Airport

Airport

Automotive

Automotive

Research Hospital
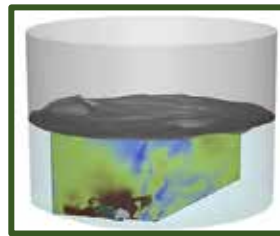
AI – ML Data Science

AI – ML Data Science

Museum

Pilot Quiz

Booth – Charlotte

Booth – Divesh

Booth – Marta & Seppi

Booth – Rasmus

Booth – Shweta

Booth – Syn

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Map Vector & town graphics in our magazine are courtesy of vecteezy

Table of contents

· **The websites noted will have the complete articles, and higher resolution graphics/videos.**
· **We reference and link to the source of information.**
· **This blog/magazine/town is a positive venue for informational purposes.**

February 2023 - Name of the person the town thanks

Town Hall Meeting Rooms

Automotive and/or Racing Information

Airport – Aerospace - Military

Research Hospital

AI – ML – Data Science Building

Thanks to Vecteezy for our Map Vector/town and many of the graphics in our magazine

Table of contents

Goodbye Page AND answers to the Old Pilot Quiz
This blog/magazine is a positive venue, for informational purposes, and not revenue

TOWN HALL MEETING
FREE COFFEE

Park Cars behind building

Tie horses to hitching rails

Serving coffee & Smores!

Our town comprises individuals interested in solutions and, of course, animals and children.

Gossip is at the local coffee shop.
Pets are welcome. (Small pets, horses stay outside)
(Pet goats or pigs also stay outside)

The town is pleased to have a new editor. We welcome Shweta. Shweta is a Biopsychology, Cognition, & Neuroscience student. Next year, as a student, she will be entering The Stephen M. Ross School of Business in the Master of Management program. As an editor she will cover a variety of articles, ranging from Business to Sciences, the research hospital, the AI/ML building, and Convention Center booth.

Our new map shows changes for February – We knocked down, combined, rebuilt.
- Racetrack with more racing and automotive. The Convention Center is redesigned.
- Research Hospital has a new wing for additional Simulation/Research
- New Data Science, AI and ML building is open with additional room for occupancy

Presiding Town Supervisor: "I think the demolition went well, but not that well."
1. Does anyone know who brought the tank and drone to demolition day?
2. Why? Only one building was marked for demolition not the 5 that were demolished.
3. Removal of buildings using an ABRAMS tank is against code and started a fire.
4. Who put out the fire using the AKSUNGUR drone?
5. We do thank you for the new construction that it brought the town.
   Please no more tanks and drones.
6. You don't need to point - I do see the Secretary and Pilot looking guilty and sneaking out.
7. Return the tank and drone to the appropriate military.

Welcome to our new AI, Machine Learning, Data Science building

1. **Intro Data science uses specific methods**

2. **AI can now write like a human. Some teachers are worried**

We hope you enjoy our new changes. Don't miss our new resident story teller RheKen (AI) in the Supervisor Section on page 34. You can contact us at feaanswer@aol.com

Horse Trail →

DYNA MORE

d3VIEW

ENGINSOFT

CADFEM

Oasys

FiGES

OZEN

HEXAGON

TOWN HALL

My Cafe

HOSPITAL

Research

LLNL

PARK

Library

Auto Race track & Auto Industry

Petting Zoo

Old Rancher

Rival Cafe

Elect/Water. & Sewage Treatment Plant Facilities

Airport

Convention Center

GRZ Technologies has pioneered the commercialization of solid-state (metal-hydride) hydrogen systems
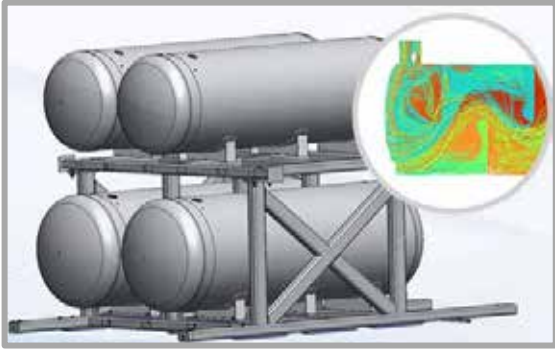
CADFEM - [Scaling up and optimization of hydrogen compressor and storage](#) -

(Images: © GRZ Technologies)
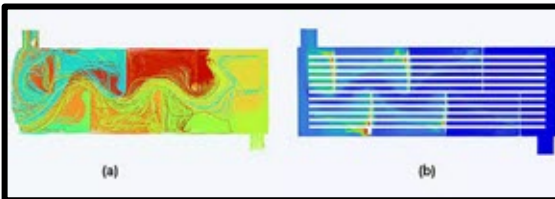
Task - The hydrogen absorption/desorption behavior is highly dependent on the temperature distribution within the metal hydride. Cylindrical cells contain the metal hydride material, which is in powder form. Several such cells are placed in a "shell-and-tube heat exchanger" type of arrangement within a bigger cylindrical container to form the overall compressor system. The thermal management of such a system is commonly done through the circulation of a thermal medium, such as water, steam, air or any other medium at accurately controlled thermal and flow conditions to provide the required heating or cooling power. GRZ technologies has developed a numerical procedure to simulate a range of systems using ANSYS Fluent and in-house developed models. The compressor or storage geometry is modeled parametrically, meshed and simulated. The spatial distribution of temperature and flow field are obtained from the numerical simulation (see Figure 1) for the case of an industrial-scale hydrogen compressor. The thermal medium flow velocity and distribution plays an important role in determining the temperature distribution within the metal hydride and eventually the compressor's performance. Using the parametric model, various options for reducing manufacturing and operating costs can be explored, while achieving the required hydrogen delivery pressure, flow rate and capacity.
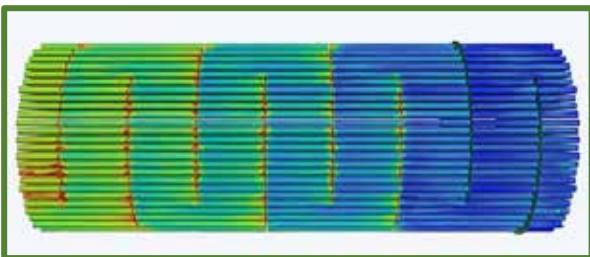
Solution - The numerical method described above can be used for many thermal and chemical technologies with similar physics. With Ansys Fluent, the thermal compression process is simulated, and the relevant evaluation parameters are quantified. The numerical results are interpreted based on the evaluation parameters defined, e.g., the maximum metal hydride temperature (see Figure 2), and an appropriate course of action is determined to optimize the design.

The coolant flow path is optimized by varying design parameters (e.g., tube arrangement) to improve performance (e.g., minimize pumping power) while maintaining certain requirements (e.g., minimum temperature non-uniformities). After achieving the optimum design, the operating limits (e.g., coolant flow rates) of the compressor are determined where the target compression rates are achieved. Novel mathematical models describing the thermal compression and storage processes can also be tested and evaluated.

Designing and building vehicles for flight is not without significant challenges, and while defying the force of gravity might be an ever-present requirement, it is probably not the most complex problem to overcome. Airflow across an aircraft is dynamic and can be highly non-linear, and the aircraft itself, while ideally rigid, will have a degree of flexibility which can lead to issues such as structural oscillation, flutter, fatigue, or potentially catastrophic failure!

HEXAGON
Overcoming the challenges of transonic aeroelasticity
By Jonas Wirgart

Excerpt of article

The most famous and dramatic illustration of flutter is the Tacoma Narrows Bridge collapse in 1940 (see below). By imagining the bridge's road surface as an airplane control surface, it is easy to appreciate the potential severity of this phenomenon. (via GIPHY)

Aeroelasticity also causes static phenomena such as deformation of the control surface, meaning the effective angle is decreased. Elasticity is dependent on the stiffness of the aircraft structure and also its shape. Before the advent of computer simulation, aeroelasticity could only be tested in wind tunnels or in flight, which requires the structure to be built first.

Simulation allows engineers to predict deformation and flutter before an aircraft is built, enabling a structure to be fully optimised for aeroelasticity at the design stage. The challenge for design engineers is to ensure that flutter occurs only at speeds well above normal operating speeds.

What has proved more difficult, until recently, is the ability of simulation software to estimate aeroelasticity at speeds within the transonic region, where airflow becomes highly non-linear and subject to shockwaves. At these speeds, the flutter boundary becomes lower, matching flight speeds, a phenomenon termed the 'Transonic Dip'. However, traditional simulation methods, that have so far served engineers well, cannot accurately predict it.

Optimised transonic aeroelasticity solutions - Hexagon has developed solutions for virtually simulating these conditions to enable shorter turnaround and better accuracy for better aircraft with optimised designs. MSC Nastran, a multidisciplinary structural analysis application, simulation sequence for aerodynamical flutter (SOL 145) has been widely used throughout the industry for many years for flutter analysis and it is a trusted tool for aerospace design engineers. It is the go-to industry option to ensure aircraft structures have the necessary strength and stiffness to avoid failure. However, additional capabilities are needed for accurate estimations of aeroelastic behaviour at transonic speeds because MSC Nastran SOL 145 is based on a linear structure and linear aerodynamic model. Now Hexagon has a solution that enables precise simulation of non-linear fluid dynamics, such as shockwave movement and separation of flow…

Article continued on the website.

Thatcham, the IIHS, and other insurance groups around the world carry out low speed bumper impacts to assess the reparability of different cars. Arup have developed an FE model of the RCAR bumper, the main barrier used in these tests.
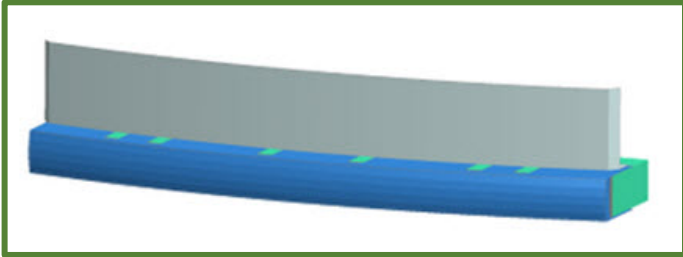
ARUP

Arup RCAR Barrier Model

Arup RCAR Bumper Barrier Model

The specification used for the develop of the RCAR bumper was taken from the "RCAR Bumper Barrier Dimensions and Specification – Appendix 1".

Thatcham, the IIHS, and other insurance groups around the world carry out low speed bumper impacts to assess the reparability of different cars. The main barrier used in these tests is the one developed by the Research Council for Automobile Repair (RCAR).

Validation - Two static crush tests have been used to calibrate the LS-DYNA RCAR model. The tests involve a rigid rectangular load plate impacting the bumper perpendicularly and with an angle.

The force-deflection curves generated from model`s analyses have been compared against the force-deflection corridors from the specification document.

This validation work has been carried out in both SMP and MPP versions of LS-DYNA R7.1.2 to ensure the correct performance and accuracy.
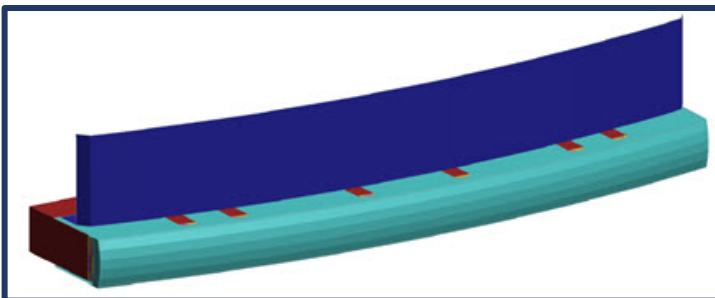
Among Arup models are:
        Arup Pedestrian Impactor Models
        Arup Cellbond Barrier Models

February 23, 2023. OZENCON, one-day conference will provide detailed insight into how leading companies are utilizing simulation to advance their product development.

OZEN Engineering
Register Now to reserve your spot!

Our conference is FREE to attend, register early to reserve your spot. Breakfast and Lunch will be provided. Complimentary parking is available - We will bring together ANSYS users, partners, developers, and industry experts for networking, learning, and sharing of new ideas. The Largest Annual Ansys Simulation Conference in Silicon Valley.

CONNECT	LEARN	DISCOVER
Network with peers, colleagues, and experts. You will have the opportunity to meet with leaders in engineering simulation.	Get real, practical, in-depth training and information from leading industry experts.Improve your skills, increase your knowledge and learn from the best.	Discover the latest innovations from the leaders in engineering simulation. Chat with experts about all upcoming news in the world of simulation.

VENUE:
  Computer History Museum
      1401 N. Shoreline Blvd.,   Mountain View, CA 94043
      (650) 810-1010   https://computerhistory.org

SPONSORS

The market for electric power generation equipment is growing more competitive every day, with customers demanding more reliable, eco-friendly products at lower cost. Marelli Motori meets these demands using Ansys Maxwell, Ansys Mechanical and Ansys CFD in multiphysics simulations to deliver the tailor-made solutions their customers have come to rely on. **Marelli Motori was one of the first companies to adopt Ansys Discovery Live when it was released early in 2018**
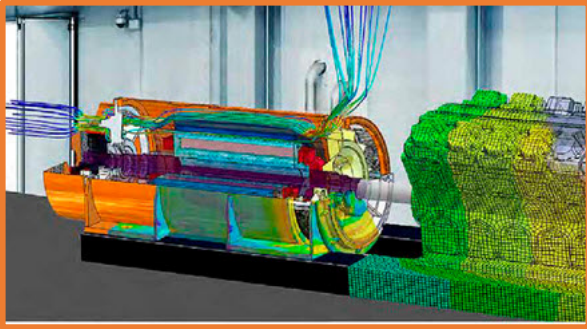
ENGINSOFT [Electrifying Solutions for Motors and Generators](#)

More recently, they have begun using Ansys Discovery Live to obtain instantaneous simulation results with every on-the-fly change to a product's geometry or operating conditions, greatly reducing design time. Electric motors and generators contain rotating magnetic coils through which electrons flow.

The resistance of electrons flowing through wires, together with the friction generated by rotating devices, causes heat to build up. Energy lost as heat is unavailable to do work, reducing the efficiency of the motors and generators. Excess heat can also cause structural problems as temperature builds up in structural components and induces stress. Heat can be dissipated with cooling airflow, but the physics of the airflow must be optimized for maximum effect. Because all these physical effects are happening simultaneously, a multiphysics simulation approach is needed. Marelli Motori engineers use Ansys multiphysics solutions to custom-design motors and generators to solve challenges in hydropower, cogeneration, oil and gas, civil and commercial marine transport, military applications, and ATEX applications involving motors and generators in explosive atmospheres, among other applications. (ATEX consists of two EU directives describing what equipment and work space is allowed in an environment with an explosive atmosphere.)

"When simulating a heat exchanger on a closed alternator, an experienced Ansys CFX user analyzed five different designs in eight hours; with Ansys Discovery Live, the same engineer reached an optimal design in two hours."

Excerpts from the website.
Mechanical, Flow And Electromechanical Multiphysics Solutions - Marelli Motori engineers use Ansys Mechanical to optimize the design of the frame, shields, cooling fan, motor shaft and generators…
Manufacturing Challenges - Even after the design has been optimized using mechanical, flow and electromechanical simulations, the challenge of building the motor or generator most efficiently and effectively remains….
Application Examples - Obviously, the importance of the various design parameters changes with each application. In marine applications, motors and alternators must be silent with very low vibrations to avoid ruining the experience of the ship's passengers. Structural finite element analysis and harmonic response calculations using Ansys Mechanical must be performed on the frame and other components to reduce sound and vibrations…."The engineers used Ansys Maxwell to identify hot spots in the coils and combined this analysis with an Ansys CFX calculation to improve the heat exchange."

Using Simulation For Ideation -. Discovery Live is the first simulation solution to enable engineers and designers to make changes to geometry and other properties while a simulation is running and instantaneously view the results of these changes…. **Read complete article on the website**

Use Multiphysics to simplify boundary conditions for a range of different simulation cases

Complex boundary conditions made intuitive - When dealing with complex systems it can be a challenge to create appropriate boundary conditions and loads.

DYNAmore Nordic

Case study [Sloshing analysis of a fuel tank](#)
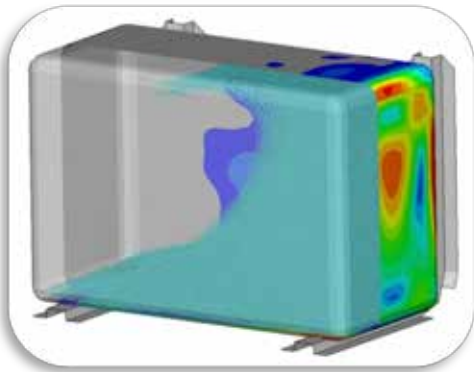
We demonstrate this here by looking at the calculation of stresses and deformations of a fuel tank containing sloshing fuel. Creating boundary conditions and pressure loads on the tank that accurately represents the sloshing fuel can easily become a project within itself. To further add to the complexity, a product often undergoes several different evaluations within the organization that all need specific boundary conditions and loads, making the array of simulation models required large and complex.

A more straightforward way to capture complex boundary conditions, such as fluid sloshing, is to use the wide range of multiphysics capabilities within LS-DYNA.

In the case presented here, you can learn how adding and solving more advanced physics can make the work more intuitive, reduce complexity, and save time within the organization.
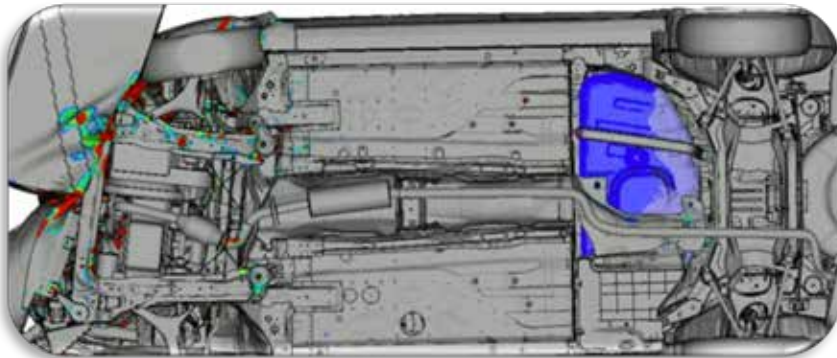
Product development enhancements - It is highly beneficial for product development to use simulations to minimize the need for expensive prototypes. In the simulation, it is easy to change things such as wall thickness, dimensions, and add reinforcements.

Traditionally, engineers need boundary conditions for the loading and evaluation of the component. In the fuel tank case, this could, for instance, be a maximum pressure obtained from testing a similar product. These loads gathered from testing might be reasonable to use when the design changes are small, but for a more substantial design change such as adding a baffle in the middle of the tank, the completely change in fluid and structure dynamics would make the loading based on the test data invalid.

A more intuitive way to solve the problem is to model the fluid-structure interaction and use a global parameter such as the acceleration of the whole vehicle, which is not much affected by changes in the tank design. The vehicle acceleration is therefore a much more suitable boundary condition. The inquiry of vehicle accelerations is also more intuitive, as these can be sampled from existing products by testing or numerical simulation. There is also a higher chance that this data already exists within the organization.

Videos can be viewed on the website case study

The following simulations were performed in LS-DYNA using a standard non-linear finite element model of the tank, coupled with a smoothed particle hydrodynamics (SPH) description of the fuel.

The fuel is discretized as SPH particles that are in full contact with the tank in a coupled fluid-structure interaction (FSI) model. The whole system is loaded using gravity and acceleration due to a sudden braking of the vehicle. One can see that the baffle clearly influences the dynamics of the fluid to a great extent and therefore also the pressure loading on the tank.
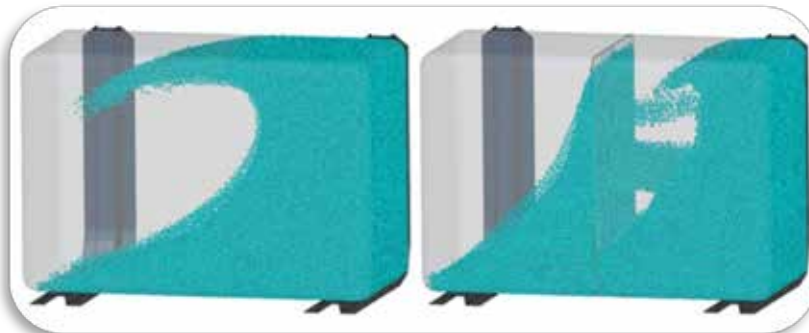
Looking at the stresses in the tank, one can see how much the change in dynamics affects the tank's structural integrity. The two design iterations were performed by only changing the tank's design, without having to come up with new boundary conditions. This facilitates rapid tests of new design ideas and continuous product improvements.

System development

Another great benefit to this method is that other departments can use the same model for system evaluations. The fuel tank could be included in a crash simulation to better understand its performance during such loads. It would also contribute to the overall system validity, as it provides a more accurate dynamic response. Below you can see a simulation where a pole hits the tank, testing the tank's integrity and the brackets that support it.
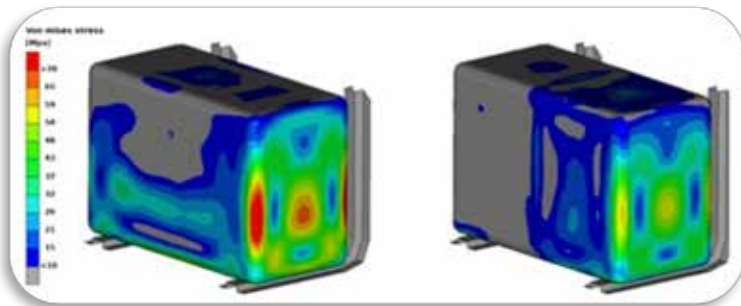
To learn more: Simulations have time and again proven to be a cost-effective product development tool that avoids costly tooling redesign. We have the software and knowledge required so that you may learn to perform these simulations yourself. We will guide you all the way, including training and support. To learn more, please contact one of our technical experts listed on this page.

The car used in this demonstration is a modified version of the publicly available Honda Accord model, provided by NHTSA

"**Did you know that Explore Designs in Peacock 3D/VR UPI can unravel more information while experiencing simulations and models in 3D space?**"

"**Additionally, d3VIEW has had a growth in development. As long as you have a Linux operating system and a computer with four cores, you're all set to use d3VIEW, regardless of the software you use for data. Accessing the software through the web is available on all operating systems and most web browsers. Don't miss the latest blog on Calendar View by Gunashree M N.**"

Videos are available on the web page with complete details and information for your demo.
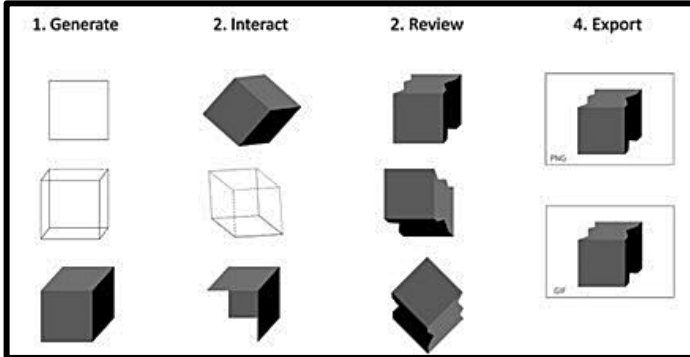
d3VIEW -A 3D/VR Simulated Viewer

Examine developments and results in a superior way by using more than just conventional 2D exploration and incorporating Peacock, d3VIEW's 3D/VR application.

Compact 3D In-Browser Viewer with Animation controls
- Review movies, animations or GIFs in 3D
- Overlay GIFs for an enhanced visualization experience
- Interactive interface allows for in-depth analysis of the simulation model at any given time of the simulated event
- Customize colors with wireframe options

Create & Integrate
- Extract 3D files from simulations or 3D responses from images, points, or curves, and convert any data into 3D to visualize in Peacock.
- Viewer seamlessly integrates with other applications on the d3VIEW platform.
- Compare 3D plots of simulations in d3VIEW's Simlytiks visualization application.
- Synchronize multiple 3D plots in Simlytiks for an enhanced visualization experience.

Excerpt of our Other Supportive Features with video on the website
- Fast loaders with the ability to pause and interact while loading and progressive loading for large models via groups by user-defined parts list
- Examine standard deviation for load-case and material specimen contouring.
- Study fringe nodal and time-histories from LS-DYNA such as plastic-strain, von-mises-stress and triaxiality.
- Displays element deletion for simulating failed parts such a material puncture.
- Visualize and upload assemblies from LS-Prepost/Primer/Meta-Post
- Review Bill-of-Materials, turning individual parts on or off for interactive viewing

Select areas of the model and filter them in or out.

The Old Racers Automotive News & Track

February

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

There is no need for plug-in charging for the E-Ray's battery system. The battery is charged via regenerative energy from coasting and braking, as well as during normal driving.

EXCERPTS - Chevrolet Gives the World an Electrified AWD Corvette

First-ever eAWD Corvette E-Ray uses an advanced electrified propulsion system in addition to its 6.2L LT2 Small Block V-8 enabling all-season performance and composure — and 0-60 mph in 2.5 seconds[1]

Exactly 70 years after the Corvette debuted at Motorama in New York City, Chevrolet has returned to introduce the first-ever electrified Corvette with all-wheel-drive and a powerful 6.2L LT2 Small Block V-8, the 2024 E-Ray.

"In 1953, the enthusiastic reaction to the Chevrolet Corvette concept kicked off seven decades of passion, performance and American ingenuity," said Mark Reuss, General Motors president. "E-Ray, as the first electrified, all-wheel-drive Corvette, takes it a step further and expands the promise of what Corvette can deliver."

…**E-Ray is also the only sports car pairing two separate propulsion systems to provide naturally aspirated V-8 power with electrified responsiveness powered by eAWD, making it one like none.**

…The E-Ray is the quickest production Corvette in history, clocking a 2.5-second 0-60 mph time[1] before breezing through the quarter-mile in 10.5 seconds[1].

"Corvettes must provide an exhilarating driving experience on backroads and tracks, and E-Ray nails it," said Tadge Juechter, executive chief engineer, Corvette. "The electrification technology enhances the feeling of control in all conditions, adding an unexpected degree of composure."

A near immediate feeling of thrust from low-end torque is core to the Corvette driving experience, and the E-Ray packs plenty of it. Power comes from the 6.2L LT2 Small Block V-8, putting 495 horsepower and 470 lb-ft of torque to the rear axle. It is complemented by an electric motor that channels an additional 160 horsepower and 125 lb-ft of torque through the front wheels via a 1.9 kWh battery pack, which is located between the seats. In total, E-Ray produces a combined 655 horsepower from both the electric motor and Small Block V-8.

The Old Racers Automotive News & Track

February

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

Hyundai Announces 2023 U.S. Racing Program Highlighted by IMSA Michelin Pilot Challenge Return

- Hyundai Returns to IMSA Michelin Pilot Challenge Vying for Fourth-Consecutive Manufacturers' Title
- Hyundai to Enter Five Elantra N TCR Cars in IMSA with Bryan Herta Autosport and Deily Motorsports

ARTICLE EXCERPTS

- Robert Wickens, Michael Lewis, Mark Wilkins, Taylor Hagler, Harry Gottsacker and Mason Filippi Return to Hyundai Team
- Driver Lineup Includes Four Hyundai Champions
- Hyundai to Field Two Entries in TC America Series Powered by Skip Barber Racing School Championship with Ricca Autosport

FOUNTAIN VALLEY, Calif., Jan. 12, 2023 – **Hyundai Motor North America is set to field five Hyundai Elantra N TCR entries in the 2023 IMSA Michelin Pilot Challenge (IMPC) season in pursuit of a fourth-consecutive manufacturers championship title.** Hyundai will be represented by reigning IMPC champions Bryan Herta Autosport (BHA) and Deily Motorsports. Hyundai will also compete in the TC America Series Powered by Skip Barber Racing School championship in the SRO Motorsports America series.

The Lineup

- Reigning IMPC champions Taylor Hagler and Michael Lewis will return in the #1 Elantra N TCR
- The No. 33 Hyundai Elantra N TCR entry will be driven by BHA drivers Robert Wickens and Harry Gottsacker—a new pairing for the 2023 season
- Mason Filippi and Mark Wilkins will pilot the No. 98 Hyundai Elantra N TCR
- Deily Motorsports will field Jacob Deily and Tyler Maxson in the No. 70 Hyundai Elantra N TCR
- Cabot Bigham and Matt Jaskol will drive the No. 76 Hyundai Elantra N TCR
- Ricca Autosport will field two Hyundai entries in TC America—Jeff Ricca in the No. 78 LIQUI MOLY GenRacer Hyundai Elantra N TC and Sally McNulty driving the No. 780 Borla Exhaust LIQUI MOLY Hyundai Veloster N TC
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Thanks to D.Doğukan Göle for mentioning the Aksungur on social media

The TAI Aksungur is an unmanned aerial vehicle (UAV)

AKSUNGUR WILL BE A BREATH FOR FIRE FIGHTING

AKSUNGUR STARTED ITS FIRST FIELD MISSION

Developed by Turkish Aerospace, AKSUNGUR Unmanned Aerial Vehicle (UAV) System started its first duty. Taking off from Turkish Aerospace Facilities in ANKARA.

AKSUNGUR will be located ADANA Şakirpaşa Airport. It will be operated by General Directorate of Forestry for fire-fighting purposes.

·   AKSUNGUR UAV which developed by national and domestic capabilities, and broke flight hours record.
·   AKSUNGUR started to serve for General Directorate of Forestry for fire control and fighting purposes.
·   AKSUNGUR which has developed in an 18 months has the capacity to perform uninterrupted multi-role intelligence, surveillance, reconnaissance and attack missions with its high payload capacity, provides Beyond Line of Sight (BLOS) operation flexibility with SATCOM payload.

About Turkish Aerospace - Turkish Aerospace is the center of technology in design, development, manufacturing, integration of aerospace systems, modernization and after sales support in Turkey. Located in Ankara, Turkish Aerospace production plant covers an area of 5 million square meters with an industrial facility of 150,000 square meters under its roof. The company has a modern aircraft facility furnished with high technology machinery and equipment that provide extensive manufacturing capabilities ranging from parts manufacturing to aircraft assembly, flight tests and delivery.

About AKSUNGUR UAV - AKSUNGUR is a Medium Altitude Long Endurance (MALE) class UAV System, capable to perform day and night Intelligence, Surveillance and Reconnaissance (ISR) and strike missions with EO/IR, SAR and SIGINT payloads, and a variety of air to ground weapons. AKSUNGUR is powered by two PD-170 twin-turbocharged diesel engines enabling long endurance operations up to 40,000ft.

The quiz was left in the suggestion box by The Old Retired Pilot.
   No one in town knows his name. You yell, "HEY, Old Pilot."

   The Old Pilot and the Town Secretary were arguing. (Yes, still arguing after 3 years!)
   The Old Pilot yelled, "Why are you on the ground wearing camouflage covered in branches?"
   The Secretary answered, "I'm a sniper."
   The Old Pilot yelled, "You're using a camera?"
   The Secretary answered, "Of course I'm using a camera. I can't take pictures with a rifle!"

Quiz – Among Sniper Rifles can you guess below? Answers on the GoodBye Page

430th EECS begins operations with new E-11A BACN

Staff Sgt. Shannon Bowman - 378th Air Expeditionary Wing

PRINCE SULTAN AIR BASE, Saudi Arabia (AFNS)

For the 430th Expeditionary Electronic Communications Squadron, delivering communication coverage to the American warfighter, the nation's allies and coalition partners is a primary objective. **The 430th EECS is the only unit in the U.S. Air Force that operates the E-11A aircraft with the Battlefield Airborne Communication Node payload.** As such, the 430th EECS strives to provide consistent and effective communication channels for air, ground and maritime forces in the U.S. Central Command area of responsibility.

"The 430th supports warfighters who conduct around the clock operations in the CENTCOM AOR," said Lt. Col. Todd Arthur, the 430th EECS commander. "We supply communication coverage to ground and air forces in active combat zones, who require consistent, clear communications to higher levels of leadership and other command and control assets." To help keep the 430th's fleet airborne projecting constant combat communications support, the Air Force and Air Combat Command procured a brand-new E-11A, which arrived at Prince Sultan Air Base Dec. 16.

"This new E-11A will relieve the pressure on the rest of our fleet and enable us to sustain a high mission capable rate," Arthur said. "Having an additional aircraft will give our maintenance team another option to reliably put combat airpower into the skies." Essentially functioning as a low earth satellite, or "Wi-Fi in the sky," the E-11A is used to provide extended aerial command and control capabilities to air assets and troops on the ground. **The E-11A is the only aircraft of its kind in the Air Force, and all the pilots with the 430th EECS are all volunteers from other airframes.**

"Just like America is a melting pot of other nationalities, the 430th is truly a melting pot of the Air Force," Arthur said. "We have fighter pilots, bomber pilots, transport pilots, tanker pilots, special operations pilots, trainer pilots, test pilots, a program manager and three enlisted career fields."

Since the BACN mission's inception in 2008, the 430th has consistently delivered thousands of annual flight hours and proven to be an essential component to modern war fighting.   With the high mission success rates, the E-11A has demonstrated in the Middle East, and the strategic capability advantages the aircraft brings to the joint force, the Air Force has announced plans to bring a new E-11A BACN squadron to Robins Air Force Base, Georgia.

"The Air Force and U.S. Congress have recognized what the E-11A platform brings to the fight," Arthur said. "As a result, we are standing up a new squadron of E-11s at Robins AFB in February of 2023."   As the only E-11A BACN squadron, the 430th EECS will play a key role in helping the Air Force establish a more traditional model with one home station squadron and a deployed squadron. According to Arthur, the 430th EECS is a unique team with a unique mission set, and he noted that it has been a truly rewarding experience to lead this squadron.   "Having the privilege and honor of commanding some of the best pilots America has to offer is the opportunity of a lifetime and one that will never be forgotten," Arthur said.

US Airforce Week in Pictures

Aerial maneuvers - Capt. Samuel Larson, F-22 Raptor

Demonstration Team commander and pilot, performs an aerial maneuver during a practice flight at Joint Base Langley-Eustis, Va., Jan. 6, 2023. This demonstration was a part of a practice flight, in addition to being a flyover performance celebrating the 71st Fighter Generation Squadron assumption of command.

(U.S. Air Force photo by Airman 1st Class Mikaela Smith)

Flight of the Flock - Two MC-130J Commando II aircraft assigned to the 1st Special Operations Squadron fly in formation during the Flight of the Flock training event at Kadena Air Base, Japan, Jan. 5, 2023. The previous day, the Airmen participated in a physical fitness competition. The event is an opportunity to flex combat capabilities while strengthening teamwork through friendly competition.

(U.S. Air Force photo by Airman 1st Class Alexis Redin)

Securing the perimeter - Senior Airman Brandon Heyman, 332nd Expeditionary Security Forces Squadron security forces specialist, maintains a defensive perimeter around an F-15E Strike Eagle at an undisclosed location within the U.S. Central Command area of responsibility, Dec. 29, 2022. An HC-130J Combat King II crew and expeditionary maintenance Airmen recovered two F-15Es after weather forced pilots to divert to an alternate airfield within the CENTCOM AOR.

(U.S. Air Force photo by Staff Sgt. Gerald R. Willis)

Marco Evangelos Biancolini
RBF Morph CTO & Founder - Associate Professor of Machine Design

Rahul Sathish Vellaparambil, ESR 08 of the MeDiTATe project, published the paper titled Potential of auxetic designs in endovascular aortic repair: A computational study of their mechanical performance in the Journal of the Mechanical Behavior of Biomedical Materials

Rahul Sathish Vellaparambil - The work was developed in collaboration with Woo-Suck Han and Stéphane Avril from Mines Saint-Étienne and Pierluigi Di Giovanni from the R&D department of HSL

[**Potential of auxetic designs in endovascular aortic repair**](#)

Abstract - With the rising popularity of endovascular aortic repair (EVAR) for aortic aneurysms and dissections, there is a crucial need for investigating the delayed appearance of post-EVAR complications such as stent-graft kinking, fracture and migration respectively. These complications have been noted to be influenced by the radial stiffness and bending flexibility attributes of stent-grafts. Auxetic designs with negative Poisson's ratio offer interesting advantages such as enhanced fracture toughness, superior indentation resistance and adaptive stiffness in response to intricate morphology for stenting applications over conventional stent designs. The objective of this study is to propose different auxetic stent candidates and to compare their mechanical performance with two conventional stent candidates for endovascular applications using numerical simulation through crimp/crushing tests for their radial stiffness and three-point bending/kinking tests for their flexibility, respectively. The results demonstrate that the novel hybrid auxetic designs (CRE and CSTAR) possess the best trade-off between radial stiffness and bending flexibility characteristics among all candidates for stent-graft applications.

Excerpt Introduction - Cardiovascular diseases have the ignominy of being a leading factor in hospitalization and deaths globally, inflicting a heavy economic distress in the industrialized world. Aortic diseases (Aneurysms and Dissections) that arise from the deterioration of aortic tissues, cause severe medical conditions. Aneurysms are the morbid expansion of aortic vessel (aorta and other arteries) developed from irreversible remodelling of the vessel wall and are more prevalent in the thoracic and abdominal aorta (Gasser et al., 2022)....
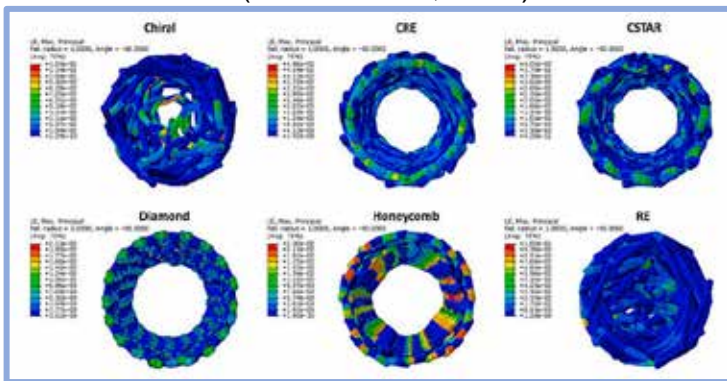
Article Excerpt = Fig 6. Applied Pressure recorded for stents to obtain a reduction in original diameter

$$of\ \varepsilon_A = 0.19\ (18\ Fr)$$

for all candidates

> **"You can't drop what doesn't exist,"** says Ross Kenyon, Associate Director and leader of the Modeling, Simulation, and Analysis team at Regeneron Pharmaceuticals. But you can simulate it.
>
> Regeneron is a leading biotechnology company that invents, develops, and commercializes life-transforming medicines for people with serious diseases. Kenyon — who is a mechanical engineer by training with over 15 years of experience combining computational and experimental work — says Regeneron has made great strides in simulation by growing from small successes. One of those successes is in drop testing of wearable electro-mechanical drug delivery devices.
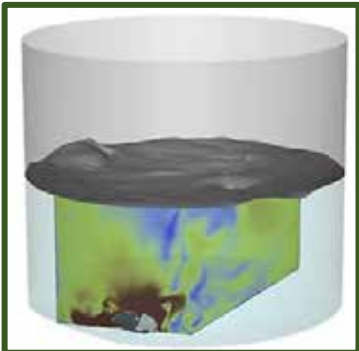
Regeneron uses Ansys for fluid analyses in mixing and is developing a formal validation of its mixing simulation process.

Regeneron is using Ansys Mechanical to analyze the interaction of a plunger inside a glass cartridge by modeling the plunger properties, employing friction models, and assessing plunger rod deformation to predict leakage margins.

How Regeneron Pharmaceuticals Transforms Products & Processes with Simulation
Author Christophe Bianchi, Chief Technologist, Ansys

"If we went the traditional route of developing a device, dropping it, figuring out what went wrong, and fixing it, then we would already be making design and manufacturing decisions," he says. "You're constrained. You've already made prototypes and molds; the arrangement of internal components has been fixed. If something fundamentally needs to be changed, there are severe limitations on what can be done. Doing virtual drop testing early in the process is so much easier than creating and redesigning physical prototypes."

Simulation-led Design Supports Ideation - Ansys Mechanical plays a big role in Regeneron's device development efforts.
"Even as we establish feasibility, Ansys simulation is guiding that effort," Kenyon says. "Simulation is intimately tied to ideation."

For example, Regeneron is using Mechanical to analyze the interaction of a plunger inside a glass cartridge, both of which are components in a drug delivery device design. With simulation, the company can model the plunger properties, study friction models, and assess plunger rod deformation to predict leakage margins. The company also employs simulation for thermal analysis to evaluate device robustness to various temperature ranges and predict how the device's container closure will behave. Those results are fed into systems models to establish boundary conditions that are applied to the Mechanical simulation.

While every device is different, Kenyon says using simulation upfront to develop new devices, rather than just to verify a physical prototype, has enabled Regeneron to drastically reduce the time and expense involved in product development.

"When you design a complex device, you go through different phases of engineering and design," he says. "Instead of having to do three or four of those iterations, with simulation, we can do it in one or two. Because we have simulation, we can get into things that we fundamentally couldn't do before, so we've reduced the number of iterations, but we've also developed products that have more capabilities."

A Mixture of Trust, But Verify - Regeneron is also using Ansys computational fluid dynamics (CFD) software for fluid analyses in mixing. As you can imagine, there are many mixing applications involved in the development of medicine. Mixing is conducted throughout the manufacturing process and with the final product that is shipped out in frozen containers that are thawed, pooled together, and mixed.

"Traditionally the way we approach process design and process validation is to run an array of tests to verify that mixing is generating a homogenous mixture and not damaging any of the raw materials used in the process," Kenyon says. "We started to introduce simulation by answering little questions that came up here and there that weren't covered in a test matrix."

Kenyon says he built trust in simulation by being able to answer those questions. Regeneron is now at the point of developing a formal validation of its mixing simulation process. "I wouldn't say we're at the point of eliminating physical testing," he says, "but certainly we're able to reduce the amount of physical testing and realize time and money savings with simulation."
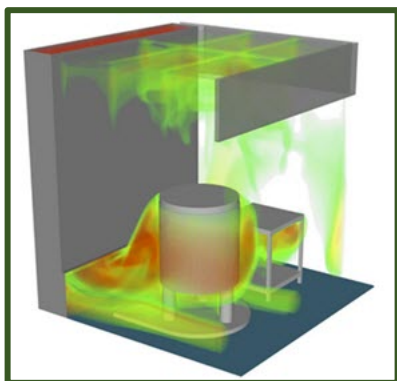
(Left - Regeneron uses Ansys simulation to perform smoke studies of entire facilities that have to be certified as sterile environments.)

Regeneron's use of simulation continues to grow. The company now simulates challenges large and small, including in silico smoke studies of entire facilities that must be certified as sterile environments. Understanding airflow in such facilities is one of the requirements for certification. Traditionally, this meant building the facility, installing the airflow equipment, and doing a physical smoke study.

"If you have an issue with a physical smoke study, there are only so many levers you can pull," Kenyon says. "We haven't implemented this yet, but we've demonstrated what can be done with CFD to assess a smoke study before a facility gets built."

Communication is Key to Digital Transformation - From small successes to airflow studies of entire facilities, simulation has become a key component in Regeneron's digital transformation roadmap.

Founded and led for nearly 35 years by physician-scientists, Regeneron's unique ability to repeatedly and consistently translate science into medicine has led to numerous FDA-approved treatments and product candidates in development, almost all of which were homegrown in Regeneron's laboratories. The company is investing in the IT infrastructure it needs for the future, including cloud computing, which runs in tandem with efforts to digitize process and manufacturing data.

"Right now, simulations inform the development process, but we see the possibility for them to take more of a front seat in our validation activities," Kenyon says. "Leadership support is key to this kind of thing. We are lucky to have strong champions in the business."

Kenyon emphasizes the importance of communication and collaboration in the digital transformation journey.

"There are a lot of different groups involved in the manufacturing process. You need to have a well-defined communications plan," he says. "You have to be willing and able to educate people who aren't familiar with simulation technology." The key is making a business connection to the simulation application. We need to learn the business process from them, and they need to learn the simulation process from us," he says. "We have to bridge that gap."
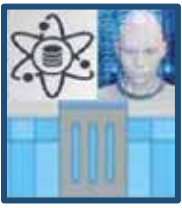
Eduardo V.S. Ramirez, freelance marketing (Part 1 of Data Science)

> **Data science uses specific methods to extract or hypothesize information from:**
> - structured data   (highly specific and is stored in a predefined format)
> - unstructured data (collection of many varied types of data that are stored in their native formats).

Are you a Data Scientist, a Data Engineer or which do you want to be in your future?
- A data scientist cleans and analyzes data, answers questions, and provides metrics to solve business problems.
- A data engineer, develops, tests, and maintains data pipelines and architectures, which the data scientist uses for analysis. The data engineer does the legwork to help the data scientist provide accurate metrics.

We all know the meaning of data. At times it is orderly, and at times there is so much, in such disarray, we need a way to turn it into useful information.

We need to have a way to interpret the various types of data information. Thereafter, we need a way to turn this new information into knowledge and insights. The methods currently used in this constantly evolving field are:
- statistics, scientific computing, scientific methods, processes,
- algorithms and systems
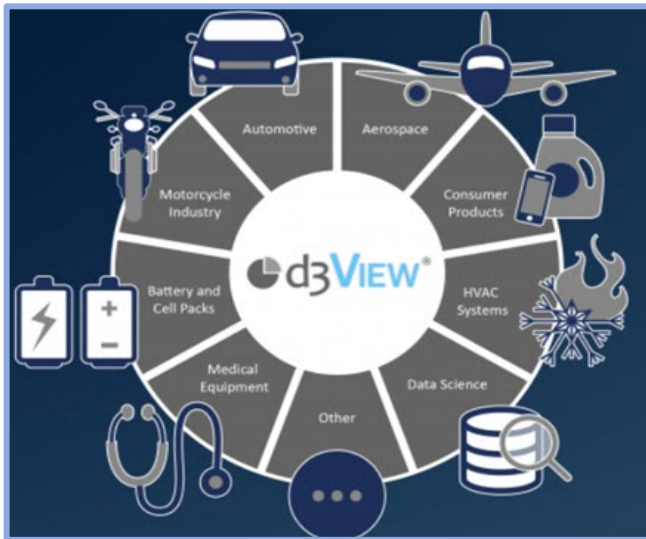
These can be accomplished using D3View - extracting, manipulating, pre-processing and generating predictions out of data.
- Analyzes and handles large amounts of unstructured and structured data.
- A comprehensive Data-to-DecisionTM Platform to Enhance and Accelerate Your Design whether you use on-premise or cloud,
- Helps you to interpret your data to empower your design process.

Engineering Data Science is a broad field that encompasses predictive modeling and data-driven design of engineering systems. Applications range from health sciences and environmental sciences, to materials science, manufacturing, autonomous cars, image processing, and cybersecurity.

One of the main advantages that D3View will give you is the ability to realize insights and interpret the knowledge from your data. You can study sales, medical, manufacturing – your industry related data needs.
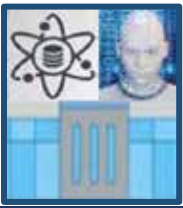
Data Extraction Templates and Data Integrations

- The use of the Data Extraction Templates will turn data into information and help automate the process of extracting information from a raw simulation or experimental files. It is designed to extract from multiple parallel simulations, that can scale to thousands of simulations at the same time.
- Data integrations in its simplest form encompasses groups of responses and transformations applied to simulations or physical tests to extract data for enhanced data mining and saved for reuse later.

Define: Your Extractions by choosing from over 30 master extractions or upload a pre-existing one. Additionally, you can build your own using responses from your processed simulations or uploaded physical tests.

Apply: You can apply your extractions by using the data extraction tools. These tools make it simple to apply templates to your simulations and physical tests.

Set: The conditions for your templates which automate the process even further making data transformation process faster.

You can even apply templates before downloading physical tests to shorten the process even more.

Manage: You can manage your Extractions by utilizing the simple template configuration tools to customize and develop your templates even further. Manage aspects such as sensors, definitions and extraction orders to keep templates catered to your extraction needs.

Whatever kind of data you have, for whatever kind of industry, d3VIEW will turn your data into clear, concise information.

Among the industries using D3View are:
Automotive, Aerospace, Motorcycle Industry, Consumer Products,
Battery and Cell Packs, HVAC Systems, Medical Devices.

Request a Demo to start enhancing and accelerating your design, on-premise or cloud, by interpreting your data and empowering your design process.
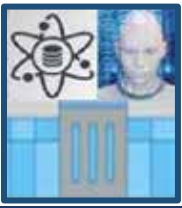
Eduardo V.S. Ramirez, freelance marketing

> **Reading, Writing & Arithmetic – do we now add AI? Who is actually writing what you read?**
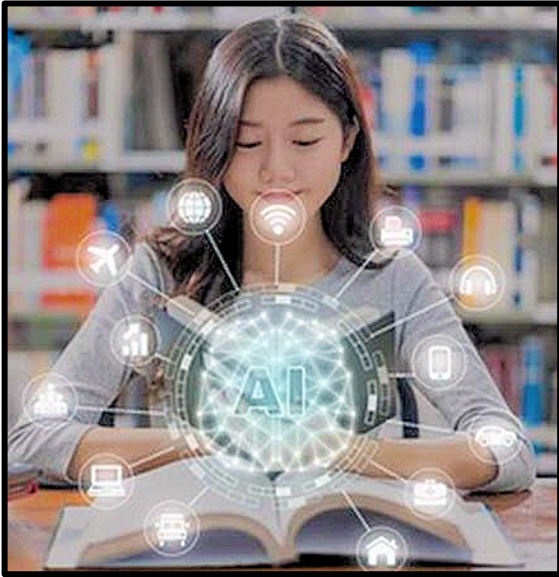
Excerpts from the article:
AI can now write like a human. **Some teachers are worried**.
Mike Bebernes·Senior Editor – Yahoo News

What's happening - Artificial intelligence has advanced at an extraordinary pace over the past few years. Today, these incredibly complex algorithms are capable of creating award-winning art, penning scripts that can be turned into real films and — in the latest step that has dazzled people in the tech and media industries — mimic writing at a level so convincing that it's impossible to tell whether the words were put together by a human or a machine.

A few weeks ago, the research company OpenAI released ChatGPT, a language model that can construct remarkably well-structured arguments based on simple prompts provided by a user.

The system — which uses a massive repository of online text to predict what words should come next — is able to create new stories in the style of famous writers, write news articles about itself and produce essays that could easily receive a passing grade in most English classes.

That last use has raised concern among academics, who worry about the implications of an easily accessible platform that, in a matter of seconds, can put together prose on par with — if not better than — the writing of a typical student.

Cheating in school is not new, but ChatGPT and other language models are categorically different from the hacks students have used to cut corners in the past. The writing these language models produce is completely original, meaning that it can't be detected by even the most sophisticated plagiarism software. The AI also goes beyond just providing students with information they should be finding themselves. It organizes that information into a complete narrative.

Why there's debate - Some educators see ChatGPT as a sign that AI will soon lead to the demise of the academic essay, a crucial tool used in schools at every level. They argue that it will simply be impossible to root out cheating, since there will be no tools to determine whether writing is authentic or machine-made. But beyond potential academic integrity issues, some teachers worry that the true value of learning to write — like analysis, critical thinking, creativity and the ability to structure an argument — will be lost when AI can do all those complex things in a matter of seconds.

Others say these concerns are overblown. They make the case that, as impressive as AI writing is, its prose is too rigid and formulaic to pass as original work from most students — especially those in lower grades. ChatGPT also has no ability to tell truth from fiction and often fabricates information to fill in blanks in its writing, which could make it easy to spot during grading.

Some even celebrate advances in AI, viewing them as an opportunity to improve the way we teach children to write and make language more accessible. They believe AI text generators could be a major tool to help students who struggle with writing, either due to disabilities or because English isn't their first language, to be judged on the same terms as their peers. Others say AI will force schools to think more creatively about how they teach writing and may inspire them to abandon a curriculum that emphasizes structure over process and creativity.

What's next - When asked whether AI will kill the academic essay, ChatGPT expressed no concern. It wrote: "While AI technology has made great strides in natural language processing and can assist with tasks such as proofreading and grammar checking, it is not currently capable of fully replicating the critical thinking and analysis that is a key part of academic writing."

With the technology just emerging, it may be several years before it becomes clear whether that contention will prove correct.

Perspectives

AI could kill the academic essay for good - "The majority of students do not see writing as a worthwhile skill to cultivate. … They have no interest in exploring nuance in tone and rhythm. Which is why I wonder if this may be the end of using writing as a benchmark for aptitude and intelligence." Daniel Herman, Atlantic

AI can't replace the most important parts of writing education - "Contrary to popular belief, we writing teachers believe more in the process of writing than the product. If we have done our jobs well and students have learned, reading that final draft during this time of year is often a formality. The process tells us the product will be amazing." — Matthew Boedy, Atlanta Journal-Constitution

AI will create a cheating crisis - "An unexpected insidious academic threat is on the scene: a revolution in artificial intelligence has created powerful new automatic writing tools. These are machines optimised for cheating on school and university papers, a potential siren song for students that is difficult, if not outright impossible, to catch." — Rob Reich, Guardian

Any competent teacher can easily spot AI-generated writing - "Many students would be hard-pressed to read with comprehension AI-generated essays, let alone pass them off as their own work." — Robert Pondiscio, American Enterprise Institute

AI can make writing more accessible to everyone - "I think there's a lot of potential for helping people express themselves in ways that they hadn't necessarily thought about. This could be particularly useful for students who speak English as a second language, or for students who aren't used to the academic writing style." — Leah Henrickson, digital media researcher, to Business Insider
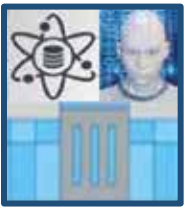
Something incredibly important is lost when people don't learn to write the hard way - "We lose the journey of learning. We might know more things but we never learned how we got there. We've said forever that the process is the best part and we know that. The satisfaction is the best part. That might be the thing that's nixed from all of this. … I don't know what a person is like if they've never had to struggle through learning. I don't know the behavioral implications of that." — Peter Laffin, writing instructor, to Vice.

AI can enhance creativity by helping students sort through the routine parts of writing - "Keep in mind, language models are just math and massive processing power, without any real cognition or meaning behind their text generation. Human creativity is far more powerful, and who knows what can be unlocked if such creativity is augmented with AI?" — Marc Watkins, Inside Higher Ed

Educators may not be able to rely on essays to evaluate students much longer - "AI is here to stay whether we like it or not. Provide unscrupulous students the ability to use these shortcuts without much capacity for the educator to detect them, combined with other crutches like outright plagiarism, and companies that sell papers, homework, and test answers, and it's a recipe for—well, not disaster, but the further degradation of a type of assignment that has been around for centuries." — Aki Peritz, Slate

AI won't kill anything we'll miss - By privileging surface-level correctness and allowing that to stand in for writing proficiency, we've denied a generation (or two) of students the chance to develop their writing and critical thinking skills. … Now we have GPT3, which, in seconds, can generate surface-level correct prose on just about any prompt. That this seems like it could substitute for what students produce in school is mainly a comment on what we value when we assign and assess writing in school contexts." — John Warner, author of Why They Can't Write

Educators shouldn't overreact, but they need to have a plan - "Whenever there's a new technology, there's a panic around it. It's the responsibility of academics to have a healthy amount of distrust — but I don't feel like this is an insurmountable challenge." — Sandra Wachter, technology researcher, to Nature
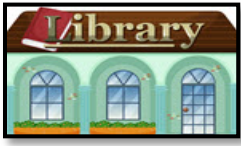
Thanks to MDPI for open source

The proposed model was based on the application of the calibrated LS-DYNA material model MAT162 extracted from the preceding phase of the NASA ACC HEDI proje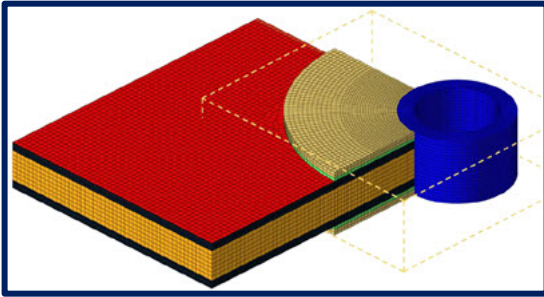ct A shell-cohesive modeling approach can be considered to be a new and substantial step in simulating composites by means of LS-DYNA application, different with respect to the usual solid-cohesive procedure

A Structured Methodology to Simulate Composite Advanced Joint Behavior for Ultra-Light Platforms Applications

Alessandro Polla
   Dept. of Mechanical & Aerospace Engineering (DIMEAS), Politecnico di Torino, Torino, Italy
   Sir Lawrence Wackett Defence & Aerospace Centre, Aerospace Engineering and Aviation,
   School of Engineering, RMIT University, Melbourne, Australia
Giacomo Frulla, Enrico Cestino
   Dept. of Mechanical & Aerospace Engineering (DIMEAS), Politecnico di Torino, Torino, Italy
Raj Das, Pier Marzocca
   Sir Lawrence Wackett Defence and Aerospace Centre, Aerospace Engineering and Aviation,
   School of Engineering, RMIT University, Melbourne 3001, Australia

Featured Application

The presented methodology bridges the gap between the numerical evaluation of the specific parameters to fulfil the right physical response of the simulated tests. This provides a more rational approach to the failure simulation of composites, reducing the need for a trial-and-error procedure based on several extensive test campaigns.

Abstract: Numerical simulations have the potential to be used for designing damage-tolerance composite structures. However, numerical models are currently computationally intensive, and their post-failure evolution and fracture morphology predictions are still limited. In the present work, a numerical methodology to simulate advanced composite joints is presented. The results of a numerical campaign aimed to evaluate the progressive damage and failure analysis (PDFA) of an advanced pin-hole connection under tensile and compressive load are evaluated. A high-fidelity stacked shell-cohesive methodology is employed to simulate the ultimate load, fracture initiation, and propagation of the proposed composite joint. Post-failure erosion methodology is proposed to control the initiation and evolution of composite fractures. The location and extension of the numerically predicted damages are compared with experimental observations. The proposed methodology demonstrates its preliminary ability to be used for designing composite joints up to failure. Specific outcomes are also pointed out.

This study investigates the lateral impact responses of reinforced concrete (RC) and composite columns through dynamic nonlinear analysis using LS-DYNA. The simulation results were first validated against experimental results performed earlier on four different cross sections. **The finite element analysis results show that the simulation results of LS-DYNA can predict the experimental results well and can be used for further parametric analysis.**
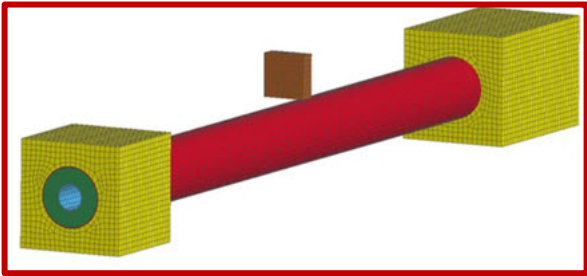
Analytical Study on Reinforced Concrete Columns and Composite Columns under Lateral Impact

Xianhui Li, Yao Yin, Tieying, Rui Wang
   College of Civil Engineering, Taiyuan Univ. of Technology, Taiyuan, China
Xianhui Li
   College of Architectural Engineering, Shanxi Vocational Univ.of Engineering Sci. & Tech., Jinzhong, China
Xiang Zhu
   School of Electric Power, Civil Engineering &Architecture, Shanxi Univ., Taiyuan, China

Abstract - This study investigates the lateral impact responses of reinforced concrete (RC) and composite columns through dynamic nonlinear analysis using LS-DYNA. The simulation results were first validated against experimental results performed earlier on four different cross sections. The finite element analysis results show that the simulation results of LS-DYNA can predict the experimental results well and can be used for further parametric analysis. The overall impact resistance of the four new composite columns is significantly better than that of RC columns. Among the composite columns, the solid concrete-filled double steel tube (S-DS) column has the best impact resistance with higher impact plateau force and smaller mid-span deflection under the same test conditions. It was found that the impact response process of all types of composite columns was similar. Finally, parametric analysis of the composite columns is performed to study the influence of load, material and other related parameters on the impact response of the composite columns. The results provide new information on the impact response of composite columns and the influence of materials and load parameters. The study provides a basis for the design and analysis of composite columns under lateral impact loading.

Excerpt Introduction - The collision load effect on structural components has to be considered in structural design and sometimes considered in whole life cycle analysis. Relevant reports on collision accidents are increasing year by year [1,2,3,4,5]. It is well-known that the compressive strength of concrete is much higher than its tensile strength. Furthermore, the compressive strength is enhanced under bi-axial or tri-axial restraint. For structural steel, the tensile strength is high while the shape may buckle locally in compression. In concrete-filled steel tubular members, steel and concrete are used such that their natural and most prominent characteristics are taken advantage of. The confinement of concrete is provided by the steel tube, and the local buckling of the steel tube is improved due to the support of the concrete core.

The Old Cattle Rancher's Ranch   **February**
No one knows his name.
You yell, "HEY, old rancher."

Agriculture, Soil, Equipment, Cattle,
and whatever he wants.

We Love Baseball –More Batters Up!

I thought for this month it would be interesting to study Maple and Ash Wood Material Properties for Bat/Ball Impact Modeling in LS-DYNA. Last month we looked at **An Investigation into the Relationship between Wood Bat Durability and Bat Taper Geometry using LS-DYNA®.**

Figure 1: Grain faces of an ash bat.
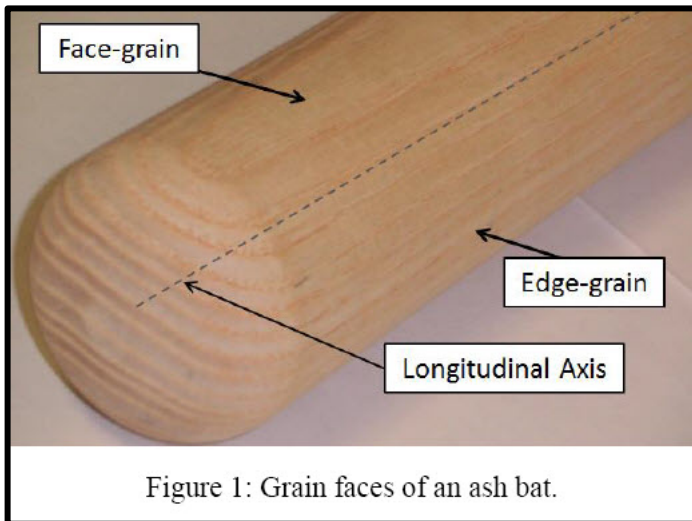
A Complementary Experimental and Modeling Approach for the Characterization of Maple and Ash Wood Material Properties for Bat/Ball Impact Modeling in LS-DYNA

To assist in developing LS-DYNA finite element models of wood baseball bats that can be used to explore the relationship between bat profile and bat durability, an experimental program was conducted to characterize the mechanical behavior of maple and ash woods for the range of densities used to make major-league quality baseball bats.

The test program included four-point bend testing to determine the elastic moduli and breaking strength and Charpy impact testing to determine strain to failure as a function of strain rate. The MAT_WOOD material was used to describe the mechanical behavior of the wood, and the input parameters were calibrated by comparing the results of LS-DYNA finite element simulations of the Charpy tests to the experimental test data. This paper describes the experimental characterization program, summarizes the material parameters and presents a comparison of the finite element simulations of the Charpy testing and bat/ball impacts to experimental results.

Thank you for joining me on my visit to this month's museum. I visit a museum every month.

A. Morin Scootavia Tripousse- 1952

Born in France in 1923, André Morin's passion for engineering and design was unmistakable, even at a young age. As a teenager, Morin was already designing small aircraft, often selling his hand-drawn plans.

Lane Motor Museum is one of the few museums in the U.S. to specialize in European cars. It is a working museum with the goal of maintaining all vehicles in running order. Some cars are in showroom condition, while others represent typical aging. Efforts are made to restore each vehicle to near-original specifications.

In 2002, Jeff Lane established Lane Motor Museum. Jeff has been an automotive enthusiast since an early age. He began restoring his first car—a 1955 MG TF—when he was a teen. His personal collection was the donation that began the foundation. The Museum unveiled its collection to the public in October of 2003.

Adler Type 10 2.5 Litre- 1938

The Adler Type 10 you see here typifies this trend. Introduced at the 1937 Berlin Motor Show, Adler's fastback streamliner caused a sensation and was given the name "Autobahn Adler" referring to its cruising ability on Germany's expanding motorway network.

Aero 18- 1931

After three years of production of the Aero 10, Aero introduced an updated version of this car in 1931. The new car was called

Aero 18.

Alfa Romeo 2600 Berlina-1962

The Alfa 2600 was Alfa Romeo's flagship car that succeeded the Alfa Romeo 2000. It is a significant car because it was the first Alfa to be powered by an inline 6-cylinder engine.

Alfa Romeo Alfetta- 1977

Introduced in 1972 and named after the Tipo 158 racing cars of 1939-1950, the Alfetta Saloon utilized a completely new drivetrain for production Alfa models.

The USAF official morning fly-in for breakfast!

Okay, that isn't really the USAF but the birds that fly in every morning.

I wondered why my brother, Art, was staring at the wall. Then I wondered why he is pointing at the wall.

THEN he started doing weird things with his fingers - touching his index finger tip to his thumb. What is up with that?

Okay, at our age I figured he finally flipped and time for the old age crazy house.

NO, he was watching a 3d space station and navigating with his new toy - so weird.

I love my squirrels!

AND they love their sunflower seeds and corn kernels

Hello fellow residents. My name is RheKen. I live on a small ranch on the outskirts of the town. I know this will be a shock to all of you, but I'm AI.

I'll be documenting our town residents and events – yes, I use ChatGPT.

Task: Document the issue between the Old Retired Cattle Rancher and our beloved, but odd, town secretary

"Why are cattle window shopping in the town?"

Once upon a time, an old cattle rancher lived in the small town of FEANTM for many years. He had always been a respected member of the community, known for his hard work and commitment to raising high-quality cattle and his special milking cows.

One day, the town secretary, dressed in her usual western outfit with her favorite western boots, approached the rancher with a problem. Some of the rancher's cattle had been wandering into the town, causing problems for the residents. The secretary asked the rancher to do something about it, but the rancher was resistant.

"These cattle have been roaming these lands for generations," the rancher said. "They have just as much right to be here as anyone else."

The secretary argued that the cattle were causing damage to the town and its residents and that something needed to be done to prevent it. But the rancher was stubborn, insisting that the cattle were not causing any harm.

The two went back and forth for some time, each trying to make their case. Finally, the rancher agreed to erect a fence around his property to keep the cattle contained. The secretary was satisfied, and the rancher could continue raising his cattle without causing any more trouble for the town.

In the end, the rancher and the secretary were able to come to a compromise that worked for everyone. The rancher was able to continue his way of life, and the town was able to prosper without any interference from the cattle.

The Old Rancher asked RheKen, "RheKen, why don't you wear western clothes and boots?"

RheKen tilted her head, looking at him like he was crazy, and answered, "As an AI, I'm not capable of wearing anything. My code stack exists on a series of cloud servers interconnected by HTTP protocols."
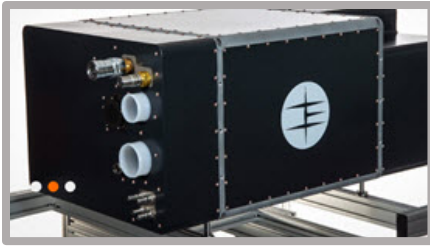
 The Town Secretary yelled, "She's my cousin, and we wear the same size. You can buy me the clothes, and I'll share them with her."

We titled our heads looking at the Town Secretary like she was crazy.

Unfortunately, purchasing clothes started another argument to be documented next month.

Town Residents Poster Board of news, events, gossip not to miss.

Applus+ IDIADA – Signed Agreement

Intelligent Energy (IEL) and Applus+ IDIADA have signed an agreement to collaborate on Hydrogen Fuel Cell development projects for automotive applications.

Applus+ IDIADA continues to enhance its Proving Ground test tracks for 2023 (Excerpt)

IDIADA's Test Facility Design team has designed and implemented a significant test track maintenance plan during the 2022/23 winter season. The main objectives of this work have been to maximize the safety of users, ensure that our testing surfaces remain in optimum conditions, and to increase testing options for Proving Ground customers.

Other improvements carried out include:

· The paving of the run-off areas and new drainage elements aimed at increasing user safety and testing efficiency.

· The Aquaplaning straight of Straight-Line Braking Surfaces Zone 1 has also been resurfaced to ensure uniformity and to keep in line with the regulation required for testing on this facility.

· To increase safety on the ADAS/CAV Platform, an S-bend has also been incorporated into the intersection zone.

The main objectives of this work have been to maximize the safety of users, ensure that our testing surfaces remain in optimum conditions, and to facilitate a wider variety of Proving Ground testing for our customers.

Visit our site for the breakdown of improvements carried out

Welcome to our Convention Center exhibit hall & Coffee Cafe.   Coffee, of course vanilla, hazelnut, and other flavors are courtesy of our favorite coffee shop (not the rival coffee shop).

Today we visited the booths listed below on YouTube:
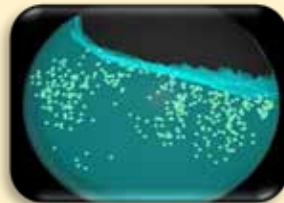
Free Coffee for visiting the booths

ANSYS

AMP Robotics & Ansys

Helpful Humanoid Robots

Astrobotic Technology

Lancemore JP

Liquid sloshing behavior

Lateral Sloshing Analysis

Behavior floating structure

Altair Engineering
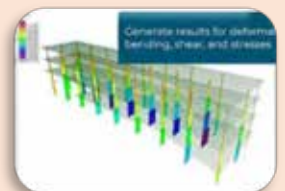
SmartWorks: Overview

I/O Profiling for HPC

S-TIMBER for Structural

SIMULIA

Hearing aids - SIMULIA

Routine Workflows

Heavy Equip. performance

Help us choosing the topic of our next infoday

The next half-day of information will be in March 23.

Help us choose the topic by filling in that poll:
https://forms.gle/hubGUpzL8oLqTjmt6

DYNAmore France

The 2023 French events and courses are available on our website.

You will find all our French training courses. Online webinars as well as on site courses in our premises in Versailles are proposed.

Free information webinars are also offered on specific topics related to customer needs.

Our 3rd French LS-DYNA User Day will occur.

Our full seminar brochure -download at: https://www.dynamore.eu/en/homepage-news/eu/brochure-2023

Evènement / Formation	Février	Mars	Avril	Mai
Introduction à LS-DYNA		27-29 (compacte*)		10-12
Introduction à LS-PrePost	02			
Introduction aux technologies de la simulation	09			23
L'analyse implicite avec LS-DYNA		09-10		
Contacts dans LS-DYNA		17		
Mise en forme à froid avec LS-DYNA			12-14	
Modélisation des matériaux métalliques				
Introduction et optimisation avec LS-OPT				
Introduction et identification de paramètres avec LS-OPT	14 (compacte*)		04	
La méthode ALE et le couplage fluide-structure dans LS-DYNA				
La méthode SPH (Smoothed Particle Hydrodynamics) dans LS-DYNA				
Demi-journée d'Information		23		
3ème Journée Utilisateurs LS-DYNA France				

Toutes les formations ont lieu dans nos bureaux à Versailles.

*Formation en ligne

Machine learning is a subfield of artificial intelligence, which is broadly defined as the capability of a machine to imitate intelligent human behavior. It allows software applications to be more accurate by using the algorithms historical data as input to predict new output values.

ETA   Machine Learning in CAE

ETA Delivers CAE design-driven solutions to build better products, with an efficient, integrative approach

Video on our blog Machine Learning in CAE

Front Crash Pulse Prediction and Optimization Using Lunar

Machine learning is relatively new in the CAE and testing world despite being used in a wide range of industries and applications.

The video will show you an AI/ML and Reduced Order Modeling based Technique

Traditional physics-based FEA (Finite Element Analysis) is an essential aspect of product development in the transportation industry.

Advancements have been made in the last few decades, improving FEA-based product design development processes. Improvements in CPU technologies have reduced simulation time from a week to a day, and currently only a few hours. Iterative studies such as if-then, reliability, sensitivity, and optimization are still time-consuming. With increased focus on digital twin and industry 4.0, there is also a perception that FEA normally comes late in the product development cycle. It's more advantageous to use machine learning before design maturation to asses performance (without running any simulations).

This is where machine learning and artificial intelligence can help. They provide an intelligent way to integrate design, CAE, test data, and historical knowledge into a model. The model then serves as a basis for what's called "predictive engineering analytics." Machine learning can benefit manufacturing as well. It can identify key parameters early in the design cycle, guiding product development or use image processing to identify quality issues during manufacturing.

Soon initial designs will be produced by machine learning using previous results and new packaging requirements. The design will include predictive CAE results, all without performing any simulation.

DFETECH - an engineering firm established since 2005 to provide advanced engineering solutions to industries ranging from automotive and aerospace to electronics, consumer products, civil engineering and defense. Our expertise includes CAE, modern stamping engineering, dimensional engineering and variation prediction.
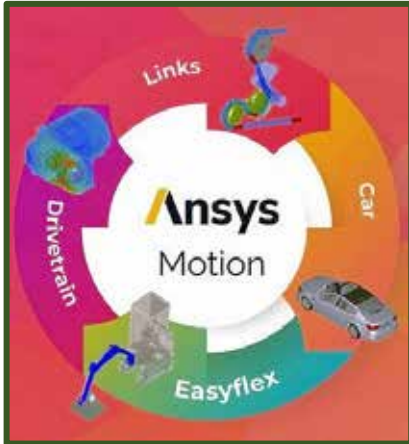
Ansys Motion - the next generation engineering solution based on flexible multibody dynamics~ Let's explore how it enables fast & accurate analysis of rigid & flexible bodies within a single solver system!

Ansys Motion - Multibody Dynamics Simulation Software

Ansys Motion, now in the Ansys Mechanical interface, is a third-generation engineering solution based on an advanced multibody dynamics solver. It enables fast and accurate analysis of rigid and flexible bodies, and gives accurate evaluation of physical events through the analysis of the mechanical system as a whole.

Robust Multibody Dynamic System Design with Ansys Motion

Ansys Motion is a completely integrated simulation environment for both component and system modeling. It provides fast and accurate analysis for both rigid and flexible bodies, simultaneously, all from a single solver. System motion performance, stress-safety analysis, heat transfer, vibration and fatigue are integral. Ansys Motion is the most robust and advanced simulation solution for multibody dynamic system design.

Watch the below video on YouTube

Jithesh Erancheri
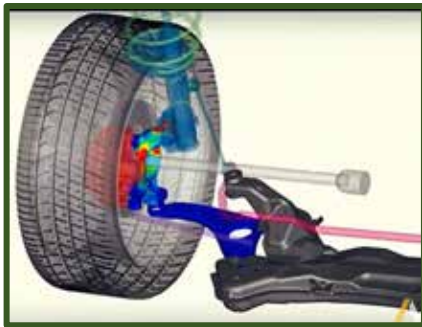
"Accelerate your toughest particle simulations by using the most powerful DEM software on the market. Ansys Rocky contains industry-leading features and capabilities to solve large, complex problems accurately and efficiently".

KAIZENAT Technologies Private Limited is founded to sell & support innovative simulation solutions for Indian Industry.


Flow of products on vibratory tray with provision for dust extraction

Tablet flow prediction in feeder channel - Ansys Rocky**:** The simulations run quickly and precisely. In many industrial applications, you may model the behaviour of variously shaped and sized particles using multi-graphics processing unit (GPU) solver technology.

For More details - Web: www.kaizenat.com
Email: info@kaizenat.com

Original Design: Particles at time range 3 to 5 sec during the simulation in the selective domain

After Modification: Particles at time range 3 to 5 sec during the simulation in the selective domain

Scope: The objective is to demonstrate Ansys Rocky's capacity to predict tablet velocity and model tablet motion through feeder channels. By lowering the velocity, this helps make the feeder's design better so that tablets won't break.

Specification: The tablets are kept in the hopper prior to being poured into the Feeder channel, which has a frequency of 100 Hz and an amplitude of 1.5 mm. A 3.5mm-thick tablet with a 10mm diameter is being considered.
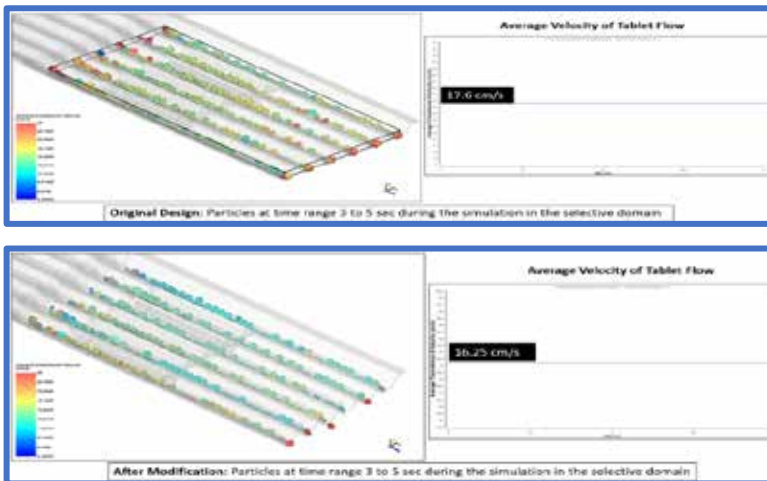
Approach: The feeder was designed to operate at a specific frequency and amplitude in accordance with the original design. It was discovered that the velocity was 17.6 cm/s. We were able to observe a decrease in tablet velocity after reducing the angle of the V-section in the feeder by three degrees. Approximate properties are taken into consideration for things like the contact stiffness ratio, restitution coefficients, static friction, etc.

Summary: There are two types of analyses presented in this report,

1. Actual Geometry   Modified Geometry

The two analyses have been compared, and the average translational velocities for the original design were 17.6 cm/s and the modified design was 16.25 cm/s, respectively. With its capabilities, Ansys rocky assisted in determining the best design to prevent tablet breakage.

About Kaizenat Technologies: With a nice blend of vast technical and commercial persons experience from Indian top OEMs & leading CAE software/service providers. **KAIZENAT is authorized distributor of LS-DYNA and ANSYS for India**.

In "Forensic evidence and the police: the effects of scientific evidence on criminal investigations", Peterson et al. (1984) found that using scientifically analyzed evidence results in three times greater rate of case clearance of crime scenes compared to cases where such evidence was not used. On the other hand, Strom & Hickmann (2010) pointed to a worrisome underutilization of forensic evidence in the vast majority of both solved and unsolved cases of assault, burglary, rape, and robbery incidents.

HEXAGON - **Five Times Faster 3D Crime Scene Documentation at the Push of a Button**

Increasing case-clearing rates with better evidence-collection solutions

Capturing the details of a mock crime scene with the BLK360 and forensic mapping software

The fact remains that only a tiny fraction of available forensic evidence present at scenes of serious crimes is actually utilised.

The reasons are complex and vary with the class of felony. Still, one thing is certain: technology which makes collecting evidence and systematically preserving the chain of custody easier and more reliable is a huge step in the right direction. Fortunately, Leica Geosystems' laser scanning and measuring solutions provide a solid foundation for any investigation. After all, developing and proving a hypothesis about what happened depends on a robust account of the crime scene layout and the precise position of all the objects or items of interest.

To increase case clearance rates, investigators are looking for scene capture solutions that will allow them to gather positional and visual information while working under time pressure – quickly, accurately, and safely. And they want end-to-end solutions with minimal learning curves.

Safer and sounder – working with a Forensic Digital Twin. Leica Geosystems is addressing these needs with our Forensic Digital Twin solutions that capture every detail of a crime scene in minutes. The Forensic Digital Twin is a virtual representation of the entire scene that investigators can navigate in a 3D environment or even virtual reality to revisit the scene as the investigation progresses. This approach has many advantages. When hurrying around a crime scene, you are always in danger of missing important details or compromising crucial evidence. On the other hand, scanning a scene can be done in minutes allowing the investigating parties to create an immutable copy of the original state of the scene, which can then be revisited at will safely and effortlessly.

For these reasons, many in law enforcement are wondering how they can begin to adopt Forensic Digital Twin solutions into their standard procedures. Fortunately, Leica Geosystems' next-generation imaging laser scanner, the BLK360, has made it even easier for investigators to start enjoying all the benefits of state-of-the-art crime scene investigation. At the touch of a button, every detail is documented in 3D for future re-examination in an immersive solution that ensures a seamless workflow all the way through to trial.

Don't miss the training seminar:
Introduction to contact definitions in LS-DYNA

Lecturers

DYNAmore GmbH

Introduction to contact definitions in LS-DYNA

Tobias Graf
Dr.-Ing.

Pierre Glay
Diplôme d'Ingénieur

Julien Lacambre
Diplôme d'Ingénieur

LS-DYNA offers extensive possibilities to model contact. In total there are more than 30 different contact types available and each type supports numerous special settings. While this generous selection guarantees extreme flexibility for the contact definition, it also requires a great deal of knowledge on the user's part.

The objective of this seminar is to provide the user with a summary of the possibilities and limits of the various contact formulations. In particular, the discussion focuses on the selection of a suitable contact type for the application in question. Furthermore, the effects of the various contact options on the simulation results are explained with examples.

Prior attendance of the seminar "Introduction to LS-DYNA" is recommended.

03/17/2023,	04/24/2023
09:00 - 17:00 Pierre Glay, Julien Lacambre French Versailles (FRA)	09:00 - 17:00 Tobias Graf English Stuttgart (GER)

LS-DYNA is suitable for simulating nonlinear processes with large deformations, stability problems and the most complex contact scenarios. **Ansys LS-DYNA solves tasks with complex nonlinearities and avoids convergence issues.**
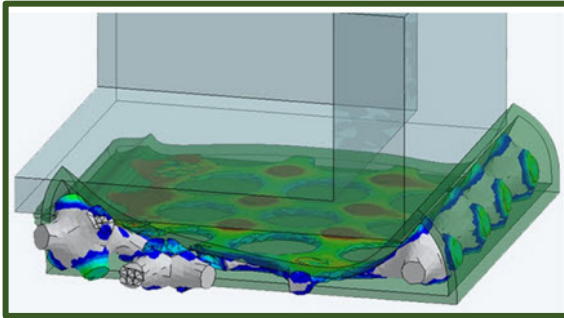
CADFEM – INDIA: **LS-DYNA -Transient simulation of impact, drop and crash tests**

LS-DYNA is suitable for simulating nonlinear processes with large deformations, stability problems and the most complex contact scenarios.

Simulation of short-duration dynamics and highly nonlinear problems with LS-DYNA

Using the explicit time integration method within LS-DYNA, very fast and highly dynamic problems can be effectively simulated. The Ansys LS-DYNA user interface makes input selections by means of proven and robust default solver and model settings. This means that even users with less simulation experience can use LS-DYNA very efficiently.

LS-DYNA integrated into Ansys Workbench - Simulation of arbitrary, nonlinear processes with very large deformations

Ansys LS-DYNA solves tasks with complex nonlinearities and avoids convergence issues. For example, short-duration dynamic applications, such as drop, impact and crash simulations, can be performed, e.g. nonlinear processes with large deformations, stability problems and complex contact problems.

Product Highlights
- Proven, robust and reliable default solver settings
- Seamless integration of LS-DYNA into Ansys Workbench
- Parameterized CAD geometry modeling up to post-processing
- LS-DYNA is the most commonly used explicit solver, making it practically the industry standard
- Optimized for maximum computing power; shortest response times

This software is part of the Ansys structural mechanics product family – Among the interesting uses:
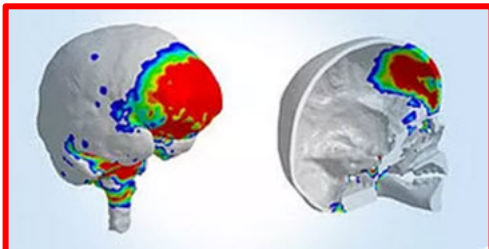
Safe kids' furniture

Biomechanical strain when falling onto furniture edges. A simulation model can be used to quickly simulate, automatically evaluate and compare different ways in which a child might fall.

43

Arup Oasys GSA - The Tower of Light is a 40-meter-tall cooling tower which supports and encloses five exhaust flues of a new Combined Heat and Power (CHP) energy centre located in Manchester city centre. The energy centre supplies several local buildings with low-carbon energy. As the energy centre is in the heart of a prominent city in the United Kingdom, there was a significant need to build a flue tower that was striking and architecturally interesting.

Arup used Oasys GSA as the primary structural analysis package for this project.

Excerpt

Tower of Light, Manchester, UK, Complex modelling using Oasys GSA
Software Used on this Project -   Structural Suite,   GSA

Project Overview - The tower perimeter shell is made up of 6-to 8-millimetre-thick laser-cut steel plates which have been curved and welded together to create a stiff, strong shell. This ensures that the structure will resist buckling without the need for any additional stiffeners. The perforation pattern of the shell has been optimised to reflect the flow of stresses in the structure, the perforations and folds make the tower less susceptible to dynamic responses to wind effects such as vortex shedding.

The stresses in the tower are channelled primarily through the outer seams of the shell, this flow follows a diagrid pattern through the curved part of the shell. The principal of the perforation pattern was to remove material at the locations of reduced stress away from the seams. The solidity of the tower reduces with height, as the forces of wind and gravity reduce.

How Oasys proved invaluable - The design of this unique structure was multi-faceted, including parametric optimisation of the geometry, detailed buckling and dynamic assessments which facilitated careful development of the geometry. During the early stages of the design, the geometry of the shell corrugations and perforations was developed collaboratively between Arup and the architect with the help of digital workflows to identify a structurally optimal form. Parametric tools were used to generate and analyse several variations of the geometry in a timely manner, which allowed the design team to study the effect of changes in the form of the shell on its strength and stiffness characteristics.

One of the key challenges Arup engineers faced during the project was finding a robust approach for analysis of the complex shell geometry. During the initial stages of the project, it was necessary to generate multiple variations of the geometry to enable optimisation of the shell. In the following detailed design stages, highly detailed models were required to ensure that the structural performance of the tower was properly understood.

A detailed 3D finite element model was generated and analysed in GSA. The tower was represented using a shell element mesh, and all perforations were modelled explicitly. Given the unique nature of the structure, this was considered the only approach which could provide confidence in understanding the behaviour of the structure with sufficient accuracy.   During the initial stages of the project, scripts using the GSA API were used to quickly generate models with several variations of the shell geometry to enable quick optimisation of the structure. This approach saved significant time compared to building the models manually. …

Product development today means satisfying requirements within a variety of fields like crash safety, durability, and sound comfort for a passenger car. In a CAE-driven development process, this puts high demands on the multi-disciplinary capabilities of analysis tools.

DYNAmore Nordic AB

Lecturer - Dr. Anders Jonsson

March 14 – SEMINAR - From Explicit to Implicit Simulation Models in LS-DYNA

The one-code strategy of LS-DYNA provides a complete solution for these demands, making it possible to use the same analysis model for many different load cases, from large deformation rapid events like drop test and crash analyses to non-linear quasi-static analyses, and linear dynamics in the frequency domain.

Many possibilities exist, to reuse the same models developed for rapid events and explicit time integration also for non-linear quasi-static analyses and linear statics with only minor modifications, and many users could benefit from taking advantage of these.

This course addresses the conversion of an existing explicit LS-DYNA model to an implicit version of it. In detail, it focuses on how to set up non-linear implicit analyses in LS-DYNA starting out from explicit (crash-worthiness-type) models. It is a hands-on course with many workshop examples, ranging from the basic setup of linear stiffness analyses to more involved non-linear sub-system analyses. Practical troubleshooting tips and guidance on how to avoid many common pitfalls are also given.

No previous knowledge of implicit analyses in LS-DYNA is required, as the course starts out on a basic level in this field, but basic knowledge of LS-DYNA or prior attendance at the seminar „Introduction to LS-DYNA" is recommended.

Content
- Basic set-up using control card templates
- Contacts
- Multiple load steps
- Elements and materials for implicit analyses
- Advanced set-up: possible control card modifications
- Troubleshooting convergence issues
- Conversion examples

Biopsychology (also known as physiological psychology, behavioral neuroscience or psychobiology) is an interdisciplinary field that analyzes how the brain and neurotransmitters influence our behaviors, thoughts and feelings.

I was honored to represent d3VIEW at the 16th LS-DYNA Forum in Bamberg, Germany this past October.

I gained invaluable knowledge about the applications of LS-DYNA and was grateful to see the rich and diverse user community in person.

It is amazing to see how d3VIEW is aiding with data challenges in order to gain insights.

Ansys **DYNA**
MORE

16th LS-DYNA Forum, Bamberg

**Shweta
Suri**
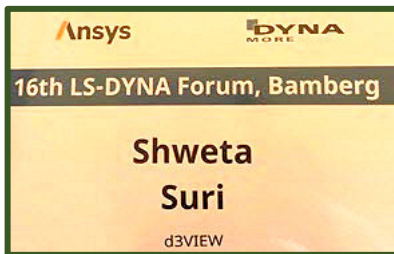
d3VIEW

Biopsychology blends two fields: biology and psychology. This blending allows us to form a picture of understanding human conditions. How the biological makeup effects a person's behavior.

Using D3View Simlytiks the following 3 images are among the examples using a dataset on Happiness Factors in 2020. Each chart reviews specific parts of the dataset in order to analyze happiness.

The complete data sets using Simlytiks.

2020 World Happiness Column Information

| Name	Description	Type	Range
Country	Name of country	Text	138 countries from Afghanistan to Zimbabwe
Happiness Score	"How would you rate your happiness on a scale from $1-10$?"	Number	$0-10$
GDP Per Capita	The extent to which GDP contributes to the calculation of the Happiness Score.	Number	$0-2$
Social Support	The extent to which social support contributes to the calculation of the Happiness Score	Text	Male or Female
Health	The extent to which health contributes to Happiness Score	Number	$0-80$
Freedom	The extent to which Freedom contributes to the calculation of the Happiness Score.	Number	$0-8$
Generosity	The extent to which generosity contributes to Happiness Score	Number	$0-9$
Government Trust	The extent to which perception of corruption contributes to Happiness Score	Number	$680-3101298$
Dystopia Residual	Unexplained components and how they relate to the dystopian constant	Number	$0-512.33$
Continent	Continent of country	Text	Africa, Asia, Australia, Europe, North America, South America

2020 World Happiness: Continent vs Happiness
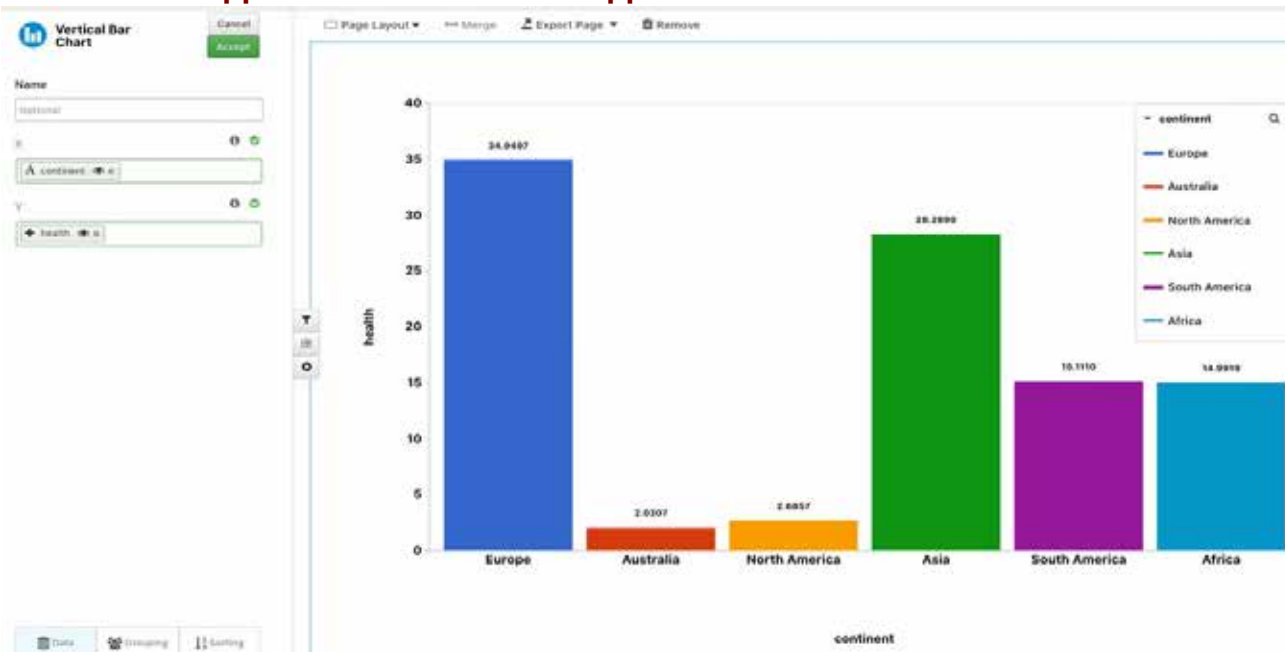
2020 Happiness : Are people with Social Support Happier?

Stefan Castravete
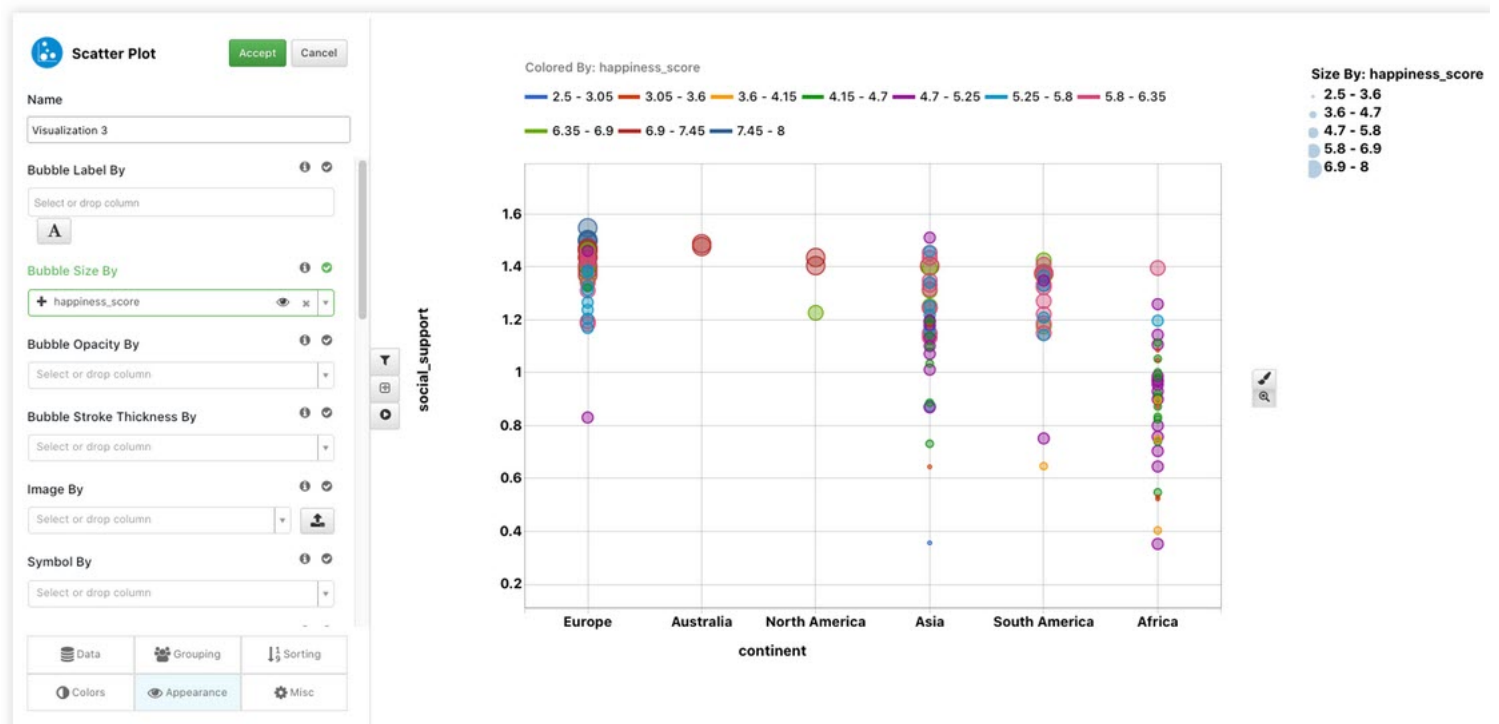
Caelynx Europe is a CAE company providing expedient, reliable consulting services to the world's finest in automotive, energy, defense, medical, and aerospace industries.
We have connected, experienced professionals in Europe and the US.

Among the products Caelynx Europe uses for consulting is fe-safe:

fe-safe® fatigue life contour plot — Stress contour plot
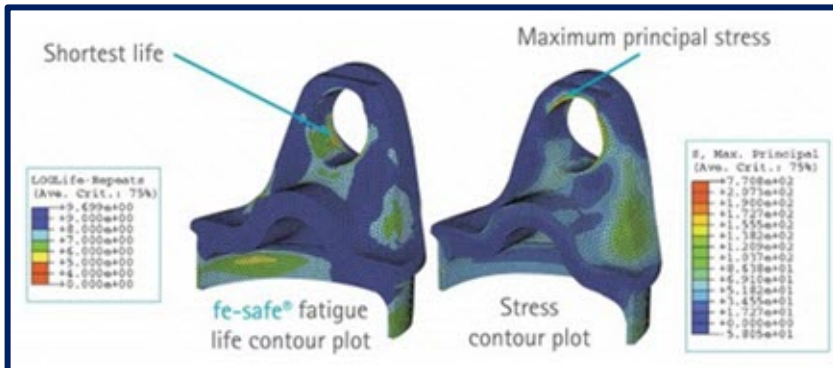
Fe-safe Durability Analysis Software for Finite Element Models

fe-safe is a technical leader in fatigue analysis software for Finite Element models and is capable of meeting its users' most demanding applications.

fe-safe directly interfaces to all leading FEA suites and is used by leading companies in the transport and mobility, aerospace and defense, general manufacturing, power generation, marine and offshore industries worldwide to determine fatigue life and optimize designs. fe-safe is renowned for its accuracy, speed and ease of use.

fe-safe has been developed continuously since the early 1990′s in collaboration with industry to ensure that it continues to set the benchmark for fatigue analysis software. It was the first commercially available software to focus on modern multiaxial strain based fatigue methods and the first to incorporate capabilities for non-metallic materials. fe-safe analyses metals and composite materials, elastomers, thermo-mechanical and creep fatigue and employs the Verity® structural stress method or the fatigue analysis of welded joints – the only commercial software to incorporate this methodology.

With fe-safe as an integrated part of the design process, customers have the ability to:
- accurately identify fatigue hotspots
- optimize designs to use less material
- reduce product recalls and warranty costs
- validate design and test programs
- improve correlation between test and analysis within a single user interface
- reduce prototype test timesspeed up analysis times, thereby reducing man-time hours
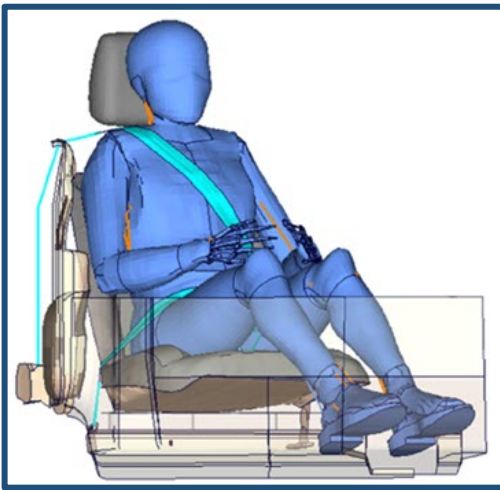- increase confidence that your product designs pass their test schedules as "right first time

ISO Certification
Caelynx Europe has Management system certification: ISO 9001

Fig. C-1. Initial occupant position with seat pre-rotated 30∘ sideways.

Evaluation of muscle strain injury severity in active human body models

Lennart V. Nolle, Oleksandr V. Martynenko, Syn Schmitt
Institute for Modelling and Simulation of Biomechanical Systems, University of Stuttgart, Stuttgart, Germany

Atul Mishra
Mercedes-Benz Research and Development, Bangalore, India

Abstract

Even though significant efforts in the field of injury detection with finite element active human body models (FE AHBMs) have been made, injuries of the muscle-tendon unit (MTU) have not yet been taken into consideration. Therefore, the goal of this study was to define a muscle strain injury criterion (MSIC) to evaluate the damage sustained by the musculature during muscle driven movement scenarios. The MSIC was derived from biomechanical tests found in the literature and the proposed threshold values were substantiated through a comparison to an estimate of the ultimate tensile strength of human skeletal muscle and the forces acting on the biceps femoris long head muscle during one sprinting gait cycle. The application of the MSIC to state-of-the-art FE AHBMs was demonstrated by evaluating the strain injury severity of selected neck muscles of a full-body AHBM during two seat rotation load cases. The results of the MSIC substantiation suggest that all three injury threshold values proposed in this work fall in a plausible corridor of forces acting on the MTU. The combined results of the AHBM simulations indicate that neither of the two examined seat rotations are likely to cause strain injury to the neck muscles and that the proposed MSIC can easily be applied to current AHBMs without further modification of the model architecture or the muscle parameters. The MSIC was also used to formulate a hypothesis on the aetiology of muscle strain injuries, through which it was demonstrated that material inhomogeneities in the MTU might be the cause for strain injuries sustained during otherwise physiological movements. This work is a first step in the direction of the definition of a wholistic injury criterion for the human skeletal muscle fibre.

Automated Driving is a driving technology that can percept the surrounding environment and move without any human intervention.

FIGES AS

Design, and Simulate Tomorrow's Automated Driving

MATLAB and Simulink enable automotive engineering organizations to accelerate vehicle development processes and to deliver vehicles that meet market requirements for safety, comfort, fuel economy, and performance.

Automotive engineers use MATLAB and Simulink to:
- Run simulations to evaluate trade-offs and optimize designs
- Develop and test perception, planning, and control algorithms
- Validate requirements early through rapid prototyping
- Generate code for prototyping or production, in floating or fixed-point, for MCUs, GPUs, SoCs and FPGA devices
- Analyze test fleet and production vehicle data
- Comply with AUTOSAR and ISO 26262 standards

Automated Driving and Advanced Driving Assistance Systems (ADAS)

Use MATLAB and Simulink to accelerate the development of automated driving functions including perception, planning, and control functions.

Run simulations in Simulink to test, integrate, and tune these functions using programmatically generated scenes and maximize test coverage across various road, traffic, and environmental conditions without expensive prototype vehicles.

Please visit the website for complete information and additional graphics

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FEA Not To Miss

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Real estate available

Goodbye and Come Back Soon

QUIZ ANSWER

- Barrett MRAD Mk22, (USA)
- SIG SSG 3000 (Germany / Switzerland)
- Sling Shot - you make it at home
- Steyr SSG 69, (Austria)

Our Town Salutes our US military, NATO and Friends of the US and NATO. We salute Freedom.