**Entering Town
FEA Not To Miss
(pop. virtual)
WELCOME**

*Monthly Town Hall Meeting
Engineering, Blog, Gossip & News*
www.feantm.com

Aerospace/Military

Aerospace/Military

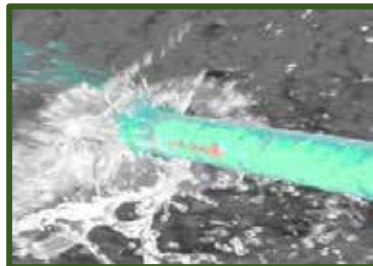Automotive

Automotive

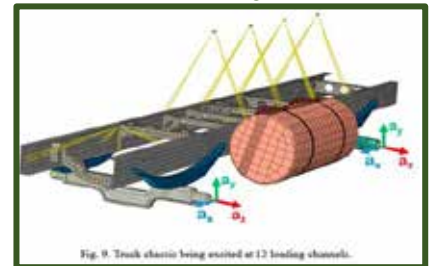Hans/Rheken – Cannon Town Hill
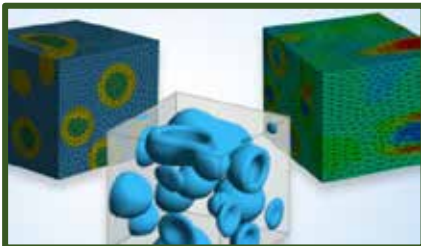
Museum- WAAM

Research – Beatrice

Rancher - SITREP

Library

Fig. 9. Truck chassis being excited in 12 loading channels.

Poster Board – JSOL

Poster Board - Applus+IDIADA

Article - Markus

Article - Metin

Article - Garrett

Article - Marta

Goal

We believe in our effort to advance knowledge. Our goal is to share information on companies with expertise and innovative products. We believe this constitutes a "fair use" of the material under Title 17 USC. Section 107."

Compensation

FEANTM does NOT receive compensation from the companies whose products we showcase. Companies and information included is at the sole discretion of FEA not to miss a/k/a FEANTM.

DISCLAIMER

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Any company may opt-out at any time by writing to Marsha feaanswer@aol.com

After that, going forward from the email's receipt, content (excluding that found on Twitter, Linkedin, YouTube, FaceBook and other social media) will not be included.

Editors: (alpha order) Anthony, Art, Marnie, Marsha, Shweta, Yanhua

Town Pretend to be Editors
The Old Rancher - No one in town knows his name. You yell "Hey, Old Rancher."
The Old Pilot   -   No one in town knows his name. You yell "Hey, Old Pilot."
The Old Racer -   No one in town knows his name. You yell "Hey, Old Racer."
           They are all brothers - strange family

Contact us at feaanswer@aol.com

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

Table of contents

June 2023 - **Name listed is the person the town thanks.**
          The above doesn't mean they are the author, OR in a specific department.

Town Hall Meeting Rooms (A)

Town Hall Poster Board & Guest Room (G)

Hans, the DYNAmore Human Body Model & RheKen, the town AI reporter News

Automotive and/or Racing Information

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

Table of contents

First named person the town thanks
The above doesn't mean they are the author, OR in a specific department.

Goodbye Page
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 & marshmallows?
Where are the cookies I ordered?

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

Gossip is at the local coffee shop.
Pets are welcome. (Horses stay outside)
(Pet goats & pet pigs also stay outside)

Through the month of September Brianna Walker will be reporting out of our Town Satellite Office in the UK. Reporting on what you need to see, in case you didn't see it!

Additionally, the town has a new Photography & Picture Gallery. Grabbing his camera for this month is our very own town ArmyBlackHawkPilot (yes, that is supposed to be one big word) that is what he uses. And off we go to grab coffee and get this meeting started.

Hans (DYNAmore's Human Body Model) and RheKen (Town's AI reporter) rescued and adopted a puppy. See their news page and their new puppy they named Henry. They spell the name HanRhe.

No, they didn't take votes for the name HanRhe. Only they voted – it was unanimous.

Presentations:

Now available: 7 presentations from our Infoday Automotive and Aerospace Applications. Ready for you to view on YouTube.

Educational

Geometry Preparation in Ansys Discovery training course will teach you everything you need to know about modeling for Ansys.

Software

Did you know about Oasys Suite? Developed specifically for LS-DYNA. Additionally, our catch-up news.

Medical

Published papers by Beatrice Bisighini, "…beam-to-surface contact problems in cardiovascular mechanics" & "ML & reduced order modelling for the simulation of braided stent deployment"

Town Map

Horse Trail →

DYNAmore

d3VIEW

ENGINSOFT

CADFEM

Oasys

FiGES

OZEN

HEXAGON

TOWN HALL

rescale

My Cafe

HOSPITAL

Research

LLNL

PARK

Library
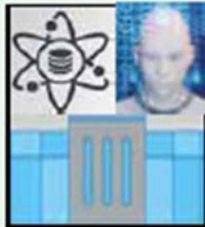
Auto Race track & Auto Industry

Petting Zoo

Old Rancher

Rival Cafe

Elect/Water. & Sewage Treatment Plant Facilities

FEANTM UK Office **–What you need to see, if you didn't see it.**

Not To Miss my choices for June

The LS-DYNA Support Site

 LS-DYNA R12.2.1 released May 23, 2023

New version of LS-DYNA is released for all common platforms.

At this site you will find answers to basic and advanced questions that might occur while using LS-DYNA. Furthermore, it will provide information about new releases and ongoing developments. The content will be regularly updated with answers to frequent questions related to LS-DYNA. LS-DYNA support will not provide information on activities of your local LS-DYNA distributor as seminars, promotions, etc. We ask you to check the local sites for any kind of non-technical information.   More information on LS-DYNA and the related products can be found at www.dynamore.de. A free LS-DYNA test license can be ordered here.

The ANSYS Blog

The ANSYS Blog

05/24 **An Introduction to Discrete Element Modeling author Mara Carrion - Interview with Dr. Lucilla Almeida, Ansys** - DEM is a numerical technique to simulate interactions between particles to particles and particles to boundaries. DEM can account for many types of forces acting on individual particles, and it is used to predict particle flow dynamics and bulk solids behavior. This approach is extremely powerful in solving many industrial problems.

05/16 - Havells India Clears the Air using Ansys CFD Simulation – **author - Tim Palucka** - Havells India used Ansys Fluent to ensure that airflow through the three stages of the Meditate Air Purifier was optimized for maximum purification capabilities.

05/15 - **TAG Heuer Porsche Formula E Team Races Toward Efficiency with Simulation** – **author Laura Carter -** The TAG Heuer Porsche Formula E Team did a lot of iterative work using simulation to develop a powertrain that is efficient under virtually every condition.
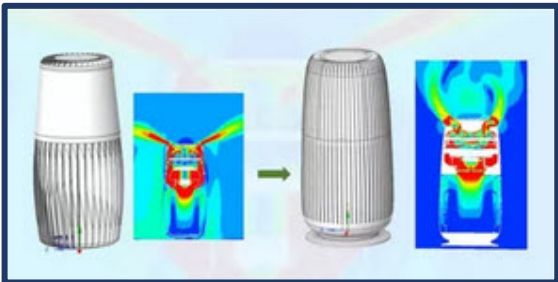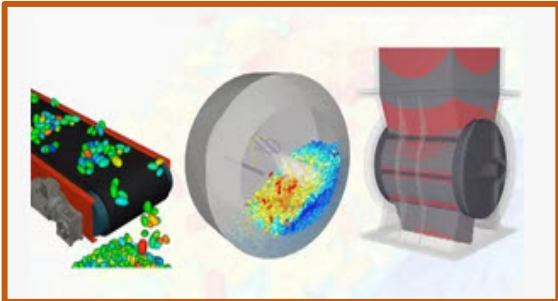
RESCALE - Accessing and managing HPC job input and output files in the cloud is foundational to R&D productivity. As part of ongoing platform improvements, we are excited to share new capabilities within Rescale Files, which enhance how users manage their simulation and modeling data. This release features a new job-oriented capability for accessing, organizing, and sharing job-specific files in-context, enriched with a variety of intuitive capabilities and metadata fields.

Job-oriented File Management for Modern Cloud HPC

Rescale Files is a core component of our HPC as a Service foundation, with intuitive data management tools that accelerate HPC and AI workflows, facilitate seamless collaboration, and maintain job integrity across complex projects.

Rethinking File Management for Accelerated Workflows and Collaboration - For engineers, scientists, and researchers who use high performance computing (HPC) to drive their analysis, managing and sharing files across multiple jobs can be a complex and time-consuming task. Modern HPC workflows often consist of multiple jobs with file dependencies from previous jobs. This makes integrated cloud file management a critical necessity to maintain productivity, collaboration, and security.

Traditional approaches to file management often break down as HPC jobs accumulate large quantities of files, often with files sharing the same name. This results in users struggling to locate specific job data or not knowing which files should be deleted or kept.
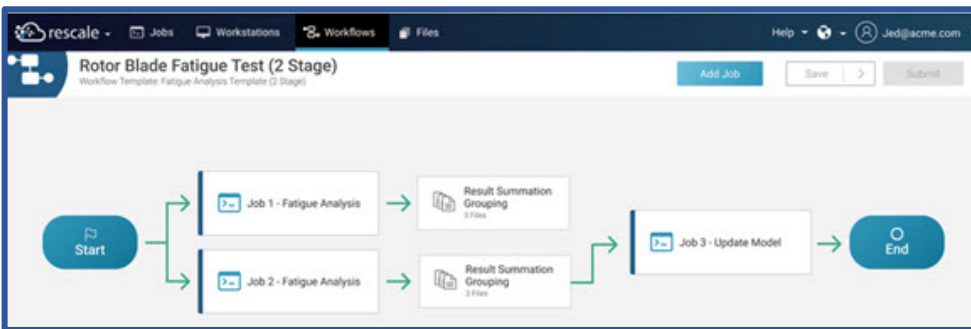
Workflow of computational pipeline with job output result files being used as inputs for subsequent analysis

Your Files In Context and New Capabilities - With additional job-oriented context and new interface capabilities, users can now easily find files through searching, filtering, and sorting with various criteria such as job name, file name, file type, and date range.

Rescale Files also allows users to delete files individually or by entire directory to manage storage consumption, with the option to recover deleted files from the trash during a user-defined retention period.

Users have full control to set a job retention period to automatically delete jobs and their associated files after the retention period has expired.
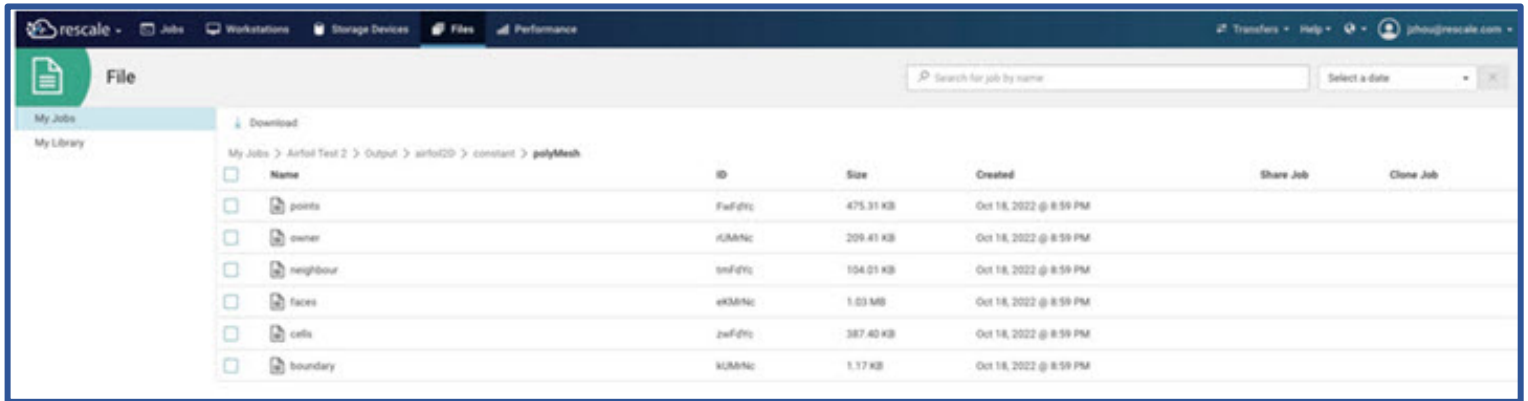
Rescale Files 'My Jobs' view with job output files associated from 'Airfoil Test 2'

Ensuring HPC Job Integrity and Efficiency in Data Management - One of the key benefits of Rescale Files is in helping teams preserve job file dependencies to ensure job integrity and prevent data loss. Users can use completed jobs as the starting point to find relevant result files, either to be used as input for new jobs or to download them for further processing. Within a shared Rescale Workspace, collaborators can clone or share jobs, making it easy to compare results and automate multi-job workflows.

Benefits of Rescale Files include:
- · Organization: Users and administrators can store and find files where they need them, in context with the jobs they are associated with.
- · Job integrity: Job file dependencies are preserved, and critical files are protected.
- · Collaboration: Users and their jobs have access to the right files.
- · Storage efficiency: Organizations can safely and systematically delete files to control storage costs.

Start Leveraging Rescale Files Today - Customers can request an upgrade to the new version of Rescale Files at no additional charge. Once upgraded, users can follow in-platform tool tips to begin exploring new features. These new features and automatic upgrades for existing customers will go into effect later this summer.

Contact us today to take advantage of Rescale's streamlined, flexible file management to help improve your HPC workflows.

LLNL - **In a room illuminated by blinking lights and glowing monitors, more than 2,000 synchronized computers are triggered to run 5 million lines of code. The intricate code language is responsible for aligning and firing 192 laser beams — and carrying some 800 channels of target diagnostic data — efficiently and reliably several times a day. This isn't a scene from a science fiction movie: it's the control room of LLNL's National Ignition Facility (NIF).**

Computational Engineering is key to ignition success
EXCERPT

The Computational Engineering Division (CED) within LLNL's Engineering Directorate, is a critical but largely invisible element of the effort toward achieving nuclear fusion ignition. CED's role in supporting NIF's fusion energy goals is writing the algorithms that direct the lasers toward the hohlraum target and for various diagnostics that help determine how to make sense of NIF shots and to keep the fusion apparatus running.

The Automatic Alignment team, led by Vicki Miller Kamm within CED's Image Analysis and Controls Group, builds automated software that aligns the 192 NIF lasers to the target before every shot. Critical to running NIF, this team develops automated image-processing routines that calibrate the laser's position using thousands of images taken throughout the facility. Automatic alignment algorithms analyze those images to provide beam positions, which the automatic alignment control system uses to move motorized mirrors that direct the laser beams.

Each of the images helping to align the lasers may require multiple algorithms to account for different disruptions that the image may be subjected to, including noise, intensity fluctuations or intensity gradients. If algorithm 1 fails, algorithm 2 may take over; if algorithm 2 fails, algorithm 3 takes over; if algorithm 3 fails, then the automatic alignment system declares a failure. Multiple beam failures may derail a planned NIF shot, so the reliability and speed with which the algorithms run is important for the day-to-day operation of NIF.

And, as the NIF is a dynamic system whose operating conditions are constantly changing, the automated alignment team's adaptability is crucial to NIF's continued functioning, too.

"When we think of NIF, we think of 192 beams impinging on a target that is the size of a millimeter," noted CED's Abdul Awwal, one of the top experts on the automatic alignment algorithms for the NIF beam lines. "But when I joined the automatic alignment team in 2003, NIF only had four beams. In those days, if the alignment failed on any beam, you were called to the control room to look at the failure and make any code changes on the fly."

Now, Awwal and his team have a systematic process involving development, testing, release and online testing, giving engineers the opportunity to anticipate and correct any code errors before they affect the shot environment. In addition to refining testing processes, Miller Kamm's team has over the last several years sped up the alignment process, and the latest power improvements were instrumental in the success of the Dec. 5 ignition shot…**Continued on the LLNL Website**

DYNAMORE - Now available: Seven presentations of our Infoday Automotive and Aerospace Applications. The Infoday Automotive and Aerospace Applications took place on December 1st, 2022 in Berlin and was streamed on our YouTube-Channel.

YouTube Videos now available - Seven presentations of our Infoday Automotive and Aerospace Applications.

On our YouTube Channel you will find:

Infoday Chapter Selection (using time code)

- 00:00:00 Simulation of resistive heating of titanium blanks (M. Merten, DYNAmore)
- 00:30:38 Isothermal Hot Forming of Titanium Blanks - From Characteristic Determination to the Component (Mr. Kaiser, Heggemann)
- 00:59:50 Examples for AM-Simulations in LS-DYNA (Dr. Buhl, BTU Cottbus)/
-
- 01:28:29 GISSMO for Damage and Failure Prediction (Dr. Koch, DYNAmore MCC)
- 01:58:50 A new material model for continuous fiber reinforced plastics in crashworthiness analysis (Dr. Klöppel, DYNAmore)
- 02:25:25 Closed process chain for the simulation of fiber reinforced composites in LS-DYNA using ENVYO (T. Usta, DYNAmore)
- 02:56:19 Multiphysics Modeling of Batteries with LS-DYNA (Dr. Karajan, DYNAmore)

CADFEM - **Whether you work with Ansys Discovery or Ansys SpaceClaim, this training course will teach you everything you need to know about modeling for Ansys. Now available as eLearning course**

Offered as a 2-day course or alternatively as a self-paced eLearning course, in which you should invest a total of 2 learning day(s) with your own time allocation.
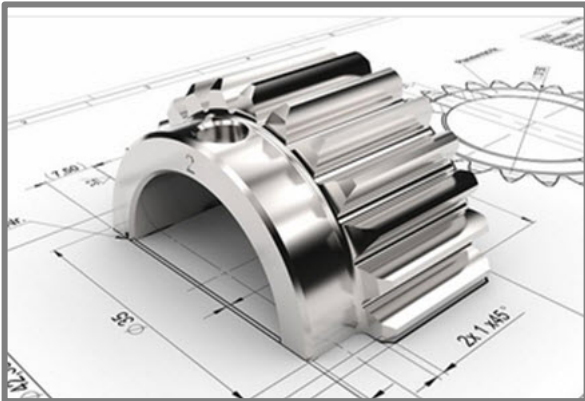
Geometry Preparation in Ansys Discovery

Modeling for Ansys Discovery, Fluent and Mechanical

Learn how to create new models from scratch or quickly modify existing CAD models and prepare them for simulation.

The "direct modeling" concept, known from Ansys SpaceClaim, has been implemented in Ansys Discovery.

Day 1
- Hands-on geometry
- Keeping a clear overview even with complex assemblies
- From sketch to 3D model
- Getting there faster with pre-processing methods

Day 2
- Efficiently generating FE-oriented geometry
- Automated geometry changes through parameters
- Transferring solid models to beam and shell models
- Geometry creation for faceted surfaces

Overview   Level: Basic   Software used: Ansys Discovery
              Prerequisites: None   Target group: Users, Instructors, General enthusiasts
              Applications: Pre- and Post-processing

Benefits
- Create simulation models for Ansys Discovery, Fluent and Mechanical
- Import, repair and modify existing geometries
- Efficient working method with parameters, Powerselect and shortcuts
- Lasting learning success due to the high "Do-It-Yourself" proportion of the training

New discount for teachers, learners and researchers at universities: If you book through your university, you will receive a 50% discount on the stated fee on training courses and eLearning courses.

For more information on the validity and how booking with the code ACADEMIC50 works, please visit our page on training for academic users.

Oasys - **Did you know about Oasys Suite? Below are a few of the many features of the software.**

Developed specifically for LS-DYNA, the Oasys Suite is at the leading edge of pre and post-processing software and is used worldwide by many of the largest LS-DYNA customers.

Oasys PRIMER	LS-DYNA®	Oasys D3PLOT	Oasys T/HIS	Oasys REPORTER
Prepare	Analyse	Visualise	Process	Report

EXERPTS: **Oasys Suite**

Oasys PRIMER is the pre-processor designed to make preparation and modification of LS-DYNA models as quick and as simple as possible.

> With support for every LS-DYNA keyword, you can read and write models with the confidence that no data will be lost or corrupted. The Oasys PRIMER user interface is designed specifically for LS-DYNA – with no compromises – giving you convenient access to a range of powerful pre-processing

Oasys D3PLOT is the advanced 3D visualisation package for post-processing LS-DYNA analysis results.

> Oasys D3PLOT provides animation, extraction and derivation of over 100 data components, with advanced graphics (including shading, contouring, lighting and transparency).tools.

Oasys T/HIS is an XY data plotting package designed primarily for use with LS-DYNA.

> Process output data in a standalone Oasys T/HIS session or use the D3PLOT T/HIS link to view XY data side-by-side with 3D results.

Oasys REPORTER offers automatic report generation using numerous layout tools with the ability to auto-create images through embedded D3PLOT, T/HIS and FAST-TCF scripts.

> Generate your report for multiple simulations, extract key data points and combine into one document, complete with automatically collated summary tables, color coding and company logos.

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Oasys - **As a strategic partner of Ansys, we were invited to exhibit the Oasys LS-DYNA Environment at the Ansys UK Innovation Conference 2023, held in Coventry, UK. The event was filled with informative presentations including updates from Ansys, software use-cases and best-practices from simulation experts, Simon Hart of Arup was also invited to speak about our contributions to the design and development of the new electric London taxi using the LS-DYNA software.**

Post Event & News
Review:
Ansys UK Innovation
Conference 2023

Held April 27-28 2023,
MTC, Coventry

Gavin Newlands, Simon Hart and Marta Kempa, Arup   Richard Tinsdeall, Ansys

The conference was a wonderful opportunity for us to connect with other software partners and clients, and share our vision on the future of virtual simulations and engineering. We would like to thank Ansys for hosting their eye-opening Innovation Conference and we hope to see everyone again at the next one.

Upcoming webinar:
LS-DYNA submission from Oasys PRIMER, checking dyna output files and load profiling - 12:30 BST on Wednesday 28 June 2023 By Manu Agarwal, Arup

This webinar will cover LS-DYNA submission from Oasys PRIMER, exploring powerful tools for optimizing simulations and analyzing results. Learn to navigate output files, validate models, analyze errors, and visualize load profiles. Enhance your LS-DYNA workflow with Arup's expertise and Oasys PRIMER's capabilities.

Key Highlights:
- Gain insight into LS-DYNA simulations using Oasys PRIMER.
- Analyze errors and warnings through output file examination.
- Investigate load and contact profiles for performance optimization.
- Validate models before submission with PRIMER's advanced checking feature.
- Streamline LS-DYNA submissions and navigate results effortlessly.
- Visualize domain decomposition.
- Join our webinar to elevate your LS-DYNA simulations with practical insights from industry leaders and innovative software tools.

OZEN Engineering – Don't miss the article by Jesus Ramirez on Monte Carlo Model & ANSYS Fluent.

Jesus Ramirez, "Greetings to engineers, designers, and analysts worldwide. Today, we're focusing on the simulation of radiant heat transfer—a task that requires precision, accuracy, and a comprehensive approach. The Monte Carlo Radiation Model (MCRM) in Ansys Fluent is ideal for facing such challenges."

This blog overviews the Monte Carlo Radiation Model's utilization within Ansys Fluent. We'll explore its capability to produce reliable and accurate results, even in the face of complex designs. Furthermore, we'll guide you on leveraging this model to its fullest potential, enhancing the robustness of your engineering solutions.

Radiate Your Results: Monte Carlo Model & Ansys Fluent

Radiant heat transfer simulation often involves complex geometries, where traditional methodologies, may fall short. This is where the MCRM stands out. As a stochastic model, it leverages the statistical nature of radiation to account for diverse solid and fluid properties, as well as spatial irregularities.

It's essential to remember that while the MCRM offers an advanced approach to radiant heat transfer simulation, it also demands more computational resources than simpler models. Therefore, its application should be carefully considered in scenarios where the added detail and precision are critical to achieving the desired results.
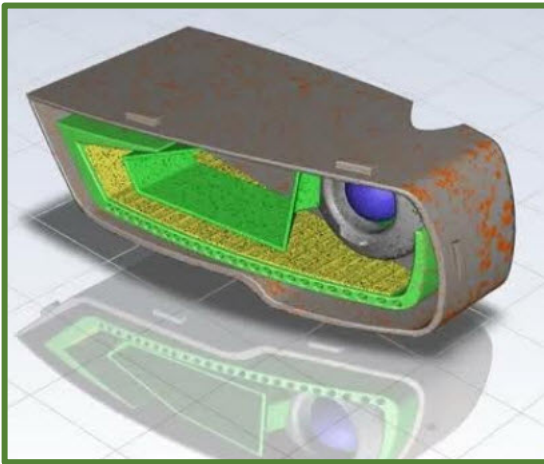
Stay tuned as we unfold the intricate workings of the Monte Carlo Radiation Model within Ansys Fluent. Learn how this powerful tool can elevate the accuracy and reliability of your engineering simulations.

Overview of Ansys Fluent

Ansys Fluent is a robust and comprehensive computer-aided engineering simulation package that simulates many physical phenomena. It allows engineers to analyze complex systems, including fluid dynamics and heat transfer. One of its primary features is the ability to use the Monte Carlo Radiation Model (MCRM) to model radiative heat transfer.

MCRM is a statistical approach for calculating radiation exchange between surfaces for uses such as solar energy, boilers, and HVAC systems. An advantage of MCRM is its ability to accurately simulate radiative heat transfer from multiple sources in complex geometries, all while maintaining realistic boundary conditions. With the Monte Carlo Radiation Model, Ansys Fluent can easily model radiation from various sources and run simulations with more realistic boundary conditions than traditional methods.

Ansys Fluent provides engineers with an invaluable tool for accurately simulating fluid and thermal systems and radiation transfer between surfaces. Ansys Fluent capabilities and flexible simulation features can save time and money in the engineering process while providing reliable and accurate results.

Radiative Heat Transfer and Monte Carlo Model

If accurate simulation of radiative heat transfer in a design is your objective, the Monte Carlo Radiation Model (MCRM) available in Ansys Fluent presents a robust solution. MCRM simulates radiative heat transfer within a 3D domain by considering the probabilistic nature of radiation and its interactions with surfaces.

While the setup of MCRM requires thoughtful parameter selection, Ansys Fluent provides an intuitive interface and extensive guidelines to ease the process. Once configured, MCRM can produce results indicative of realistic physics behavior efficiently. As part of Ansys Fluent's comprehensive suite, it allows the simultaneous examination of other crucial physics behaviors, encompassing manufactured objects and natural elements.

For radiative heat transfer, MCRM offers improved prediction capabilities that enhance engineering precision and optimize performance. In addition, its proficiency in predicting temperature distribution in 3D domains renders it a valuable asset for generating accurate simulations for design optimization or verification under specific operational conditions.

Monte Carlo Model in Ansys Fluent - You can take advantage of the Monte Carlo Model when you use Ansys Fluent. Ansys Fluent supports integrating the Monte Carlo model with advanced mesh technologies that provide fast, reliable, and accurate results.

The latter means that when you use the Monte Carlo model in Ansys Fluent, you get the most out of your simulation. Let's take a look at why the Monte Carlo model can be so beneficial when used with Ansys Fluent:
- Handling Complex Geometries: The MCRM is well-suited to handle complex geometries and boundary conditions. This includes enclosures with irregular shapes or non-uniform material properties.
- Accounting for Multiple Scattering: Unlike simpler radiation models, the MCRM can account for multiple radiation scattering between surfaces and within participating media. This is particularly important in cases where radiation is repeatedly absorbed and re-emitted, such as in combustion chambers or solar concentrators.
- Accounting for Spectral Effects: The MCRM can account for the spectral dependence of radiative properties, which is vital in cases where radiation absorption and emission vary significantly with wavelength. This is important in combustion, atmospheric radiation, and semi-transparent solids (e.g., glass).
- Integration with Other Models: The MCRM can be easily integrated with other Fluent models, such as those for fluid flow, heat transfer, and chemical reactions, providing a comprehensive solution for complex multiphysics problems.
- High Accuracy: Due to its ability to account for complex physical phenomena like spectral dependence and multiple scattering, the MCRM can provide highly accurate solutions for a wide range of radiation problems.

It's important to note that the MCRM can be computationally intensive compared to simpler radiation models, particularly for large-scale problems or those involving a wide range of wavelengths. As always, the choice of model should be guided by the specific requirements of the problem at hand.
How to Implement Monte Carlo Model in Ansys Fluent

The full article is on the OZEN website with steps to follow if you want to explore the Monte Carlo Radiation Model in Ansys Fluent with video

[Optimizing the shape of the M10 engine's injector head methane circuit using RBF mesh morphing](#)
Futurities Year 19 n°4

By Ubaldo Cella, Marco Evangelos Biancolini
RBF Morph
Viviana Ferretti, Andrea Terracciano,
Daniele Liuzzi, Daniele Drigo
AVIO
Francesco Di Matteo
ESA

The optimization problem was to minimize the total pressure drop between the inlet of the collector and the outlet of the combustion chamber with a constraint on the maximum temperature at the firing plate

Abstract

The M10, which will use liquid oxygen and liquid methane as propellants, is a new-generation more environmentally friendly engine for the final stage of the launcher, and was developed and built by Avio in Colleferro in Italy. It is a 10-tonne LOX/LCH4-class cryogenic liquid rocket engine and is the first European engine to use methane. The design team, led by Avio, involves a consortium of companies from Belgium, the Czech Republic, Switzerland, France, Austria, and Romania. The design objective for this activity was to reduce the pressure drop between the inlet of the manifold and the outlet of the engine combustion chamber with a constraint on the maximum temperature of the firing plate.

Fig. 1. The M10 engine.

…The M10 (see Fig. 1), which will use liquid oxygen and liquid methane as propellants, is a new-generation more environmentally friendly engine for the final stage of the launcher, and was developed and built by Avio in Colleferro in Italy. It is a 10-tonne LOX/LCH4-class cryogenic liquid rocket engine and is the first European engine to use methane. **The design team, led by Avio, involves a consortium of companies from Belgium, the Czech Republic, Switzerland, France, Austria, and Romania**. The design objective for this activity was to reduce the pressure drop between the inlet of the manifold and the outlet of the engine combustion chamber with a constraint on the maximum temperature of the firing plate.
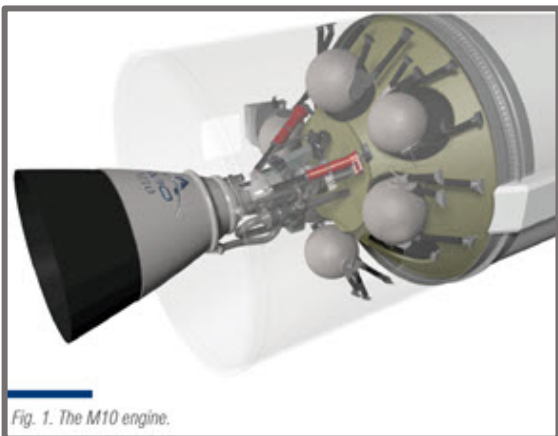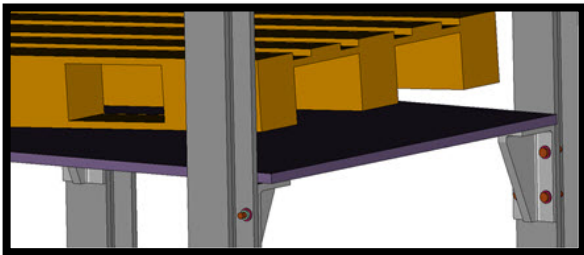
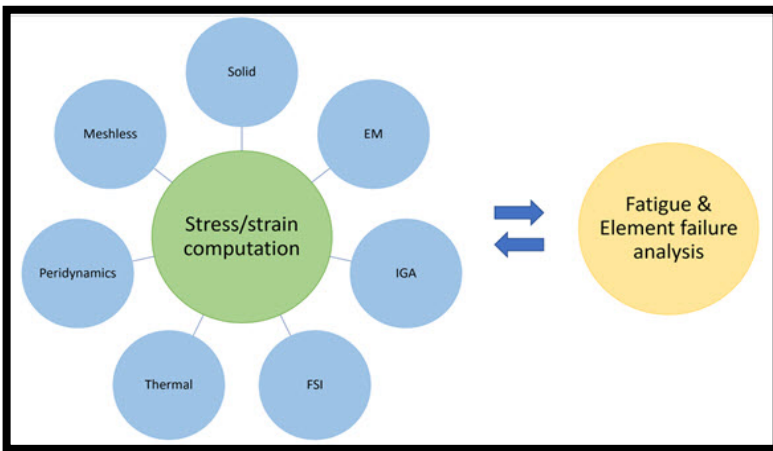**DYNAMORE -** The time-domain fatigue solver is fully coupled through element stress/strain-computations making it compatible with most of the solvers included in LS-DYNA today. Fatigue failure is the primary cause of structural failure. Because of this, fatigue analysis is today often a well-integrated part of the product development cycle. Starting with version R12, the LS-DYNA package includes both a frequency-domain fatigue solver and a time-domain fatigue solver. The latter offers the possibility to perform fatigue analysis for highly non-linear event

Fatigue analysis - Case study: Warehouse shelves - Time Domain Fatigue analysis for pallet impact loads using sub-modeling

The time-domain fatigue solver offers several useful features, for example:

- Stress- and strain-based fatigue
- Multiaxial fatigue options
- Mean stress correction options
- Restart analysis option

This case study shows a fatigue analysis using LS-DYNA, evaluating the radii in a bracket for the case of a pallet drop. The load case corresponds to a heavily loaded pallet being roughly set down on a shelve, i.e., dropped from the height of 10 mm with an impact angle of 3 degrees. This load case will contribute to the accumulated fatigue damage of the shelve brackets and must therefore be analyzed. Since this is a very dynamic event, the bracket's stress history cannot be determined accurately using a static analysis. Instead, a realistic dynamic simulation is made in LS-DYNA, which provides an accurate stress-time history as the basis for the fatigue calculation. To estimate the fatigue damage of the bracket radii, a highly resolved mesh must be used at these locations. To avoid large and time-consuming FE-models, sub-modeling is applied. The solution strategy can be summarized as follows:

- Explicit time-dependent simulation of the impact
- Coarser mesh
- Interface output for sub-modeling
- Time dependent sub-model analysis
- Time domain fatigue analysis
- Only on selected highly stressed elements

- Fine mesh.
- Using the interface output in (1)
- Element output (elout) of elements for fatigue analysis
- Stress based, high-cycle fatigue
- S-N curve input

Step 1: Impact simulation - **This LS-DYNA model contains the entire structure and uses a medium resolution mesh.** The mesh is fine enough to yield accurate displacements/velocities at the selected interface areas of the sub-model. The bolts connecting the brackets to the frame are modeled with solid elements and are pre-tensioned. For calculating fatigue damage, applying the correct preloading from gravity and tensioned bolts is crucial since it greatly affects the mean stress level and effective stress amplitude, and therefore the calculated fatigue damage. Appropriate sub-model interfaces are selected for output through the *INTERFACE_COMPONENT_{OPTION}-keyword.
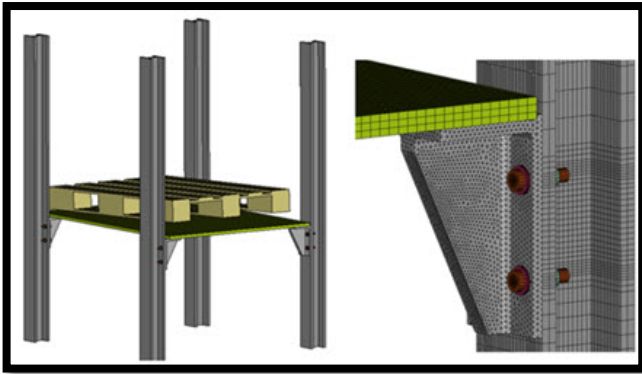
The simulation time is selected to be long enough to cover all stress peaks that may contribute to the fatigue damage.

Step 2: Sub-model of the bracket - Analysing only a portion of the large model makes the evaluation less time-consuming. The bracket mesh is refined for better resolution of the stress gradients, especially at the radii. The sub-model is driven at selected interfaces by *INTERFACE_LINKING_{OPTION}-keyword using interface data from the impact simulation. To further reduce the input to the time-domain fatigue solver, the keyword *FATIGUE_ELOUT will be used. Using this keyword, fatigue analysis will only be performed on the most stressed elements that have been selected and output through *DATABASE_ELOUT. In this case, only the radii are of interest, so only the elements in the radii are output to the ELOUT database.
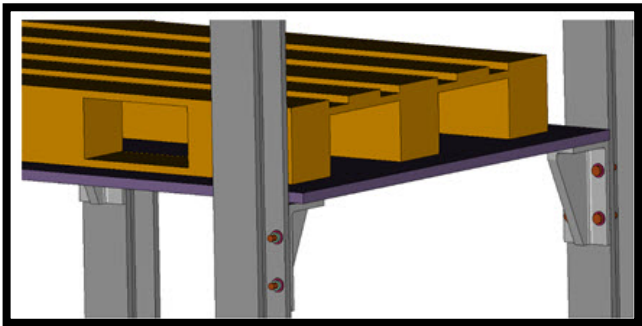
Step 3: Fatigue analysis and results

The element stress history is in a case like this very dynamic. A rainflow-counting algorithm is automatically applied to the recorded element stress histories in the fatigue solver to perform the fatigue cycle counting. After the cycle counting is finished, Palmgren-Miner's rule is used to calculate the cumulative fatigue damage ratio.
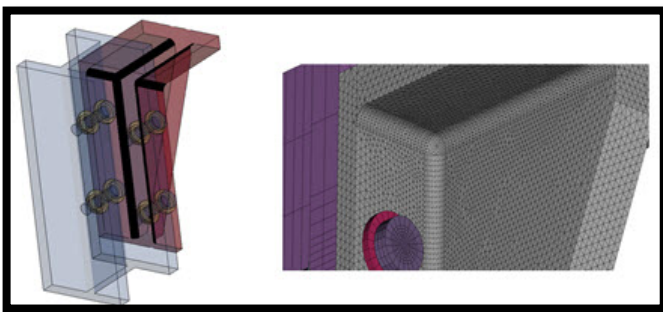
d3View – Did you know that Simlytiks unites exploring, sharing and analyzing data into one application.

D3View - one Platform offers you 12 different applications to interpret your data for your design process.
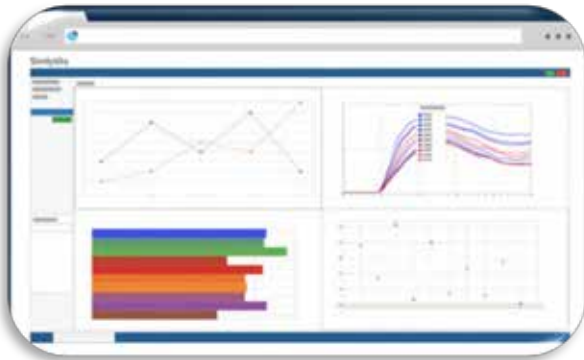
Simlytiks® - A Rich, Interactive Platform to Your Support Decisions.

Enhance the Experience of Exploring Data.

It's uses extensive visualization tools to hone in on specifics, trends, patterns or just the most important aspects of large or small datasets.

Because of this, Simlytiks creates stories from your data, so you can understand what is working and what needs improvement.
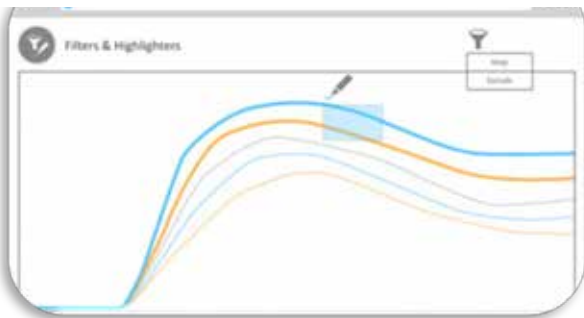
Extensive Visualization Tools

Clarify data with visualizations to answer questions that enhance, refine or reshape products, services, etc.

Exclude unwanted data or highlight important aspects with filters and highlighters.

Train, predict and identify data trends or patterns easily with A.I. and Machine Learning integration.
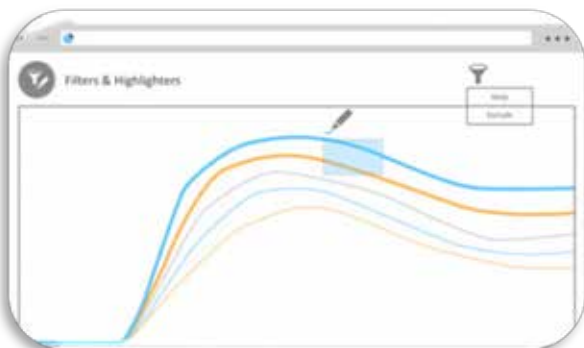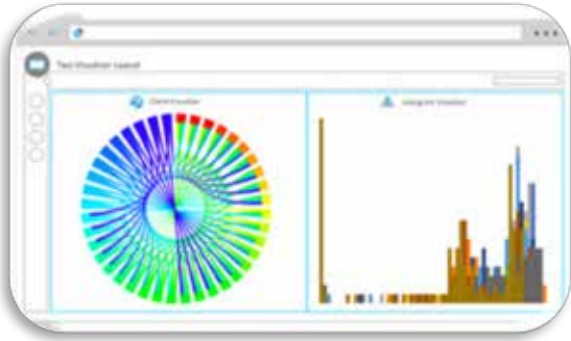
Visualizers, Pages and Layouts - Explore an extensive list of basic and advanced visualizers that include 3D options for both basic and scientific data.

Apply and save visually distinct colors through out all visualizations in a data set.

Utilize options to animate information and responses.

Use grid layouts to easily compare up to 16 different visualizations on one page, and create as many pages as needed to explore with multiple layouts.

Platform Integration - Simlytiks seamlessly integrates with other applications on the platform so no matter how you are reviewing your data, you can always delve into and disseminate it vividly and efficiently.

Compare records from simulations with records from physical tests directly.

Visualize and explore database records, and examine them further by applying view templates.

· Speed up and nourish your decision-making process by utilizing better more robust ways to investigate,
· Perceive, record and narrate valuable data.
· Choose the most effective and advanced path for your most significant business endeavors.
· Create a better tomorrow by making better decisions today with Simlytiks®.

FIGES AS - Signal processing engineers use MATLAB and Simulink at all stages of development—from analyzing signals and exploring algorithms to evaluating design implementation tradeoffs for building real-time signal processing systems.
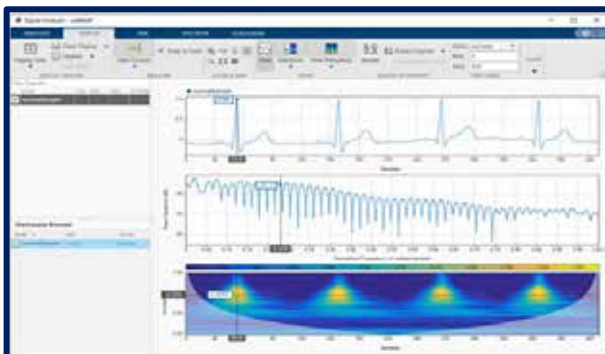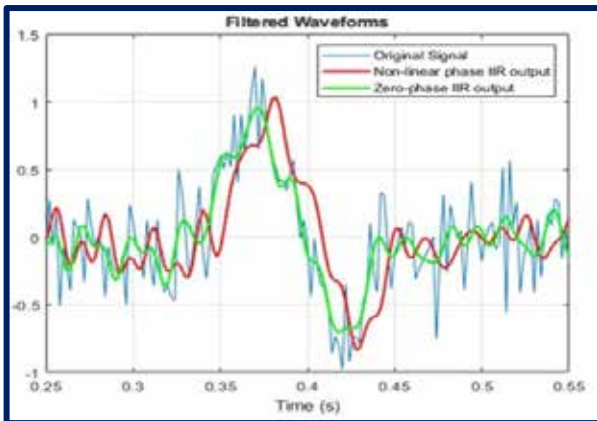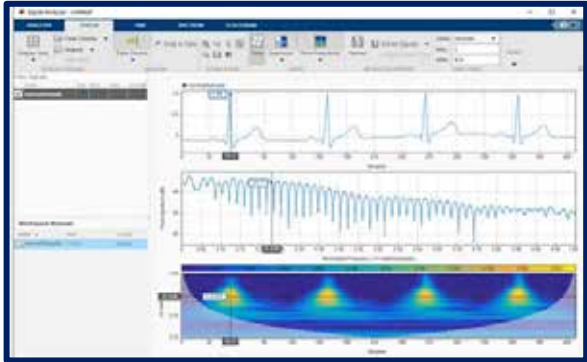
[Signal Processing](#) **Excerpts -** Built-in functions and apps for analysis and preprocessing of time-series data, spectral and time-frequency analysis, and signal measurements.

Signal Analysis and Measurements - MATLAB and Simulink help you analyze signals using built-in apps for visualizing and preprocessing signals in time, frequency, and time-frequency domains to detect patterns and trends without having to manually write code. You can characterize signals and signal processing systems using domain-specific algorithms across different applications such as communications, radar, audio, medical devices, and IoT.

Filter Design and Analysis - Design and analyze digital filters from basic single-rate lowpass or highpass to more advanced FIR and IIR designs, including multirate, multistage, and adaptive filters. You can visualize magnitude, phase, group delay, and impulse response, as well as evaluate filter performance, including stability and phase linearity. Filter designs can be analyzed and simulated to evaluate the effects of different internal structures and fixed-point data types. They can also generate embedded software or hardware implementations. For advanced and application-specific use cases, you can exploit predesigned filters and filter banks, like wavelet-based filter banks, perceptually-spaced filter banks, or channelizers.

Model-Based Design for Signal Processing - When designing signal processing systems, you can use a combination of block diagrams and language-based programming. You can use Simulink to apply Model-Based Design to signal processing systems for modeling, simulation, early verification, and code generation. You can use libraries of blocks with application-specific algorithms for baseline signal processing, audio, analog mixed-signal and RF, wireline and wireless communications, and radar systems. You can visualize live signals during simulations using virtual scopes, including spectrum and logic analyzers, constellations, and eye diagrams…

My Physics Café - CAE Analyst and a passionate blogger, <u>My Physics Cafe</u>
CAE Compass: Career Roadmap

As beginners, it can be difficult to know what career path to pursue in order to become a professional in CAE. Often, we find ourselves uncertain about the steps we are required to take in order to develop a career in this field.

EXCERPTS – The full article with links are on the website

In this article, I will take you through the exact steps you can follow to become a CAE professional. I will share with you a detailed (downloadable) roadmap that you can use for reference whenever you feel uncertain. But before that, I hope you've already gone through the prerequisites for a career in CAE. So, let's begin.

Here are 4 of the 8 steps you can follow for 'Beginner to Professional' career journey:

1) Gain a fundamental understanding of Engineering subjects:
- Before diving into FEA, it is important to have a strong foundation in mechanics and mathematics as they form the core of Engineering problem solving. I've written a detailed post on exactly what to learn, how and from where to learn the fundamental concepts. You can read it on the website.

2) Learn FEA software:
- There are several **FEA software packages available in the market, such as ANSYS….** Choose a software package that suits your interests and start learning it right away.
- Many software vendors offer free trial versions or online tutorials to help you get started. **Also keep in mind that, choosing a product/domain of your interest before choosing the software is of utmost importance. The software you need to learn will depend on your area of interest.**
- For example, if you are interested in Aerodynamics of a car, then your domain of interest is CFD and therefore the software that you must learn will be Ansys. Similarly, if your domain of interest is Vehicle Crashworthiness or product domain as Seating system, then you need to learn LS-DYNA in this case.

3) Practice with sample problems:
- Once you have learned the basics of FEA, start practicing with sample problems. A lot of software packages include sample problems that you can use to practice and refine your skills.
- **One such example is Dynamore.com where they have provided numerous case studies in LS-DYNA along with the input files for reference**. Similarly, if you visit websites like Altair.com or Ansys.com you will find good number of tutorials and case studies on almost any kind of problem or load cases. If that's not enough, you can always visit platforms like Youtube to explore different channels or trainings based on CAE.

4) Gain Industrial Exposure:
- Often, when we start learning something new, we tend to do things which we aren't supposed to do. What I mean is, when we chase our inclinations, we immerse ourselves in the flow and go further, doing things just because they interest us and lose track of reality.
- The best way is to attend industry conferences, seminars and workshops to learn from experts in the field. This will allow you to stay up-to-date with the latest trends and developments in FEA. Another good way is to get in touch with the senior industry personnel who can guide you well.

On the website continue **5)** Join professional organizations. **6)** Gain practical experience. **7)** Network with the right people. **8)** Keep learning and upgrade yourself consistently. Conclusions and roadmap
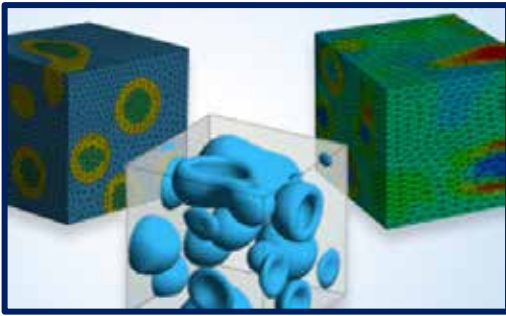
JSOL - **J-OCTA can be used at the forefront of materials and life science R&D.** J-OCTA is a multi-scale simulation software that predicts properties from the atomistic to the micrometer scale on a computer for research and development of a wide range of high-performance materials such as resins, rubbers, nanocomposites, thin films, inks, and batteries, and in the life science field such as drug discovery and pharmaceutical formulation.

Applus+IDIADA **NVH Laboratories** - **THE SOLUTION - Hemi-anechoic chamber:** The hemi-anechoic chamber is used to perform any type of test that requires no distraction from foreign noises and vibration events. The room is completely isolated from the rest of the building and the dynamometer inside the chamber is capable of reproducing the driving conditions existing in the proving ground. The noise absorbing wedges installed in the walls and ceiling minimize noise reflection emulating free field condition.
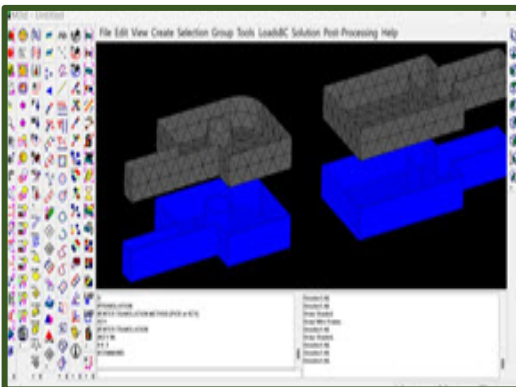
M3d FEA - **M3d FEA download the free FEA software.** - M3d is a fully integrated Finite Element modeller, solver and post-processor in one small executable. M3d supports a basic form of command line scripting making it easy to automate basic tasks. It also has an API which can be accessed directly using MS-EXCEL visual basic. Consider M3d for bespoke integrated solutions tailored to your specific company needs…. Use M3d with MSc, NX or Autodesk Nastran.

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CNH INDUSTRIAL - **New Holland Agriculture a global brand of CNH Industrial has been awarded a 2023 Green Good Design Award** - Awarded for its T7 Methane Power LNG (Liquefied Natural Gas) prototype tractor...

We partnered with Bennamann, a UK-based expert whose multi-patented approach converts fugitive methane to clean biofuel – helping support an energy independent and sustainable farm system. We stand with the world's farmers and construction workers.

Welcome to our Town 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 Current Content:

Free Coffee for visiting

Booth		Description
Rescale		Revolutionizing Supersonic Travel: Exosonic and Rescale Redefine the Future with Tim Macdonald
DYNAmore		Now available 7 presentations - The Infoday Automotive and Aerospace Applications took place on December 1st, 2022
OZEN Engineering		How to model surface coating stress in Ansys Mechanical - This video demonstrate how you can model this in Ansys mechanical very easily.
OASYS		Top Tip: How to extract max and min countour values from Oasys REPORTER
RAND		Join Dennis Chen from Rand Simulation for a detailed introduction to Ansys LS-Dyna for structural engineering simulation.

Hans the human body model from DYNAmore   **RheKen the AI reporter from FEANTM**

**My name is Hans and I'm visiting my friend Rheken in the US.
I'm from DYNAmore Germany & working remotely.**

Did you know that I have a newsletter? – I call it **Hans**
(Yeehaw! I learned to yell that from the Old Cattle Rancher)
Did you know that RheKen has a pdf newsletter? – She calls it **RheKen**

Meet Henry, and we spell his name HanRhe. He was eating food out of a trashcan. Then we noticed he was running toward the traffic to chase a tire. I ran and picked up HanRhe. I saved him from a tire impact injury. We decided to adopt him.

As a human body model one of my main interests is crash/impact injuries. June we're teaching HanRhe not to chew on shoes and never to chase car tires.

OUR NEWS:

DYNAmore Support days Occupant Safety
July 27th Information day, headquarters in Stuttgart-Vaihingen

On the occupant safety support days, you can bring your own LS-DYNA simulations or input decks. The support days will mainly focus on questions regarding the handling and analysis of dummy models. Experienced members of the DYNAmore staff will be available to discuss your specific needs and to find solutions to your problems.

The 14th European LS-DYNA Conference
October 18 &19 Baden-Baden, Germany

We invite you to the 14th European LS-DYNA Conference. At the get together on the evening of October 17, there will be an opportunity to enjoy meeting friends and colleagues and look forward to the coming two conference days. At the conference you have the opportunity to network with old and new contacts.

About me, Hans: I am based on the geometry of a 50-percentile male adult. At this time my model development will focus on the following key aspects:

My Level of detail	I will have realistic modeling of the musculoskeletal system for detailed analyses of the skeleton and musculature at the geometry and material level
My Robustness	I will include having robustness considerations during meshing and material card generation
My Efficiency	I will have moderate element count and sparing use of "expensive" solver features
My Usability	I will escort the entire workflow with positioning concepts, tools for pre- and post-processing as well as user support

A human body model (HBM) is a computerized model used to simulate and analyze the biomechanical response of the human body to various types of forces, such as impacts or vibrations. The HBM can be customized to represent different body sizes, shapes, and postures.

Hans the human body model from DYNAmore is working remotely in our town while visiting RheKen, the town AI reporter. Additionally, they are training their adopted rescue dog HanRhe not to chase tires.

Visiting The FEANTM Town Civil War Cannon located on the Town Hill

The Old Racers Automotive
News & Track
No one knows his name. You yell, "HEY, old racer."

June
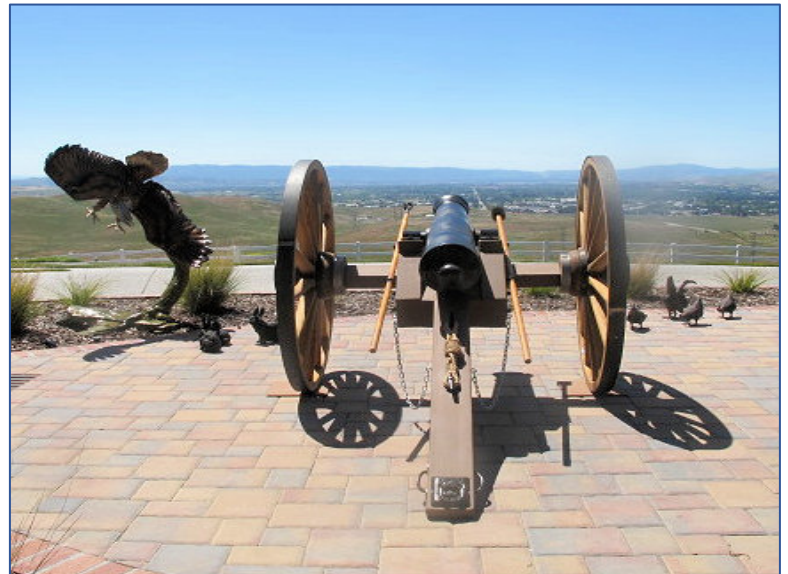
Mercedes-AMG GT3 Teams and Drivers Secure Three Overall Race Wins and a Podium Lockout in Fanatec GT World Challenge and GT America Competition at NOLA Motorsports Park

Three Mercedes-AMG GT3 teams combined to secure three overall race wins and a podium lockout to highlight a string of additional class wins, podium finishes and a Mercedes-AMG GT4 runner-up result that was decided in a photo finish.

For the second-straight SRO Motorsports America event, the weekend's overall race winners were the No. 04 CrowdStrike Motorsports with Riley Mercedes-AMG GT3, co-driven by George Kurtz and Colin Braun, and the No. 101 TKO Motorsports Mercedes-AMG GT3 of Memo Gidley.

Excerpts - Both teams factored into the most impressive result of the weekend which was a top-three podium lockout in Sunday's second GT America powered by AWS 40-minute sprint race. Gidley took the victory to sweep the NOLA weekend with his third and fourth GT America victories in this season's first six races. He was joined on the podium by Kurtz in second and a resurgent Jason Daskalos who finished third in the No. 27 CP Racing Mercedes-AMG GT3.

Daskalos followed Gidley to the finish line in Saturday's opening GT America race for a top-two Mercedes-AMG GT3 finish that was topped only by Sunday's result. The strong NOLA finishes provisionally keep both Gidley and Daskalos first and second in the GT America early-season championship standings after the first half-dozen of this year's 18 scheduled races.

Kurtz closed out the NOLA weekend with a convincing overall and Pro-Am class victory in Sunday's featured Fanatec GT World Challenge America 90-minute race. Co-driving with longtime teammate Colin Braun, Kurtz stayed clear of several late-race incidents to secure his and the team's second victory in this year's first four GT World Challenge races.

Saturday's rain-delayed GT World Challenge opener saw co-drivers Scott Smithson and Bryan Sellers step up for the best Mercedes-AMG results of the day with a second-place Pro-Am finish and top-five overall result in the No. 08 DXDT Racing Mercedes-AMG GT3.

For the complete racing information, wins, stats - visit the website!

The Old Racers Automotive
News & Track
No one knows his name. You yell, "HEY, old racer."

June

BMW [First design highlights of the future MINI models.](#)

MINI provides a first glimpse of the trend-setting design of the upcoming all-electric model family, giving a preview of Charismatic Simplicity, the new, reduced design language that focuses on the essentials. Each new MINI model gains its own strong individual character that is expressed in distinctive design features, while exuding individuality with a clear brand affiliation. Sustainable materials are another essential part of the new design language.

> With our new Charismatic Simplicity design language, we are completely rethinking the iconic MINI. Our purist, progressive approach combines the simplicity of functional elements with the emotionality that MINI is renowned for. We are convinced that the conscious reduction to a few, but expressive elements enable innovations that would have been unthinkable before."
> **Oliver Heilmer,   Head of MINI Design**

Round OLED display combines tradition with state-of-the-art technology.

At the centre of the visually reduced interior is the circular central instrument display iconic of MINI, which will be reinterpreted in the form of an OLED display in the upcoming model family. MINI is the world's first car manufacturer to offer a touch display with a fully usable round surface. The OLED display has a diameter of 240 mm and combines the functions of the instrument cluster and the on-board monitor. The sleek design and frameless look give it a particularly high-quality appearance. The touch control enables a completely new, minimalistic user interface that also controls the integrated infotainment and climate functions. With the purist dashboard as a stage for the circular central display, MINI continues the traditional design heritage of the classic MINI.

The completely redesigned light-alloy wheels also follow the principle of the new design language. The MINI wheels of the upcoming model family no longer focus on the sculptural nature of the spoke structure, but on a graphic design characterised by strong colour contrasts. This creates an illusion of size, which is further emphasised by the outward-pointing spokes. The pared-back, two-dimensional wheel design contributes to improved aerodynamic qualities and increased range with its somewhat compact, two-dimensional design.

With these innovative design highlights, MINI is already dropping a hint of the ground-breaking step the Charismatic Simplicity principle is taking. The new MINI design language combines quality, sustainability, and purist reinvention in perfect synthesis with the historic DNA of the brand

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Based on the new Stryker A1 chassis, the M–SHORAD enables the Army's maneuver units for Multi–Domain Operations. General Dynamics Land Systems is a global leader in the design, development, production, support and sustainment of tracked and wheeled military equipment.

Excerpt **M-SHORAD system bolsters Army's air defense capabilities**© to U.S. Army - By Jordan Allen

The 5th Battalion, 4th Air Defense Artillery Regiment (5-4 ADA), 10th Army Air and Missile Defense Command, is the first unit in the Army to receive the Mobile Short Range Air Defense (M-SHORAD) system. The M-SHORAD integrates existing guns, missiles, rockets and sensors onto a Stryker A1 vehicle. The system is designed to defend maneuvering forces against unmanned aircraft systems, rotary-wing and residual fixed-wing threats. **(Photo Credit: Cpt. Jordan Allen)**

In continuing efforts to revitalize and update the U.S. Army's Air and Missile Defense forces and systems, the 5th Battalion, 4th Air Defense Artillery Regiment (5-4 ADA), a subordinate unit under the 10th Army Air and Missile Defense Command, is the first battalion in the Army to test, receive, and field the Mobile Short Range Air Defense (M-SHORAD) system.

The M-SHORAD, which integrates existing guns, missiles, rockets and sensors onto a Stryker A1 vehicle, is the Army's newest addition in a variety of modernization efforts. The system is designed to defend maneuvering forces against unmanned aircraft systems, rotary-wing and residual fixed-wing threats.

The 10th Army Air and Missile Defense Command is U.S. Army Europe and Africa's executive agent for all theater air and missile defense operations and force management. Since activating the battalion in 2018, 5-4 ADA has played a major role in supporting Allies and partners through their involvement in various joint and multinational training exercises across the European theater.

"This is truly a testament to our Army's commitment to increase air and missile defense capability and capacity to the joint force, and especially here in Europe," said Brig. Gen. Gregory J. Brady, Commander of the 10th Army Air and Missile Defense Command. "Just under 3 years ago 5-4 ADA was the Army's first SHORAD battalion activated in almost 13 years, and now they are proud again to be the first to lead the Army's Air and Missile Defense modernization initiatives with M-SHORAD. The 10th AAMDC is proud to be a part of this Team effort and remains engaged, postured and ready to assure, deter, and defend the maneuver force in an increasingly complex Integrated Air and Missile Defense environment, shoulder to shoulder with our NATO Allies."

The Army utilized a rapid prototyping strategy to accelerate the timeline for M-SHORAD initial operating capability by four years, resulting in the delivery of a prototype system in approximately one year. In 2020, 18 Air and Missile Defense crewmembers from 5-4 ADA were selected to undergo a 6-month initial operational assessment with the prototype systems at White Sands Missile Range, New Mexico.
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Bayraktar KIZILELMA
YouTube
[Highlights of future Documentary](#)

English subtitles are available

Updated:
[The Goal: KIZILELMA Documentary](#)
| Chapter 1
English subtitles are available

The quiz Name That Fighter was left in the suggestion box by The Old Retired Pilot.

No one in town knows his name. You yell, "HEY, Old Pilot."

Answers are on the last page.

_____"Turkish Fighter" - developed by Turkish Aerospace Industries (TAI).

_____Designed originally as an air superiority fighter and is manufactured by a consortium of Airbus, BAE Systems and Leonardo that conducts the majority of the project through a joint holding company, Eurofighter Jagdflugzeug GmbH.

_____
(French, literally meaning "gust of wind", and "burst of fire" in a more military sense) is a French twin-engine, canard delta wing, multirole fighter aircraft designed and built by Dassault Aviation.

US Airforce Red, White & Blue

A **U.S. Air Force C-17 Globemaster III** participating in Exercise Golden Phoenix takes off on a dirt runway at Schoonover Airfield, Calif., May 9, 2023. Golden Phoenix is a large-scale readiness exercise hosted by Travis Air Force Base with full-spectrum support from partner units.

(U.S. Air Force photo by Heide Couch)

Commemorative flight

An **F-16C Fighting Falcon** assigned to the 120th Fighter Squadron, Colorado Air National Guard, painted to commemorate the 100th anniversary of the unit, flies with an F-35A Lightning II, assigned to the 134th Fighter Squadron, Vermont Air National Guard, over Leadville, Colo., May 8, 2023. Today the 120th FS is a dual-purpose fighter squadron with pilots qualified to perform air-to-air and air-to-ground missions including Offensive Counter-Air, Defensive Counter-Air, OCA Interdiction, Close Air Support and Combat Search and Rescue missions.

(U.S. Air Force photo by Master Sgt. Matthew Plew)

Fear the Reaper

An **MQ-9 Reaper** lands on Highway 287 during exercise Agile Chariot in Rawlins, Wyo., April 30, 2023. Instead of relying on large, fixed bases and infrastructure, Agile Combat Employment uses smaller, more dispersed locations and teams to rapidly move and support aircraft, pilots and other personnel wherever they are needed.

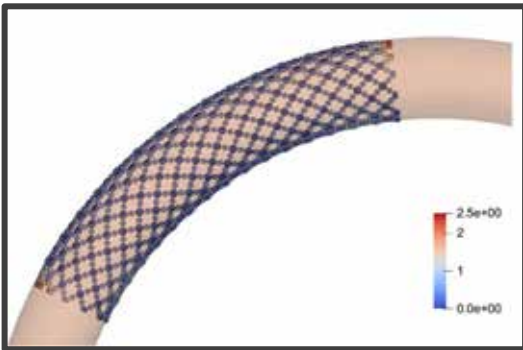(U.S. Air Force photo by Tech. Sgt. Carly Kavish)

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

Beatrice Bisighini - Early Stage Researcher 03

A published paper on EndoBeams.jl: A Julia finite element package for beam-to-surface contact problems in cardiovascular mechanics

EndoBeams.jl: A Julia finite element package for beam-to-surface contact problems in cardiovascular mechanics

The increasing use of mini-invasive and endovascular surgical techniques is at the origin of the pressing need for computational models to support planning and training. The increasing use of mini-invasive and endovascular surgical techniques is at the origin of the pressing need for computational models to support planning and training. Several implantable devices have a wire-like structure, which can be modelled using beam elements.

Our objective is to create an efficient Finite Element (FE) modelling framework for such devices. For that, we developed the EndoBeams.jl package, written exclusively in Julia, for the numerical simulation of contact interactions between wire-like structures and rigid surfaces. The package is based on a 3D FE corotational formulation for frictional contact dynamics of beams. The rigid target surface is described implicitly using a signed distance field, predefined in a volumetric grid. Since the main objective behind this package is to find the best compromise between computational speed and code readability, the algorithm, originally in Matlab, was translated and optimised in Julia, a programming language designed to combine the performance of low-level languages with the productivity of high-level ones. To evaluate the robustness, a set of tests were conducted to compare the simulation results and computational time of EndoBeams.jl against literature data, the original Matlab code and the commercial software Abaqus. The tests proved the accuracy of the underlying beam-to-surface formulation and showed the drastic performance improvement of the Julia code with respect to the original one. EndoBeams.jl is also slightly faster than Abaqus. Finally, as a proof of concept in cardiovascular medicine, a further example is shown where the deployment of a braided stent is simulated within an idealised artery.

Meditate Early-Stage Researchers (ESRs) presented their research at the 18th Int'l Symposium on Computer Methods in Biomechanics & Biomedical Engineering in Paris, France.

Beatrice Bisighini– ESR 03: Towards a real-time simulator of flow diverters deployment based on model order reduction.
Rahul Sathish Vellaparambil– ESR 08: In silico analysis of Auxetic inspired stent-grafts for endovascular aortic repair.
Francesco Bardi– ESR10: Preoperative hemodynamic simulation of a patient specific evar procedure.
Marta Bracco–ESR 13: Validation of abdominal aortic aneurysm motion tracking with simulated ultrasound cine-loops.

Beatrice Bisighini

Endoluminal reconstruction using flow diverters represents a novel paradigm for the minimally invasive treatment of intracranial aneurysms.
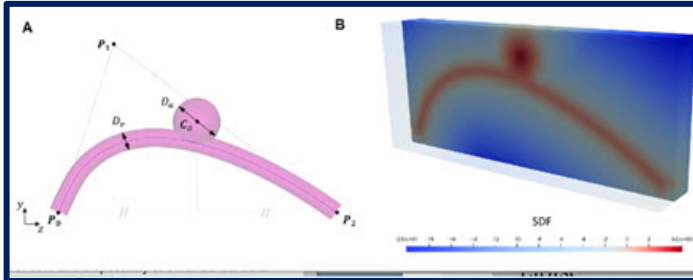
Machine learning and reduced order modelling for the simulation of braided stent deployment

Authors :

Beatrice Bisighini   Miquel Aguirre   David Perrin
Federica Trovalusci   Stéphane Avril   Baptiste Pierrat
Marco Evangelos Biancolini

The configuration assumed by these very dense braided stents once deployed within the parent vessel is not easily predictable and medical volumetric images alone may be insufficient to plan the treatment satisfactorily.

Therefore, here we propose a fast and accurate machine learning and reduced order modelling framework, based on finite element simulations, to assist practitioners in the planning and interventional stages. It consists of a first classification step to determine a priori whether a simulation will be successful (good conformity between stent and vessel) or not from a clinical perspective, followed by a regression step that provides an approximated solution of the deployed stent configuration. The latter is achieved using a non-intrusive reduced order modelling scheme that combines the proper orthogonal decomposition algorithm and Gaussian process regression. The workflow was validated on an idealized intracranial artery with a saccular aneurysm and the effect of six geometrical and surgical parameters on the outcome of stent deployment was studied. We trained six machine learning models on a dataset of varying size and obtained classifiers with up to 95% accuracy in predicting the deployment outcome. The support vector machine model outperformed the others when considering a small dataset of 50 training cases, with an accuracy of 93% and a specificity of 97%. On the other hand, real-time predictions of the stent deployed configuration were achieved with an average validation error between predicted and high-fidelity results never greater than the spatial resolution of 3D rotational angiography, the imaging technique with the best spatial resolution (0.15 mm). Such accurate predictions can be reached even with a small database of 47 simulations: by increasing the training simulations to 147, the average prediction error is reduced to 0.07 mm. These results are promising as they demonstrate the ability of these techniques to achieve simulations within a few milliseconds while retaining the mechanical realism and predictability of the stent deployed configuration.

Introduction Excerpt - Intracranial aneurysms (IAs) are local dilations of the arteries in the brain caused by a degenerative weakening of the arterial wall. Saccular, or blister-like, are the most common IAs. Their prevalence among the general population is estimated to be around 2%–3 (Rinkel et al, 1998). With an incidence of 10/100,000 person-years, IAs rupture leads to subarachnoid haemorrhage, a life-threatening type of stroke with high morbidity and mortality (Wiebers, 2003; Vlak et al., 2011)…

Thanks to A. Weaver on Social-Media for bringing the post to our attention.
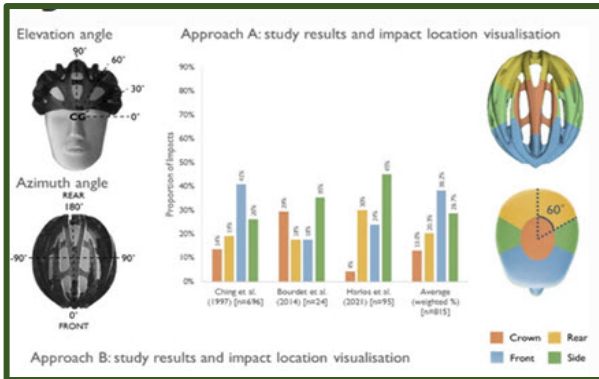
[A Review of Cyclist Head Injury, Impact Characteristics and the Implications for Helmet Assessment Methods'](#). - Our review shows that helmeted cyclists have a considerable reduction in skull fracture and focal brain pathologies compared to non-helmeted cyclists, as well as a reduction in all brain pathologies. This considerable reduction in focal head pathologies is likely to be influenced by helmet standards mandating thresholds of linear acceleration, which is understood to be primary contributor to such injuries.

Similarly, the less considerable reduction in Diffuse brain injuries is likely to be due to the lack of monitoring head rotation in test methods.

We performed a novel meta-analysis of the location of 1,809 head impacts from ten studies and found that the side and front regions are frequently impacted. Helmets frequently had impact locations low down near the rim line, and do not protect the face well. We highlight the need for consistent and clear reporting of head impact location, to enable researchers to properly compare and combine data sources.

Fewer studies were found examining head impact speeds, angles and surfaces. Further studies in these areas will help grow our understanding of head injury biomechanics. It's vital to continue to update the collision landscape relating to bicyclist head impacts, to ensure testing conditions for helmet assessment methods remain representative of what is happening on the roads and beyond, in turn, raising helmet safety.

Abstract - Head injuries are common for cyclists involved in collisions. Such collision scenarios result in a range of injuries, with different head impact speeds, angles, locations, or surfaces. A clear understanding of these collision characteristics is vital to design high fidelity test methods for evaluating the performance of helmets. We review literature detailing real-world cyclist collision scenarios and report on these key characteristics. Our review shows that helmeted cyclists have a considerable reduction in skull fracture and focal brain pathologies compared to non-helmeted cyclists, as well as a reduction in all brain pathologies. The considerable reduction in focal head pathologies is likely to be due to helmet standards mandating thresholds of linear acceleration. The less considerable reduction in diffuse brain injuries is likely to be due to the lack of monitoring head rotation in test methods. We performed a novel meta-analysis of the location of 1809 head impacts from ten studies. Most studies showed that the side and front regions are frequently impacted, with one large, contemporary study highlighting a high proportion of occipital impacts. Helmets frequently had impact locations low down near the rim line. The face is not well protected by most conventional bicycle helmets. Several papers determine head impact speed and angle from in-depth reconstructions and computer simulations. They report head impact speeds from 5 to 16 m/s, with a concentration around 5 to 8 m/s and higher speeds when there was another vehicle involved in the collision. Reported angles range from 10° to 80° to the normal, and are concentrated around 30°–50°. Our review also shows that in nearly 80% of the cases, the head impact is reported to be against a flat surface. This review highlights current gaps in data, and calls for more research and data to better inform improvements in testing methods of standards and rating schemes and raise helmet safety.

ArmyBlackhawkPilot

An Engineer trying to use the other half of his brain.

Please enjoy my modest collection from life's experiences and my travels I have been fortunate enough to make.
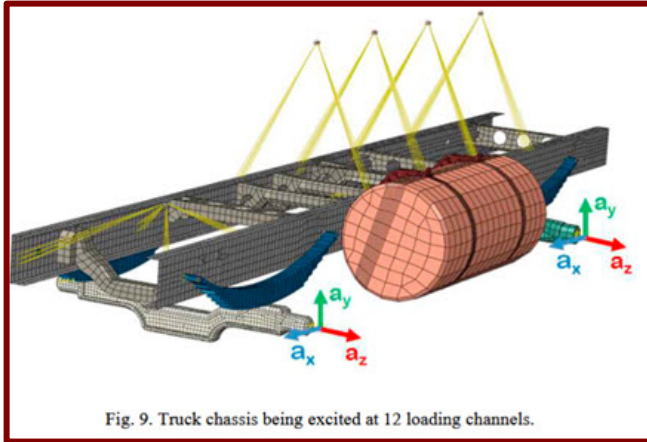
California Coast **One of the pictures from the Album.**
The website has high resolution graphics and information on the picture.

Library Learning Room

Thanks to Marco Evangelos Biancolini on Social-Media for bringing the post to our attention.

Fig. 9. Truck chassis being excited at 12 loading channels.

Thanks to Science Direct for Open Access

Random vibration fatigue of welded structures - Applications in the automotive industry

Giovanni N. Teixeira, Martin Roberts
 Dassault Systèmes Simulia R&D, Sheffield S1 4LW, UK

Juliano Silva
   Volkswagen C&O, Resende, CEP 27537-803, Brazil

Juliano Silva Filho, "I'm excited to share an interesting paper on Random Vibration Fatigue of Welded Structures and its applications in the Automotive Industry.

The paper presents a stochastic method that is consistent with fatigue analysis based on sampling and estimated component life. It also focuses on a method that is insensitive to mesh, making it suitable for use with finite elements. This method was applied to welded joints, which are typically the weak point of the structure.

Understanding random vibration fatigue is important in ensuring the durability and reliability of welded structures in the automotive industry. This paper provides valuable insights into the analysis and design of such structures, and could be beneficial for researchers and practitioners in this field."

Abstract Excerpt - The automotive industry is facing its most significant transformation since the first Ford factory. The rise of electrical vehicles alongside autonomous driving and additive manufacturing increase demand for lightweight vehicles, which require proper numerical analysis tools in place in order to keep the cost low and to achieve durability targets. Vibration in heavy and light-duty vehicles poses many challenges in the design phase mainly due to the uncertainties associated with the loads and material properties. Therefore, stochastic methods have attracted the attention of engineers responsible for the fatigue assessment of truck chassis and their welded attachments…

Final Remarks Excerpt - The paper approaches two of the most important subjects in the fatigue field for the automotive industry: random vibration and welded joints. The two fields have been significantly developed over the last two decades as a result of the high demand for accurate and consistent results that could be safely used in the early stages of design. Although both fields (frequency domain fatigue and fatigue of welds) received substantial attention from a number of researchers around the world, a considerable gap existed between the two, thereby motivating the research presented here…

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

Agriculture, Soil, Equipment, Cattle,
and whatever he wants.
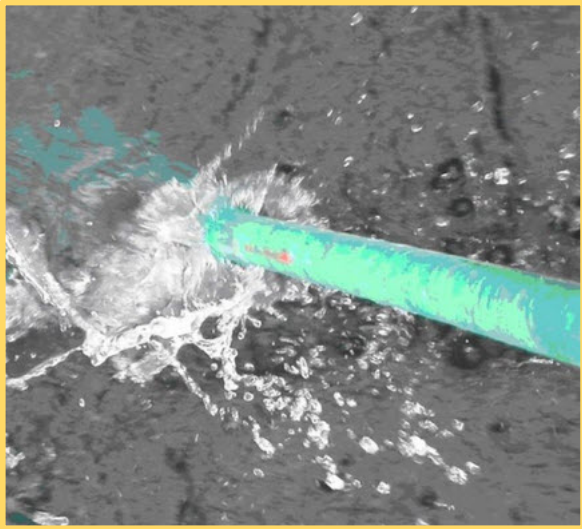
SITREP is a **Hazard Log tool, providing the ability to enter and track hazard specific information.**

It has been specifically designed and developed by AMOG Consulting

SITREP provides a simple, platform-independent, user friendly program for recording and tracking hazards information, a key element of any Safety Program.

AMOG stands for "Australian Marine & Offshore Group

The SITREP tool is closely aligned with Safety Case methodologies and provides flexibility is defining project specific risk acceptance criteria.

Report outputs are provided via a Report Server repository which provides consistent and controlled data presentation. SITREP is hosted on an Apache2 software platform, integrated using PHP5 scripting language to provide interactive web applications and utilises the open source MySQL5.1 relational database engine supporting transactions, views, procedures and functions.

SITREP's web-based design offers many advantages including:
- The ability to have multiple users logged in simultaneously.
- Multiple Platform Support via its web browser interface.
- Compatibility with current Microsoft operating systems and web browsers (Firefox and IE).
- Multiple access sites, including remote VPN access.
- Ease of installation (no local application).
- Apache2. The most popular web hosting software platform - almost twice the active installs as its nearest rival (Microsoft IIS).

SITREP has the ability to generate many reports including:
- Preliminary Hazard Analysis (PHA).
- Risk Acceptance Criteria.
- Mishap Lists.
- Key controls (and assignments).
- System Hazard Analysis (SHA).
- Verification matrix.
- Derived requirements list.
- Control impact report.
- Control verification report.

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

WAAAM is a living museum dedicated to the preservation and operation of, and education about, antique aircraft, automobiles, and other transportation related relics. The WAAAM Air & Auto Museum has one of the largest collections of still-flying antique aeroplanes and still-driving antique automobiles in the country. The items on display at this museum are not only full of history, they're full of LIFE!

1900 Locomobile Steam	**1909 Franklin**
1939 Ford Tractor	**1916 Sopwith Scout "Pup"**

Thank you for joining me on my visit to this month's museum.
AND, don't forget to join me next month when I visit another museum!

Glad you wanted my puzzles. I've decided to build upon the last one. Now you have the old and new!
If you have an ANSYS product/answer please send it to feaanswer@aol.com subject line Secretary

ANSYS Across

5. Create & Deploy Digital Twin Models
10. fluid simulation
11. optical system design
13. StructuralFEA Analysis

ANSYS Down

1. Simulation Integration Platform
2. Optical Design and Analysis
3. Material properties Database
4. Predict electronic reliability
6. Simulation for Photonic Components

ANSYS Down

7. 3D CADModeling
8. Electromechanical Design
9. 3D High Frequency Simulation
12. 3D Product Simulation
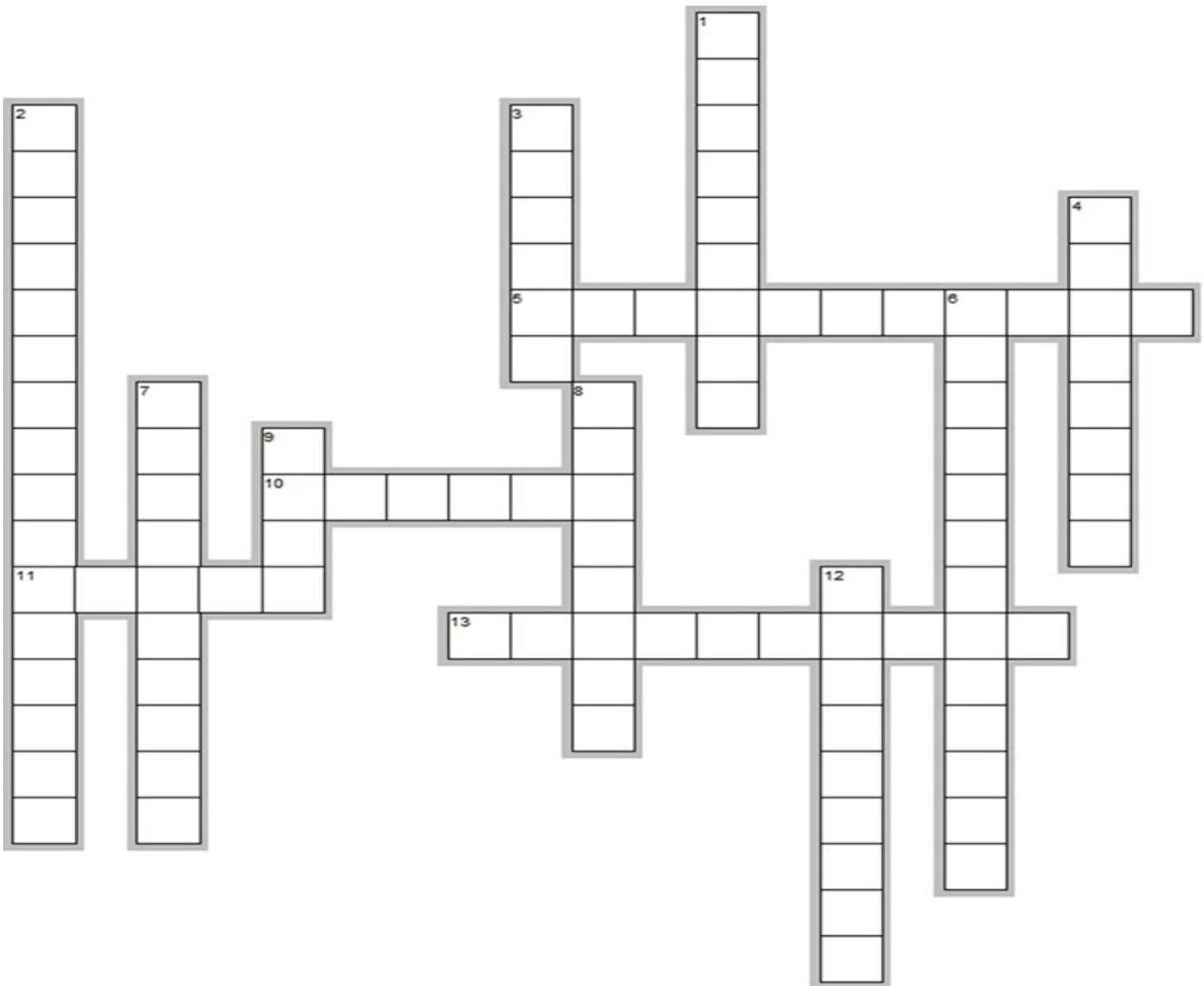
RheKen

Town investigative reporter   June

I am AI and live on a small ranch on the outskirts of the town
I use chatGPT for assistance.
Investigate: Who put Xmas decorations in the park in June?"

The town residents were discussing the town supervisor.

She was known for her strong leadership skills and to solve problems. At least, she thought she had strong leadership skills.

One day, the town was facing a significant crisis. Someone, perhaps more than one person, had been causing trouble at the local park. The trees suddenly had Xmas decorations, but the month was June! Marsha, with the strong leadership skills that she thought she had, knew that she had to take action to solve this mystery before it got any worse.

Marsha assigned several council members to work with the local police department to increase park patrols. She called a meeting with the town council. They devised a plan. Additionally, they set up a community watch program to catch who was doing decorating.

The town also organized a community volunteer clean-up day at the park to remove the Christmas decorations. The decorations that were removed were to be placed in a large roped off area. At the end of the day the area had collected no decorations. The decorations were taken home by the volunteers for their own Xmas.

Who put up Xmas decorations? Finally, Jason and Brett, from the town movie theater suggested, "Marsha, why don't we look at the park surveillance cameras?" It didn't matter to the townspeople that she didn't think of it first, they were occupied taking home the decorations!

Brett and Jason watching the video both yelled, "Marsha, see those two people in the hooded jackets?" They were wearing black jackets and hoodies, while decorating trees. Jason said, "Brett, bring in a close up view of their jackets." One jacket said Rancher and the other jacket said, Secretary. They don't get along; why would they team up? Much to everyone's surprise, the Secretary AND The Rancher decorated the trees and park.

The mystery was resolved thanks to Marsha's leadership and hard work (and finally viewing the videos, at the suggestion of Movie Theater Brett and Movie Theater Jason.)

The Rancher confessed that he was going to pay the Secretary 10 Rhubarb Pies to help him. They both like Xmas and were tired of waiting to decorate in December. And Marsha, knew that she was making a difference in the lives of the people she served. Again, did I mention that she thinks she has strong leadership skills?

The End – at least of this silly park mystery. The sad news is that The Rancher didn't pay the Secretary the promised pies. We all know she didn't like that. And she has now started a new argument!

If you have a product/answer please send it to feaanswer@aol.com

ANSYS Across
5. Create & Deploy Digital Twin Models
10. fluid simulation
11. optical system design
13. StructuralFEA Analysis

ANSYS Down
1. Simulation Integration Platform
2. Optical Design and Analysis
3. Material properties Database
4. Predict electronic reliability
6. Simulation for Photonic Components

ANSYSDOWN
7. 3DCADModeling
8. Electromechanical Design
9. 3D High Frequency Simulation
12. 3D Product Simulation

Crossword grid answers:
- 1 Down: WORKBENCH
- 2 Down: ZEMAXOPTICSTUDIO
- 3 Down: GRANTA
- 4 Down: SHERLOCK
- 5 Across: TWINBUILDER
- 6 Down: LUMERICAL
- 7 Down: SPACECLAIM
- 8 Down: MOTORCAD
- 9 Down: HFSS
- 10 Across: FLUENT
- 11 Across: SPEOS
- 12 Down: DISCOVERY
- 13 Across: MECHANICAL
- Down: ALFDTD

Goodbye and Come Back Soon

You are now leaving
Our Town
FEA Not To Miss

Please come back
Real estate available

QUIZ

TAI TF-X Kaan

The Eurofighter Typhoon

The Dassault Rafale

We will always remember.
They will never be forgotten.

Our Town Salutes our US military, NATO and Friends of the US & NATO.

We salute freedom
- First Responders, Police,
- Fire Fighters
- EMT's, Doctors, Nurses, ALL!

This month we salute teachers, professors, tutors – all educators!