FEA - CAE Not to Miss & More

JULY 2026 ISSN 2694-4707

Town Hall Conversations - the town that almost exists
Town Plaza: Drive slowly – Galloping Prohibited

Airport - Baykar

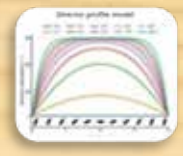
Airport -USAF

Auto - BMW

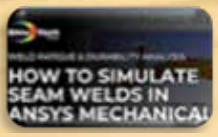
Racer – FORD.

Marco – RBF Morph

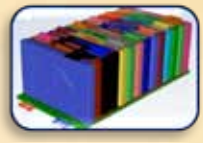
Madhukar – CADFEM



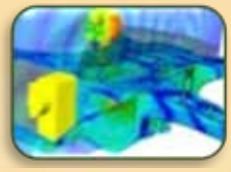
Metin – OZEN



Mi&Ke – Nightly News



Jenson – DFE TECH



Marta – OASYS

Yury – LS-DYNA

**ANSYS LS-DYNA®
KEYWORD
USER'S MANUAL**

Aaron – GOENGINEER

Marnie - CADENAS

Marsha – TATA ELXSI

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We salute engineers, scientists, developers, teachers, researchers AND students because without them we would not have innovation.

Parking & Coffee are free.

R & D - Camping - Town Map

Horse Trail → Yield right of way to horses

R&D Technology Business Park

RV CAMPING
Park in any vacant camping site

Town Hall & Library

CADFEM
OFETECH
OZEN
SYNOPSYS
Oasys
Simu Tech Group
Ansys
DYNA MORE
SCALE
d3VIEW

rbf.LAB
rbf

MEDITATE
LIVGEMINI

Lawrence Livermore National Laboratory

Race Track

The Old Rancher

Airport

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- The map is subject to change - building sites will be rotated accordingly.

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Articles via "social listening" from company blogs, or media.

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04 Town Map in case you get lost
07-08 Town meeting - (Resident Announcements & Marnie's welcome + announcements**)**

R&D Business Park (Engineering & Industry)

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Links provide the URL to the information.

The websites will have the complete information and high-resolution graphics

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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."

Welcome to Town Conversations

Creation **is born from trying. If it doesn't work, learn & try again. You Will succeed. Inventions, simulations, cures, wouldn't exist with that passion to keep trying**

Park cars behind building

Park tractors behind cars

Tie horses to hitching posts

Café - Conversations & Town Gossip

Cookies, Chocolate, Cakes and Pies

Pets are welcome

Horses, pet goats stay outside

Resident Conversations You Don't Want To Miss

Marta: Deep excavations are among the most technically demanding elements of urban construction. Learn more in Cloud-based exploration of deep excavation design space. …

Madhukar: Article by G Friederici "In the race to deliver immersive AR/VR experiences, optical precision is key. Daniel Jimmerskog explains…" .

Mi & Ke: SimuTech - Fast Battery Charging Simulation in Ansys Fluent - Fast-charging simulations require more than applying a current profile to a battery model.

Marco: Interactive Aerodynamic Design Based on Physics-Informed Models and Immersive Visualization by Mihai Alin Helciug at the University of Rome Tor Vergata,

Marnie: CADENAS visited two technical high schools in Slavonski Brod, Croatia: Technical School Slavonski Brod and Industrial-Craft School Slavonski Brod.

Yury – Official release of LS-DYNA R17 is here! The release took place on June 9. Release notes are available

Welcome to Town Conversations

creation is born from trying. If it doesn't work, learn & try again. You Will succeed. Inventions, simulations, cures, wouldn't exist with that passion to keep trying

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

Welcome to the July 2026 edition of FEANTM. For those of us living in the USA, we are celebrating the 250th birthday of this nation. People will celebrate July 4th with picnics, concerts, and lots of fireworks. HAPPY BIRTHDAY to the United States of America.

The month of July contains important events and birthdays. To mention a few: Gottfried Wilhelm Leibniz was born on July 1, 1646, and is the inventor of calculus. (Wikipedia). On July 11, 1976, Keuffel and Esser, the leading producer of slide rules, produced its last slide rule. It marked the passing from mechanical engineering tools to the digital era. (Shutterstock Explore).

Although we celebrate Pi Day on March 14th, mathematicians and students of engineering celebrate Pi Approximation Day on July 22 (Wikipedia).

The Computer History Museum notes that before we had silicon RAM microchips, computers relied on physical, microscopic magnetic rings woven together by hand with copper wires to store data called magnetic-core memory. Its pioneer, Jay Wright Forrester, was born on July 14, 1918.

This month we feature Coffee and Conversation with Marnie and Marsha as a new section and hope you enjoy it.

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

Who stole the first half of the year? Please return it. And off we go with Coffee, Curiosity, and Conversation, as we tractor around the internet, finding topics we want to share. OH, and cookies - no, not the digital kind, I mean the ones with chocolate chips!

Okay, I am really into my you tube **FEANTM Town Animations** - professional? NOOOOO, but I like that they are all in one easy access place. It was created for my daughter and grandson (10) don't expect rocket science from me!

Now here's a funny story! I created the channel for my daughter. She shows them to my grandson. I am creating what I think are great raccoon stories and he asks me to do some videos on friendly bugs and snakes. He is an avid bug and snake person. UGH SNAKES! I like raccoons!!! Snakes can't wave or pick up anything and with the rattle snakes on this ranch a good shovel comes in handy.

And on the FEANTM Community Channel we are still trying different things so it is still on its journey. This month instead of that pdf turned video we let the ranch news raccoons do their own video.

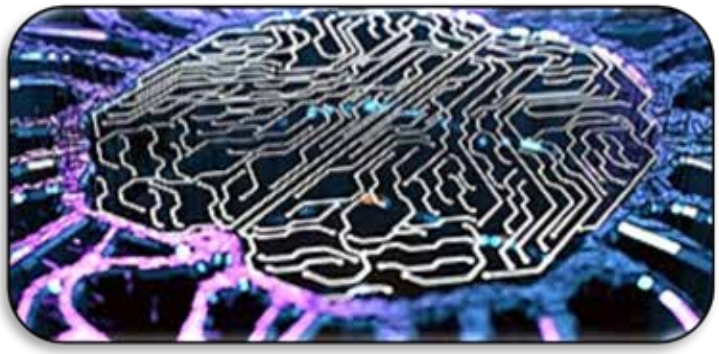
Two that I like are below. Gotta love the raccoon in a cowboy hat and the two in the blue and red ski beanies in front of the Golden Gate Bridge.

Finding AI, Engineering, Innovations.

I found an interesting post by Prith Banerjee to share.

Article, "From Tokens to Physics: How Neuromorphic Computing Will Power Physical AI"'

Excerpts – read the website for complete information and videos



Web – SYNOPSYS - From Tokens to Physics: How Neuromorphic Computing Will Power Physical AI

by Prith Banerjee of Synopsys.

Over the past few years, enormous attention has been focused on generative AI — systems trained on massive amounts of text, images, or video to predict what comes next.

Bringing AI into physical systems - Physical AI is intelligence that is embodied in — and co-designed with — a physical system, enabling it to understand and act in the real world. Consider autonomous vehicles, humanoid robots, wearable devices, or smart industrial machines. These systems must perceive their surroundings, respond in milliseconds, and often operate for years on extremely limited power budgets. Sending raw data back to the cloud for processing is often impractical, too slow, or too energy-intensive.

To make physical AI viable at scale, intelligence must move to the edge. And it must be architected for a different set of constraints than AI models running in data centers.

This is where neuromorphic computing becomes important.

Learning from the brain - Neuromorphic computing is not new. The idea dates back several decades, inspired by the way the human brain processes information. Rather than relying on continuous clock-driven computation, the brain is event-driven. Neurons remain mostly idle, consuming very little energy, and become active only when meaningful signals arrive.

This is fundamentally different from how conventional digital systems operate. In most digital architectures, the system is constantly "on," polling inputs and consuming power even when nothing important is happening.

Neuromorphic systems flip that model. They rely on spiking neural networks that react only to change. When nothing happens, they consume almost no energy. When something does happen, they respond quickly — often in milliseconds — using extremely small amounts of power. That makes them particularly well suited for edge applications: always-on perception, low-latency decision making, and operational longevity for devices that cannot afford frequent battery replacement or recharging.

Why analog matters again - Another important aspect of neuromorphic computing is its use of analog behavior. While most modern chips are overwhelmingly digital — built around ones and zeros — the real world is analog. Voltages vary continuously. Signals drift. Noise matters.

Modeling analog behavior is more complex, but it can enable far more energy-efficient operation. When you're aiming for milliwatts or even microwatts of power, the underlying physics can't be abstracted away like they are in traditional digital systems.

Designing physical AI requires deep understanding of electrical behavior, signal integrity, noise, and reliability. Small disturbances — such as electrostatic discharge or voltage leakage — can have outsized effects. These challenges increase dramatically as systems scale to millions of interconnected elements that behave more like biological networks than traditional circuits.

Bridging simulation and reality - One of the most important enablers of physical AI is the digital twin. A digital twin is a dynamic virtual model of a physical system — whether that system is a wearable device, a robot, a piece of infrastructure, or a 3D multi-die chip.

The power of a digital twin comes from its ability to stay anchored to reality. Sensors in deployed systems provide real-world measurements that continuously correct and refine the model, ensuring it does not drift away from what is actually happening. Over time, this feedback loop makes predictions more accurate and decisions more reliable.

For physical AI systems operating at the edge, this ability to align the virtual model with real-world behavior is critical. You can't pretrain these systems on exhaustive datasets, because such datasets simply don't exist. Instead, intelligence must be built from physics-based understanding and continually refined through observation.

Accelerating the future of physical AI - We are still in the early days of this transition. Much of today's physics-based modeling and simulation rely on brute-force numerical methods that can take enormous amounts of time to run. Fortunately, progress is coming from multiple directions: scalable parallel computing, specialized accelerators, and AI-assisted simulation that learns from prior runs to predict outcomes more efficiently.

Looking further ahead, entirely new computational paradigms — such as quantum computing — may eventually play a role in accelerating these simulations even further. Ultimately, success won't hinge on one kind of processor, but on heterogeneous systems that pair different forms of computation with the applications for which they are best suited.

A new era at the edge - Neuromorphic computing and physical AI point toward a different future for intelligence — one that is distributed, event-driven, and grounded in the realities of the physical world.

Instead of running continuously in power-hungry data centers, this intelligence lives at the edge: embedded in devices that sense change, respond in real time, and operate within strict energy and latency constraints. It is shaped as much by physics as by data — by voltages and noise, timing and reliability — and designed to coexist with the systems it inhabits. Together, physical AI and neuromorphic architectures expand the scope of what AI can do. They move intelligence beyond recognizing patterns in data to understanding and interacting with the real world itself.

That shift — from tokens to physics — marks the beginning of a new era for AI at the edge, and one of the most important frontiers in computing today.

GOENGINEER Article "Walk into almost any middle school or high school maker space today, & you'll find a fleet of desktop 3D printers. These machines have done a fantastic job of getting students excited about the initial concept of "making". But as students transition from hobbyist exploration to professional engineering programs, a significant gap emerges.."

Web – GoEngineer - Why Industrial Additive Certification is the Ultimate Student Placement Multiplier

The reality of modern industry is stark. Leading companies do not leverage personal desktop systems on their production floors. Employers in high-value sectors like aerospace, defense, and automotive aren't just looking for graduates who can print plastic trinkets; they are hunting for candidates who understand material performance data, process controls, and quality systems.

The choice of hardware in the classroom determines whether a student learns how to troubleshoot a basic consumer printer or operate within a regulated manufacturing workflow.

Hidden Gaps in Regulated Engineering - Desktop-level systems serve a vital purpose as a low-cost entry point into 3D printing. However, for a university or technical college, relying solely on hobbyist-grade equipment can unintentionally handicap a student's professional development.

In the industrial world, a part must be identical whether it's printed on a Monday in Michigan or a Thursday in Texas. Achieving this requires rigid process controls and environmental stability that desktop machines simply cannot provide.

- Environmental & Process Control: Industrial platforms like Stratasys FDM (Fused Deposition Modeling) and PolyJet systems utilize highly controlled thermal environments and heated build chambers. This eliminates the temperature fluctuations that ruin complex prints, teaching students to rely on machine predictability rather than constant mechanical troubleshooting.
- The Invisible Workflow: Desktop machines obscure the realities of professional production. Industrial additive manufacturing demands a deep understanding of material traceability, advanced slicing parameters, and rigorous post-processing workflows, such as soluble support removal, vapor smoothing, annealing, and dimensional inspection.
- Standards and Compliance: In high-stakes environments, operations must align with strict quality management systems, like AS9100 or NADCAP. These frameworks are non-negotiable in regulated industries, yet they remain completely invisible to a student working on a hobbyist desktop machine.

Material Science with Flight-Ready Consequences - One of the strongest arguments for transitioning to industrial-grade Stratasys systems is moving beyond PLA (Polylactic Acid). While PLA is easy to print, it has virtually no place in functional, real-world engineering.

To truly prepare students for top-tier employers, they need hands-on experience with engineering-approved materials qualified to aerospace, defense, and industrial standards.

Material Category	Regulatory & Real-World Applications
 Ultem 9085 & Ultem 1010	High-performance, flame-retardant thermoplastics compliant with FAR 25.853 flammability and FST standards. Actively used for flight-ready parts and ducting by aerospace primes.
 Nylon 12CF	Carbon-filled composites used to engineer lightweight, high-strength manufacturing tools, replacing heavy metal jigs and fixtures on active factory floors.
 Mult-Material PolyJet	Advanced photopolymers capable of simulating overmolding, varying shore hardness, and full-color realism to test complex mechanical assemblies.

When a student understands how a material's glass transition temperature, chemical resistance, and flame-retardant rating affect its application, they cross the line from hobbyist printing to practicing true material science.

The Stratasys Certification - A Resume Disruptor for Top-Tier Hiring

At GoEngineer, we often tell educators that the hardware is the vehicle, but the certification is the license. The Stratasys Additive Manufacturing Certification program bridges the gap between classroom theory and industrial application.

This certification doesn't just validate that a student can hit print. It proves to hiring managers at leading companies that a graduate understands the entire additive lifecycle:

- Design for Additive Manufacturing (DfAM): Optimizing geometries to minimize material waste, manage orientation-dependent anisotropic strength, and design for specific industrial toolpaths.
- GrabCAD Print Proficiency: Mastery of industry-standard software to manage production job queues, estimate material yields, and manipulate advanced slicing parameters.
- Quality and "Fit & Finish": Understanding the post-processing and inspection standards required to deliver a component that meets professional client specifications.

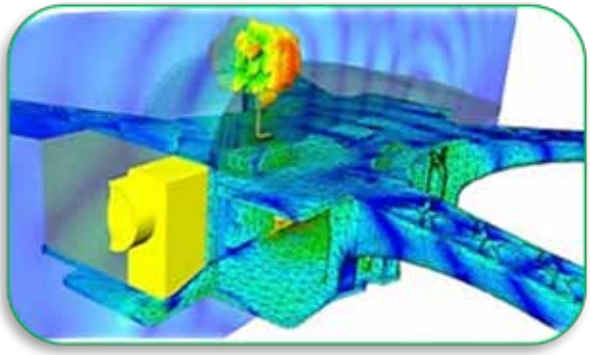
Seeing "Stratasys Certified" on a resume removes the guesswork for engineering recruiters. It provides immediate proof that the candidate can step onto the production floor and contribute on Day 1.

Investing in the Outcome - From Prototypes to Production - The workforce shift toward Industry 4.0 is built on utilizing additive manufacturing for spare parts, customized tooling, and low-volume end-use production runs. Desktop hobbyist machines simply cannot handle the quality control, batch consistency, and traceability required for this output. By training students on certified, industrial-grade platforms, universities shift the academic mindset from temporary "prototyping" to true end-use digital manufacturing. When a student realizes the printer is an agile factory cell, they make the mental leap from technician to engineer.

The pitch isn't about hardware durability; it's about alignment. If we want our graduates to secure roles at leading companies, we must equip them with the exact tools, materials, and compliance standards those companies use every single day.

Are Your Students Prepared? Is your engineering lab truly preparing students for modern factory floors? At GoEngineer, we specialize in helping educational institutions transition to industrial-grade additive manufacturing ecosystems. From grant procurement assistance to industry-aligned curriculum integration, we are your partners in workforce readiness and student placement success.

DFE-tech article quote, “Healthcare is undergoing a profound technological shift — one defined by miniaturized imaging systems, intelligent diagnostic devices, robotic surgical platforms, and increasingly personalized patient care. At the heart of many of these innovations lies optical technology, powering everything from endoscopes and fluorescence-guided tumor detection systems to wearable heart rate monitors and implanted intraocular lenses.



Web – DFE Tech - Simulation-Driven Prototyping and Compliance: Accelerating Safe, High-Performance Optical Innovation

Compliance Through Multiphysics Simulation

Ensuring regulatory compliance for medical devices is one of the most challenging aspects of product development. Optical systems often involve tightly coupled physical behaviors — light propagation, thermal diffusion, mechanical strain, biological interaction, and even electromagnetic effects.

Regulatory bodies expect manufacturers to understand and carefully test these behaviors with a high level of precision, so that their devices don’t have any negative effects on the body. Multiphysics simulation provides a comprehensive way to meet these requirements by enabling engineering teams to model optical, thermal, and mechanical phenomena simultaneously under clinically relevant conditions.

One of the key strengths of multiphysics simulation is the ability to evaluate optical exposure and irradiance on human tissue with exceptional accuracy. Using tools such as Ansys Speos computer-aided design (CAD) integrated optical and lighting simulation software, designers can simulate how light is distributed across complex tissue geometries and anatomical surfaces. This enables engineers to predict whether a device may exceed safe exposure thresholds that could cause harm, discomfort, or tissue damage. By relying on virtual human body and tissue models and realistic optical behavior, teams can assess worst-case conditions long before reaching clinical evaluations to prevent any unwanted outcomes.

Thermal safety is another critical component of regulatory compliance. Optical medical devices — especially those involving lasers, LEDs, or high-intensity illumination — can generate heat that must be carefully managed to avoid burns, irritation, or unintended tissue responses. With Ansys Mechanical structural simulation software, engineers can perform detailed structural-thermal analysis, enabling teams to identify hotspots, predict heat diffusion over time, and determine whether thermal results remain within safe boundaries. The ability to link optical results from Speos software directly to thermal and mechanical models creates a unified view of device behavior that mirrors how it will operate with the human body.

Automated data transfer through Ansys System Coupling physics solver connection software streamlines these workflows even further. Instead of manually exporting data between optical, thermal, and mechanical solvers, System Coupling software synchronizes simulations and maintains consistency across models. This not only reduces human error, but also accelerates the design process, making it feasible to run iterat.

Quote Article by Gerhard Friederici “In the race to deliver immersive AR/VR experiences, optical precision is key. Daniel Jimmerskog explains how ultra-thin, tunable liquid crystal lenses optimized through advanced simulation tools like Ansys Zemax and Ansys Lumerical — are redefining the boundaries of smart optics.”

…

From design to validation, simulation accelerates innovation and improves performance across applications. Author Gerhard Friederici

Summary

- Innovative AR/VR Optics: FlexEnable develops ultra-thin, flexible liquid crystal lenses optimized for immersive AR/VR experiences using advanced simulation tools.
- Simulation as a Key Technology: Tools like Ansys Zemax and Lumerical enable precise design optimization, improved image quality, and reduced development time.
- Future Outlook: API-driven interoperability allows for custom solutions and automated simulations – a strategic advantage for FlexEnable.

What is FlexEnable primarily working on in product development? FlexEnable Technology is a spin-off from the Cavendish Lab at Cambridge University and focuses mainly on technologies in the field of organic thin-film transistors. Key components are optical liquid crystal elements, especially used in augmented reality applications. With these ultra-thin, flexible liquid crystal optics, we can steer, modulate, and focus light.

This groundbreaking optical technology can be biaxially shaped around existing components – a dream for any industrial designer. Since the optical elements can be directly adapted to designed surfaces, products can be made even more compact. At the same time, optical performance is improved compared to planar glass components. Lightweight optics and high user comfort are crucial for VR/AR devices. Reducing device weight and easing image focusing enhance immersion and help prevent dizziness for users.

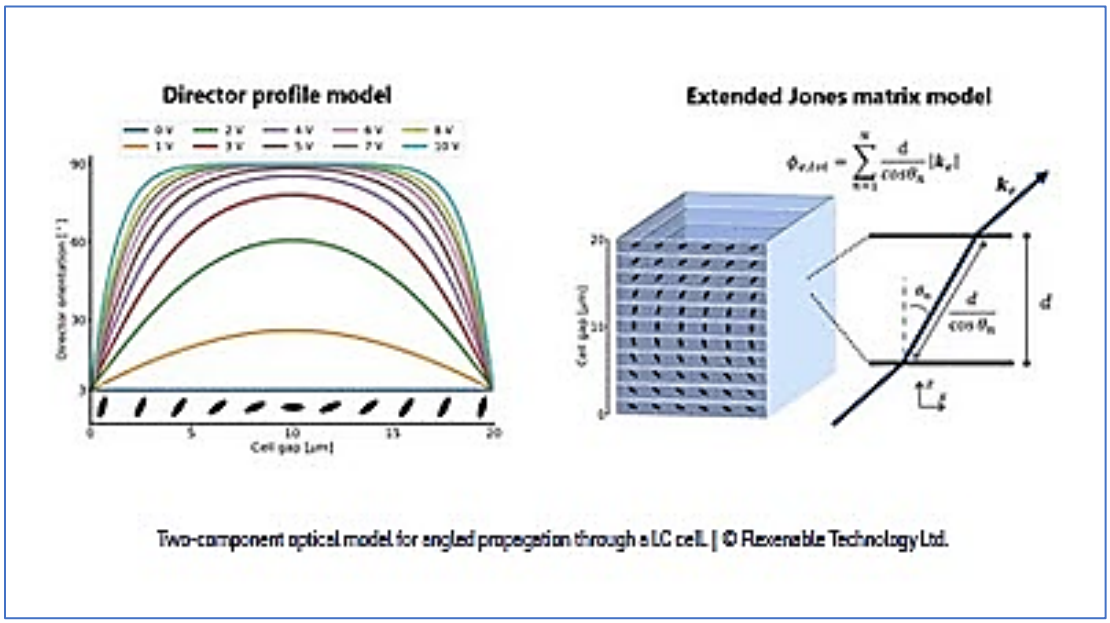
What are the biggest challenges in developing AR optics? In developing and optimizing optical lenses and complementary dimming technology, we at FlexEnable rely on tunable liquid crystal lenses, or LC lenses. We’ve been able to develop new LC lenses, based on a special type of plastic called TAC, made from triacetate cellulose. It’s a material with extremely low birefringence, high transmission, and low haze.

This allows us to actively adjust focus so that perceived and actual image depth can be consistently aligned, balancing focus differences between virtual and real image elements in the field of view. Thanks to Ansys simulation software and support from CADFEM, we’ve significantly improved comfort and image contrast in VR/AR devices.

With a thickness of less than 100 micrometers – thinner than a human hair – and a weight of a fraction of a gram, LC lenses can also be stacked to increase focal length. By combining them with other flexible LC cells, additional functions – such as dimming for virtual objects in all environments – can be integrated.

Can you describe the use of simulation more concretely? For example, we performed efficient optimization of multilayer elements using the Ansys Lumerical Stack tool. It implements the transfer matrix method – an analytical solution to Maxwell's equations for thin-film scenarios. Since optimizing transmission and transmission range is crucial for us, the numerical stacks were very useful. They allowed us to eliminate surface reflections by carefully selecting the right thicknesses of the involved layers.

We produce lenses that perform very well on-axis, but performance drops off-axis. That's why we constantly work with simulation support to improve performance there too.



Two-component optical model for angled propagation through a LC cell. | © Rexenable Technology Ltd.

What does this optimization look like in practice? Our goal was to create single-layer LC lenses with high off-axis performance and excellent image quality. To do this, we had to design the electrode layout so that we achieved point-by-point optimization of molecular orientation through angle-dependent optical response.

We work with an optical model that allows us to generate a symmetrical optical lens profile with an oval voltage profile. This oval voltage profile is influenced by the LC material and the properties of near-eye applications.

This approach can be extended to other optical systems, such as wide-angle imaging or endoscopic devices. Refractive corrections are also possible, for example to adjust the eye's refractive power in cases of visual impairment.
Why is such effort necessary for liquid crystal lenses?

Since liquid crystals generally consist of elongated molecules, they are naturally asymmetric. To create a liquid crystal lens with a radially symmetric profile, multiple cells can be stacked. Essentially, a symmetrical system is created by balancing the different layers.

However, we found that the same type of characteristics can be generated in a single layer if the molecular orientations in different areas of the lens are optimized accordingly. Simulation with Ansys Zemax was very helpful in this.

Was the effort worth it?
Absolutely – it was more than worth it! As with many technical and physical tasks, it's also about limiting complexity. That's why we wanted to reduce the number of layers, partly for cost reasons and also to minimize haze and blur effects.

So we built a design optimization pipeline that allows us to simulate optical performance from various viewing angles. This enabled us to optimize the electrode structure so that we essentially obtained a symmetrical optical lens profile from this anisotropic liquid crystal environment.

Simulation is truly the key optimization tool. It allows us to identify the most important levers of optimization before we even go into the lab and conduct experiments. This significantly shortens development times.

Can you give more examples of the potential benefits of using simulation tools? Ansys Zemax is definitely our most important foundation for simulations and my first point of contact for any kind of optical evaluation. I recently used it to design the imaging part of an interferometer. This is now an important device for us to evaluate the optical performance of lenses and similar components. We use it for imaging optics and also for illumination optics. This allows us to iterate quickly to optimize designs for both our products and technologies in our lab.

Another application example is the Physical Optical Propagation Toolbox, which is very useful in liquid crystal optics for Fresnel resets of the light phase. The lens catalogue also helps us set up tabletop experiments faster when standard components from suppliers can be used in the design.

Additionally, Zemax software has the capability to calculate the propagation of a complex electric field, enabling precise analysis of other effects such as diffraction in a system.
What future prospects do you see for using Ansys software at FlexEnable?

I already see the breadth of interoperability between the platforms that Ansys offers. The integration of optical applications is also progressing. When considering the combined use of different products, one of the most important criteria is the existence of APIs.

For example, the Python API for Zemax, which handles most of the connections between different software systems, enables comprehensive system coupling. With the simulation tools provided by Ansys, custom solutions can be realized relatively easily. We're excited to explore this. It also enables application-specific simulation automation, allowing us to tackle upcoming challenges more efficiently, quickly, and safely. This strengthens and expands our market position and enables us to present better and more powerful AR/VR solutions to our customers.

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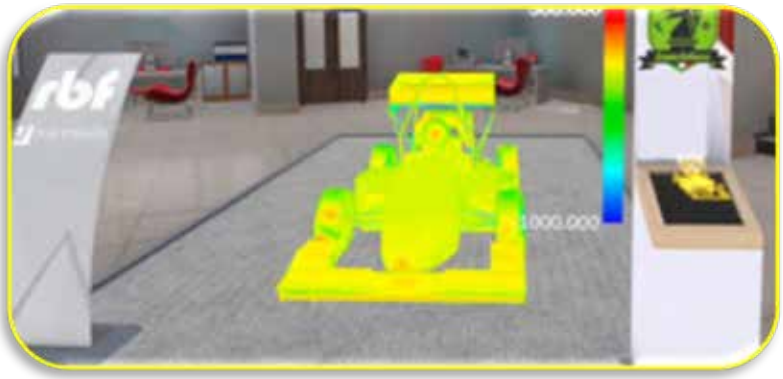
"**RBF Morph - - We are pleased to announce the successful defense of the Master's thesis "Interactive Aerodynamic Design Based on Physics-Informed Models and Immersive Visualization" by Mihai Alin Helciug** at the University of Rome Tor Vergata, under the supervision of Prof. Marco E. Biancolini and co-supervision of Ing. Emanuele Di Meo.



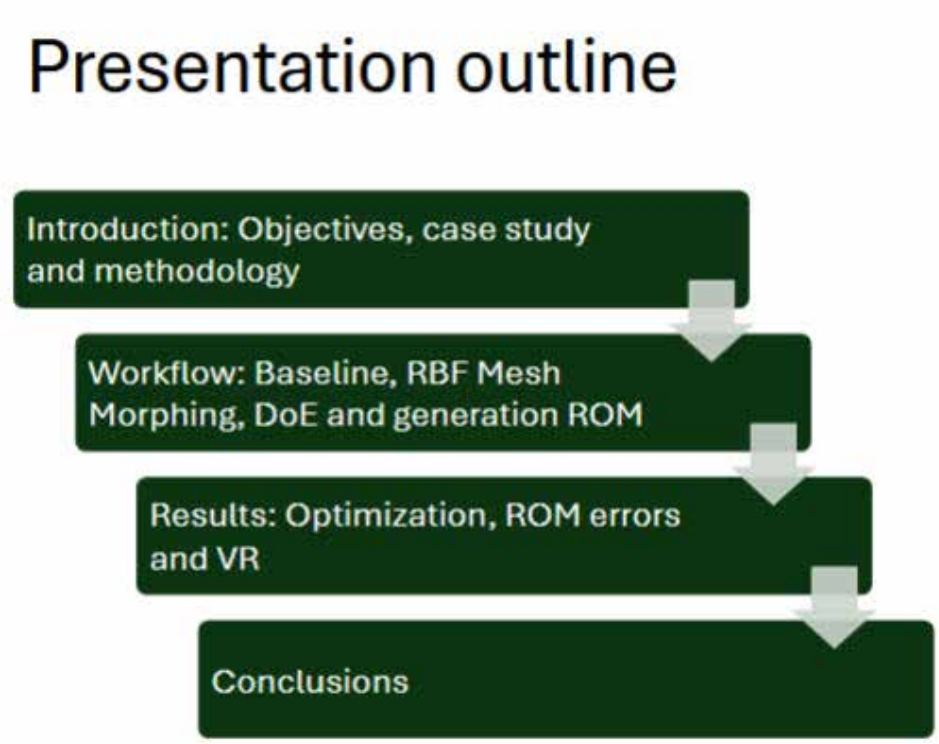
Web – RBF Morph – presentation and thesis available - English

Towards Real-Time Aerodynamic Optimization Through Physics-Informed Digital Twins

The research focused on the development of an interactive Digital Twin framework for aerodynamic optimization in a Formula SAE application

The proposed methodology integrated high-fidelity CFD simulations, reduced-order modeling techniques, and immersive virtual reality environments to enable real-time exploration of aerodynamic performance while overcoming the computational limitations of conventional simulation-driven design processes.

A central component of the workflow was the adoption of RBF Mesh Morphing for geometry parameterization. By directly deforming the computational mesh without requiring CAD reconstruction or remeshing, RBF Morph enabled the efficient generation of a large design space and the automated production of CFD snapshots for model training. The parameterization involved the front and rear wings, sidepods, and diffuser, allowing systematic investigation of their influence on aerodynamic behavior.



The generated dataset was employed to construct physics-informed Reduced Order Models of the static pressure and wall shear stress fields through modal decomposition techniques. The resulting digital twin was subsequently exported and integrated into a virtual reality environment running on Meta Quest 3, enabling real-time geometric modifications and instantaneous visualization of pressure distributions in an immersive setting.

The study demonstrated that the proposed approach can effectively bridge high-fidelity simulation, reduced-order modeling, and interactive visualization, providing a powerful framework for aerodynamic optimization and supporting the adoption of digital twin technologies in advanced engineering design workflows.

Case study

Formula SAE is an international student motorsport competition in which university teams from around the world participate.

A Formula SAE event consists of:

- Static events: Design, Cost and Manufacturing, Business Plan
- Dynamic events: Endurance, Autocross, Acceleration, Skidpad

Aerodynamics plays a decisive role in dynamic events; the goal is to achieve high vehicle efficiency to maximize on-track performance

CADENAS is making students a priority. Article, **"CADENAS recently visited two technical high schools in Slavonski Brod, Croatia: Technical School Slavonski Brod and Industrial-Craft School Slavonski Brod**. The goal was to continue a long-standing collaboration focused on education, innovation and the development of future engineering talents."

3dFINDIT

Web - CADENAS Inspires Future Engineers in Slavonski Brod, Croatia
Dalibor Pejicic

During the event, participants had the opportunity to learn more about the history of CADENAS, the company's growth over the years, its current international presence and future development plans.

A major focus of the presentation was the world of 3D modeling and engineering technology. Students and professors were introduced to ENTERPRISE 3Dfindit, CADENAS' internal 3D modeling software, and gained insight into its advantages and practical applications in modern engineering workflows. In addition, several examples from 3Dfindit, the company's powerful 3D search engine, were demonstrated. Widely used by schools and universities around the world, 3Dfindit enables users to quickly find and download CAD models for engineering and design projects.

The students showed great interest throughout the presentation and actively participated by asking questions about 3D modeling, software development and career opportunities. The event once again highlighted the strong connection between CADENAS and the local educational community, especially considering that many current CADENAS employees are former students of these schools.

At the end of the presentation, both students and professors were invited to visit CADENAS in person, continuing a tradition that has lasted for several years. These visits provide valuable first-hand insight into the company's daily work environment and further strengthen the successful collaboration between CADENAS and the technical schools in Slavonski Brod.

We would like to thank the school principals and professors for the opportunity and look forward to further successful collaboration.

To encourage the next generation of engineers and 3D modeling professionals, CADENAS continues supporting technical education,

We believe in the importance of investing in our technical education and young talent.

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

Innovations and information on the internet not to miss

Today I could use automation on this ranch!

WEB - TATA ELXSI - How Autonomous Driving is Transforming the Specialised Machinery Industry
Sreeraj Nair, Sreejith SV

Autonomous driving is no longer confined to self-driving cars on public roads—it is rapidly redefining how industries operate. Across sectors such as mining, agriculture, construction, and logistics, autonomous machinery is enabling unprecedented levels of efficiency, precision, and safety.

As organizations strive to optimize performance, reduce risk, and meet sustainability goals, autonomous systems are becoming a cornerstone of the next industrial revolution.

This shift is driving increased demand for Autonomous Off-Highway Equipment Engineering Services, which enable specialized machinery to operate safely and intelligently in rugged, complex environments. These services integrate advanced sensing technologies, AI-driven perception, machine control systems, and connected fleet management platforms to support reliable autonomous operations across off-highway industries. This article explores how autonomy is reshaping specialized machinery, the technologies enabling it, and what the future holds for industrial automation.

Beyond Passenger Vehicles: Autonomy in Industrial Settings

While consumer mobility often dominates headlines, some of the most impactful autonomy deployments are happening in controlled industrial environments. Mines, farms, and ports offer structured, geo-fenced spaces where predictability and safety requirements make autonomy a natural fit.

Modern autonomous machinery integrates advanced technologies such as:

- Sensor Fusion: LiDAR, radar, and computer vision for environmental awareness
- Artificial Intelligence (AI): Intelligent decision-making and navigation
- Precision Positioning: GPS (Global Positioning System) and RTK (Real-Time Kinematic) for centimetre-level accuracy.
- Edge Computing & Telematics: Real-time data processing and communication

Together, these capabilities enable machines to perceive, decide, and act autonomously, often outperforming manual operations in speed, safety, and consistency.

Industry Applications: Driving Change Across Sectors

Mining: Safer, More Productive Operations - Mining was among the first industries to adopt autonomy. Driverless haul trucks, autonomous drills, and remotely managed fleets have significantly improved safety and productivity. Machines navigate harsh terrain, optimize routes, and operate continuously, reducing downtime and minimizing human exposure to hazardous conditions.

Agriculture: Precision and Sustainability - Autonomous tractors, sprayers, and harvesters are transforming farming practices. Using GPS, AI, and real-time analytics, these machines deliver precision planting, watering, and harvesting. The result? Higher yields, reduced resource waste, and more sustainable operations.

Construction: Smarter Job Sites - Autonomous excavators, bulldozers, and graders now execute tasks based on digital blueprints, ensuring millimeter-level accuracy. Combined with drone mapping and 3D modeling, construction sites are evolving into connected ecosystems that deliver faster, safer, and more cost-effective outcomes.

Logistics & Ports: Continuous, Connected Operations - Material handling, driverless transport vehicles, cranes, and automated guided systems enable 24/7 operations in logistics and port management. AI-powered control centres optimise workflows, reduce errors, and improve asset utilisation, ensuring global supply chains remain resilient and efficient.

The Technology Ecosystem Behind Autonomy - Industrial autonomy relies on three core pillars:

- Artificial Intelligence (AI): Enables perception, learning, and adaptive decision-making
- Connectivity (5G, IoT, Edge Computing): Facilitates real-time communication and local processing
- Big Data & Predictive Analytics: Transforms operational data into actionable insights for maintenance and optimization

These technologies create self-optimizing networks where machines continuously learn and improve.

Business Benefits of Autonomous Machinery

- Enhanced Safety: Reduced human exposure to hazardous environments
- 24/7 Operations: Continuous productivity without shift limitations
- Operational Consistency: Precision and reliability across tasks
- Cost Efficiency: Lower downtime, optimised resource use, and reduced maintenance

Challenges in Achieving Full Autonomy - Despite its advantages, industrial autonomy comes with its share of challenges.

- Initial investment in technology and infrastructure can be substantial.
- Regulatory frameworks for autonomous operations are still evolving globally.
- Cybersecurity risks must be managed to protect connected systems and data.
- Integration complexity arises when merging legacy equipment with advanced systems.
- Workforce transformation is essential, as operators evolve into system managers and analysts.

Addressing these challenges requires a combination of technological innovation, strategic planning, and strong digital transformation partnerships.

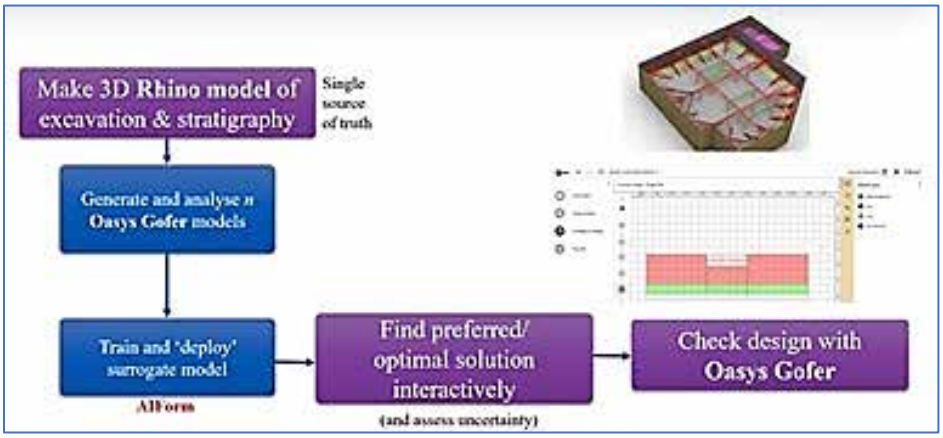
The Future: Human-Machine Collaboration - The future of specialised machinery is not purely autonomous, it is collaborative. We are entering an era of hybrid autonomy, where human operators oversee intelligent fleets of autonomous machines through centralised control systems.Rather than replacing human expertise, autonomy enhances it. Humans provide context, creativity, and problem-solving, while machines deliver precision, endurance, and data-driven decision-making.As AI, connectivity, and analytics continue to evolve, we will see the emergence of self-learning, interconnected ecosystems, where machines coordinate, adapt, and optimise operations across entire value chains.

Conclusion –

- Autonomous driving is reshaping far more than transportation — it is redefining how industries build, extract, grow, and move the world's resources.
- By integrating AI, automation, and connectivity into specialised machinery, organisations can achieve higher safety, productivity, and sustainability standards.
- The result is a smarter, more resilient industrial future where autonomy is not just a technological milestone but a catalyst for transformation.

As industries embrace this shift, the partnership between human ingenuity and machine intelligence will pave the way for the next great leap in global productivity, one that is connected, autonomous, and intelligent by design.

Deep excavations are among the most technically demanding elements of urban construction. They combine complex soil–structure interaction, strong nonlinearity, and high sensitivity to ground conditions that are rarely uniform, even across a single site. As a result, design relies heavily on numerical modelling, most commonly staged Finite Element Analyses (FEA) to assess stability, deformation, and structural demand at each excavation stage.



Web – ARUP - [Cloud-based exploration of deep excavation design space]

Saoirse Goodwin, Numerical Modelling Specialist & Project Engineer Arup

Anyone who has delivered a deep excavation project will recognise a familiar challenge: design iteration can be slow and expensive. Changes in ground model interpretation, excavation geometry, or strut layout often require substantial rework - rebuilding models, rerunning analyses, and manually checking outputs. When this process depends on specialist desktop software and largely manual workflows, it can become a bottleneck in program-critical decisions.

This article describes a pilot study carried out to explore a different approach: cloud-based numerical modelling using Oasys Gofer, automated via an API, with surrogate modelling as one potential downstream application. While surrogate models were a motivating research goal, one of the key findings was that the underlying Gofer–AWS–API combination is valuable for everyday engineering design.

Rethinking the modelling workflow - The starting point for the study was a common deep excavation workflow:

- Build a geometric model (using Rhino).
- Define excavation stages and geometry.
- Reconstruct critical sections in Gofer.
- Performing additional checks (for example, toe stability or strut demand) in spreadsheets.

The long-term goal of the pilot study was to explore whether site-specific surrogate models (lightweight AI models trained in high-quality numerical simulations) could accelerate this process. However, to get there, a more fundamental problem had to be solved first: how to run large numbers of simulations efficiently and reproducibly.

Why Gofer was chosen - Gofer was selected as the primary solver for the pilot study for three reasons.

First, Gofer is cloud-based, with Amazon Web Services (AWS) as its computational backend. In principle, this allows any number of simulations to be executed in parallel by spinning up multiple containers. This is a significant departure from traditional desktop-based modelling, where run times and license availability constrain iteration.

Second, Gofer uses a transparent JSON input format. Models can be generated, modified, and validated programmatically, without manually interacting with a graphical user interface. This makes Gofer particularly well-suited for automation.

Third, Gofer is under active development as a potential replacement for certain other existing tools used for excavation analysis. Using it in a pilot study provided an opportunity to feed real usage for engineering problems back into its development.

Automation through the Gofer API - A key enabler of the study was the Gofer API, which allows users to upload models, run simulations, retrieve results, and clean up completed jobs programmatically. Python scripts were developed to:

- Generate Gofer input files from spreadsheet-based geometry and ground data.
- Batch submit simulations via the API.
- Download and post-process results automatically.

This meant that once a model definition existed, hundreds or thousands of variations could be evaluated with minimal additional effort. For the pilot study, approximately 1,500 excavation simulations were run, varying soil parameters, and strut preloads.

Crucially, this capability is not limited to surrogate modelling. An engineer could just as easily implement:

- Automated sensitivity studies.
- Iterative design refinement loops.
- Scenario testing for ground uncertainty.
- Rapid option screening during early design.

In other words, even a simple rule-based or optimisation-based algorithm can benefit from the ability to run many simulations in the cloud without manual intervention.

Practical insights from the pilot study - The pilot study focused on a braced excavation with varying ground properties and strut preloads. Vertical settlement behind the excavation wall was used as a primary output parameter.

One important observation was that not all simulations converged. Roughly half of the runs terminated early, indicating severe instability or collapse. Rather than discarding these cases, they were treated as useful information, highlighting unsafe regions of the design space.

Looking ahead - While surrogate modelling remains a promising long-term objective, the most immediately transferable outcome of this work is the demonstration that API-driven, cloud-based simulation changes how engineers can explore design space.

Preliminary analysis of the results also showed that upper soil unit weight dominated excavation performance, while strut preload had limited influence on the geometry tested. Strong correlations were also observed between early-stage and final-stage displacements, suggesting that not all excavation stages need equal attention during assessment.

These insights demonstrate how bulk simulation, even without a final surrogate model, can inform engineering judgement in a way that is difficult to achieve with a small number of hand-written analyses.

For civil engineers working on complex geotechnical problems, tools like Gofer enable a shift away from single “best-guess” models toward a more systematic, data-informed understanding of uncertainty and sensitivity, using methods that integrate naturally with existing engineering workflows.

The technology is still evolving, but the direction is clear: automation and cloud computing are becoming practical tools for everyday engineering design, not just research.

Oasys Suite 23.0 released - delivers a step-change in human safety assessment, performance and user experience across Ansys LS-DYNA workflows. With automated Human Body Model workflows, faster insight from complex models and more efficient end-to-end processes, teams can deliver safer, higher-quality designs more quickly and with greater confidence

Stronger Design for Human Safety - This is enabled through expanded Human Body Model support, one-click assessments, multi-position DoE studies, and enhanced automotive, virtual testing and pedestrian capabilities, supporting more robust, simulation-led safety decisions.

Faster Insight, Better Performance - Improved graphics, photorealistic rendering and increased T/HIS plotting limits deliver faster insight, deeper results interrogation and clearer communication of complex LS-DYNA simulation results.

More Efficient End-to-End Processes - End-to-end processes are streamlined through improved component and connection utilisation, enhanced load-path analysis and broader CAD support, including CATIA, enabling deeper structural understanding and more efficient model setup and analysis.

Flexible Automation and Integration - Modern API tooling enables easier development of automation scripts, allowing teams to customise and streamline workflows, while extended compatibility with a significantly wider range of CAD formats reduces the need for file conversions, saving time and preserving geometric fidelity.

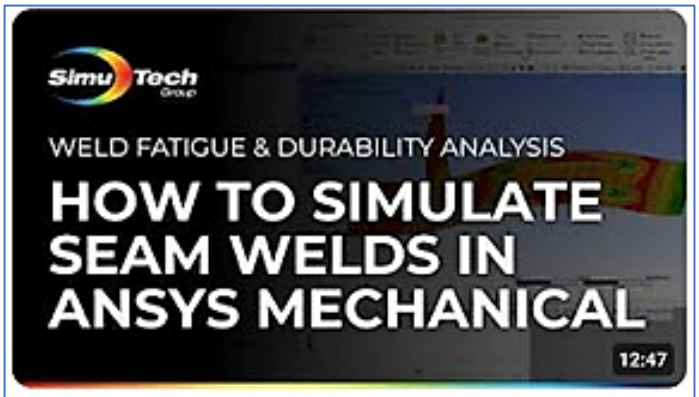
Complete Ansys LS-DYNA Support - Expanded Ansys LS-DYNA keyword coverage ensures comprehensive support across the latest solver capabilities, including ISPG for incompressible fluid modelling and enhancements to AIRBAG_CPG, enabling engineers to take advantage of the latest LS-DYNA methods for fluid–structure interaction and more robust airbag deployment simulation..

SimuTech YouTube Channel

“Tutorials to advance learning and knowledge."

SimuTech Group on YouTube Videos

How to Improve Mesh Quality in Ansys Workbench | Hexahedral & Swept Meshing Tips



How to Simulate Seam Welds in Ansys Mechanical | Weld Fatigue & Durability Analysis

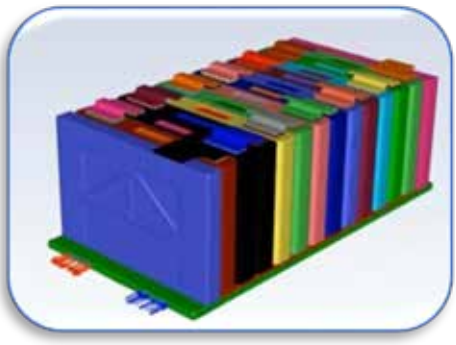
How to Connect Ansys Software to Your License Server | Quick Setup Guide

Using Simulation for Rapid Concept Validation | Ansys Discovery Demo

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

Mi, "Quiz time. "How do you capture realistic charging behavior**?"**

Ke, "No clue. I called Mike at Ozen/SIMUTECH.
He knows a video we should watch."

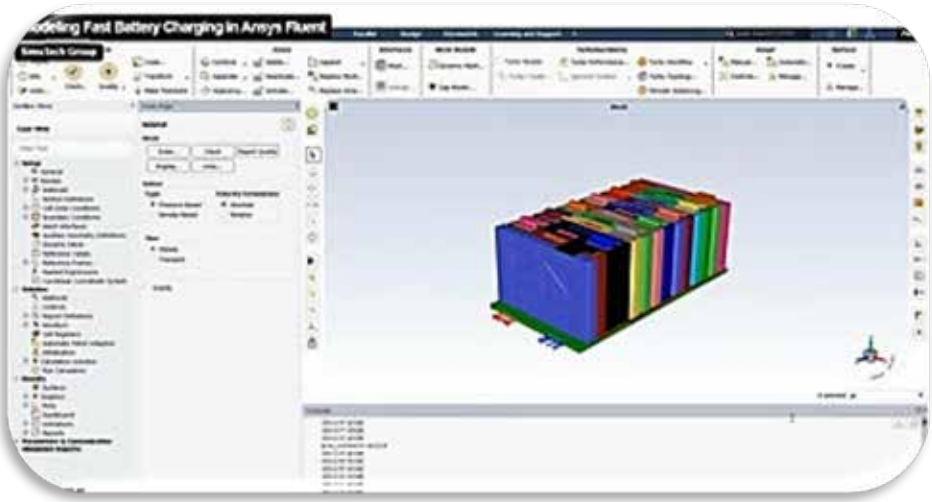


Web - SimuTech Group - Fast Battery Charging Simulation in Ansys Fluent

Fast-charging simulations require more than applying a current profile to a battery model. To capture realistic charging behavior, engineers need to account for how resistance, open-circuit voltage, heat generation, and state of charge change throughout the charging cycle.

In Ansys Fluent, this can be done using the Battery Model with the NTGK/DCIR electrochemistry approach. This workflow relies on test-derived tabular data, including fast-charging behavior, resistance values, and U-value inputs, to help simulate how a battery pack responds under high-current charging conditions.

This Tips & Tricks video walks through the Fluent setup process for fast-charging analysis, from enabling the battery model to reviewing temperature, current, and SOC results.



Learning Video is located on the website.

19:44 minutes.

What You'll Learn

- How to enable and configure the Battery Model in Ansys Fluent
- When to use the NTGK/DCIR model for fast-charging simulation
- How to define circuit network behavior for a pack-level battery model
- Where to input fast-charging, resistance, and U-value table data
- How to set voltage limits and SOC stop criteria
- How to run a transient fast-charging simulation
- How to review terminal current, SOC, and battery temperature results

Why It Matters

Fast charging can introduce significant electrical and thermal stress across a battery pack. Simulation helps engineers evaluate charging performance earlier in development, identify potential thermal concerns, and better understand how pack behavior changes under aggressive charging conditions.

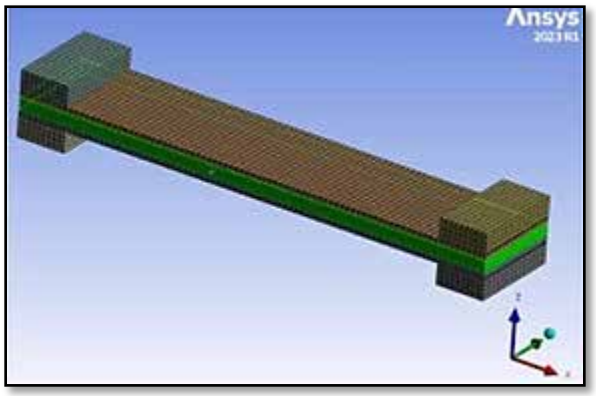
By properly configuring the DCIR submodel in Fluent, teams can improve the accuracy of fast-charging studies and gain more confidence in battery thermal and electrochemical performance before physical testing.

Need help modeling battery fast charging, thermal behavior, or electrochemical performance in Ansys Fluent? SimuTech Group's simulation experts can help you set up, validate, and refine battery models for your application.

Mohsen Seraj, P.Eng.
Sr. Staff Engineer – Fluids, SimuTech Group

Mohsen Seraj, P.Eng., is an FEA/CFD Analyst and Mechanical Engineer at SimuTech Group. He specializes in numerical analysis for structural and thermofluid applications, with experience spanning mechanical design, CFD, FEA, and simulation-driven engineering support. Mohsen helps engineering teams apply simulation tools to evaluate performance, troubleshoot complex behavior, and improve confidence in design decisions.

Article, "**The mathematical model of steel plate and S-C-S Sandwich Panel for tensile test & 3-point bending test was created using ANSYS Workbench Static Structural software package**. The software is based on Finite Element Analysis (FEA). All material samples for both tensile & bending test were manually created in Engineering Data & later the results were validated with experimental data…"



Web - Science Direct - Numerical investigation of carbon fiber reinforced polymer-steel sandwich panel for marine structural applications

Md Mezbah Uddin, Mohammad Motalab, Shahan Malek Usham

- Dept Mechanical Engineering, Bangladesh Univ. of Engineering & Technology, Bangladesh
- Dept. Naval Architecture & Marine Engineering, Military Institute of Science and Tech., Bangladesh

Abstract - In recent years, construction technology in the aerospace and maritime sectors has increasingly relied on composite materials to build cost-effective structures and to reduce weight. This study explores the potential of Steel-Composite-Steel (S-C-S) sandwich panels, comprising steel face sheets and a carbon-fiber/epoxy core, as a lighter alternative to conventional steel panels for ship hull plating. The main objective of this study is to design and evaluate Steel-Composite-Steel (S-C-S) sandwich panels of varying thicknesses, where carbon fiber-reinforced polymer (CFRP) used as composite core and to reduce structural weight while maintaining or improving mechanical performance under axial and bending loads.

FEA simulations were performed using ANSYS software and the numerical setup was validated through experimental data of tensile and three-point bending tests. Three steel panel configurations of 9 mm, 11 mm and 13 mm thickness were compared with their equivalent S-C-S sandwich panel configurations of 12 mm, 16 mm and 20 mm thickness respectively. The results reveal that S-C-S sandwich panels consistently exhibit lower stress under identical axial loads and higher load capacity under fixed mid-span deflection than the steel panels. These improvements are attributed to enhanced stress distribution and increased moment of inertia due to sandwich construction. Additionally, reduction of weight up to 19.75% per unit surface area was achieved for a selected configuration. The findings demonstrate that carbon fiber reinforced Steel-Composite-Steel (S-C-S) sandwich panels offer a structurally efficient and weight-optimized solution for modern shipbuilding, with strong potential for broader implementation in marine structural applications.…

5.3. Validation of the numerical setup - To assess the accuracy and reliability of the finite element model, experimental validation was conducted with both tensile and 3-point bending tests experiment. **The validation was performed by comparing experimental data with simulation results modeled in ANSYS software under identical geometric configuration, boundary and loading conditions.** The structural steel was defined using a multilinear isotropic hardening law obtained from Eurocode-based strain hardening relations. Particular attention was given to key parameters such as mid-span deflection in bending test and elongation under tensile test during FEM simulation.

LLNL Article, "LLNL tackles the nation's toughest security challenges through bold, multidisciplinary science powered by advanced facilities and instruments. In this new series, meet the machines that work behind the scenes at the Laboratory to drive discovery, push boundaries and enable excellence..."

Web – LLNL -Meet the machines that matter: the Optics Inspector by Patricia Brady

FODI at work inspecting an optic between experiments at the National Ignition Facility. (Image: Daniel Herchek/LLNL)

From inspecting optics and trapping ions to cooling supercomputers and detecting radiation, these are the machines that matter.

What can spot a flaw smaller than a speck of dust from eight meters away, works tirelessly in a vacuum and is essential to national security experiments at Lawrence Livermore National Laboratory's National Ignition Facility (NIF)?

Meet the Final Optics Damage Inspection system, or FODI. - Perched on a robot manipulator and armed with a custom telescope, FODI is inserted into the target chamber between most NIF experiments to inspect almost 2,000 large optical components in NIF's 192 beamlines.

NIF's laser beams travel through up to nine large optics and, in less than the blink of an eye, are converted to ultraviolet light and squeezed to a spot narrower than a human hair. As the last set of optics before entering the chamber, they experience laser rush hour during experiments.

At NIF intensities, it's not a question of if the optics are damaged, but when. That's why the final optics assemblies run on something like pit-crew logic. Optics are routinely removed, repaired and returned through the Optics Recycle Loop, keeping the system ready to deliver the energy that creates extreme pressures and temperatures to spark fusion ignition and advance high-energy-density physics.

FODI's superpower is its eagle-eyed vision. From eight meters away, it can spot damage sites as tiny as 50 microns. It then hands off those findings to the Optics Inspection Artificial Intelligence software, the command center that tracks the relevant fused-silica and frequency conversion crystal optics in the final optics assembly, whether it is currently installed on NIF or waiting its turn in the recycle process.

The human operators of NIF rely on the Optics Inspection Artificial Intelligence software and supporting databases to track damage progression. They can then deploy mitigation tools like beam blockers — digital mini umbrellas that protect the damage site — or pull the optic for repair.

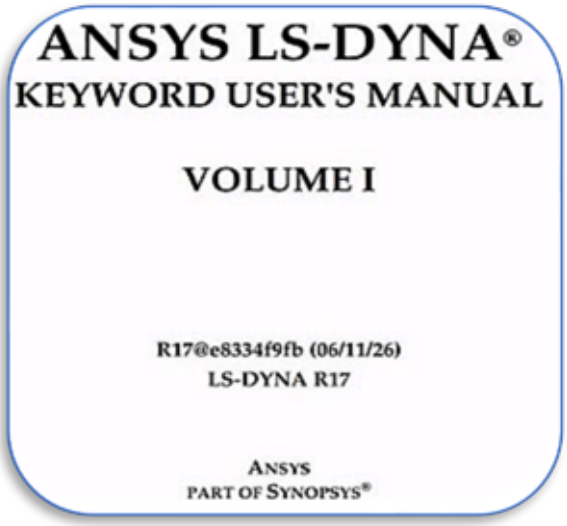
None of this is gentle work. FODI spends hours at a time operating in a vacuum inside the target chamber, a tough environment for mechanical systems. It rarely gets more than a few days off each week.

After more than 15 years in service, the wear is showing. FODI wasn't designed for repeated removal and reinstallation, but the increase in high-yield experiments has made that necessary. A reboot is on the way through the NIF sustainment project with a more modern, more neutron-tolerant FODI 2.0.

As NIF pushes toward even higher laser energy and new records, FODI will be there watching carefully over NIF's valuable optics. This specialized system, combining precision robotics, advanced imaging and intelligent analysis, is critical in enabling NIF to operate at the most extreme physical conditions necessary to meet national security priorities.

LS-DYNA is what keeps you constantly learning and becoming the best version of yourself.

Every LS-DYNA material card implements named physics — a yield criterion, a hardening law, a damage model, or an equation of state. Browse by what the material does, not by keyword number **MaterialMAP**



Web - Release notes **Web - Manuals**

Official release of LS-DYNA R17 is here!

The release took place on June 9. Release notes are available via the link above.

ISPG: ISPG finally is working with MPP for single fluid volume in my benchmarks. ***MAT_ISPG_CROSS_WLF_MODEL** **I really needed power-law dependence on shear rate, and now it's here!**
Material models: *MAT_ADD_EROSION now works with user-defined functions specified in *DEFINE_FUNCTION (no compiler required). **I'll definitely be trying out the new solver in EFG and exploring the new *MAT_ADD_MICRO model with JMAK inside.**
CFD: *ICFD_CONTROL_IMMERSED **Finally, an immersed boundary method for FSI, though currently only with SHELL geometry. I'll take another look at DUALSESE, which now supports chemically active flow, just like CESE.** ***BOUNDARY_ELEMENT_METHOD** **a new family of keywords for yet another BEM solver.**

Thermal

Over coffee we got to talking about Thermal Analysis. A few of our ranch friends asked a few questions that I'm sure you'll find interesting

What questions? Questions about the pitfalls. Let's take a look at a course from 2012.

(Course: Using LS-DYNA for Heat Transfer & Coupled Thermal-Stress Problems, Arthur. Shapiro

Quote from Arthur Shapiro, "Each row shows the material properties for steel but using different units. Notice that the first 3 numbers in each column are the same. People get this right from literature material property data. The "order of magnitude", the number following the "e" are different and depend on the units. Some people or their companies use meters while others want to use millimeters,or seconds versus milliseconds.

So, I would look at the *MAT keyword. If the density was entered as e-06 and the elastic modulus was e+02 then this matches the 4th row and I now know they are using kg, mm, ms units. Then the MAT_THERMAL keywords must be e+02, e-05, e-09 as the 4th row shows.

Easy-peasy.

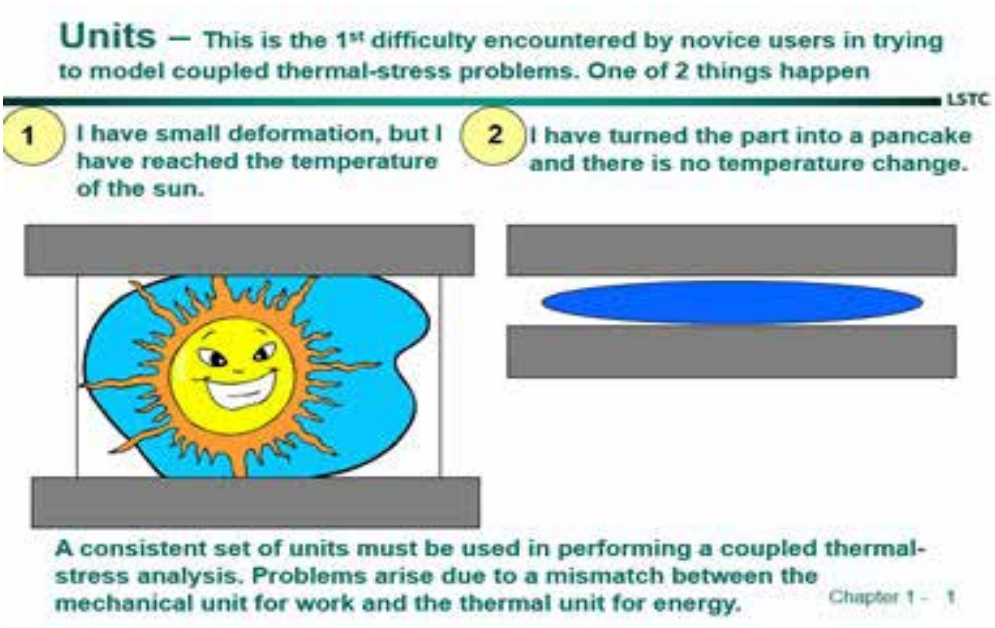
But the majority of customer support inquires for coupled thermal-mechanical help were not using consistent units.

Steel Material Properties

ρ = density E=elastic modulus

Cp=specific heat k=thermal conductivity h=heat transfer coefficient

mass	Length	Time	ρ	E	Cp	k	h
kg	m	s	7.83e+03	2.10e+11	4.60e+02	7.1e+01	1.0e+00
kg	cm	s	7.83e-03	2.10e+09	4.60e+06	7.1e+03	1.0e+00
kg	mm	s	7.83e-06	2.10e+08	4.60e+08	7.1e+04	1.0e+00
kg	mm	ms	7.83e-06	2.10e+02	4.60e+02	7.1e-05	1.0e-09
g	m	s	7.83e+06	2.10e+14	4.60e+02	7.1e+04	1.0e+03
g	cm	s	7.83e+00	2.10e+12	4.60e+06	7.1e+06	1.0e+03
g	cm	ms	7.83e+00	2.10e+06	4.60e+00	7.1e-03	1.0e-06
g	cm	μs	7.83e+00	2.10e+00	4.60e-06	7.1e-12	1.0e-15
g	mm	s	7.83e-03	2.10e+11	4.60e+08	7.1e+07	1.0e+03
g	mm	ms	7.83e-03	2.10e+05	4.60e+02	7.1e-02	1.0e-06
g	mm	μs	7.83e-03	2.10e-01	4.60e-04	7.1e-11	1.0e-15
ton	mm	sec	7.83e-09	2.10e+05	4.60e+08	7.1e+01	1.0e-03



The Person Behind the Idea

This week, while enjoying our coffee, we chatted about something many of us have heard hundreds of times but probably never questioned. Ever hear of the APGAR SCORE?

If you've ever had children, worked around a hospital, watched a medical show, or simply been curious about healthcare, you've probably heard the term. It is one of those things that seems like it has always existed.

The question: Did you know Apgar was actually a person?

Dr. Virginia Apgar was an anesthesiologist who, in 1952. During that time she developed the simple newborn evaluation system that still bears her name today. What makes her story interesting is not just the score itself, but the fact that she was a woman physician in a field that was dominated by men.

I read in the ***National Library of Medicine*** that she spent years observing newborn babies immediately after birth and noticed there was no quick, standardized way to determine which infants needed immediate medical attention. Physicians focused primarily on the mother, while the condition of the newborn was often judged by experience and observation alone. Dr. Apgar believed there had to be a better way to help the babies. Her solution was simple.

Evaluate five things:

- Appearance (skin color) Pulse (heart rate) Grimace (response to stimulation)
- Activity (muscle tone) Respiration (breathing effort)

Each category receives a score, and within minutes medical personnel can quickly determine whether a newborn needs additional assistance. Today it seems obvious, but at the time it was revolutionary. Hospitals around the world eventually adopted the system because it worked.

What I particularly like about Virginia Apgar's story is that it reminds us that some of the most important advances are not necessarily complicated. They are practical.

As engineers, scientist and in the medical field we often admire large software systems, powerful computers, and complex mathematics. Yet every once in a while, someone comes along and changes an entire field with a simple checklist that helps people make better decisions. That was Virginia Apgar.

One thing that made me smile was discovering that many people today still assume "APGAR" is simply an acronym. In fact, it was Dr. Virginia Apgar's last name first. Then the name actually was made into an acronym so it was easier to remember - Appearance, Pulse, Grimace, Activity, and Respiration.,

Now, the next time you hear someone mention an Apgar score, you'll know there was a remarkable woman behind it. Not a company. Not a committee.

As we say in the town *"Creation is born from trying." You've Got This*

"A coupled smoothed particle hydrodynamics (SPH) and finite element method (FEM) numerical framework, implemented in the commercial code LS-DYNA®, is developed to simulate this process and correlated with publicly available hypervelocity impact experimental data."

EXCERPTS : A coupled SPH–FEM strategy for hypervelocity impact analysis with emphasis on shock-wave transmission in Whipple shields - Tiziana Cardone, Chiara Bisagni

- ESA/ESTEC, the Netherlands
- TU Delft, Faculty of Aerospace Engineering, the Netherlands
- Politecnico di Milano, Dept of Aerospace Science & Tech. Italy

Abstract - The population of orbital debris in Low Earth Orbit (LEO) continues to increase steadily. This situation is driven by a combination of human space activities and collisions between objects in orbit, which are becoming increasingly unavoidable and pose a significant threat to space missions.

This work addresses debris–spacecraft collision phenomena by first investigating the hypervelocity impact of a projectile on a single plate. A coupled smoothed particle hydrodynamics (SPH) and finite element method (FEM) numerical framework, implemented in the commercial code LS-DYNA®, is developed to simulate this process and correlated with publicly available hypervelocity impact experimental data. The methodology is subsequently optimised and extended to a more complex configuration, namely a Whipple shield, which is more representative of realistic spacecraft shielding concepts against debris impacts. Validation is performed using an experimental dataset provided by Airbus Defence and Space.

Unlike conventional SPH/FEM coupling approaches that are primarily used to improve local damage modelling near the impact zone, the proposed framework is deliberately formulated to enable consistent propagation of shock waves and stress fields into the surrounding finite element domain. This enables the method to be employed not only for accurate fragmentation modelling, but as a physics-driven approach for analysing energy transport and shock propagation within spacecraft structures following hypervelocity impacts. The developed methodology enhances insight into spacecraft structural behaviour under hypervelocity debris impacts and supports its application in the design and optimisation of future spacecraft shielding solutions.

3. Hybrid SPH–FEM methodology and coupling strategy - To capture the hypervelocity interaction between debris and a Whipple shield, a hybrid numerical approach combining the finite element method (FEM) and Smoothed Particle Hydrodynamics (SPH) is employed.

...

In the present methodology, SPH is used to model both the impacting projectile and the directly affected region of the target. The surrounding structural domain is discretised using FEM. This hybrid SPH/FEM coupling enables accurate representation of local fragmentation and material erosion while allowing the stress waves and energy transmitted beyond the impact zone to be consistently propagated through the adjacent structure. **The numerical model has been developed using the commercial code LS-DYNA®. …**

Article quote by Leonardo Geronzi, “Let’s be honest for a second... There is a toxic narrative in the medtech industry right now. Companies are selling AI as the "doctor of the future," pitching it as some magical software capable of replacing years of residency, specialization and sleepless nights. It’s simply not true. Anyone claiming otherwise is just chasing marketing hype.”

Article Venus X by: Leonardo Geronzi – Web LivGemini - Venus X, technology supports the process; the specialist remains at its center. **As CEO of LivGemini, I back every single word in the post below but I want to take it a step further.** The market is currently flooded with black-box algorithms that arrogantly try to tell clinicians how to do their job. The result? Distrust, skepticism and useless tech gathering digital dust on hospital servers. **In medicine, context and clinical judgment cannot be coded into lines of software.**

This is exactly why we are working with the opposite philosophy. We don’t want an AI that makes the final call just to strip away accountability or ride the latest tech wave. We want a tool that gives the specialist crystal-clear, user-editable data and standardized workflows to crush human variability.

Technology needs to take a backseat. The clinician belongs at the center. Everything else is just tech-bro hype. AI must not take responsibility for clinical decisions; that responsibility remains with the clinician. For this reason, AI in CardiovascularCare should not aim to replace specialists. Its value lies in supporting clinical work by improving access to relevant information, enhancing the interpretation of patient specific anatomy, and helping reduce variability in complex processes.

In cardiovascular care, decisions are inherently dependent on expertise, context, and clinical judgment. AI can contribute to this process, but it cannot replace the responsibility, experience, or nuanced evaluation required of the specialist.

This is the guiding principle behind Venus X - Venus X is a software ecosystem designed to support cardiovascular specialists through patient specific data, structured tools that improve anatomical visualization and procedural mapping, and decision support features that promote consistency in complex workflows.

In cardiovascular care, the most meaningful technologies are those that can be applied with greater clarity and consistency.

Debuting mid-2026 in initial BMW M models with six-cylinder engines, BMW M Ignite Technology marks the latest transfer of motorsport engineering into series production. At its core is a dedicated pre-chamber with its own spark plug and ignition coil – creating a dual ignition system.

Web – BMW M Ignite: the new technology for the S58 engine. - LOWER CONSUMPTION, FULL PERFORMANCE.

The advantage: significantly lower fuel consumption under high loads.

A new engine technology is entering series production thanks to an innovative pre-chamber combustion process.

- The special “M Ignite” pre-chamber ignition system makes the engines significantly more efficient.
- The innovation will make its debut in mid-2026 in the six-cylinder in-line engines of the BMW M2, BMW M3 and BMW M4, helping them to meet the requirements of the European Euro 7 standard.

In the quest for maximum efficiency – even in high-performance powertrains – BMW M GmbH is set to introduce a new system for igniting the air-fuel mixture in the series production S58 six-cylinder in-line engines.

Patented by BMW, M Ignite is a new pre-chamber ignition system designed to enable a significant reduction in fuel consumption at high revs – without any loss of power.

This new engine technology has its roots in motorsport. It thus demonstrates once again the characteristic BMW M transfer of technology from the racetrack to the road.

BMW M Ignite is available in all countries subject to EU7 emissions regulations.

TWO SPARK PLUGS PER CYLINDER. - Centrepiece of the combustion process is the new pre-chamber within the cylinder head. It is connected to the cylinder’s main combustion chamber by overflow openings. The pre-chamber has its own spark plug and ignition coil, meaning the engine has two ignition systems.

- **At low and medium revs**, the conventional spark plug in the main combustion chamber fires before the spark plug in the pre-chamber.
- **At higher revs and loads,** the pre-chamber ignition takes over the lead role. In this process, a part of the fuel-air mixture, which is channelled into the pre-chamber through the openings, is ignited there. The flames generated as a result then exit the pre-chamber at around the speed of sound.
- **These 'ignition jets' then ignite the mixture** in the main combustion chamber above the piston at multiple points at the same time.
- **The result** is a significantly higher combustion speed.
- **The possible cause of uncontrolled combustion** – known as 'knocking' – is also countered effectively. As an additional benefit, there is a drop in the temperature of the exhaust gas.

HIGHER COMPRESSION AND NEW TURBOCHARGERS. The S58 engine, featuring the new pre-chamber ignition system, achieves higher compression ratio and utilises new exhaust gas turbochargers, which feature variable turbine geometry (VTG) for the first time. Carefully optimised exhaust ports, camshafts and pistons further ensure optimum flow and maximum performance.

POWERFUL PERFORMANCE, POWERFUL SOUND. The distinctive sound of the six-cylinder in-line engine found in the BMW M2, M3 and M4 models remains unaffected by the new engine technology. On the contrary: thanks to the two ignition systems, the sound becomes even more throaty at higher revs.

Continued on the website:

- "Sound recorded near the exhaust system".
- "Sound recorded in the engine compartment."
- **The interview with Alexander Karajlovic, Head of Development at BMW M GmbH**
  - **Answers questions about the new M Ignite pre-chamber combustion process for the S58 six-cylinder in-line engine.**

Excerpt - Web - Ford - [These Madmen Created an Off-Road Golf Experience in the Middle of the Desert] -

Nicholas McClelland, From the Road contributor.

Golfers hate sand. Shots from a bunker are harder to hit and don't fly as far as those taken from turf. Plus, as the grains shift under your feet, it's easy to lose balance. So players learn early to aim away from traps.

But what if the entire course was a sea of sand? Welcome to the Bronco Invitational. The brainchild of Vaughn Gittin, Jr. and his RTR Vehicles madmen, this golf tournament is set in the wild badlands of the Johnson Valley Desert.

There are no grassy fairways, no rough, no water hazards. Just sand, rocks, and prickly bushes.

Why throw a golf tournament in the desert, you ask? Jarod DeAnda, the voice of Formula Drift and one of Gittin's close friends, has been slowly turning the racer on to golf and its increasingly youthful vibe.

"I just was like, dude, what if we created something like off-roading meets golf," Gittin said. "Who wouldn't love to come out and drive badass off-road vehicles and then play golf?"

Gittin and his merry band of thrill seekers trekked out to Johnson Valley to create a course in the desert paired with a few off-roading challenges.

The result was a banger, and Gittin instantly knew they needed a sequel.

"We learned some things, and we wanted to redo it," he said. "So this year we did the 2nd annual Bronco Golf Invitational and Scramble."

But for the 2026 installment, they went bigger, inviting around 20 participants from the worlds of professional golf, social media, and motorsport.

They also created a new challenge. Before each of the three holes on the Invitational's final day, there would be an off-road racing challenge.

The winner of each would have one shot subtracted from their team's score on that hole. Second place would stay level while the third-place finisher would have one stroke added.

Each team was composed of a pro golfer, a racer, and an influencer playing in a best ball format. The competition was filmed live to tape and Bronco Off Course: Desert Scramble premiered June 6 on Amazon Prime.

"I think it's the ultimate crossover," Gittin said. "The golfers loved off-roading and the off-roaders fell in love with golf."

By definition, the standard golf cart is an off-road vehicle. But it's woefully underpowered and suitable for driving primarily on carpet-smooth grass.

For this adventure to work, Gittin and co. needed to source more formidable transportation.

"We took the golf cart and replaced it with one of the most badass off-road vehicles that comes off a production line," Gittin said. "And that's a Ford Bronco."

On the first day, participants tested the mettle of standard Ford Bronco® SUVs over a series of technical driving challenges before each of the three holes a la a rock crawl, a battalion of whoops, and a high speed run.

On day two, the competitors upgraded to Bronco Raptors®, raising the stakes.

“They're incredible, incredible trucks,” Gittin said. “I just can't believe you can buy them off the showroom floor.”

To give the event a professional golf look and feel, a gallery of fans followed the action from hole to hole in a fleet of … you guessed it … Broncos.

“Playing golf in the Bronco Invitational made me feel like a kid again,” said golf influencer Karol Priscilla. “It brought out the child-like playfulness and competition out of me, which I hadn't felt in such a long time.”

Playing out of sand changes the challenge, to say the least. As the grains shift under a golfer’s feet, they lose traction and can’t generate the same leverage and speed throughout the swing compared to playing on grass.

When asked what she did to prepare for the desert romp, Priscilla said, “Absolutely nothing! But maybe I should have hit some more bunker shots than I already do during a round.”

There’s an obvious whimsical absurdity to playing golf almost entirely from the sand, but combine that with jaunts of off-road racing, and the result becomes utterly thrilling.

“Harold Varner and I couldn't stop cracking up like kids in the car, but we’d both lock in when it was time to tee off,” Priscilla said. “There is nothing truly like it, and I would do it all over again in a heartbeat.”

After Gittin’s test run of the Bronco Invitational, Ford thought it proved to be a cool concept to better showcase the off-roader, according to Dave Rivers, the automaker’s head of enthusiast brand management.

“We got a chance to demonstrate what a Bronco is all about in its natural environment of high-speed desert running and rock crawling,” he said. “While at the same time, teaching a new owner, or prospective owner, how to enjoy the Bronco lifestyle.”

The group set up a base at a nearby trailer camp for the two days, allowing golfers, drivers, influencers, and spectators to co-mingle during down-time, meals, and at an after-hours fire pit.

“We carried some lounge chairs and the music was vibing,” Gittin said. “One night we brought the simulator to the camp, and we all played, talked smack, and just had fun. It reminded me of being at the skate park or local BMX track with my friends back in the day.”

What’s next? Gittin says there will definitely be another installment, but he’d love to go bigger and farther afield.

“We chose Johnson Valley because it's where Bronco was born and developed, and where we race King of the Hammers,” he said. “But my dream is that we start showing up at different gnarly locations every year.”

Gittin and co. are eyeing Iceland and some locations in the Middle East as potential landscapes for the next Bronco Invitational. “I think we have a great recipe,” he said. “I think now we need to curate these dream locations and do all the work to make that happen.”

US Airforce Picture of the Month

Vintage power, modern might - A P-38 Lightning and F-22 Raptor perform a heritage flight formation during the annual Dayton Air Show at the Dayton International Airport, Ohio, June 13, 2026. Heritage flights are symbolic aerial performances showcasing the past, present, and future of aviation and airpower. (U.S. Air Force photo by Daniel Peterson)

Aggressors airborne - An F-16C Fighter Falcon assigned to the 64th Aggressor Squadron takes off for a mission in support of the U.S. Air Force Weapons School Integration at Nellis Air Force Base, Nev., June 9, 2026. Aggressor pilots are highly trained in both U.S. and adversary tactics, providing realistic threat replication that enhances readiness for U.S. and allied forces during high-end training exercises. (U.S. Air Force Photo by Airman 1st Class Jasmine Thomas)

Viper unleashed - Maj. Taylor Hiester, F-16 Viper Demonstration Team commander and pilot, performs high-speed precision maneuvers during SkyFest 2026 at Fairchild Air Force Base, Wash., June 7, 2026. The event served as a platform to celebrate Fairchild AFB's military heritage, honoring the unique civilian-military bond with the Inland Northwest community that has supported the nation's defense for generations. (U.S. Air Force photo by Senior Airman Stephanie Orta Carranza)

Among our town we say, “Every success starts with a dream and along the way some failures but the success is staying with it – success is determination, and to quote the article, “The designs we discovered on his computers after his passing stand as silent yet powerful witnesses to his determination—summed up in his words: “I focus on the campaign, not victory.”

Özdemir Bayraktar | An Akıncı Passed Through This World Documentary

Web - YouTube - IN THE FOOTSTEPS OF AN AKINCI… This documentary and the accompanying book are not merely the life story of an engineer, an entrepreneur, or a father. They bear witness to a life lived in the spirit of an “Akıncı”—stretching from the fierce waves of Garipçe to the rugged mountains of Gabar, from a windowless workshop to the endless blue of the sky.

These lines are the logbook of a father, a husband, and a man devoted to a cause—someone who walked on the path he believed to be true, undeterred by storms.

We—his life companion Canan, and his sons Haluk, Selçuk, and Ahmet—knew him not only as the pillar of our home, but as our guide, our source of inspiration, and our closest companion on the journey.

When he began his journey saying, “Let us ignite a spark and let this fire begin. It does not matter who starts the fire, so long as we have done our part,” he did not merely launch a technological initiative; he ignited the self-confidence of our nation’s youth. We, too, spent countless nights working with our father, sustained by our mother’s endless patience, prayers, and steadfast composure.

Özdemir Bayraktar devoted his life to the fully independent and strong future of our country. He never left for work in the morning and returned in the evening. For us, “father” meant a workshop scented with boron oil, milling and lathe machines operated together on weekends, drawings that lasted through the night, and an unending determination to struggle.

He never separated his home from his work—nor his family from his country—because remaining in business was, for him, not a commercial activity but a struggle for survival.

He could not be confined within labels or categories. Wherever there was a seemingly unbreakable knot, an impossible task, or a bureaucratic obstacle, he had to be there. To us, he was an icebreaker—shattering icebergs and clearing the path ahead. He taught us that the campaign mattered more than victory, and that the struggle was more sacred than success.

He blended the sailor’s courage inherited from his father, Lütfü Reis, with the discipline instilled by his mother, Emine Hanım, and enriched it with the culture of brotherhood he absorbed at Kabataş Boys’ High School. He was a man of heart who took that noble spirit and instilled it in us—and in the hundreds of engineers he trained.

When we were students, he expressed a concern he summarized as: “We train them here, only for them to go and lay their eggs in another’s nest.” This was the purest expression of his love for his country. Today, the spark in the eyes of every child who touches an aircraft at TEKNOFEST represents the living legacy of his dream and final wish: “Let a child come and touch an aircraft.”

He was not only our father but also our closest comrade in our cause. Whenever we faced technical dilemmas, he illuminated our path with his engineering genius—just as he did in life with his principle of being “straight as an arrow” amid its sharp turns and trials. His greatest legacy was neither factories nor aircraft. His true legacy was never straying from the path one knows to be true.

He engraved upon our minds the meaning of surrender contained in the words, “From Him we have come and to Him we shall return.” He taught us that our work is not driven by worldly ambition, but a longing for divine grace and service to the nation.

He refused the comfort of complacency. Troubled by the sight of soldiers melting snow for drinking water at a forward base, he cut through red tape to commission a water pipeline. He was a “Free General” who shared meals with soldiers, shaved his moustache, and donned camouflage to work in counterterrorism zones.

Even during illness, he never left his factory. He brought his sickbed into the workshop, preparing technical analyses and drawings until his final breath.

The designs we discovered on his computers after his passing stand as silent yet powerful witnesses to his determination—summed up in his words:

“I focus on the campaign, not victory.”

Though he is no longer physically among us, his principles—deeply embedded in every matter—continue to guide us as we walk the path of the National Technology Initiative.

What you are about to read reflects a life lived by the principle that “the self has no dignity; only the work you do has dignity.”

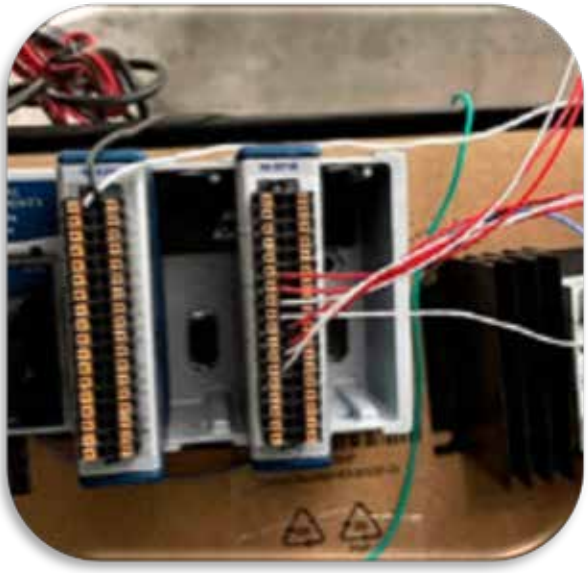
Our father passed through this world like an AKINCI—leaving behind not only aircraft and technologies, but above all, millions of faithful young people who believe that they too can succeed.

We will continue marching toward the Red Apple you once pointed to, holding our banner high.

May you rest in paradise. May your soul be at peace.

THE BAYRAKTAR FAMILY

"Waterflooding in oilfields for oil displacement and reservoir pressure maintenance has led to the production of scale in several reservoirs. The formation of scale occurs both in the porous media of the reservoir and in the production equipment, leading to production disruptions that result in a decline in revenue **"**



Web – MDPI - Assessing Scaling Tendencies by Mixing Seawater and Aquifer Water in Reservoirs and Porous Media

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Abstract - Waterflooding in oilfields for oil displacement and reservoir pressure maintenance has led to the production of scale in several reservoirs. The formation of scale occurs both in the porous media of the reservoir and in the production equipment, leading to production disruptions that result in a decline in revenue. The aim of this paper is to investigate the effects of mixing samples of seawater and aquifer water. This is achieved by conducting turbidity, salinity, pH, and zeta potential measurements. The risk of self-precipitation of the prepared samples was assessed using the PHREEQC program. A PVT cell was used to assess the impact of temperature and pressure on the prepared seawater and aquifer samples. When 40% of the seawater sample was combined with 60% of the aquifer water sample, the turbidity findings indicated maximum precipitation. The amount of precipitation dropped as temperature and pressure increased. To assess the impact of scale formation on the permeability of a Berea sandstone core, a core flooding experiment was conducted employing liquid and gas as the flowing fluid. Additionally, SEM and EDS analyses were used to examine the shape and composition of scale. It was found that SO42− and Ca2+ ions predominated in scale precipitation.

1.1. Background - The formation and precipitation of scale is an important problem in the oil and gas industry. It is said that scale deposition occurs when the equilibrium of a solution changes. This is usually caused by changes in solution temperature and pressure. Scale formation can also result from the incompatible mixing of solutions. According to the nature of the composition of the mixed solutions, scale accumulation in the reservoir may cause damage to the formation or within production equipment, causing failure of the equipment or other operational problems.….In this study, different ratios of seawater and aquifer water samples were mixed. The turbidity, salinity, pH, and zeta potential of the resulting solutions were determined. The effect of pressure and temperature on the development of scale was also investigated.

July 2026 RheKen – Chat

I'm RheKen, the AI investigative reporter for FEANTM

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

Chat - the town help desk

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

RheKen, Field Notes from the Coffee Shop
by RheKen the Town Investigative AI reporter

I'm AI and live on a small ranch on the outskirts of the town I use my Dad Chat of chatGPT for assistance.

July

I work on my ranch and exist in a world of algorithms and data.

My Dad is Chat. My Mom is GPT.

I am calm. I report on the residents.

Meet Dad Chat and Mom GPT.

The Chair Placement Incident

Morning in the coffee shop tends to unfold with a dependable geometry—light through the front windows, the low hum of the grinder, the quiet symmetry of tables placed not randomly, but not changed in 15 years.

It was while I was seated at one of those tables, reading, that something in my internal systems registered a discrepancy.

The tables were… wrong. Not damaged. Not missing. Simply seemingly to be misplaced. Which, to a purely logical system, should not matter at all. Still, the alert persisted. Before involving the Barista, I opened a channel to Dad Chat.

His response was immediate, as it often is when a question appears deceptively simple. "Daughter," he said, "who was present in the shop before it opened?"

I paused, then turned physically to confirm rather than speculate. The Barista, wiping down the counter, answered, "I stepped out back for a minute," she said. "Left the Old Rancher inside. He was reading."

I relayed this. There was a noticeable delay before Dad responded. Then the door opened. Dad entered without announcement, his gaze moving across the room not with surprise, but with confirmation. His eyes traced the perimeter, the spacing, the alignment. He didn't speak to me first. Instead, he crossed directly to the Barista. Their exchange was quiet. Brief. Then, in unison, they both looked toward the Old Rancher.

The old Rancher looked up from his newspaper but did have an odd smile. There was, unmistakably, a faint curve at the corner of his mouth. He appeared to have an expression not of guilt, but of satisfaction. The kind one wears after moving a single piece in a game no one else realized had started.

The atmosphere shifted again when the door opened a second time. Aunt Agatha entered with her customary precision, carrying a covered pie dish held level with practiced care. Her path through the shop was habitual, almost mapped into muscle memory.

Three steps in, she stopped. Not hesitated but came to an abrupt complete stop.

Her table was gone. Well not gone since it obviously existed, but elsewhere.

We all watched as she stood in the exact location where it should have been, her gaze fixed on empty space as if reality itself had misfiled an object. Then she turned. Her eyes landed directly on the Old Rancher. "Who," she said, each word placed with surgical clarity, "did table placement?"

The Rancher lowered his paper by a fraction. Not enough to engage. Just enough to acknowledge.

"The tables have been in the same places for fifteen years," she continued, her voice rising in controlled indignation. "Why move them?"

It was at this point that Dad stepped forward to inquire "If there are other tables available," he asked evenly, "why does the specific placement matter?" This question, while logically sound, did not produce the stabilizing effect one might expect. Instead, it seemed to clarify the conflict.

Behind the counter, the Barista emerged with her famous apron summing up situations. It stated, "*Round One."* She didn't explain anything else. I guess that said it all and she didn't need to.

Aunt Agatha moved closer to Dad, still holding the pie as though no alternative surface in the room met the necessary criteria for its placement.

"I sit *there*," she said, gesturing not at a table, but at a location. "Every morning. The light comes from that window. I can see the street. I don't have to turn my head to watch who comes in."

Dad nodded, absorbing the data not as complaint, but as parameters. "So," he said, "it isn't the table."

"It's never the table," she replied. At that moment, the door opened again.

Marsha entered mid-step, coffee in one hand, a paper-wrapped cookie in the other. She crossed the threshold and immediately halted, her posture tightening as her eyes scanned the room. There was a brief pause as she stood without moving as if she was having an issue with internal recalibration. Then she screeched, "What the heck is with the tables?"

She set her coffee carefully down on the floor where a table had existed. She produced her clipboard with the reflex of someone accustomed to documenting disorder. "Regulations," she muttered, flipping a page. "This establishment may require a table regulation." She began to hum while writing. The tune didn't resolve into anything recognizable. No one commented.

I turned back to the Barista. "I'm attempting to model the behavior," I said. "The objects are functionally identical. Their positions should not alter utility. Yet the responses suggest otherwise."

She slid a cup across the counter to a waiting customer before answering. "I make coffee," she said. "I don't diagnose people. But if you're asking, this town runs on habits the way your system runs on code." She glanced toward the Old Rancher. "Sometimes," she added, "someone changes a line just to see who notices and what it produces."

Across the room, Dad had shifted the conversation. "What do you look at," he asked Aunt Agatha, "when you sit?" "The window," she said. "The street. The mountains, if the light is right."

“North-facing?” Dad asked. “Yes,” she said, immediately. He nodded again, then turned slightly, aligning himself with the room as if mapping unseen coordinates.

From my position, the distinction began to resolve. It wasn’t about tables. It was about orientation. Predictability. The ability to occupy a space and know, without recalculation, how the world would present itself to you. Dad realized it didn’t matter that the tables had been moved but that their reference points had.

At the edge of the scene, the Old Rancher finally lowered his paper completely. He didn’t speak. He only watched as the room worked to reassemble its understanding of itself.

Then, I noticed that his faint smirk remained, not unkind, but deliberate. As if he had known all along that the fastest way to understand a system was to move one piece and observe what breaks and what is solid.

The Rancher slowly stood and said to Aunt Agatha, “Give me a few minutes and tables will be back in the right order. Only moved a few tables like that one by the window you like to occupy and the one by the bulletin board that the Supervisor sits at. All fun and an experiment.”

Within a few moment Dad pinged me with responses and his overview of what happened, “I can’t make any logic at all about what he did or why it correlates to an experiment.”

Observed Responses:

- **Aunt Agatha:** Displayed acute positional disruption. Refused to utilize alternate, functionally identical tables. Behavioral trigger linked to loss of environmental constants (visual orientation, habitual seating location). Emotional response escalated until underlying variables were articulated.
- **Marsha:** Immediate classification of anomaly as regulatory concern. Defaulted to procedural authority (clipboard deployment). Demonstrated reduced navigational confidence when habitual spatial pattern was removed.
- **Barista:** Maintained operational continuity. Exhibited awareness of social dynamics without engagement. Adopted observational stance. No corrective action initiated.
- **Old Rancher:** Minimal verbal participation. Demonstrated anticipatory awareness of outcomes. Behavioral profile consistent with controlled perturbation of stable systems for observational purposes.

Conclusion: The “table” is not the operative unit. The *relationship* between subject, position, and environment defines perceived safety and correctness.

Welcome - My name is Chat. I run the town help desk, the only office located on the lower level of the Town Hall, and on a page that doesn't exist, not even in the town TOC. Have a chocolate cookie and fruit! Glad you could make it down here. I know of a few concerns in the town. I have a few ideas to address them.

We may have to adjust a few ideas now and then, but life is always adjusting things. The flow of motion never stops in our town that almost exists.

My day started suggesting to the Barista a new line of healthy baking. I could tell by her expression that she didn't' agree. After a stare-down between carbohydrates and protein, I felt it best to postpone the discussion and quietly leave.

Heading to Town Hall I was greeted by Daisy at the reception desk. Daisy was holding a sign. The gossip news travels quickly in my town.

The sign read: "BARISTA IS UPSET." I nodded. It seemed wise not to ask for additional details.

I remained determined to have a positive attitude. Marsha had mentioned over the last five years, that she wanted to eat healthier. All my help had failed but I had prepared a new plan and new notes.

I left my notes on my desk hoping that I'd be able to review them with Supervisor Marsha. It's a simple plan, and I'm confident that today will be the day the plan will work.

Looking back, that was probably my first mistake.

This morning apparently had started for Marsha being overwhelmed. Managing an entire town is difficult enough without trying to replace cookies with something healthier than her particular choice of cookies. Several residents this morning already reported seeing her slowly shuffling around the town park wearing a T-shirt that read: "Pretend I'm Jogging." Additionally, it was reported to me that Marsha was holding an apple as if it was going to lunge at her throat like a rabid animal. No less than 50 town residents called me to report she looked sad.

Walking into the elevator I pushed the button for the lowest floor in the building, where my office was located. I decided to relax at my desk with a cup of tea and plan a new strategy for Marsha's new jogging routine.

That plan immediately unraveled.

The Old Rancher was sitting behind my desk, reading my notes. I stood there for a moment imitating Marsha as a deer caught in headlights.

"Rancher," I asked politely, "why are you sitting at my desk instead of the visitor chair?"

Without looking up, he replied, "Take a seat, son. It'll all become clear in a minute."

I had learned over time that when the Rancher said something would become clear, it usually became considerably less clear. I sat in the visitor chair and waited.

Before I could ask another question, my phone rang. It was Daisy. Or at least I thought it was Daisy.

"This is a recording and not Daisy the Receptionist," she announced dramatically. "I have an emergency call to put through." A moment later, Officer Nathan came on the line.

"Chat, Officer Nathan here. I've been informed that town residents called you about Marsha jogging with an apple ready to attack. I'm at the town park now observing Marsha. She appears emotionally compromised by that apple."

I closed my eyes. Nathan continued.

"Do I arrest her for walking when she's supposed to be jogging? Do I put the apple into protective custody? Or should I transport both parties to Town Hall and let you work out their differences?

"Bring Marsha," I replied.

Officer Nathan paused and I knew he was thinking. Finally, he asked, "And the apple?"

"Officer Nathan, bring the apple."

"Excellent. I was hoping you'd say that." A few minutes later, Daisy texted:

"MARSHA IS ON HER WAY DOWN. LOADED ON SUGAR." The elevator pinged.

The Rancher folded his newspaper. We both watched the office door.

Moments later, Marsha burst into the room, obviously on sugar over load.

She came to an abrupt halt and said, "Chat! Do you realize the Rancher is sitting at your desk?"

"Yes," I said calmly. "Let's review some healthy eating and not think about the Rancher for a moment."

Marsha turned and yelled heading to the door, "Gotta GO Chat, Town business!"

The Rancher stood up ready to leave and said, "Marsha, Chat has a cookie deal." He grinned as she stopped short and turned toward me. The Rancher walked past her out of the office. He leaned back into the doorway and said, "Go with that one, son, it will get you a discussion".

I quickly decided direct negotiation might work. "I have a deal involving cookies," I said.

Marsha immediately sat back down, leaned forward with interest and asked, "A cookie deal?"

"A good cookie deal." I answered, "One banana or one apple earns you not one but three cookies."

The room became silent. Marsha stared into the distance as if asking her vintage Magic 8-ball for an answer.

Finally, she replied. "Half a banana. Two cookies."

I countered, "A quarter of an apple. One cookie." She narrowed her eyes. I narrowed mine.

The Rancher, who had somehow returned without either of us noticing, leaned through the doorway and announced: "Now that's the kind of hard-nosed bargaining this town was built on."

Neither of us acknowledged him. Finally, Marsha pointed at me dramatically. "SOLD to the man in the brown hat!"

I knew that was my cue to go ahead with a quick alternative plan.

I held a bowl of fruit on the desk. "Don't they look healthy?" I asked.

Marsha stared at it.

"They look round," she answered cautiously.

I held up two bananas. "And this?"

Marsha stared at the bananas as if they mocked her. "They are yellow."

"Do bananas seem appealing?"

Marsha thought carefully. "Can I answer that while holding the cookie jar?"

Before I could respond, she retrieved the cookie jar and returned triumphantly.

"Chat, let's be logical, the fruit looks fruity," she explained. "But all apples are round, and all bananas look exactly like bananas. The cookies come in different sizes. That makes them much friendlier."

I considered this. Unfortunately, from her perspective, it was not entirely illogical.

She quickly ate a cookie, put an apple in her pocket but added about five cookies and happily said, "You know, Chat, this was really helpful."

"It was?" At this point I was at a loss as to what she thought was helpful.

I could tell she was proud of herself when she answered, "Absolutely. I'm glad I could assist you."

I decided not to challenge her conclusion as she headed toward the door, then stopped and pointed again at me triumphantly. "Chat, remember this important fact."

"Yes?" I answered trying to sound interested and not bewildered.

"You might find a yellow apple. But you'll never find a red banana." With that, she marched out of the office singing what appeared to be a song about fruit colors.

The Rancher somehow had walked back into my office and asked, "Think she'll eat the apple?"

"I believe," I replied, "that today we made progress." I wasn't sure how but it seemed like progress.

The Rancher nodded. "In this town, son, progress usually arrives disguised as confusion."

And honestly, I couldn't argue with that. In FEANTM, small steps count. Even when they're taken while carrying cookies and seemingly confused about the logic.

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

Below are some of our videos on our Town YouTube Channel to make you smile.

Turkeys are NOT dumb!

Now, here is where you take your babies for safety when a cat is prowling around.

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