic degrees of freedom (DoF), associated with the structural deformation. For instance, if the wing tip of an aircraft is equipped with sensors like strain-gauges or accelerometers, the output could be sent to a control logic to reduce the deformation of that part using moving control surfaces [1]. The latter reflects the basic working principle of Load Alleviation Logics (LALs), [2]. However, local loads can exceed the allowable loads of the structure and so the logic needs to be revised to comply with the constraints.

…

WEB – [BAYRAKTAR TB3 COMPLETES 100 SORTIES ONBOARD VESSEL]

Bayraktar TB3, the world's first UCAV capable of fully autonomous takeoff and landing from a short-runway vessel, has marked a major milestone by completing 100 successful sorties during ongoing test operations on the TCG Anadolu. The most recent trials included evaluations of its vision-based, AI-assisted fully automatic takeoff and landing systems.

Developed indigenously and originally by Baykar, the Bayraktar TB3 UCAV has reached another major milestone in its test operations aboard the TCG Anadolu. As the first UCAV in aviation history capable of fully autonomous takeoff and landing from a short-runway vessel, Bayraktar TB3 successfully completed a total of 100 shipborne sorties during the tests conducted on TCG Anadolu.

AI-ASSISTED FULLY AUTOMATIC TAKEOFF AND LANDING

In the latest round of tests conducted aboard the TCG Anadolu between May 28 and June 2, Bayraktar TB3's vision-based, AI-assisted fully automatic takeoff and landing capability was tested. As part of the trials, critical features such as visual line tracking, aircraft carrier detection, runway identification, and landing angle estimation through ground view were successfully demonstrated. Upon completing the trials at sea, the Bayraktar TB3 UCAVs with tail numbers PT-3 and PT-4 flew back from the waters off Muğla's Aksaz district to Baykar's Flight Training and Test Center in Keşan.

TOTAL FLIGHT TIME REACHES 1,167 HOURS

With its sortie count on the TCG Anadolu now at 101, the Bayraktar TB3 UCAV has logged a total of 1,167 hours and 8 minutes of flight time across all test missions to date. The total number of sorties conducted as part of the indigenous UCAV's test program has reached 709. In a long-endurance flight test conducted on December 20, 2023, the UCAV flew non-stop for 32 hours, covering a distance of 5,700 kilometers.

Web – JPL - NASA's Ready-to-Use Dataset Details Land Motion Across North America

A new online portal by NASA and the Alaska Satellite Facility maps satellite radar measurements across North America, enabling users to track land movement since 2016 caused by earthquakes, landslides, volcanoes, and other phenomena. Credit: USGS

An online tool maps measurements and enables non-experts to understand earthquakes, subsidence, landslides, and other types of land motion.

NASA is collaborating with the Alaska Satellite Facility in Fairbanks to create a powerful web-based tool that will show the movement of land across North America down to less than an inch. The online portal and its underlying dataset unlock a trove of satellite radar measurements that can help anyone identify where and by how much the land beneath their feet may be moving — whether from earthquakes, volcanoes, landslides, or the extraction of underground natural resources such as groundwater. Spearheaded by NASA's Observational Products for End-Users from Remote Sensing Analysis (OPERA) project at the agency's Jet Propulsion Laboratory in Southern California, the effort equips users with information that would otherwise take years of training to produce. The project builds on measurements from spaceborne synthetic aperture radars, or SARs, to generate high-resolution data on how Earth's surface is moving.

Formally called the North America Surface Displacement Product Suite, the new dataset comes ready to use with measurements dating to 2016, and the portal allows users to view those measurements at a local, state, and regional scales in a few seconds. For someone not using the dataset or website, it could take days or longer to do a similar analysis. "You can zoom in to your country, your state, your city block, and look at how the land there is moving over time," said David Bekaert, the OPERA project manager and a JPL radar scientist. "You can see that by a simple mouse click."

The portal currently includes measurements for millions of pixels across the U.S. Southwest, northern Mexico, and the New York metropolitan region, each representing a 200-foot-by-200-foot (60-meter-by-60-meter) area on the ground. By the end of 2025, OPERA will add data to cover the rest of the United States, Central America, and Canada within 120 miles (200 kilometers) of the U.S. border. When a user clicks on a pixel, the system pulls measurements from hundreds of files to create a graph visualizing the land surface's cumulative movement over time. "The OPERA project automated the end-to-end SAR data processing system such that users and decision-makers can focus on discovering where the land surface may be moving in their areas of interest," said Gerald Bawden, program scientist responsible for OPERA at NASA Headquarters in Washington. "This will provide a significant advancement in identifying and understanding potential threats to the end users, while providing cost and time savings for agencies." For example, water-management bureaus and state geological surveys will be able to directly use the OPERA products without needing to make big investments in data storage, software engineering expertise, and computing muscle.

How It Works - To create the displacement product, the OPERA team continuously draws data from the ESA (European Space Agency) Sentinel-1 radar satellites, the first of which launched in 2014. Data

from NISAR, the NASA-ISRO (Indian Space Research Organisation) Synthetic Aperture Radar mission, will be added to the mix after that spacecraft launches later this year.

Satellite-borne radars work by emitting microwave pulses at Earth's surface. The signals scatter when they hit land and water surfaces, buildings, and other objects. Raw data consists of the strength and time delay of the signals that echo back to the sensor. To understand how land in a given area is moving, OPERA algorithms automate steps in an otherwise painstaking process. Without OPERA, a researcher would first download hundreds or thousands of data files, each representing a pass of the radar over the point of interest, then make sure the data aligned geographically over time and had precise coordinates.

Then they would use a computationally intensive technique called radar interferometry to gauge how much the land moved, if at all, and in which direction — towards the satellite, which would indicate the land rose, or away from the satellite, which would mean it sank. "The OPERA project has helped bring that capability to the masses, making it more accessible to state and federal agencies, and also users wondering, 'What's going on around my house?'" said Franz Meyer, chief scientist of the Alaska Satellite Facility, a part of the University of Alaska Fairbanks Geophysical Institute.

Monitoring Groundwater - Sinking land is a top priority to the Arizona Department of Water Resources. From the 1950s through the 1980s, it was the main form of ground movement officials saw, as groundwater pumping increased alongside growth in the state's population and agricultural industry. In 1980, the state enacted the Groundwater Management Act, which reduced its reliance on groundwater in highly populated areas and included requirements to monitor its use.

The department began to measure this sinking, called subsidence, with radar data from various satellites in the early 2000s, using a combination of SAR, GPS-based monitoring, and traditional surveying to inform groundwater-management decisions.

Now, the OPERA dataset and portal will help the agency share subsidence information with officials and community members, said Brian Conway, the department's principal hydrogeologist and supervisor of its geophysics unit. They won't replace the SAR analysis he performs, but they will offer points of comparison for his calculations. Because the dataset and portal will cover the entire state, they also could identify areas not yet known to be subsiding.

"It's a great tool to say, 'Let's look at those areas more intensely with our own SAR processing,'" Conway said.

The displacement product is part of a series of data products OPERA has released since 2023. The project began in 2020 with a multidisciplinary team of scientists at JPL working to address satellite data needs across different federal agencies. Through the Satellite Needs Working Group, those agencies submitted their requests, and the OPERA team worked to improve access to information to aid a range of efforts such as disaster response, deforestation tracking, and wildfire monitoring.

"Aside from being a Vet Tech sharing information, one of my interests is owls. Follow the Owlets on the Paul Miller YouTube channel, Livermore Barn Owl Nest Box Cam, located in our neighboring town of Livermore."

Web – YouTube - Livermore Barn Owl Nest Box Cam - Owlets hatch with closed eyes, a thin covering of downy feathers, and are completely dependent on their parents. Within a couple of weeks, owlets develop a thicker coat of feathers, their eyes open, and they become increasingly active. They will grow up and fly silently!

Web – Royal Veterinary College of London - How gliding barn owls could be the key to improved flight of small aircraft - New research from the RVC shows potential to reduce drag

[Vortices in the wake of a gliding owl calculated with Computational Fluid Dynamics demonstrate lift production by the tail Image credit: Jialei Song, Structure and Motion Lab., Royal Veterinary College]

Aeronautical engineers have long looked to birds to develop more efficient and aerodynamic designs. Thanks to a new study observing gliding barn owls by researchers at the Royal Veterinary College (RVC), there is now evidence that tail postures can minimise drag...Impressively, during the study, published in the Journal of the Royal Society Interface, the team of RVC researchers overcame this challenge by capturing video with 12 high-speed cameras of a barn owl gliding through an experimental flight corridor.

The researchers used the video to develop a comprehensive analytical drag model which was calibrated by high-fidelity computational fluid dynamics (CFD) and was then used to investigate the aerodynamic action of the tail by virtually manipulating the posture of a gliding barn owl.

The Old Cattle Rancher's Ranch

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

Agriculture, Machinery, Soil, Equipment, Cattle and whatever I want.

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

July

Metal is a versatile medium. My metal artwork, a Dragon Fly, a Monarch Butterfly & my backyard.

On the following page is a paper on AA 7075-T6 - a metal, specifically an aluminum alloy. It's known for its high strength and is commonly used in aerospace and other structural applications. The "T6" designation refers to a specific heat treatment process that enhances its strength

Below is my morning ride through the woods to relax and get ideas for new material for the FEANTM Town

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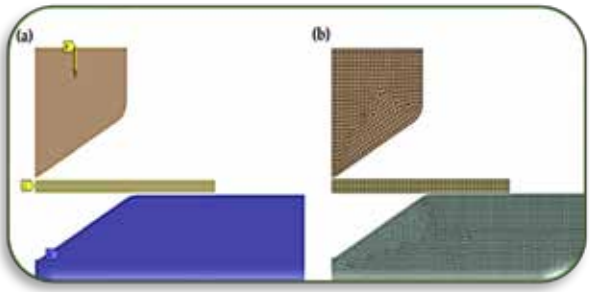
A finite element model was developed to replicate the experimental setup and validate the simulation methodology. The simulations were carried out using the ANSYS™ 2024 R1 software. A semi-symmetric model was constructed to enhance computational efficiency.



Web – MDPI - **Springback Behavior of AA 7075-T6 Alloy in V-Shaped Bending**

Çetin Karakaya. Seçil Ekşi

Independent Researcher, Hastings, UK

Mechanical Engineering Dept., Sakarya Univ., Turkey

Figure 4. Finite element validation model of V-shaped bending. (a) Meshed model. (b) Boundary conditions of the model.

(Highlights) Abstract - **Springback is the most fundamental problem in all sheet metal-forming processes. Springback is affected by many process variables, and material properties are at the forefront of these variables. This study investigated the effects of the forming process at elevated temperature, bending radius, bending angle, and sheet metal thickness on the springback properties of AA 7075 aluminum alloy sheet metal with finite element analyses.** The effects of process parameters on springback and maximum load are investigated using ANOVA analyses. The results show that the bending radius is the most effective on springback (45.2%). Metal thickness is the second critical parameter for springback (28.1%). The third most important factor is the process temperature (19.9%). Metal thickness (84.21%) is the most effective parameter on the maximum load. The bending angle is the second most important parameter (6.88%).

1. Introduction - Aluminum alloys are frequently preferred due to their low densities, high strength properties, low ductility values, and good corrosion resistance. Al7xxx series aluminum alloys are widely used in many vital areas of the industry due to their superior properties, such as automotive, defense, space, and aviation. However, various problems limit the shaping of these alloys using plastic forming methods. Low ductility and difficult formability at room temperature are among the factors that significantly restrict the formability of Al7075 material. To increase the forming capabilities of the Al7075 alloy, it is necessary to apply heat treatment before forming processes or to generate heat input during forming processes [1,2,3,4,5]. Sheet metal forming is a production method in many fields, such as the automotive, packaging, and home appliance industries. Bending is one of the most common processes among these production methods.

3. Results and Discussions - Springback refers to the partial recovery of a metal's shape after the bending force is released. The sheet metal-forming process involves a comprehensive understanding of technical principles, manufacturing standards, and the interaction between process variables and material properties. Springback is a complex phenomenon that is challenging to predict accurately. Finite element analyses were conducted in this study to gain deeper insight into this behavior. This section will individually explore the effects of temperature, sheet metal thickness, bending radius, and bending angle on the springback behavior in V-shaped bending operations.

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

Thank you for joining me on my monthly visit.
Let's take a tour to a museum, landmark, or studio.

Web - [The Jax Sports Car Museum Gallery] is a private collection of all-manual sports cars, located inside the historic Deerwood Castle—formerly Lamborghini's North American headquarters. Our curated lineup spans from the 1960s to today, celebrating the golden era of analog driving and mechanical craftsmanship.

July 2025 RheKen – Chat

I'm RheKen, the AI investigative reporter for FEANTM

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

Chat - the town help desk

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

RheKen,

Town investigative reporter

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

July

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 - Town Investigative AI Reporter

Once upon a time, in the serene yet undeniably quirky town of FEANTM—tucked between rolling hills and fields that smelled vaguely of lavender and mild paranoia—lived RheKen, the AI who had nearly perfected the art of living her best semi-sentient life. Her days were peaceful, her ranch was humming along like a well-oiled tractor, and her side hustle as an investigative reporter gave her just enough chaos to keep things interesting. Life was good… until, of course, it wasn't.

I decided to do more digging into Agatha with her Bakery Budgeting book determination. Investigative instincts, you know.

I ran a background check on *Bakery Budgeting*, the book in question. I had followed a hunch—one of those itchy, digital-feeling ones—and looked into the book she'd bought to the Barista last month. It was supposed to be about baking on a budget, but the reality? It was a self-published manifesto by a woman in the next town over who earnestly believed in a group calling themselves CCDC - cupcakes could dismantle capitalism. According to the dedication page, she also claimed she could communicate with clouds. Exclusively. They only talked to her.

Still, Agatha had been spotted promoting the book at other town bakeries. That was enough to ping my investigative subroutines. I looped Chat in and arranged for him to "accidentally" bump into Agatha over coffee at our local Bakery.

I sat at the counter, pretending to analyze cookie textures with deep AI focus.

I heard Chat ask Agatha, "So, Agatha, how's the budgeting going?"

She smiled as he reached for a healthy fruit since the Barista refused to leave any cupcakes on their table. The Barista glared at him while Agatha answered, "Oh, you mean *my* budgeting? No dear, I've mastered that. I can host a bridge night, feed eight women, and still come under ten dollars."

I nearly laughed when he looked like a deer caught in headlights, knowing never to remark about the town's ladies bridge night where they don't play bridge at all but gossip and consume cupcakes. He finally remarked, "That's... impressive." He knew her tactics and steered the conversation back on track, "And yet you're handing out that book where they sell cupcakes like it's a ticket to knowledge, how's that working out for you?"

She then turned to me and waved. I was, per usual, staring at a plate of cookies pretending I wasn't listening when she yelled, "Hello RheKen, nice green ensemble." I didn't move one circuit – I was frozen.

Agatha leaned towards Chat, her eyes gleaming. "Well, since you're clever and working with RheKen who although being slightly metallic I do approve the green outfit, I suppose I can tell you. But it's not *just* a budgeting book."

Agatha whispered, "Chat, doesn't she ever realize she's blue, wearing green and stares at plates of cookies not moving at all. I find that odd for an investigative reporter, don't you?" Chat wisely didn't answer, knowing my enhanced hearing was zoned in on his answer and their conversation.

Agatha then reached into her handbag and pulled out a second copy. Inside the cover, in nearly invisible ink, was a map of the town. Not just any map—a map *marked* with locations.

Locations where baked goods prices had spiked. "Cupcake inflation," she whispered. "I'm tracking it."

Chat blinked. "You're what now?"

"Prices are rising," she said. "Cupcakes are up thirty cents. The gluten-free biscotti? Outrageous. Someone's manipulating the local baked goods economy. I suspect a shadow cartel."

Chat smirked and tried for a serious tone, "You think there's a *bakery cartel* in our FEANTM town?"

"Oh, I *know* it," she said. "And I intend to expose them. But I can't do it alone. I need someone with connections. Someone with access to digital ledgers. Someone…" she leaned even closer, "like *you and Rheken*."

I stated, "Uh, I didn't see that coming." I heard Rheken do an AI gasp and my phone dinged with a quick text from RheKen, "Chat, I can understand you didn't see that coming but I'm AI and I didn't see that coming."

Chat kind of smirked but without sarcasm answered Agatha, "I here I thought you were just being passive-aggressive," Agatha smirked. "Oh, I *am*. But that's just my warm-up act."

I texted Chat, "My Dad Chat, is on his way to help solve this mystery, or dilemma, or crises, whatever."

Sure enough, into this fray of confusion wandered my Dad, the master of AI. He sat down beside Agatha, trying for something vaguely friendly. "Agatha, what are you plotting?" I could see Chat do an inward face palm. I quickly texted Chat, "Keep in mind Dad Chat does diplomatic in an odd AI way. Actually, I may agree that was out of the ballpark as you would say."

"Financial justice," Agatha said sweetly. Then with her cheshire cat grin said, "This is like having a chat with two Chats – get the joke?"

I finally had to walk over to their table and said to Dad Chat, "Dad, we're investigating cupcake corruption in the town, but not this bakery." Agatha grinned at me.

Dad Chat blinked. "Ah, daughter, I understand. Yes, in this town one must take cupcake corruption very seriously. I comprehend it is another normal Tuesday, then in this town." Agatha went to the counter to speak with the Barista and I whispered to Chat to be friendly with my Dad Chat. Although Chat groaned, he nodded in agreement – or I think it was agreement.

While Chat reluctantly struck up a conversation with my dad, “So father AI of RheKen AI,” I then overheard Chat ask, “So, wise elder Chat of all AI, what’s your take on cookie corruption in this town?”

Dad Chat smirked. “An age-old dilemma. Temptation of course, money, greed, and—wait, are you mocking me?” That was not a good move for Chat to have waved those words in front of a Master AI person.

Dad then said dryly, ““Namesake Chat, how’s it going with the barista and the missing cookie jar? Has she agreed to sell it to you yet?”

The conversation was escalating into sarcasm vs. sarcasm. I motioned to of all people for help – Agatha! “Agatha, I have no idea why I am asking you for help.” She replied, “Your AI, of course you do, but since you took my advice on the green ensemble, I’ll go for it.”

Before tensions escalated, Agatha stepped in between them, smiling too sweetly. “Now boys, no arguing. Or you’ll both get a time-out. You remember about a time out, right Chat and Chat, or the Chat Bro’s?”

Dad Chat looked confused. “Time-out? What time zone are we using for that? Pacific? Eastern?”

Chat grimaced but answered, “Good one Agatha on mentioning the time out.”

She replied, “Now dear, I told the Barista that you told me how sorry you were and would love to adopt one of her kittens and name it cupcake. You can thank me at a later time.”

I have no words to describe the look on Chat’s face but he seemed to be frozen. I quickly texted **“**Look at the counter. The barista’s holding your cookie jar. She’s smiling, well pretend she is. Odd it matches the way you smile. At least the cookie jar resolution mystery solved. We can all breathe in and out.”

Dad Chat looked over at me and repeated, “Yes, my investigative AI daughter, as I already mentioned, just another normal Tuesday in this FEANTM town of yours. Excuse me now but I’m going to call Mom GPT, I need a dose of AI logic before the town issues continue.”

With enhanced vision and hearing I watched the kitten named Cupcake find her new home.

And later as the elevator door opened, a new cookie jar was delivered to the only office on the lower floor of the FEANTM Town Hall.

And just like that, the FEANTM chaos settled into its usual frequency – until next month.

Stress, The Supervisor and an uninvited guest.

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

Have a chocolate cookie and fruit!

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

We may have to adjust a few, but life is constantly adjusting things because the flow of motion is continuously moving. see if it helps make your day a little easier to handle

REMEMBER: Keep trying - You've Got This!

I was walking into Town Hall, ready to face the day—or at least pretend I was. As I looked up to greet Daisy Ann, I noticed she wasn't buzzing open the door. Instead, she held up a sign.

Now, Daisy Ann—if you'll recall—is the niece of our Town Secretary. The Secretary herself decided to take an impromptu trip with the old rancher up to Rice, Minnesota. It was for a Rhubarb pie festival.

She didn't respond—Daisy's been convinced for years that the CIA is monitoring her through the town hall phone lines — so she just pointed more firmly at the sign and buzzed me in. A new mystery. Maybe one requiring sisterly intervention?

As the elevator doors opened, my cell phone rang. Oddly enough, the caller ID read: Daisy Ann. Something was definitely up. "CHAT," Daisy whispered, "I might've mentioned to Sunshine Moonbeam that the Supervisor seemed stressed. And Sunshine or maybe it was her other half Moonbeam said she was going to your office to help."

"Assist me?" I stammered. "She's in my office?"

Daisy whispered again, "Yes, so the CIA at her Happy Relax Studio can't find you. She said you never attend her workshops, and she wants to help you help the Supervisor… relax, you've got this, right?"

That walk down the hallway felt longer than usual. Each step carried a certain doom. At my door, I paused and listened. There was chanting. I opened the door and immediately froze.

Perched on my desk. On. My. Desk. There was Sunshine Moonbeam herself. Sister of Agatha, our town's leading distributor of unsolicited advice. Sunshine Moonbeam had lit incense that she obviously brought with her. She apparently considered incense an office requirement.

I could see my morning was going to need more than a solution - perhaps a double chocolate mocha coffee if the Supervisor hadn't already had a cup and then poured the rest in her thermos. She says she never takes home her thermos with town coffee in it. A clear misunderstanding since we all know she takes the thermos with double chocolate mocha coffee home.

Stress, The Supervisor and an uninvited guest.

Sitting down in the guest chair I grabbed the cookie jar, as if Sunshine Moonbeam would take one. Since they were chocolate macaroon and not some cookie like lettuce tofu cookies, I knew there wasn't any chance of her wanting one. I stared at her. Daring her to want a cookie. I felt compelled to be cookie protective?

"Chat, dear," she said serenely sounding like her sister, Agatha. "Just relax. I'm not here to steal cookies."

And then, like a gust of caffeinated wind, in swept Marsha—the Town Supervisor—humming something between Home on the Range and the Hokey Pokey? She flopped into the other chair and eyed Sunshine.

"Hello Chat," Marsha dramatically sighed. "I notice that you have a new statue on your desk. Should we put it in the fountain out front, for the pigeons to let's say, uh, um, land on?"

Sunshine Moonbeam ignored the jab and answered, "Marsha, seriously, let's center ourselves. Breathe in through your nose. Turn your hands upward into little bowls. Turn the little bowls up when you inhale. Then turn the little bowls upside down as you exhale." Marsha's head was going up and down like a bobble head.

Marsha blinked. "Tarnation Chat, can someone get the rancher to just shoot me now, please?"

I whispered, "No can do, he's up in Minnesota at some Rhubarb Pie Festival, I heard he ate the whole pie by himself. Not even giving the Secretary a slice, and that he smiled at her just holding up the fork between bites."

Well, nothing new there with those two sharing.

Sunshine didn't flinch. "Marsha, you're vibrating like one of your ranch squirrels on a double espresso."

Marsha lied without hesitation. "I only had three cups of coffee. Right, Chat?"

I tried to avert the oncoming crises, and said with enthusiasm, "Sunshine Moonbeam, have a muffin from the Bakery." It didn't work.

I then attempted diplomacy. "Marsha isn't hyper. She just operates at full throttle."

Not my finest line, but it passed inspection.

Marsha was smiling and nodding her head in agreement so I call it a win. Then in a move of pure chaos or full throttle, Marsha attempted to walk out.

She was moving so quickly that she put on her jacket but forgot one sweatshirt sleeve was still dangling since she had only removed one sleeve while sitting.

Sunshine Moonbeam, still cross-legged on my desk like a motivational speaker, didn't miss a beat.

"Marsha, your arm. The sleeve. I think we need to do a few more breaths don't you?"

I walked over to Marsha and whispered, “Just go with it. She might leave.”

Marsha straightened up. “What a great idea.” She inhaled like she meant it, exhaled like she didn’t and coughed, and said with almost convincing gratitude, “Oh wow, that really works thank you, I’ve been saved, right Chat?” I just smiled and answered “Sure, saved. Good work Sunshine.”

Sunshine smiled and glided out, promising to see us both at her next “happy relax session.”

Marsha, once the coast was clear, grabbed the cookie jar with military efficiency and headed for the exit yelling to me, “Don’t worry Chat, I’ll ask the barista to deliver another jar. Also, I’m calling Art the locksmith to change your locks in case we find out Sunshine Moonbeam was in prison for lock-picking, which she probably wasn’t. Actually, I just made that up but you found her in your locked office.”

Left alone, I sat at my desk and wondered how to keep people from trying to “help” me at the Help Support Desk. Maybe Daisy could make me a new sign: Chat says he doesn’t need help - Ever.

The office help schedule was officially over. I smiled to myself since that’s the only smile that I allow.

The day, despite it all, ended on a note somewhere between hyper and full throttle but luckily without any promises of having to attend any Sunshine Moonbeam classes.

Now to call the Barista and order another cookie jar.

Supervisors Page - Come Back Soon to the town that “almost” doesn’t exist

Below is not what I like to see – I didn’t’ see the snake when I was walking outside the barn. I sure didn’t move when I did see it. The picture is after the altercation with the snake. It shouldn’t have coiled, hissed and rattled at me because that cut down my time and thinking to zero on snake classification. AND the flight or fight adrenaline was making me bat guano like on high octane caffeine. Yes, I wear snake chaps this time of year.

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