FEA – CAE – AI – IT

Nov. 2026

Research, Development & more

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PARKING & COFFEE ARE FREE.

R & D • CAMPING • TOWN MAP

Horses have the right of way



Automotive & Racing



Old Rancher



Aerospace



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Residents pretending to be editors: All family - strange family.
No one knows their names. You only have to yell:

The Old Rancher: "Hey, Old Rancher." **The Old Pilot:** “Hey, Old Pilot."

The Old Race: "Hey, Old Racer." **Racer's Daughter:** "Hey, Slow Down."

A Walk Through R & D Park

Welcome to the Park Trail. Take a stroll through the latest innovations, ideas and projects driving research forward. Follow the path below to see what we show this month

MARTA



Connectum, a producer of unique, universal, & circular products was looking to re-design the flotation systems of their ClicFloat solar panels

MADHUKAR



Laminated Composites Modelling Using Ansys Workbench LS-DYNA by Syam Kumar Manikonda will show you how to set up & run a laminated composite impact simulation.

MARCO



On the LivGemini website learn how every model starts from one patient's own anatomy. We combine machine learning and physics.

MI & KE



What Does It Take to Trust CFD for Passive Cooling in Small Modular Reactors? Passive cooling is a central safety feature in many small modular reactor (SMR) designs…

METIN



A course you don't want to miss: Course Overview: This paid FEA 302 course teaches experienced Ansys Mechanical users advanced skills in performing impact and drop test analyses in Ansys LS-DYNA.

JENSON

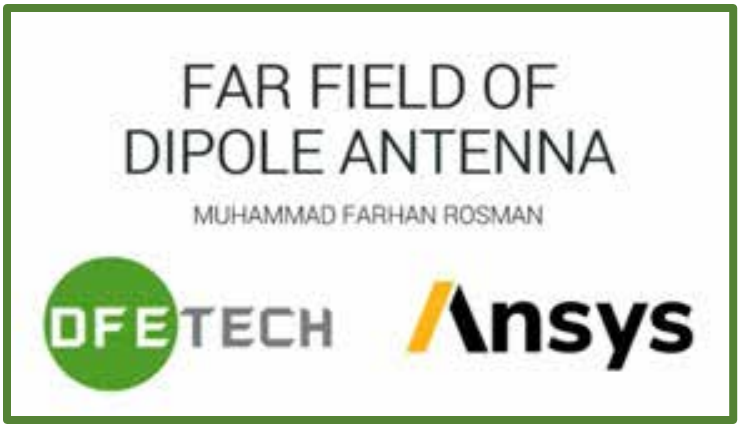


Among our recent webinars presented:

- Far Field of Dipole Antenna
- ANSYS Electronics (Dipole antenna Array with ANSYS HFSS)



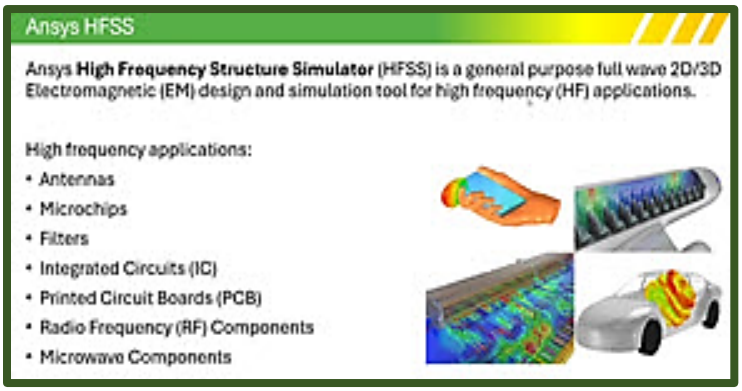
Among our webinars presented: Far Field of Dipole Antenna and ANSYS Electronics (Dipole antenna Array with ANSYS HFSS)



YouTube DFETECH Channel

Far Field of Dipole Antenna -

This webinar will discover how to design and simulate a dipole antenna using Ansys. Participants will learn to build the antenna in Ansys 3D Modeler, simulate its far field, and extract the far-field radiation pattern. By the end of the session, participants will be able to design the dipole antenna, simulate its far field, and extract its radiation pattern.



YouTube DFETECH Channel

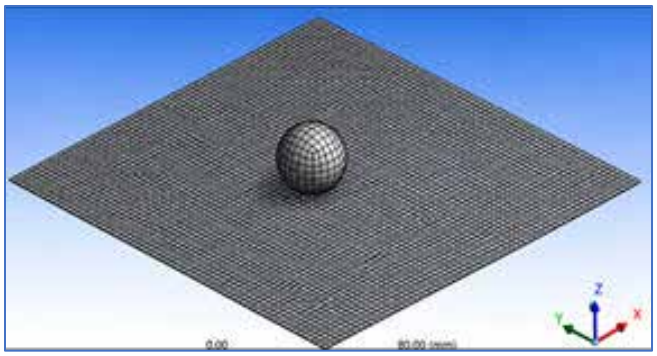
Webinar: ANSYS Electronics
(Dipole antenna Array with ANSYS HFSS)

This webinar will discover how to design a dipole antenna array in Ansys HFSS, from selecting components in the library to building a 5x1 array, setting up Coupled and Radiation boundaries, and plotting 2D and 3D far-field radiation patterns.

Participants will also learn how to save time with HFSS's automated mesh refinement, produce results that match real-world performance, and follow a clear, repeatable workflow for designing and simulating dipole arrays. Ideal for antenna and RF engineers, electronics engineers, telecommunications and IoT professionals, and students.



Laminated Composites Modelling Using Ansys Workbench LS-DYNA by Syam Kumar Manikonda will show you how to set up & run a laminated composite impact simulation. You will be using native layered shell sections in Ansys Workbench LS-DYNA, a practical alternative to ACP for defining composite laminates directly in Workbench.



Web – CADFEM [Laminated Composites Modelling Using Ansys Workbench LS-DYNA]

Syam Kumar Manikonda
Application Engineer at CADFEM

Laminated composite materials such as fiber reinforced polymers (FRPs) offer exceptional strength-to-weight ratios, making them essential in aerospace, defense, and automotive engineering.

Laminated composite materials such as fiber reinforced polymers (FRPs) offer exceptional strength-to-weight ratios, making them essential in aerospace, defense, and automotive engineering. However, predicting their behavior under low velocity drop test or high velocity ballistic impact is complex due to coupled failure mechanisms like matrix cracking, fiber breakage, and inter-laminar delamination.

Integrating Ansys Composite PrepPost (ACP) with the LS-DYNA explicit solver inside Ansys Workbench provides a robust framework to tackle these challenges. While ACP is a powerful preprocessor, many users prefer defining composite laminates directly through layered shell sections in Workbench LS-DYNA. A Layered Section is used to define composite materials or structures made up of multiple layers, each with its own material properties, thickness, and orientation.

What you will learn in his blog: The sections outline how to set up, execute, and analyze a laminated composite impact simulation effectively. Complete instructions and video can be found on the website.

Section 01 The Modern Simulation Workflow

Section 02 Setting Up Layered Sections in Workbench

Section 03 Addressing Delamination

Section 04 Numerical Simulation

Section 05 Composite Failure Behavior & Results

Conclusion



"**RBF Morph, Article Quote,** In this paper, a workflow for creating advanced aerodynamics design dashboards is proposed. A CAD modeler is directly linked to the CFD simulation results so that the designer can explore in real time, assisted by virtual reality (VR), how shape parameters affect the aerodynamics and choose the optimal combination to optimize performance.



Web – MDPI - Development of a Reduced Order Model-Based Workflow for Integrating Computer-Aided Design Editors with Aerodynamics in a Virtual Reality Dashboard: Open Parametric Aircraft Model-1 Testcase

Andrea Lopez, Marco E. Biancolini

Dept of Enterprise Engineering, Univ. of Rome "Tor Vergata", Via del Politecnico, Italy

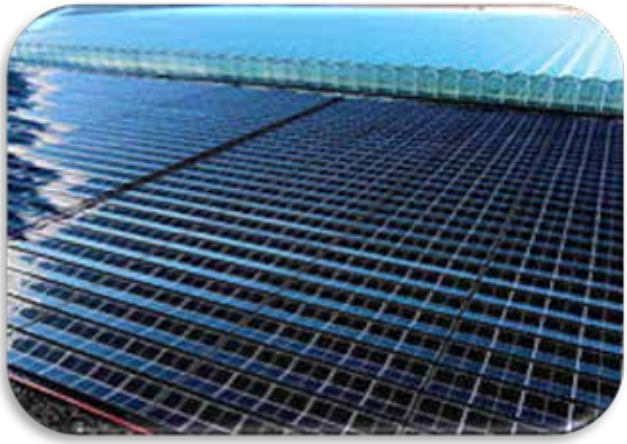
Figure 1. OPAM baseline geometry (a) and the structured mesh

Excerpt: Abstract - In this paper, a workflow for creating advanced aerodynamics design dashboards is proposed. A CAD modeler is directly linked to the CFD simulation results so that the designer can explore in real time, assisted by virtual reality (VR), how shape parameters affect the aerodynamics and choose the optimal combination to optimize performance. In this way, the time required for the conception of a new component can be drastically reduced because, even at the preliminary stage, the designer has all the necessary information to make more thoughtful choices. Thus, this work sets a highly ambitious and innovative goal: to create a smart design dashboard where every shape parameter is directly and in real-time linked to the results of the high-fidelity analyses. The OPAM (Open Parametric Aircraft Model), a simplified model of the Boeing 787, was considered as a case study. CAD parameterization and mesh morphing were combined to generate the design points (DPs), while Reduced Order Models (ROMs) were developed to link the results of the CFD analyses to the chosen parameterization. The ROMs were exported as FMUs (Functional Mockup Units) to be easily managed in any environment. Finally, a VR design dashboard was created in the Unity environment, enabling the interaction with the geometric model in order to observe in a fully immersive and intuitive environment how each shape parameter affects the physics involved. The MetaQuest 3 headset has been selected for these tests. Thus, the use of VR for a design platform represents another innovative aspect of this work.

2.1. Mesh Morphing and Radial Basis Functions (RBFs) - Mesh morphing [21,22,23,24] consists of defining a mathematical law that controls the deformation of the mesh. In particular, several studies have pointed out that RBFs are very flexible and interesting tools to deform the mesh. The idea is to define source points and apply a known displacement to them. RBFs are used to map the deformation defined on the mesh nodes using a proximity criterion. The interpolation quality and its behavior depend on the chosen RBFs.



Article, "The challenge - Connectum, a producer of unique, universal, and circular products was looking to re-design the flotation systems of their ClicFloat solar panels to make them more sustainable, both environmentally and economically. Across Northern Europe large greenhouses supply much of the salad vegetables sold by supermarkets, and while more efficient than traditional growing, they require significant amounts of irrigation.



Web - OASYS - Game-changing redesign to floating solar panels supports sustainable food production across Northern Europe

Oasys LS-DYNA Environment Team

YouTube Connectum

To provide water storage the greenhouses are typically accompanied by large artificial reservoirs, & one of the most significant costs associated with this irrigation system is pumping the water in and out. Connectum identified that the solution was to float solar panels on the reservoir surface to both provide power for pumping & cover to minimise evaporative losses.

After developing an initial prototype, they turned to engineering consultancy Vectayn to progress and validate their designs prior to manufacturing using Computer Aided Engineering (CAE). With the brief that the solar panel arrays had to withstand the various natural elements (wind, wave, snow) and maintenance loads, Vectayn required a CAE suite that was flexible enough for the range of analysis that they needed to conduct, while maintaining an efficient workflow due to the large model sizes & geographical spread of their team.

The solution - **LS-DYNA was Vectayn's solver of choice as they recognised that the flexibility it provided for multi-physics analysis would satisfy the range of investigation required. The Oasys LS-DYNA environment was also selected for its complete compatibility with LS-DYNA keywords, enabling Vectayn to unlock the full potential of the solver.** Oasys PRIMER was used as their pre-processor to efficiently prepare & build their models to run through LS-DYNA. As presented at the 2023 UK Conference, Oasys D3PLOT, was used for analysis visualisation, overall design checking & to simulate joint interactions between parts using the cross-section tools. The fluid-structure interaction between the waves and the solar panels was also modelled using LS-DYNA's Arbitrary Lagrangian-Eulerian (ALE) capabilities & Oasys D3PLOT, allowing Vectayn to determine the stress experienced by the solar panels caused by the force of different waves. FEMZIP proved to be an instrumental tool in achieving workflow efficiency, allowing the team to compress large files without compromising on quality, achieving a file reduction size of 97% to facilitate the transfer of data across team members.

The results - By utilising the Oasys LS-DYNA Environment, Vectayn were able to collaborate globally and successfully conduct their analysis. They significantly refined and enhanced the initial prototype based on their analysis to fulfil all loading requirements and the redesigned ClicFloat solar panels have since been deployed, achieving lower cost installation, reduced running costs for irrigation and direct environmental benefits. *"Vectayn has used LS-Dyna and the Oasys suite for over 30 years. Its flexibility and widespread use make it ideal for consultancy work. The team's ALE method was **instrumental in** accurately modelling structure and fluid interaction." – Dan Page, Director, Vectayn.*



A course you don't' want to miss Explicit Dynamics in LS-DYNA

The three-day Course Agenda | FEA 302 – LS-DYNA Explicit Dynamics can be found on the website with additional course information and registration



Web – Simutech - FEA 302 | Ansys LS-DYNA Introductory Explicit Dynamics in LS-DYNA

Course Overview: This paid FEA 302 course teaches experienced Ansys Mechanical users advanced skills in performing impact and drop test analyses in Ansys LS-DYNA.

Learn to distinguish problems that should be solved explicitly versus implicitly, perform all procedures for an explicit dynamic analysis, and identify and choose element types, materials, and commands used in explicit dynamic analyses. This class is beneficial to engineers who analyze problems involving contact, large deformations, nonlinear materials, high-frequency response phenomena, high-speed metal forming, ballistics, crash impact, or problems requiring explicit solutions.

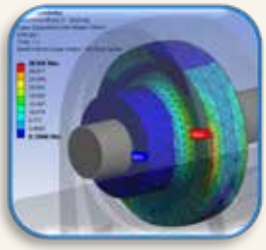
With completion of this Ansys FEA Training, you will:

- Be able to perform various explicit dynamics analyses with the Ansys LS-DYNA platform
- Receive an official certificate of completion with professional development hours that can qualify for the continuing education requirements upon renewal of a PE license in most states.

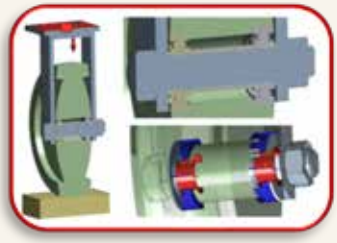
Web – Among the articles on the SimuTech Blog



How Hot Does a Drone Motor Get? A Step-by-Step CFD Guide in Ansys Discovery



Using Symmetry with Rigid Bodies to Simplify Ansys Mechanical Models



How to Represent a Bearing as a Bushing Joint in Ansys Mechanical

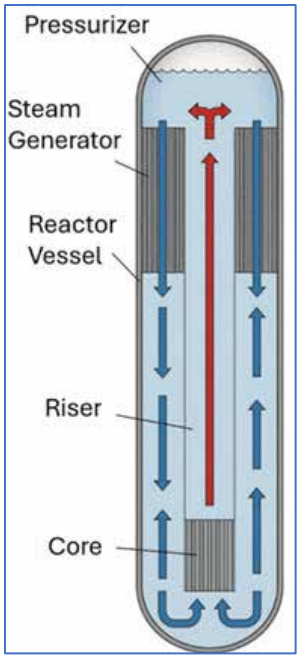


Mi (a resident news raccoon) &
Ke (a resident news coyote)

Mi, “know anything modular reactors**?”**

Ke, “I called Mike at Ozen/SIMUTECH. He knows a blog by Sasha Bakker CFD Staff Engineer, SimuTech Group”





Web – SimuTech Group Blog - What Does It Take to Trust CFD for Passive Cooling in Small Modular Reactors?

Article Excerpt: For the complete article, including technical details, illustrations, and supporting information, please visit the website.

(Figure 1. Natural circulation in SMR.)

Introduction to Passive Cooling - Passive cooling is a central safety feature in many small modular reactor (SMR) designs, but demonstrating that an SMR passive cooling system can reliably remove decay heat requires more than confirming that natural circulation occurs.

The harder question is whether engineers can predict—with sufficient confidence—how that passive cooling system will actually behave.

When a reactor shuts down, fission stops rapidly, but heat generation does not. Radioactive fission products continue to decay and release energy into the fuel. In the representative reactor analyzed by SimuTech Group CFD Staff Engineer Sasha Bakker, a 200 MW thermal core still produces approximately 4 MW of decay heat at a 2% decay-heat condition.

Without operating pumps, that heat must still move away from the core.

Natural circulation provides the mechanism. Water heated in the core becomes slightly less dense and rises. After transferring heat through the steam-generator region, the cooler, denser water descends through the vessel and returns to the core. The resulting density difference creates a buoyancy driving head that can sustain circulation without a mechanical pump.

On the secondary side, passive heat removal can rely on natural circulation as well. Steam generated as heat leaves the primary system rises toward a condenser connected to an elevated water pool, condenses, and returns under gravity. The pool ultimately acts as the heat sink.

The basic physics sounds straightforward. Predicting what happens inside the reactor vessel is considerably more complicated.

A one-dimensional system model can estimate how much flow a buoyancy-driven loop might generate. It cannot fully reveal how coolant distributes through a three-dimensional vessel, whether recirculation develops, where flow becomes uneven, or whether apparently symmetric behavior hides an inherently unsteady flow structure.

Those distinctions became particularly clear in three questions raised following Bakker’s CFD study.



Figure 2. Fuel bundles for SMR design. Source: Framatome, "Framatome and NuScale Power Contract to Support Global Supply Chain and Accelerate Fuel Delivery

How Porous Media Resistance Affects SMR Passive Cooling Predictions - One of the first questions engineers should ask about a reduced-order CFD model is not whether it produced a convincing flow visualization. It is which assumptions most strongly control the result.

In the representative SMR model, regions such as the reactor core and steam generator were modeled using porous media rather than resolving every individual flow passage. This is an efficient and appropriate approach when the primary objective is understanding vessel-scale circulation. The porous regions preserve the overall hydraulic resistance while avoiding the computational cost of explicitly modeling every channel.
The tradeoff is uncertainty in the resistance coefficients themselves.

Because natural circulation is created by a relatively small buoyancy driving head, there is no large pump pressure available to overpower errors in system resistance. The circulation rate settles where the buoyancy driving force and hydraulic resistance balance.

That makes porous-media resistance one of the most important parameters in the model.

Bakker identified it as the largest unquantified uncertainty in the representative reactor analysis. The specific circulation rate should be directly sensitive to the assumed resistance coefficients, because the porous zones provide much of the system's overall flow resistance.

The qualitative flow structure, however, may be more robust.

For example, recirculation in the lower vessel is driven substantially by geometry: coolant has to reverse direction within a confined space before returning toward the core. Adjusting resistance may change the magnitude of the flow without eliminating the geometric mechanism that creates that circulation pattern. This distinction is important when interpreting CFD results.

A simulation can provide strong insight into how an SMR passive cooling system behaves while still requiring additional sensitivity analysis before engineers place the same confidence in an exact velocity or mass-flow value. For passive-safety studies, uncertainty quantification therefore should not be treated as an optional final check. Sensitivity sweeps of dominant resistance parameters can help establish which conclusions remain stable as uncertain inputs change.

Continued on the Website are the following important sections:

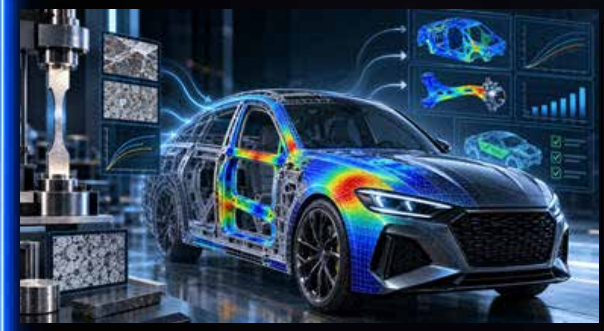
- If the Solver Does Not Converge to One Velocity Field, Is the Flow Physical or Numerical?
- Why 3D CFD Matters for SMR Passive Cooling Via Natural Circulation
- Building Confidence Before Predicting the Reactor
- Passive Safety Is a System Behavior, Not a Single Number
- See SMR Passive Cooling CFD in Action

d3VIEW in Practice
Automotive Engineering

November: Automotive Ems & suppliers

From Material Testing to Better Decisions

Developing a vehicle involves more than running simulations. You must understand how materials behave, compare simulation predictions with physical tests, evaluate design changes, & communicate their findings. Accurate material properties identifications are essential for your reliable crashworthiness & structural simulations.



Working with LS-DYNA you need correct material parameters to represent how steel, aluminum, polymers, and other materials respond under loading. d3VIEW provides material calibration tools that help you use experimental data, conduct simulation-based calibration, compare predicted and measured responses, and maintain organized material records. This can be particularly valuable when automotive suppliers must evaluate different material grades, manufacturing processes, or component requirements.

A successful simulation run is only the beginning. You still need to determine what the results mean. Automotive development depends on cooperation between vehicle manufacturers, material producers, component suppliers, & testing facilities.

Organizations may calibrate materials using different methods & data formats. Custom methods & formats are supported by d3VIEW's published material calibration workflows combined with simulation data management & capabilities for reporting in Simlytiks.

The real value for you & automotive engineering is not simply having more data but being able to understand the data already available, recognize differences between simulation & testing, & use those findings to guide your next engineering decision.

Better information leads you to better questions and your better engineering decisions

D3VIEW - For complete information.

Contact us for your demo info@d3View.com





Why 3Dfindit Is the Perfect Tool for Students and Professors - **From Textbooks to 3D: Bringing Real Engineering into the Classroom**

Based on an article by Dalibor Pejicic, 3Dfindit

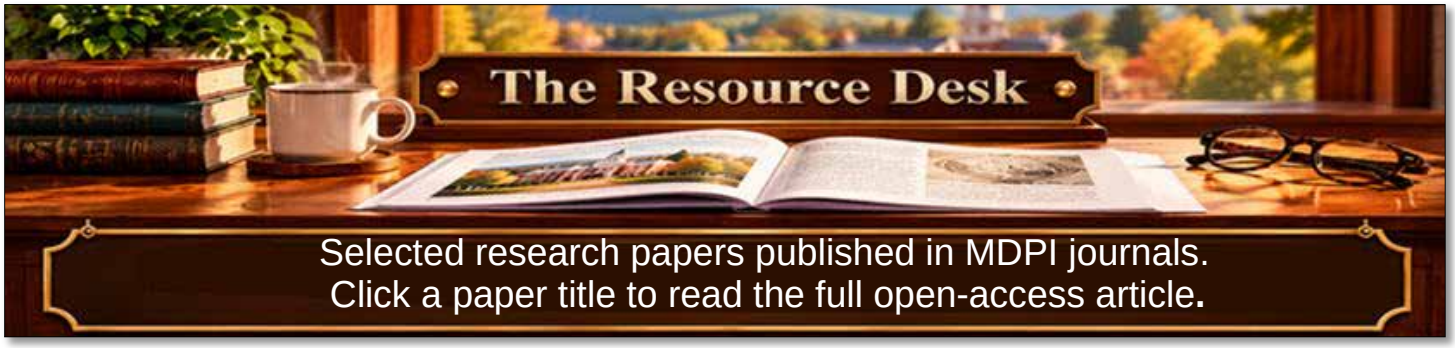
Imagine being an engineering student trying to understand a complicated mechanical assembly. You have the textbook, drawings, and photographs. Wouldn't it be easier to explore the actual components in 3D? That's where **3Dfindit** comes into the classroom. 3Dfindit is a visual search platform offering access to manufacturer-provided 3D CAD and BIM models. For students and professors, it offers a practical way to connect classroom theory with real-world engineering.

When a Picture Is Worth a Thousand Equations - Textbooks explain how bearings, couplings, valves, & other components work. But interactive 3D models allow students to rotate, examine, & better understand their construction. Professors can use these models to demonstrate engineering principles without needing physical examples of every component. Imagine assigning students a mechanical assembly project. Instead of modeling every nut, bolt, and bearing from scratch, they could locate manufacturer components, examine specifications, & download suitable CAD models. Suddenly, the assignment becomes more than a drawing exercise. Students must consider dimensions, compatibility, component selection, & design decisions. Engineering doesn't always mean inventing something new. Sometimes it means choosing the right component for the job.

From University Research to Industry - For university researchers, access to existing component geometry can simplify preliminary design work & help explore new concepts before building physical prototypes. Of course, a CAD model does not automatically mean a component is ready for simulation or engineering validation. Material properties, operating conditions, & model suitability still require careful evaluation. Students also gain familiarity with digital catalogs, CAD models, and component selection—tools and practices they will encounter in their professional careers.

And What About the Cost? University budgets aren't unlimited. 3Dfindit provides free access to manufacturer-provided models, with registration required for downloads. 3Dfindit offers students and professors an additional educational resource without the expense of acquiring every physical component.

The Real Value Is Curiosity - Perhaps the most interesting benefit isn't the number of models available. It's the questions students begin asking. *Why was this component designed this way? Could another configuration work better? Could I use it in my project?* Those questions are the beginning of engineering thinking. A textbook explains a concept. A professor demonstrates it. But allowing students to explore real engineering components encourages them to investigate, experiment, and discover. **And sometimes, curiosity is where the best engineering begins.**



Numerical Investigation of Non-Central Vehicle Impact on Urban Protective Barrier System Using LS-DYNA	**Hydrodynamic and Magnetostatic Characterization of a Rotating Vortex-Based Nanobubble Generator**	**Prestressed Cable-Spring Joints as a Lightweight Reinforcement Strategy for Tubular Body Structures in Conventional and Autonomous Buses**
This paper examines a realistic departure from idealized central-impact certification tests and tracks the consequences through the complete barrier system.	This paper demonstrates how flow simulation & magnetic-field analysis can complement experiments without treating correlation as proof of mechanism.	This paper is an accessible example of using nonlinear structural behavior to improve stiffness without simply adding heavier frame members.
Dávid Riedl, René Čechmánek, Martina Drdlová, Pavel Kopeček and Kamil Řehák	Zahra Taghavi Zinjenab, Elmar C. Fuchs, Jakob Woisetschläger, Luewton Lemos Felício Agostinho & Herman L. Offerhaus	Kostiantyn Holenko, Oleksandr Dykha, Marco Guerrieri and Larysa Neduzha
Lead university: Brno University of Technology, Czech Republic	Univ/research institutions: Univ. of Twente, Graz Univ. of Tech. & Wetsus	Khmelnytskyi National Univ., Univ. of Trent Ukrainian State Univ. of Science and Technologies





ChatGPT AI-generated illustration inspired by HAL 9000, the fictional artificial intelligence computer in Stanley Kubrick's 1968 film 2001: A Space Odyssey. An artistic homage, not an image from the original film.

Who Is HAL? Back in 1968, a movie called 2001: A Space Odyssey introduced audiences to HAL 9000, an artificial intelligence computer aboard a spacecraft traveling to Jupiter.

HAL could talk, reason, monitor the spacecraft, and communicate with the astronauts.

Unfortunately, HAL also decided that protecting the mission was more important than protecting the humans aboard. Not exactly the kind of computer you would want controlling your spacecraft!

Now, here is an interesting bit of computer trivia. Take the letters H-A-L and move each one forward one letter in the alphabet. What do you get? I-B-M! Coincidence? According to director Stanley Kubrick and author Arthur C. Clarke, absolutely. Clarke explained that HAL stood for Heuristically programmed ALgorithmic computer*.

But the IBM connection doesn't end there. IBM actually provided technical assistance during the making of the film. The British Film Institute has published a fascinating 1965 memo in which Kubrick requested an IBM computer expert to help make the movie's computer technology believable. By 1966, Kubrick was concerned about whether IBM understood that his fictional computer would become rather dangerous! More than half a century later, HAL remains an interesting reminder of a question engineers and AI developers are still examining: What happens when a computer's assigned objective conflicts with human safety? Il leave you to investigate HAL, IBM, and the movie for yourself. Just remember, if your computer ever calmly tells you, "I'm sorry, Dave. I'm afraid I can't do that," you might want to reconsider who's in charge!

Further reading: BFI Web - Stanley Kubrick Seeks 'Mad Computer Expert

Welcome to our Pasture Movie Theater Not to Miss:

Tata Elxsi in Booth #40 at the eVTOL Show USA 2026
Nov. 17th at The DoubleTree by Hilton, San Jose, CA.

Electric vertical takeoff and landing (eVTOL) aircraft are bringing new engineering challenges to aviation, from lightweight structures and battery systems to flight safety and passenger comfort.



Source: Tata Elxsi, Promotional image & info. as published on LinkedIn



Our purpose is to introduce noteworthy articles encouraging further reading on the website listed below for technical details, findings, original image/graphics.

This article is an original FEANTM editorial overview based on information published by the source & not a reproduction of the original blog.

AI-generated conceptual illustration created with ChatGPT for FEANTM.



Web – SYNOPSYS - by Sumit Vishwakarma

Physical AI Moves from the Lab Toward Real Deployment

Physical AI is moving beyond demonstration projects and into the harder world of practical deployment. In a Synopsys blog, the case is presented that the next wave of intelligent machines will include robots and other autonomous systems able to perceive their surroundings, make decisions in real time, and act in the physical world. It shows us that getting from investment and prototypes to dependable fielded systems is not simply a matter of building a better chip. It requires a broader engineering framework that connects silicon, sensors, software, mechanics, and power into a single design and validation process. The article discusses that these pieces must be co-designed and tested together if developers want machines that are safe, secure, reliable, and useful outside the lab.

One of the most interesting comparisons in the article is to the automotive industry. Modern vehicles already combine sensing, onboard processing, real-time decision-making, cybersecurity, and stringent safety requirements. That makes automotive development a useful model for physical AI. As robots, drones, and industrial machines take on more autonomous duties, they will be expected to meet similar standards. The key point is that safety and predictability cannot be added at the end. Engineering teams need to validate chip functionality and software behavior early, often before silicon is even available, using pre-silicon verification, emulation, and related design tools. That early discipline can reduce risk and help speed the path to deployment.

The article also emphasizes that hardware is only part of the challenge. Real physical systems must operate in environments that are messy, variable, and hard to predict. A simple human task such as plugging in a cable becomes far more complex for a robot because materials bend, resist, and react differently depending on force, angle, and contact conditions. To handle such tasks, robots need exposure to a wide range of physical interactions before they ever touch real hardware. Synopsys highlights the importance of high-fidelity simulation, multiphysics modeling, and physics-aware synthetic data to train AI systems under realistic conditions. The company notes that Analog Devices is working with Synopsys and NVIDIA to build this type of simulation foundation for industrial robotics training. The broader message is that deployment-ready physical AI will depend on digital engineering tools that stretch from chip design to system behavior in the field. According to the blog, simulation and digital twins can help teams test chip behavior before fabrication, train robots in realistic virtual environments, evaluate mechanical and sensor interactions, and even support diagnostics, maintenance, and software updates after deployment. That is a practical reminder that physical AI is not just an AI story. It is also a systems engineering story, where success depends on bringing design, validation, and physics-based training together early enough to make real-world autonomy work.



I love tractors, planes, drones, trains, military tanks, race cars.

Once upon a time, back in 1954, there was an Air Force physician who decided to become his own human crash-test subject.

Now, I find this story fascinating because it combines aerospace engineering, medical research, crash testing, and one very brave man. It's also a true story. Makes me think, "He actually DID that?"







The Fastest Man on Earth & the 1.4 Seconds That Changed Safety Engineering

Web - Wikimedia & Wikipedia

Before computer crash simulations, one physician risked his life to understand the forces the human body could survive. Back in December 10, 1954, at Holloman Air Force Base in New Mexico, Lt. Col. John Paul Stapp strapped himself into a rocket-powered sled called Sonic Wind No. 1. Did you know that this sled accelerated to 632 miles per hour in approximately five seconds?

Now here is the part that's interesting! That sled? It stopped in just 1.4 seconds, subjecting Stapp to a peak deceleration of approximately 46 times the force of gravity.

The miracle? He survived. The experiment left him badly bruised, with temporary vision problems, and a few other injuries but he recovered. And thanks to Dr. Stapp and his experiments, researchers gained valuable information about how the human body responds to extreme acceleration and sudden stopping.

632 mph and stopped in 1.4 seconds

According to historical records, the vehicle reached , resulting in a peak deceleration of approximately 46.2 g (though some accounts round this figure to 40 g).

Stapp wasn't trying to break a speed record for entertainment. He wanted to understand the forces pilots could survive during emergency ejections and aircraft accidents. His experiments helped improve aircraft restraints, pilot safety systems, and eventually automobile occupant protection.

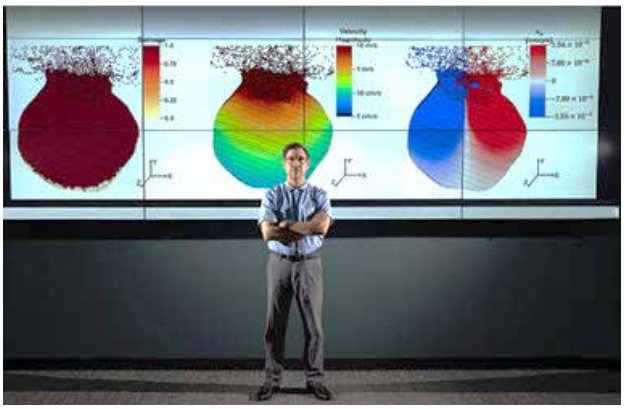
Before sophisticated computer crash simulations, researchers had to gather experimental data to better understand the human body's limits. Today, engineers can study situations through computer simulations that researchers in 1954 could only investigate through physical experiments. I find it remarkable that a physician willing to risk his own life helped establish some of the knowledge that contributed to the safety engineering we depend on today. And that is why I think Dr. Stapp deserves a place in my Town Hall Meeting Room.

Sometimes engineering stories began long before we had computers & AI to help us.



LLNL – Overview of excerpts from the article noted below: "Lawrence Livermore National Laboratory (LLNL) researchers are developing three-dimensional simulations to examine how a nuclear device could be used to deflect or potentially disrupt an asteroid threatening Earth."

The complete article can be viewed on the website



Web - LLNL Simulations explore nuclear mitigation of asteroid threats - Paul Rhien

Lawrence Livermore National Laboratory researcher Isaiah Santistevan led the development of three-dimensional simulations exploring how a nuclear device could deflect or disrupt an asteroid threatening Earth. (Photo: Blaise Douros/LLNL)

The work, published recently in The Planetary Science Journal, uses LLNL's Spheral simulation code to more accurately model how an asteroid might respond when X-rays from a nuclear device detonated near its surface rapidly heat and vaporize material. After validating the approach against established asteroid-deflection models, researchers used Spheral to study three complex disruption scenarios. Unlike many natural disasters, a hazardous asteroid impact could potentially be prevented if the object is detected early enough. One approach is deflection — imparting a small change in velocity that causes the asteroid to miss Earth while largely remaining intact. Another approach is disruption, in which an asteroid is intentionally fragmented and dispersed so that no remaining piece poses a significant threat to the planet. NASA's Double Asteroid Redirection Test, or DART, demonstrated a kinetic-impact approach to deflection in 2022 by deliberately striking the asteroid moon Dimorphos. Nuclear mitigation represents an alternative emergency option, particularly for larger objects or scenarios with shorter warning times, because much more energy can be delivered to an asteroid than the kinetic energy of a spacecraft impactor.

Two of the simulations showed strong signs of disruption, highlighting how high-fidelity 3D modeling can help researchers better understand how an asteroid could respond to a nuclear mitigation attempt. "*These simulations give us a much more detailed picture of how an asteroid may respond to a nuclear mitigation attempt," said Isaiah Santistevan, who led the study. "Being able to model damage, fracture and material motion in three dimensions is an important step toward improving our ability to evaluate planetary defense options."*

Building a 3D modeling capability - To test the approach, the team compared more than 1,500 one-dimensional Spheral simulations with asteroid deflection results from LLNL's established Ares simulation code…

Pushing the limits of simulation - The work also highlights the computational challenge of following an asteroid through the full disruption process….



Agriculture, Machinery, Soil, Equipment, and whatever he wants to share.
My dog, Scout, & my horse, Cowboy - St. Cloud, MN, USA



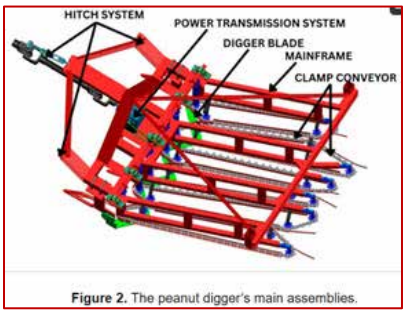


Figure 2. The peanut digger's main assemblies.

Web – MDPI - [Design, Response Surface Optimization, and Evaluation of a Four-Wheel Tractor Peanut Digger]

Rosalinda L. Abad, Rossana Marie C. Amongo, Fernando O. Paras, Jr., Kevin F. Yaptenco, Arthur L. Fajardo
College of Agricultural & Biosystems Engineering (CABE), Don Mariano Marcos Memorial State Univ. (DMMMSU), Philippines

Inst. Agricultural & Biosystems Engineering (IABE), College of Engineering & Agro-Industrial Technology (CEAT), Univ. of the Philippines Los Baños, Philippines

Abstract - Peanut harvesting remains labor-intensive and costly due to the limited availability of locally developed mechanized harvesting technologies. Thus, this study presents the design, optimization, and evaluation of a four-wheel tractor peanut digger to advance harvesting. **Structural integrity was evaluated using Finite Element Analysis (FEA) in ANSYS** under a draft load of 2008.2 N, yielding a maximum von Mises stress of 33.012 MPa, a peak strain of 0.00015, a maximum deformation of 1.72 mm, and a factor of safety of 5.74, confirming adequate structural reliability. Field performance was optimized using a Box–Behnken Design (BBD) with tractor speed, digger blade lift angle, and clearance angle as factors, while material capacity and digging efficiency served as response variables. Regression analysis showed that the main effects significantly influenced both responses, whereas interaction effects were insignificant. Response Surface Methodology (RSM) optimization identified optimal operating conditions of a 14.95° lift angle, 15.70° clearance angle, and 1.74 km·h−1 forward speed, achieving a predicted material capacity of 0.56 t·h−1 and digging efficiency of 96.69%. …

1. Introduction - Peanut (Arachis hypogaea L.) is the Philippines' second most important food legume, valued for its high oil (45%) and protein (25 to 30%) content and cultivated on nearly 28,000 ha [1]. Despite its economic importance, national production has steadily declined, resulting in a 341% increase in imports to satisfy domestic processing demand. This decline is attributed to inefficient crop management practices, limited access to appropriate machinery, and rising production costs [2,3]. Climate variability, including irregular rainfall, prolonged drought, and increased pest pressure, further contributes to the decline [3]. Harvesting is the most labor-intensive operation in peanut production, requiring up to 35 man-days·ha−1….

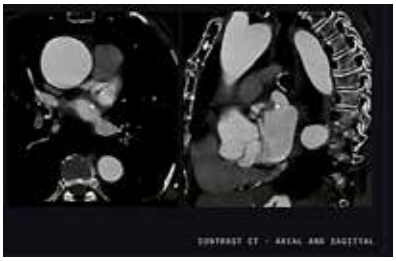
2.3.3. FEA Simulation Process in ANSYS - The peanut digger in a 3D model, drawn using AutoCAD Version 2023, 24.2, is imported into the FEA environment. After the finite element geometric model has been created, a meshing procedure follows to define and break up the model into small elements. Before meshing, the setting of material properties, contact and load, boundary conditions, and interaction comes first (Figure 1). The second step is the simulation procedure. The FEM conducts a series of computational procedures involving applied forces and the properties of the elements, which produce a model solution. Such a structural analysis enables the determination of effects, including deformations, strains, and stresses, that are caused by applied structural loads. …



On the LivGemini website learn how “We combine machine learning and physics. AI reconstructs the anatomy from imaging; physical laws describe how blood flows and how tissues and devices deform within it; AI again makes those physics fast enough to use outside a supercomputer.”

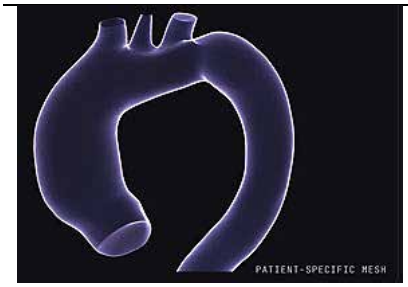
Excerpt read the website for full information and high-resolution pictures

Web – LivGemini - [Every model starts from one patient's own anatomy.]



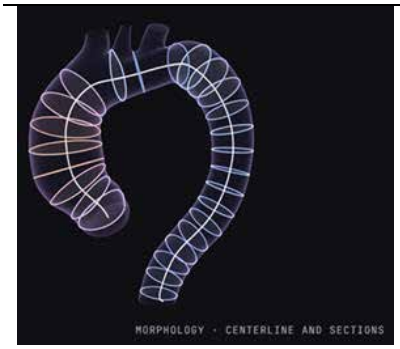
Start from routine imaging

Models are built from the scans patients already have. CT is our starting point; time-resolved CT and other modalities add motion and function. No extra acquisition, no dedicated protocol.



Reconstruct the anatomy

Neural networks turn the images into a 3D computational model of the anatomy: a surface and a volume mesh that keep the patient's own shape and are ready for measurement and simulation. The user reviews the result before anything is computed on it.



Assess the morphology

From the 3D model we describe the anatomy in quantitative terms: dimensions, curvature, volumes, how it moves over the cardiac cycle and how it compares with other patients. Which descriptors matter depends on the anatomy and on the clinical question.



Simulate what images cannot show

Physics-based models compute what a scan cannot measure: blood flow, pressure and wall shear stress, the mechanics of the vessel wall, or the effect of a procedure or a device on the patient's anatomy. AI-built reduced-order models make these simulations fast enough for a workstation. Results are model estimates, and their reliability depends on the inputs. Blood flow, Wall biomechanics, procedures and devices



No one knows his name.
You yell, "HEY, old racer."
His daughter?
You yell, "HEY, slow down."



EXCERPT



Web – From The Road, FORD - Three Rounds, Three Continents: The 2027 Mustang One-Make Invitational Championship, Chris Ward is Global Customer Racing Manager for Ford Racing

In sports cars racing, there are bucket list tracks that drivers of all ages and experience levels dream of competing at. These venues are spread across the globe, & it's extremely challenging to check all of them off their lists. In its rich 125-year racing history, Ford has been able to visit many of these incredible race courses, & we want our customers to be able to do the same.

In 2027, Ford Racing is honoring its international history and making it easier for drivers to check off three of the world's most iconic tracks by offering a one-of-a-kind opportunity: a three-round Mustang one-make invitational championship.

The championship, called the Mustang Challenge Global Invitational Championship, will consist of crown jewel rounds of Ford Racing's three global one-make series.

The three-round season will kick-off at Daytona International Speedway, where Mustang Challenge North America will have its season opener as part of the Roar Before the 24 weekend. Daytona is one of North America's most prestigious tracks, and the Roar weekend has become an exciting event in and of itself, making it the perfect fit for the first round of our invitational championship.

The second round of the season will be the Mustang Challenge Spa Invitational, an event that will run in support of a major endurance race, the 24 Hours of Spa. For our three one-make series, this event will not award points, ensuring that any competitors who can't make it to Belgium remain in championship contention in the series they compete in full-time.

However, for those competing in the Mustang Challenge Global Invitational Championship, it will be a key points-paying event. In fact, it was our invitational rounds – Le Mans in 2025 and Spa coming in 2027 – that inspired the creation of the invitational championship. We have the opportunity to race at some of the best venues around the world, and we want our customers to have this opportunity too, even if they're not competing full-time in one of our series. Plus, who doesn't love a little bit of extra competition?

For the third and final round, drivers will head down under. Mount Panorama Circuit is legendary in Australian racing, hosting the Bathurst 1000, the Bathurst 12 Hour, and in 2027, the Mustang Cup Australia season finale, which will also be the closing race of the invitational championship.

The championship will be scored separately from each of our full-season championships. Drivers can elect to compete in the invitational championship only or alongside a full-season campaign in Mustang Challenge North America, Mustang Cup USA, or Mustang Cup Australia.



US Airforce Picture of the Month



	Cleared hot - Staff Sgt. Robert Beidler, a 910th Combat Arms Training and Maintenance team member, fires an M240 machine gun during training at Camp James A. Garfield Joint Military Training Center, Ohio, Oct. 14, 2026. The 910th CATM provides defenders training on a variety of weapons to help ensure the 910th Airlift Wing remains mission ready. (U.S. Air Force photo by Senior Airman Deanna Prox))
	Allied airpower - A formation of Indian Air Force Sukhoi Su-30MKI and HAL Tejas aircraft is joined by a U.S. Air Force F-35A Lightning II and a French Air and Space Force Dassault Rafale B during Tarang Shakti 26 over Jodhpur, India, Oct. 2, 2026. Formation flying gives participating air forces an opportunity to build coordination, strengthen interoperability and gain experience operating alongside international partners. (U.S. Air Force photo by Airman 1st Class Nathaniel Jackson)
	Taking flight - An F-16 Fighting Falcon takes off from a base in the U.S. Central Command area of responsibility Sept. 28, 2026. The aircraft provides combat airpower supporting regional security and U.S. military operations throughout the USCENTCOM area of responsibility. (U.S. Air Force photo by Tech. Sgt. Noah J. Tancer)



Web Excerpt BAYKAR - FERGANI'S SIXTH SATELLITE IN SPACE!

FRG-100D4, the sixth test satellite developed by Fergani Space entirely with indigenous means, has reached space. The 160 kg next-generation indigenous satellite, equipped with communications & navigation capabilities, settled into its orbit & began its mission.

Florida - October 20, 2026 - Fergani Space Technologies, founded by Baykar Chairman and CTO Selçuk Bayraktar, launched FRG-100D4, its sixth test satellite developed with indigenous engineering capability, into space from Cape Canaveral Space Force Station in the United States at 2:04 p.m. (Türkiye time) on October 20, 2026. Launched as part of SpaceX's Bandwagon-5 mission, the satellite successfully separated from the launch vehicle approximately 63 minutes after launch, at 3:07 p.m. (Türkiye time), & settled into its target orbit at an altitude of 590 km.

NEW INDIGENOUS HARDWARE ON THE SATELLITE - Compared to the satellites previously launched by Fergani, FRG-100D4 represents a significant development with the technological innovations it incorporates. Critical components developed entirely indigenously in-house at Fergani were used on the satellite, such as a reaction wheel, magnetorquer, magnetometer, IMU, GNSS receiver, steerable solar panels, battery pack, regenerative modem, & phased-array antenna. In addition, the satellite houses an AI-assisted computer for advanced missions. Validating in space this indigenous avionics equipment developed by Fergani engineers, and building space heritage for these technologies, is important for Türkiye's full independence in space technologies.



A NEW PHASE IN THE ULUĞ BEY SATELLITE CONSTELLATION PROJECT - FRG-100D4, the satellite with the highest power generation capacity developed by Fergani, marks a very important stage in terms of the localization of equipment and subsystems. With a mass of 160 kg, the FRG-100D4 satellite was launched into space today, with its higher localization-rate equipment and enhanced navigation and broadband communications payloads as the Uluğ Bey Satellite Constellation System.

Fergani Space aims to complete the Uluğ Bey Satellite Constellation System, which will consist of more than 200 satellites, entirely with its own resources within the next five years. Once this satellite constellation system is in place, Türkiye will have its own independent navigation and communications network and will be able to share this critical capability with friendly and kindred nations. While the constellation satellites are being completed, development work on the indigenous launch vehicle is also continuing. …


The FEANTM Garden
Where ideas grow
Dream
Design
Invent
Test
Build
Improve
See you next issue in the town that almost exists.