

FEA - CAE Not to Miss & More **Eclectic & Innovative Blog** June ISSN 2694-4707 **Monthly Town Hall Meeting Engineering, Research, Interests** www.feantm.com







Curt - Autodesk









Carla - LS-DYNA Conference





Marco - RBF/Univ.TorVergata

Madhukar - CADFEM



OKRONE





Brianna - LLNL





Jenson - DFETECH



Margaret – CADFEM





Karl – DYNAmore Forum

Abigail - NVIDIA





Now Entering the Town Hall Plaza - drive slowly - galloping prohibited





knowmats

Adam – Knomats Repository

FEA not to miss a/k/a (FEANTM) Blog is a collective of individuals who exchange information Welcome to reading information that we find interesting. This is a hobby, no compensation.

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Editors: (alpha order) Anthony, Art, Churchill, Marnie, Marsha, Sabyl, Shweta, Taylor Jr. Editors: Rheannon and Kensington (yes, she likes pink)

Town Pretend to be Editors:

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

Contact us at: feaanswer@aol.com Attribution: Map town graphics are courtesy of vecteezy

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We will always remember



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

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- The individuals mentioned are the persons we wish to thank.
- The above doesn't imply that they are the author, with a particular company, or department

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Welcome to our Town Hall Meeting & Announcements



Free coffee & More coffee - all different flavors The town consists of individuals who

are passionate about finding solutions, as well as caring about animals and children.

Town Gossip is at the local coffee shop. Pets are welcome. Horses, pet goats stay outside.

More town changes - Who yelled, "OH no, doesn't this town ever stop changing?" A few volunteers are deciding to be future bloggers, marketers, or journalists. They have requested to use an AI image rather than their picture. I authorized it but did refuse sci-fi creatures, wizards, and paranormal images - I allowed Adam on a motorcycle since he dislikes horses, farming, and ranching - I have no idea how he can dislike those!

The Old Pilot went to the Kentucky Derby. When he returned, he mentioned that he had brought home Challenger. I thought he brought home a horse! Have him return the tank to the British Army. See Airport – British Army

RheKen has delved into why I feel a kinship to Marsa Victory. Marsa is a container ship. The names are similar. We must be related. See RheKen

The Old Rancher tried his hand at making coins for the town. We all vetoed the idea! He discovered it wasn't a simple task. See Ozen - Coin Stamping by Lucas Costa

With the AI image approval, the Pilot, Rheken, Rancher, and I failed creating an AI image (see the goodbye page). I will not bang the gavel on the desk. I am heading for coffee - a lot of coffee! Enjoy the meeting and reading – I'm taking the entire coffee pot with me AND the cookies!



Article:

- **G. Ibarra** Calculate & Visualize Relative Humidity results.
- L. Costa ANSYS LS-DYNA: Coin Stamping - Car Crash -Metal Forming



Article:



Article: **DYNAmore LS-DYNA Forum**

I want to make sure you write

down the date Oct. 16, 2024



- E. Di Meo Reduced-Order Model of a Time-Trial Cyclist Helmet...
- E. Lombardi Human Body Models customization by advanced mesh morphing ...





Dynas+ Engineering Products: "A Technical Centre of DEP MeshWorks for the European territory. **This paper introduces an innovative approach to overcome these challenges by employing advanced morphing capabilities within DEP MeshWorks, coupled with LS-OPT and LS-DYNA software**"

Vehicle Restraint System optimization and robustness assessment using the coupling between LS-DYNA LS-OPT and DEP MeshWorks software



PDF- Vehicle Restraint System optimization and robustness assessment usign the coupling between LS-DYNA, LS-OPT and DEP MeshWorks software

Authors:

- C. Goubel, T. Maillot, V. Lapoujade, M. Seulin,
- N. Van Dorsselaer

(Dynas+ Engineering Products)

J.Y. Gouiffes (ROUSSEAU Equipements)

Abstract: Road safety structures are vital components in modern transportation, marked by the European Commission, and subject to rigorous crash testing. The performance in these tests has significant marketing implications for manufacturers and

is influenced by stochastic variations in factors like raw material properties, test conditions, and vehicle design.

For decades, numerical simulation has aided in the design of road safety devices. However, the substantial variability in factors such as material characteristics, ground connections, impact conditions, and more often leads to discrepancies between simulated predictions and actual test results.

This paper introduces an innovative approach to overcome these challenges by employing advanced morphing capabilities within DEP MeshWorks, coupled with LS-OPT and LS-DYNA software. This synergy allows for efficient management of complex constraints induced by various impactors, such as light vehicles, buses, and trucks, enabling the quick and automated definition of optimal design.

The first part of the paper delves into this new methodology, shedding light on how it simplifies the intricate process of designing road safety structures. The second part emphasizes the importance of additional sensitivity studies using LS-OPT / LS-DYNA. This approach facilitates a better assessment of the variability in device response due to dispersions, empowering designers to evaluate failure risks more accurately during mandatory standard tests.

If you are a road safety engineer, designer, or involved in transportation safety standards, this paper by Dynas+ Engineering Products, utilizing DEP MeshWorks, LS-OPT, and LS-DYNA, offers valuable insights into a cutting-edge approach to road safety structure design and testing...





NVIDIA Blog – I was reading a very interesting article by James McKena and want to share it.

"To address the shift to electric vehicles, increased semiconductor demand, manufacturing onshoring, and ambitions for greater sustainability, manufacturers are investing in new factory developments and re-engineering their existing facilities. These projects often run over budget and schedule, due to complex and manual planning processes, legacy technology infrastructure, and disconnected tools, data and teams.



WEB - Excerpt - <u>How Virtual Factories Are Making Industrial</u> Digitalization a <u>Reality Manufacturers are using virtual</u> factories to <u>unlock new possibilities from planning to</u> <u>operations.</u> by James McKenna

To address these challenges, manufacturers are embracing digitalization and virtual factories, powered by technologies like digital twins, the Universal Scene Description (OpenUSD) ecosystem and generative AI, that enable new possibilities from planning to operations.

What Is a Virtual Factory? A virtual factory is a physically accurate representation of a real factory. These digital twins of factories allow manufacturers to model, simulate, analyze and optimize their production processes, resources and operations without the need for a physical prototype or pilot plant.

Virtual factories unlock many benefits and possibilities for manufacturers, including:

- **Streamlined Communication:** Instead of teams relying on in-person meetings and static planning documents for project alignment, virtual factories streamline communication and ensure that critical design and operations decisions are informed by the most current data.
- **Contextualized Planning**: During facility design, construction and commissioning, virtual factories allow project stakeholders to visualize designs in the context of the entire facility and production process. Planning and operations teams can compare and verify built structures with the virtual designs in real time and decrease costs by identifying errors and incorporating feedback early in the review process.
- **Optimized Facility Designs**: Connecting virtual factories to simulations of processes and discrete events enables teams to optimize facility designs for production and material flow, ergonomic work design, safety and overall utilization.

Intelligent and Optimized Operations: Operations teams can integrate their virtual factories with valuable production data from Internet of Things technology at the edge, and tap AI to drive further optimizations.

Virtual Factories: A Testing Ground for AI and Robotics - Robotics developers are increasingly using virtual factories to train and test AI and autonomous systems that run in physical factories. For example, virtual factories can enable developers and manufacturing teams to simulate digital workers and autonomous mobile robots (AMRs), vision AI agents and sensors to create a centralized map of worker activity throughout a facility. By fusing data from simulated camera streams with multi-camera tracking, developers can generate occupancy maps that inform optimal AMR routes.

Developers can also use these physically accurate virtual factories to train and test AI agents capable of managing their robot fleets, to ensure AI-enabled robots can adapt to real-world unpredictability and to identify streamlined configurations for human-robot collaboration...





Knowmats - Your go to for catalogued information on materials & simulation.

Knowmats is comprised of catalogued posts, links & preprints to help you perform your simulations with a better understanding how to represent your materials in Finite Element Analysis (FEA) and your simulations.

Among their repository: A publication by Applus+DatapointLabs



Validation of shear: test and simulation

WebIntegratedExperimentalAnalysis,Modeling,andValidation of High-Performance UD CFRTP Lamina

By Dr. Daniel Campos Murcia and Brian Croop, Applus+ DatapointLabs

Abstract: Thermoplastic composites present a promising opportunity for innovation within the automotive sector, owing to their lightweight properties, durability, and recyclability.

Our efforts concentrate on testing and developing models to accurately simulate the behavior of materials in automotive settings.

By delivering precise simulation models, we empower manufacturers to gain deeper insights into the performance of these materials, thereby streamlining their incorporation into vehicle design and manufacturing workflows. This advancement ensures the effective utilization of thermoplastic composites, resulting in tangible advantages such as improved fuel efficiency, enhanced safety, and reduced environmental footprint across the automotive industry.

Among the slides from the PDF that can be downloaded at KnowMats (Excerpts)

Table of Contents: Introducing DatapointLabs - Background and objectives Materials and methods - Results - Conclusions

- Introducing DatapointLabs Applus+ Group DatapointLabs-Expertise
- · Introducing DPL Materials Testing for Product Development
- Background -Thermoplastic composite materials (Long fiber reinforced thermoplastic materials (CFRTP) offer to industry a sustainable alternative to thermoset composites, combining fibers (like glass, carbon, or aramid) with thermoplastic polymeric matrices for lightweight and durable materials.)
- Background -CFRTP in the Automotive industry
- Background -Project overview (Objective of the study: To develop new testing capabilities for calibrating composite materials at meso-scale and macro-scale levels)
- Methods -Models selection: LS-DYNA MAT054 vs LS-DYNA MAT058
- · Methods Model Calibration Results Discussions- Conclusion and Remarks





HEXAGON – ODYSSEE A-Eye 2024, your decision support tool updates – I have included a few of the many updates and improvements from their website.

Using a combination of Machine Learning (ML), image processing and reducedorder modeling technology ODYSSEE A-Eye proposes predictions. The predictions are based on a database from multiple sources. A few of these sources are images, qualitative data, quantitative data, 3D models, curves, etc.



ODYSSEE A-Eye includes:

- · A-Eye_Manager
- A-Eye_App
- Quasar
- ODYSSEE A-Eye Launcher

Excerpts - What's New in ODYSSEE A-Eye 2024.1.1

- **A-Eye Manager**: The A-Eye Manager is now directly integrated within the launcher. This provides a more straightforward approach to creating and modifying customisations.
- A-Eye App: Includes the following improvements: For the STL viewer, the lighting has been enhanced to provide a better view of the displayed 3D part. In the dialog window "Methods Analysis and Settings", For clarification purposes, we have modified the labels...

ODYSSEE Quasar – Solver – Excerpts -This version includes the following updates:

- Chain Monte Carlo estimation has been updated to return an output csv file presenting the mean and standard values of the estimated parameters.
- **FMU builder:** The creation of Functional Mockup Units (FMU) based on ODYSSEE predictive model was only possible in CAE user interface.
- Thin Object Detection new function efficiently detects thin objects like cracks, holes, or burrs in images based on a learning database.

ODYSSEE Nova-Optimizer: This version includes the following updates:

- SLSQP (optimization with constraint, method 12): if optimization goes until 999, the optimal point with constraint was not displayed.
- A new keyword *SAPARAMETERS has been added (*SA_PARAMETERS is also accepted), allowing to configure the Annealing schedule. To do so, this new keyword takes two arguments: the Initial Simulated Annealing Temperature convergence parameter, and the Number of iterations until the Temperature will be decreased.

Whats New In ODYSSEE Solver	Whats New In ODYSSEE-CAE
Description: ODYSSEE Solver includes:	Description ODYSSEE CAE uses knowledge of a
ODYSSEE QUASAR: The solver to make	model's time-dependent behavior to:
predictive models and data mining analysis.	Predict the response of the model for parametric
ODYSSEE NOVA: The optimizer to search for	surveys - Use this prediction as an initial guess
optimal variables to minimize an objective	for improving the model or to test the model via
function, by respecting constraints.	a reduced-order-modeling (ROM) simulation
	coupled with optimization.





BALA – Career Growth Coach

The Future is Now: Unleashing Potential with AI and Quantum Computing. As we stand on the brink of technological revolutions, the convergence of AI and quantum computing promises to redefine the boundaries of data processing and problem-solving. Here's how this powerful synergy could transform industries and what it means for our future:



Pharmaceutical Innovations Models: Quantum computing can process complex datasets faster than traditional computers, which means AI can learn more efficiently and at an unprecedented scale. For instance, in pharmaceuticals, this could lead to discovering new drugs quicker than ever before.



Optimization in Logistics: Quantum algorithms could significantly optimize routing for logistics and supply chains, reducing costs and increasing efficiency. For example, optimizing delivery routes in real-time during peak traffic hours, thus saving millions in fuel costs



Advances in Materials Science: Al can predict new materials, but quantum computing can simulate their properties at an atomic level, which could lead to the development of new superconductors or energy-efficient materials.



Cybersecurity Breakthroughs: With quantum computing, we can process enormous datasets to identify patterns that would be invisible to classical computers, leading to stronger AI-driven security systems capable of identifying and mitigating potential threats almost instantly.



Climate Change: Quantum computing could enhance climate modeling, integrate vast amounts of environmental data, and help in designing more effective strategies to combat climate change impacts.

While the full integration of AI with quantum computing is still a developing field, the progress made so far suggests significant advancements in the near future. Companies like IBM and Google are already investing heavily in quantum research, indicating that practical applications might be closer than we think.



Stay tuned as we continue to explore how these groundbreaking technologies are shaping a new era in science and business.



Bart Robbins - FEANTM Retired teacher - tutoring town students.



Monthly simulation choice. Mia told me that I reminded her of her grandfather. She meant no disrespect. She said she loves her grandfather, even if he isn't into technology. I smiled and said, "I see you like pink. Let's learn from this simulation."

LS-DYNA Multiphysics channel on YouTube.



YouTube - The simulation shows capabilities of LS-DYNA.

LS-DYNA PBM: Combined effect of blast and fragmentation loading of concrete wall

The structure response of a concrete wall subject to the combined blast and fragmentation impact loading from a cylindrical shaped charge is simulated using Particle Blast Method (PBM). ADAPTIVITE_SOLID_TO_SPH is used to transfer eroded concrete element to SPH element.







Livermore, CA - LLNL - Excerpts - In a groundbreaking development for addressing future viral pandemics, a multi-institutional team involving Lawrence Livermore Nat'l Lab. researchers has successfully combined an artificial intelligence-backed platform with supercomputing to redesign & restore the effectiveness of antibodies whose ability to fight viruses has been compromised by viral evolution. The work was published in the journal Nature. Graphic by A. Connell/LLNL, image by A. Levasseur.



Web- <u>GUIDE team develops approach to redesign antibodies against</u> viral pandemics - Jeremy Thomas

Nature and showcases a novel antibody design platform comprising experimental data, structural biology, bioinformatic modeling and molecular simulations — driven by a machine-learning algorithm.

With funding from the Department of Defense's (DOD) Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense's (JPEO-CBRND's) Generative Unconstrained Intelligent Drug

Engineering (GUIDE) program, the interagency team used the platform to computationally optimize an existing SARS-CoV-2 antibody to restore its effectiveness to emerging SARS-CoV-2 Omicron subvariants, while ensuring continued efficacy against the then-dominant Delta variant. Their computational approach has the potential to significantly accelerate the drug-development process and improve pandemic preparedness.

The work was completed within the GUIDE program, one of LLNL's largest strategic partnerships with DOD. The paper includes multiple collaborators from government and academia, including Los Alamos National Laboratory, Vanderbilt University Medical Center, the Washington University School of Medicine, the Fred Hutchinson Cancer Center and the JPEO-CBRND.

The work also leveraged initial seed funding from the Defense Advanced Research Projects Agency (DARPA). The GUIDE program was developed to address the urgent need for a rapid and agile approach for responding to biological threats, including the relentless mutation of the SARS-CoV-2 virus. SARS-CoV-2 evolution has led to the emergence of subvariants that have eluded existing clinical antibody therapeutics. GUIDE researchers said the achievement could potentially lower drug-development costs, reduce developability risks and accelerate the timeline to clinical use when compared to a novel drug-product screen with comparable breadth and efficacy. This acceleration continues to be relevant as SARS-CoV-2 variants continue to emerge, researchers said.

"Using LLNL's supercomputing capabilities and our modeling platform, we identified just a few key aminoacid substitutions necessary to restore the antibody's potency," said Tom Desautels, a machine-learning expert and first author of the paper. "The original antibody had been authorized by the Food and Drug Administration for emergency use as pre-exposure protection — which is especially critical for immunecompromised patients — but suffered substantial reduction in potency against Omicron variants, rendering it no longer protective."

The LLNL GUIDE team virtually assessed the mutated antibodies' ability to bind to the virus, selecting just 376 proposed antibody candidates for laboratory evaluation out of a theoretical design space of over 1017 possibilities.

"We were able to start with an antibody that had already been authorized and known to work safely and modify it to compensate for viral escape," Desautels said, stressing that the antibodies the team developed are not potent against the newest strains of the SARS-CoV-2 virus. The research published in the new paper used models from 2020 — since then, the team's capabilities have progressed. Recent work has expanded



the breadth of a different SARS-CoV-2-targeting antibody to neutralize against 22 different variants, including potential future escape variants.

In a biosecurity first, the National Nuclear Security Administration's Sierra supercomputer, sited at LLNL, calculated the molecular dynamics of individual substitutions or mutant antibodies using one million graphicsprocessing hours (GPU hours). LLNL researchers also utilized other LLNL high-performance computing (HPC) systems to perform the computational redesign, a promising strategy to recover antibody functionality and avoid the time-consuming process of discovering entirely new antibodies.



An effective antibody has dozens of locations on its amino-acid sequence that interact with the SARS-CoV-2 protein, meaning the team had a vast number of available sites to propose mutations to enable binding, according to LLNL principal investigator Dan Faissol.

LLNL GUIDE team members include dozens of scientists and engineers from across the Laboratory. (Photo: Glenn Silva/LLNL)

"Our binding predictions are driven by advanced structural bioinformatics and large-scale molecular simulations, which allows us to directly optimize for far more antigen targets than laboratory-based evaluations," Faissol said. "The design space in this work was 1017 possibilities — it's not infinite but it is far too many to evaluate even with the world's most powerful supercomputers. To put it into context, the space of possibilities for the Powerball lottery is more like 108. We aren't going to succeed by hoping to get lucky. You can't 'design' your lottery numbers to win, but you can now redesign an antibody to recover from viral escape."

Once the LLNL team produced their list of potential antibody candidates, LLNL and Vanderbilt biologists synthesized, produced, purified, screened and characterized the designs to determine if binding was improved. After the redesigned antibodies were produced for real-world testing, the LLNL and Vanderbilt teams each rapidly evaluated a combined 376 antibody candidates for binding to multiple variants of concern. The rapid-screening capability at LLNL was made possible in large measure through a related Laboratory Directed Research and Development (LDRD) project aimed at assisting with developing monoclonal SARS-CoV-2 antibodies.

"We were able to perform our work much faster and more accurately than past attempts, using just a tiny amount of protein," said biomedical scientist Kathryn Arrildt, a principal investigator for the experimental evaluation phase of the project. "Everyone on the team was excited to be working on this."

Washington University later confirmed the top candidates' potency with authentic neutralization assays and in vivo studies. Structural characterization of the top antibody performed at Vanderbilt confirmed that the predicted structure was consistent with the LLNL team's predictions.

"SARS-CoV-2 is a difficult microbial target because the sequence of the virus is changing so fast that we face the need to update the antibody therapeutics that served us so well at the beginning of the pandemic," said Vanderbilt Vaccine Center Director James Crowe. "The work performed here in this collaborative network rapidly accomplished a historic leveraging of supercomputing resources and expertise to update an important therapeutic model. Clearly, this is a new method for how we will keep future antibody drugs up-to-date in the future against highly variable viruses."

Faissol added that a "huge benefit of GUIDE is that it also enables the preemptive optimization of antibodies to increase robustness to potential future viral escape, extending the clinically useful life of a therapeutic."

The article on LLNL has the additional LLNL GUIDE team members...



Café – M & M Cousins - FEANTM Discussion & Information



"**M**, I found another interesting course at DYNAmore Nordic. Their website says that it's recommended for simulation engineers who want to use LS-DYNA as an FE code to simulate general nonlinear problems and that prior knowledge is not required. The Town Mayor is sending our newer simulation engineers to learn LS-DYNA. It starts 08/20/2024. They can bring us back dessert."

Lecturers: Anders Bernhardsson, Marcus Gustavsson



WEB - <u>The introductory seminar gives a quick, comprehensive</u> introduction to the applications of LS-DYNA

The main application areas of LS-DYNA are strongly non-linear tasks such as crash, metalforming, and impact problem simulation, and these are covered in the seminar. LS-DYNA can also be used to successfully solve complex nonlinear static problems with either the explicit or the implicit solver. The participant will be introduced to both solvers as well as coupling the mechanical solvers to the thermal solver in order to simulate multiphysics problems.

Prior knowledge: The seminar is suited for users with limited or no experience of the program that want an overview of the LS-DYNA possibilities and learn how to perform basic analyses.

The seminar participant works on exercise examples to help him/her understand the applications of LS-DYNA and LS-PREPOST. Prior to the seminar, the participant will receive an LS-PrePost tutorial as an introduction.

- Date: (3 days) starts 08/20/2024
- Time: 09:00 17:00

Seminar outline:

- · Introduction and application examples
- Implicit and explicit finite element methods
- Keyword format
- Elements
- Contacts
- Boundary and initial conditions
- Constraints

Lecturers



Anders Bernhardsson

- Location Gothenburg
- Languages: English, Swedish
- · Material models
- · Rigid bodies
- · Coupled analyses
- Control parameters
- Output format and output files
 - Pre and post processing with LS-PREPOST Hands-on exercises throughout the seminar



Marcus Gustavsson



Carla – FEANTM The International LS-DYNA Conference

Proud to showcase the 2024 International LS-DYNA Conference

Welcome to the world of innovation. You don't want to miss your invitation to the upcoming International LS-DYNA Conference. The conference is globally known to be a stimulating environment. Meet leading engineers, students, educators and enthusiasts to explore the latest advancements.





Join us in Metro Detroit on Oct. 22 - 23, 2024

WEB <u>All LS-DYNA Users plan to meet in</u> <u>Plymouth, Michigan.</u>

Saint Johns' Resort - 44045 Five Mile Rd Plymouth, MI 48170

An iconic landmark surrounded by natural beauty on 200 acres

All LS-DYNA users can contribute to the agenda with a paper from their areas of interest and expertise.

- Full technical papers are highly recommended.
- Submit your proposal, and we will notify approved presenters of the next steps.

Key Dates and Deadlines

- Paper Acceptance Notification | July 1, 2024
- Final Paper & Presentation Due | September 31, 2024
- · 2024 International LS-DYNA User Conference | October 22 23, 2024

Additional Presenter Information

- Submissions will be reviewed and approved according to the following criteria: Technical innovation, scientific rigor, relevance to LS-DYNA community, meaningful conclusions and more.
- All papers will need to be accompanied by a presentation.
- Presenters will be assigned to a 30-minute timeslot:
 - o 20 minutes for presenting
 - o 5-10 minutes for Q&A.
- · Recorded presentations may be considered if you are unable to attend in-person.

June





From the publication: The model governing and boundary equations were solved using the finite element method (COMSOL Multi-physics® version 5.6). The product temperature profile during the processes was predicted as a function of position and time in the loin. The model was validated using measured temperature profiles from industrial production, and a good agreement between the measured and simulated temperature profiles was obtained



Web – MDPI - <u>An Integrated Model of Heat Transfer</u> in Meat Products during Multistage Operations

A. Hailu Feyissa and Stina Frosch

Food Production Engineering, National Food Institute, Technical University of Denmark k

Left:

Simulated temperature distribution in the loin pork

EXCERPTS – Abstract: This work focuses on the modelling of the heat transfer in the key processes during the manufacturing of salted–smoked loin pork, a traditional Danish product called "Hamburgerryg". Drying, smoking, steam-cooking, water-cooling, and air-cooling processes are important process steps in the production of "Hamburgerryg". A mathematical model that describes the heat transfer during these processes was developed. A current model formulation, multiple unit operations, and the transfer between these unit operations were considered and described by an equation that combines boundary conditions. The model governing and boundary equations were solved using the finite element method (COMSOL Multi-physics® version 5.6). The product temperature profile during the processes was predicted as a function of position and time in the loin. The model was validated using measured temperature profiles from industrial production, and a good agreement between the measured and simulated temperature profiles was obtained. Additionally, the effects of the position (in the heating, cooking, and cooling chamber) on the temperature profile (particularly cold and hot spots) for entire processes and this can aid in the digitization of food processes by providing a more accurate and efficient means of temperature control.

1. Introduction - Thermal processing, heating, and cooling are the key processes in the manufacturing of salted–smoked pork loin, a traditional Danish meat product called "Hamburgerryg". During the manufacturing of the salted–smoked pork loin, the product undergoes drying, smoking, cooking, and cooling processes. The product temperature profile during these processes is an important variable that determines the final product quality and microbial safety. In particular when processing a big piece of meat such as salted–smoked pork loin, efficient control of the process conditions (e.g., heating, cooking, and cooling processes) and obtaining knowledge of the temperature distribution within the product is a relevant issue for the food industry, which directly affects the product's safety and quality. Therefore, monitoring and controlling the temperature is commonly accepted as important during the processing of meat products, for example, high cooking temperatures can reduce cooking time, but can also cause greater cooking loss and lower texture quality ...





Autodesk – Did you read the article by Mickey Wakefield? For this new helmet design, O'NEAL incorporated Quin, a sensor device inserted into the base of the helmet that connects to an app on the rider's mobile phone

Fusion reduces average design process time by 4X



A sensor device inserted into the base of the helmet that connects to an app on the rider's mobile phone

Unlike average crash detectors, Quin locates and tracks crashes much more precisely. It can even inform an emergency service provider if the rider is in a severe crash.

Since both O'NEAL and Quintessential Design use Autodesk Fusion for their designs, the teams were able to seamlessly bring the product, hardware, and software together.







O'NEAL & Quintessential Design Deliver a Smarter, Safer Helmet With Autodesk Fusion - Mickey Wakefield

When you're racing through mud or gravel, maneuvering tight curves, and flying off hills, motocross and mountain biking require more than your typical gear. And that's especially true for the helmet.

For more than 50 years, O'NEAL has been synonymous with the design and development of protective apparel and accessories focused on safety. Recently, the company collaborated with Quintessential Design to develop a new helmet that could save a rider's life in more ways than one.

YouTube Video

Quote Thomas Adam Saier, head of design, O'NEAL Europe:

- "Fusion helped us a lot because we were working with three types of companies, and therefore you need one hub where all the data and all the R&D work is being stored and managed,"
- "I think Fusion helped us save on costs because if you take an average design process of such an implementation, it takes up to 24 months. We did it in six months."





DFE-tech: We offer comprehensive software solutions that span the entire range of physics, providing access to virtually any field of engineering simulation that a design process requires.

On our YouTube Channel you can find webinars, simulations and learning videos



AXWE

Electromagnetic -

YouTube Videos

Ansys Polyflow i

A powerful software program used to simulate polymer processing.

It is a type of computational fluid dynamics (CFD) software that is specifically designed to model the behavior of fluids like plastics, glass, metals, and even cement as they flow through molds and dies during manufacturing processes.

YouTube - Ansys Maxwell:

Electromagnetic - Thermal Coupling

Ansys Maxwell is an EM field solver for electric machines, transformers, wireless charging, permanent magnet latches, actuators and other electric mechanical devices.



19





DYNAmore – DYNAmore LS-DYNA Forum is the place to be in October!

Riding in the town of FEANTM is fun but I miss my Hanoverian, Gerhard.

Horse FYI – The Hanoverian came from Lower Saxony, a state in northern Germany, and is named after the capital, Hanover. YEEEEHAW!



17th German LS-DYNA Forum

The 17th German LS-DYNA Forum will take place on October 16, 2024 in the Filderhalle in Leinfelden near Stuttgart.

Invitation - Ansys and DYNAmore cordially invite all LS-DYNA users to the 17th LS-DYNA Forum in the Filderhalle in Leinfelden near Stuttgart. The forum will take place as a one-day event on October 16. Participation is free of charge.

A full paper is not required for the forum. However, we ask you to prepare a two-page abstract (extended abstract) and send it to us by September 6, 2024 (short abstract by May 24, 2024). The templates for the extended abstract and the short abstract can be found here.

Venue - Filderhalle Leinfelden

The Filderhalle in Leinfelden near Stuttgart is a modern event location just outside Stuttgart. Its convenient location close to the airport and the highway make the Filderhalle the ideal venue for the German LS-DYNA Forum.

Address

- FILDERHALLE
- · Leinfelden-Echterdingen GmbH
- · Bahnhofstr. 61
- 70771 Leinfelden-Echterdingen, Germany





RBF Morph – Did you miss the presentation at the NAFEMS 2024 Conference?

"Reduced-Order Model of a Time-Trial Cyclist Helmet for Aerodynamic Optimization through Mesh Morphing and Real-Time Interactive Visualization"



PDF - <u>"Reduced-Order Model of a Time-Trial Cyclist Helmet for</u> Aerodynamic Optimization through Mesh Morphing and Real-<u>Time Interactive Visualization."</u> by Emanuele Di Meo

This research, conducted in collaboration with the University of Rome Tor Vergata and RBF Morph presents the development of Reduced-Order Models (ROMs) for Digital Twins in aerodynamics, focusing on optimizing a time-trial cyclist helmet.

The study exemplified the convergence of advanced computational techniques with practical engineering applications, showcasing the innovative capabilities within the field.

Among the presentation slides:

Car.	Summary	Introduction
J.	1 Introduction	Time-trial cycling races against the clock require optimal aerodynamics
Jar -	2 Methods	Research emphasizes positioning, attire, and helmet choices to minimize drag for efficiency
	3 Case Study	Reducing aerodynamic drag in cycling was crucial in Greg Lemond's victory over Laurent Fignon in the 1989 Tour de France
	4 Results	Recent helmets aerodynamics development led to innovative helmet design shapes
	5 Conclusions	Credit. Furt Viera Lass a five

Who are we? Tor Vergata University Department of Enterprise Engineering "Mario Lucertini", Machine Design Group, involved in national and international research projects



- · Authors details:
 - Emanuele Di Meo, Research Fellow in Novel CAE-based Digital Twin Technologies
 - Andrea Lopez, PhD Student in Digital Twin Technologies
 - Corrado Groth, Tenure-track Assistant Professor of Machine Design
 - Marco Evangelos Biancolini, Associate Professor of Machine Design
 - Pier Paolo Valentini, Full Professor of Computer-Aided Design and Virtual Prototyping







CADFEM India: Did you know Simulation allows design changes to be quickly analyzed and evaluated.

Minimizing the flow resistance of Krone semi-trailers



WEB - <u>GPU technology in Ansys Fluent:</u> accelerating the simulation instead of the wind tunnel

Sector: Automotive (motor vehicles/trucks) Specialist field: Fluid mechanics

Task - For over 100 years, Krone has been committed to quality and innovation in its commercial vehicles. Today, semi-trailer units with all attachments – such as hubcaps and rear wings – must be certified in accordance with the guidelines of the European Commission with regard to their CO2 emissions and fuel consumption. The decisive factor here is flow resistance, which is determined by measurements in the wind tunnel or by calculations using CFD software.



Future EU standard for certification will be based on numerical simulation software | © CADFEM

Solution - Krone relies on simulation with Ansys Fluent to determine drag coefficients. By simulating the trailer unit, design changes can be quickly analyzed and evaluated. There is no need to create a real model and test it in the wind tunnel.



This provides a clear advantage when designing the aerodynamics, as the cause-and-effect relationship is not always obvious and even small changes in the reduction of flow resistance can lead to significant CO2 savings throughout the entire "trailer life".

Fast meshes and simulations with Fluent | © CADFEM



An additional benefit of using Fluent is that the meshing of poor geometries can be performed efficiently using the fault-tolerant workflow in Fluent Meshing, without having to repair the geometry beforehand. Even very large or finely meshed models can be quickly simulated with the new Fluent GPU solver.

700 iterations with a mesh size of 30 million nodes can be carried out in less than 10 minutes - something that was once just a dream. Such computing times were previously only achieved with massive parallelization on a large number of CPU cores. With the new Fluent GPU technology, this now happens on powerful graphics cards, with significantly lower costs and energy consumption.

Customer Benefit - Development engineers at Krone can assess the flow resistance of their trailers using a wide variety of add-on parts available in the CFD software from Ansys, without the need for time-consuming and expensive measurements in the wind tunnel. Rapid analysis using simulation reduces costs and shortens development times.

In addition, a new EU standard is currently being developed in which the certification obligations and regulations for determining the CO2 emissions and fuel consumption of heavy commercial vehicles will be based on numerical simulation software. Corresponding programs and generic 3D vehicle models will be made available in the future. Of course, trailer manufacturers who have been using simulation for a long time and can draw on extensive experience will have an advantage.

CFD simulations not only provide information for EU certification, given that the clear representation of the flow field gives designers important information on potential for improvement, they also enable so-called "dead zones" or areas with vortex separation to be reliably identified. The simulation allows a better understanding of the trailer's behavior and thus enables the identification of design measures to further reduce fuel consumption for the end customer.

The GPU solver in Fluent provides additional acceleration, meaning that the calculation results are available in a very short time. Due to the larger number of simulations at the same time, more extensive variant studies can be carried out, with which the design can be optimized in an even more targeted manner.





I was discussing robotics with Bart. I thought we could use a few that are human friendly to help out on the ranch and in our town industries. Bart said he has no idea what that means - he decided to send a ranch hand to the Human Friendly Robotics conference for first-hand information.

Web



September 30th to October 1st, 2024

Lugano, Switzerland

Organized by: Dalle Molle Institute for Artificial Intelligence (IDSIA), USI-SUPSI.

The organizers are pleased to announce that the 17th International Workshop on Human-Friendly Robotics will be held on 30 September and 1 October 2024 in

The workshop scope mainly focuses on human-robot interaction, and robots safely and meaningfully working with/alongside humans in various daily or industrial tasks. We aim to bring together researchers and industry working in the related areas to discuss the recent results, discoveries, applications, and challenges in the field. The workshop has a single-track format to maximize the interaction between all participants.

Organizing Chairs - IDSIA, USI-SUPSI, Switzerland Antonio Paolillo



Alessandro Giusti



Gabriele Abbate





HFR 2024 will be held at East Campus USI-SUPSI, at walking distance from the city center and Lake Lugano.

Workshop presentation and keynotes will take place in Room A0.01 "Aula Polivalente", Sector A, on the ground floor of the Campus.

Address: via la Santa 1, CH-6962, Lugano-Viganello





News: CADFEM: (D-A-CH) - On LinkedIn they had a very interesting post about a BBQ. Let me read to you a few things from their post, "CADFEM engineers love and live simulation. Founded in 1985, we are not only one of the pioneers of its application but are still advancing it technologically today."

I think I'll call the Rancher, Secretary and Rheken - time for a ranch BBQ

YouTube Simulation - A grill can be heated up excellently even without chemical lighters. "With the warmer temperatures, the consumption of charcoal & firelighters is now increasing again. However, igniters based on kerosene and long-chain hydrocarbons (alkanes) are an underestimated danger to air & climate...

According to a study by the University of Galway, combustion releases an extremely

large amount of black carbon, which is considered to be particularly harmful to the environment and climate. Have fun trying it out! 🞯"

<u>World of the Simulation Engineer</u> - Self-caught fish, a cold beer and a bit of simulation - that's how I imagine a good weekend! This is definitely the best way to light a charcoal grill. Try it out for yourself!





Don't miss the news - Maruti Suzuki India Limited had partnered with AIIMS, India's premier medical institute, and International Road Federation (IRF) to provide first aid and trauma care training to commercial drivers at its Institute of Driving and Traffic Research (IDTR).



Web – <u>Maruti Suzuki - successfully completes</u> a pilot program of First Responder training

- **Trained 8,500 people**, primarily commercial drivers in post-accident emergency care during the "golden hour" after an accident
- **Comprehensive emergency care training** in collaboration with JPN APEX Trauma Centre, AIIMS, New Delhi and International Road Federation (IRF) India chapter
- **Voluntary training** across Maruti Suzuki's Institute of Driving and Traffic Research (IDTR) facilities in Haryana, Delhi, and Bihar

New Delhi: Through a pilot program, 8,500 people primarily commercial drivers have been trained at IDTRs in Haryana, Delhi, and Bihar. Participants received comprehensive training in emergency care in collaboration with Jai Prakash Narayan-AIIMS Trauma Center, Delhi. The training equips them with the knowledge and practical skills needed to assist road accident victims during the "golden hour" in an event of a road incident. Golden hour after an accident refers to the first hour after an accident during which medical intervention can reduce mortality.

Speaking on trauma care, Dr. Amit Gupta, Professor of Trauma Surgery and Critical Care, JPN Apex Trauma Centre, AIIMS, New Delhi said, "In the absence of robust trauma care systems, there is an urgent need to train bystanders in basic trauma and first aid. As trauma is time-sensitive, the training of bystanders who are the real first responders to any road accident can go a long way to reduce the mortality and morbidity following road traffic crashes. Usually, this group of bystanders includes drivers of commercial vehicles. To standardize first-aid modules and training, WHO along with the experts from AIIMS and other major institutions of the country have devised a first-aid course for the by-standers. We used these modules for training at Maruti Suzuki IDTRs which has got a lot of positive feedback from



Highlights of First Responder Programme

The First Responder Training Program is designed to train drivers in:

- critical life-saving techniques like cardiopulmonary resuscitation (CPR),
- controlling bleeding,
- · correct way of helmet removal,
- use of splint & sling and moving victims safely.
- Participants also learn to promptly activate emergency response systems.

These skills can improve survival rates, especially in the first hour after an accident.





OASYS: This release further strengthens the Oasys LS-DYNA Environments' leading position in the market by offering comprehensive LS-DYNA support, speed, performance, and user-friendliness, as well as advanced crash and safety analysis tools. With five global locations, our team are strategically positioned to innovate and meet the needs of our diverse clientele through support, training and consultancy.



Web - Oasys/21 Performance, Integration, and Automation

Oasys 21.0 introduces key new functionality, enabling users to achieve even greater automation and process integration, resulting in significant workflow efficiency and excellent model and results quality. Advancements include highly accurate correlation analysis and controls for Virtual Testing and extended multi-physics related features such as battery modelling and our new Python API.

Suite highlights

Automation and Process Integration

- New Python API
- · JavaScript enhancements: nested functions and run multiple scripts at one time
- FAST-TCF a scripting language for Oasys T/HIS that can be used for automatic post-processing

End-to-end Workflow efficiencies

- · Further key workflows and extended protocols support
- Enhanced collaboration with non-CAE and external stakeholders through viewer updates
- Complete slip-ring positioning automation

Quality models and results

- Highly accurate correlation analysis and controls for Virtual Testing
- · Extended multi-physics related features, including battery modelling
- · Spotweld meshing enhancements
- Further translation capabilities (NASTRAN)
- Precision enhancements
- <u>YouTube</u> The Oasys LS-DYNA Environment offers complete LS-DYNA support, speed, performance and convenience.









OZEN Engineering: Don't miss the article by German Ibarra.

Excerpts from the article - Calculate and Visualize Relative Humidity results. Understanding Relative Humidity - Atmospheric air is the mixture of dry air and water vapor, each one has a pressure that combined is equal to the vapor pressure.



WEB- Calculate and Visualize Relative Humidity results German Ibarra

Relative humidity refers to the amount of moisture in the air compared to the maximum amount of moisture the air can hold at a specific temperature. It is usually expressed as a percentage. It ranges from 0 (dry air) to 100 percent (saturated air).

The expression below shows the relation between the vapor pressure (Pv) and the saturation pressure (Psat), which is the partial pressure of water vapor in saturated air,

 $P_{v} = \phi P_{sat}$ Where f is the relative humidity. The saturation pressure is available in different sources in Literature. Understanding relative humidity is crucial in various

applications, such as weather forecasting, HVAC systems (Comfort), and indoor air quality management. For instance, in cooler temperatures, the air has a reduced ability to hold moisture, causing water to more readily condense and separate from the air.

Calculation - The main goal is to calculate the mass fraction of water vapor needed for the boundary conditions in the CFD model. Note that there is a specific mass fraction for a given air temperature and relative humidity. Ultimately, these equations need to be created in CFD-Post as expressions, as explained in the video in the following section. Please follow these steps:

- Find the saturation pressure. While tables are available in books, in this case, the Tetens equation is used for this purpose (Monteith, J.L., and Unsworth, M.H. 2008. Principles of Environmental Physics. Third Ed. AP, Amsterdam). The pressure is given in Pascals.
- Since the relative humidity f is a known value, the equation presented in the previous section is used to determine the vapor pressure (or partial pressure, Pp). Next, identify your absolute pressure (Pabs) and iteratively calculate the Mixing Ratio (MR) using the following equation, $P_p = \frac{MR \cdot P_{abs}}{MR + 0.622}$

$$MR = \frac{MF_w}{1 - MF_w}$$

How to set up your CFD model - For this demonstration the flow from two chimneys is modeled in a steadystate using Ansys CFX. Atmospheric air is also included, flowing in the positive direction of the Y-axis as shown in the image below. Both the air and that from the chimneys have specified velocity, temperature, and relative humidity. This means, the model handles Species transport. The geometry is created in Ansys SpaceClaim, and the mesh is created in Ansys Meshing using tetrahedral elements within Workbench.



The extents of the fluid domain were chosen arbitrarily and can be adjusted accordingly. The equations mentioned earlier must be included in CFD-Post to visualize the results and the video shows the procedure to get the results. YouTube Video



OZEN Engineering: Don't miss the blogs by Luis Costa

Excerpts from three comprehensive blogs on ANSYS LS-DYNA by Luis Costa. Each blog is detailed with complete information and explanations on: Simulation Coin Stamping – Car Crash Simulation – Metal Forming

<u>Simulating Coin Stamping with Ansys LS-DYNA and the Smooth Particle Galerkin Technique</u> This blog explores the application of LS-DYNA and the SPG technique in simulating coin stamping, highlighting the benefits, setup process, and analysis.

Coin stamping, a high-precision manufacturing process, involves pressing a metal blank with a die to impart intricate designs. This process requires accurate simulation to predict material behavior, optimize parameters, and minimize defects. Traditional Finite Element Method (FEM) simulations often struggle with the extreme deformations and complex contact interactions characteristic of coin stamping. The Smooth Particle Galerkin (SPG) method, implemented in Ansys LS-DYNA, offers an advanced approach to overcome these challenges....The SPG method is a mesh-free computational technique that excels in handling large deformations and complex material behaviors. Unlike FEM, which relies on a predefined mesh, SPG uses a set of particles to represent the material domain. These particles carry properties such as mass, velocity, stress, and strain, interacting through a smooth kernel function.

<u>Ansys LS-DYNA for Car Crash Simulations</u> - This blog explores the use of Ansys LS-DYNA in car crash simulations, highlighting its features, benefits, and practical applications....By simulating and analyzing crash scenarios, LS-DYNA helps in identifying potential safety improvements, ensuring compliance with regulatory standards, and ultimately protecting the lives of vehicle occupants and pedestrians alike.... Car crash simulations are a critical aspect of automotive design and safety engineering. These simulations allow engineers to predict the behavior of vehicles during collisions, helping to improve safety features, enhance vehicle structures, and comply with regulatory standards. ...

Introduction to Metal Forming Simulations with ANSYS Forming and LS-DYNA -This blog explores the understanding and leveraging the strengths of both ANSYS Forming and LS-DYNA, whereby manufacturers can achieve more efficient and reliable metal forming processes, ultimately leading to better products and a competitive edge in the market....Metal forming is a crucial process in manufacturing industries, where raw metal materials are transformed into desired shapes through deformation. This can include operations like stamping, bending, and deep drawing. The quality and efficiency of these processes depend heavily on the precise control of various parameters such as material properties, tool geometry, and processing conditions. To optimize these parameters and ensure successful forming, simulations play a vital role. Among the leading software tools used for such simulations are ANSYS Forming and LS-DYNA. ANSYS Forming is a specialized software developed by ANSYS Inc. for simulating sheet metal forming processes. It leverages advanced finite element analysis (FEA) techniques to predict how metals will behave under different forming conditions...Both ANSYS Forming and LS-DYNA are powerful tools for metal forming simulations, but they have distinct strengths

Please read the blogs by Luis Costa for complete information and explanations for each blog





Did you know that the Ansys Innovation Courses are free, online physics and engineering courses designed for educators, students and engineers to enhance simulation and physics learning.

Just found out they have a new 3D Design Course covering Structural Simulation Using Ansys Discovery.

3D DESIGN

Web - Structural Simulation Using Ansys Discovery

Duration:	2-4 HOURS
Skill Level:	Intermediate
Skills Gained:	Structural Analysis, Design Optimization,
	Ansys Discovery

This course will give you an understanding of the complete end-to-end procedure for conducting structural analysis in Ansys Discovery. After completing this course, you will be able to apply the lessons learned to the solution of your own analysis problems.

Just as importantly, you will gain an understanding of the basic approaches in performing design changes. You will also gain an understanding of the basic factors that affect the efficiency of your solution and the accuracy of your results.

A course completion badge allows you to showcase your success. We partner with the Credly Acclaim platform, and digital badges can be used in email signatures, digital resumes and social media sites. The digital image contains verified metadata that describes your participation in our course and the topics and skills that were covered. This badge is for successfully completing the Structural Simulation in Ansys Discovery course.

Complete Descriptions are on the website for:

- · Lesson 1 Structural Analysis for a Single Part Geometry
- Lesson 2 Design Exploration
- Lesson 3 Modal and Thermal Stress Analysis with Report Generation
- Lesson 4 Structural Analysis on Multipart Assembly

m

- Practice Quiz
- Post Completion Survey

Shiv Kumar

Instructors

Masters in Mechanical Engineering, Florida State University Fluid Dynamics, Heat Transfer,

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Engineering

Jorge P. (in Masters in Mechanical Engineering, California Polytechnic State University Structural Analysis, Advanced Design, Geometry Optimization

D3View - Have you ever considered the comprehensive capabilities of d3View for all of your data needs?

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Web- <u>d3VIEW</u> - The Data-to-DecisionTM Platform to Enhance and Accelerate Your Design, On-Premise or Cloud

d3VIEW is a comprehensive platform that helps interpret your data in better ways, empowering your design process.

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Simulations - With d3VIEW, you can manage simulations in a whole new way. The smooth Simulations interface provides the ability to seamlessly create, track, update, compare and share your simulations and their data more efficiently.

Simlytiks - Use over 40+ visualizations to mine data, eliminate noise and reveal information to enable faster decisions. With a data-source agnostic approach, Simlytiks can be used with any data originating from experimental labs, simulations or CSV/TSV/Excel files. **Data Extraction Templates** - Templates help turn data into information and help automate the process of extracting information from a raw simulation or experimental files. Designed to extract from multiple parallel simulations, they can scale to thousands of simulations at the same time.

Workflows - Powered by 800+ workers, Workflows help break down complex business processes into simpler tasks that can be chained to transmit data and perform tasks such as data sanitizing, decisionmaking and job submission. Execute complex workflows either in the browser, server or your desktop giving you the flexibility to run the workflows on any device. Scientific Databases - We help you organize and structure your data so you can visualize it efficiently. Store your digital assets in a structured database that is powered by interactive visualizers to support decisions.

Keeping military vehicles safe is important to our town.

Introduction excerpt: Design for mine blast protection of armored vehicles requires great effort considering the increasing threat levels defined by military standards. Finite element analysis plays an important role considering the time and effort that it saves compared to the conventional test campaigns. However, it is important to establish a reliable modelling method to have proper accuracy and feasible solution time.

14th European LS-DYNA Conference

A Comparative Study of Modeling Approaches for External Structures in Mine Blast Simulations of an Armored Military Vehicle WEB

İsmet Kutlay ODACI, Samet Emre YILMAZ, İlker KURTOĞLU FNSS Savunma Sistemleri A.S., Ankara, Turkey

External structures are known to be critical in ensuring the protection of occupants in military vehicles during mine blast events.

There are variety of modelling approaches that can be employed to represent external structures in mine blast simulations of armored military vehicles. This study aims to present an accurate configuration considering the modelling efforts and tight project schedules by comparing different modeling techniques applied to external structures, such as add-on armor plates and other external subsystem components.

A whole vehicle finite element model is utilized for an on-going research and development project to evaluate the effectiveness of these modeling approaches by comparing simulation results with live fire test data of Hybrid III dummy and plastic deformations of the hull structure. The findings emphasize that the modelling approach of not only primary protective structures but also other external components significantly contribute to better representation of the tests.

Configurations featuring accurately modeled external structures demonstrate improved accuracy in occupant safety assessment. The outcomes of the study contribute to enhancing the efficiency and reliability of the conceptual design phase by providing faster and relatively reliable finite element solutions, specifically in terms of representing external structures in the simulations.

Excerpt – Model Information

Table 1: Modelling approaches for the addon armor plates

In order to represent add on armor plates three different approaches are used as given in Table 1.

Model	Modelling of Add-on Armor Plates		
1	1 *ELEMENT_MASS_PART		
2	*CONSTRAINED_INTERPOLATION + *ELEMENT_INERTIA		
3 Physical			

Research - Development Marco Evangelos Biancolini RBF Morph & MeDiTATe Project

RBF Morph – Did you miss the presentation at the Automotive CAE Grand Challenge 2024? Improving Vehicular Safety: **Customizing Human Body Models through Advanced Mesh Morphing** by Emanuele Lombardi. His work revolutionizes the field by proposing a method to customize FE HBMs through sophisticated mesh morphing techniques.

Human Body Models customization by advanced mesh morphing: parametric THUMS - Emanuele Lombardi

Web - <u>You can read the presentation and the full thesis here</u>. Presentation is in English – The Thesis is in Italian

Supervisor: Prof. Ing. Marco E. Biancolini Co-Supervisor: Ing. Emanuele Di Meo

Finite Element Human Body Models (FE HBMs) have emerged as indispensable tools in the realm of vehicular safety research and design. However, their efficacy has often been hampered by a lack of versatility due to a limited range of available forms. Addressing this issue head-on, Emanuele Lombardi's groundbreaking thesis, "Human Body Models customization by advanced mesh morphing: parametric THUMS," introduces a novel strategy aimed at expanding the applicability of these models.

Presented at the Automotive CAE Grand Challenge 2024 in Frankfurt-Hanau, Germany, on April 17, 2024, Lombardi's work revolutionizes the field by proposing a method to customize FE HBMs through sophisticated mesh morphing techniques. The core concept involves modulating the shape variances between two prominent FE HBMs, THUMS AM50 and THUMS AM95, utilizing radial basis functions (RBF) for mesh morphing, and implementing the process automatically with Python scripting.

The significance of this approach lies in its ability to bridge the gap between the limited forms of existing FE HBMs and the diverse anthropometric profiles of real-world populations. By leveraging RBF-driven mesh morphing, Lombardi's method enables the creation of parametric THUMS models that can approximate the statistical anthropometric percentile of a broader range of individuals.

Central to Lombardi's thesis is the validation of the proposed methodology through rigorous testing. The parametric THUMS models generated using the advanced mesh morphing technique are subjected to frontal sled tests conducted in LS DYNA. These simulations serve to validate the effectiveness of the modeling choices and demonstrate the potential of the customized FE HBMs in accurately predicting human responses to crash scenarios.

The implications of Lombardi's work extend far beyond the confines of academic research. By enabling the customization of FE HBMs to better reflect diverse human anatomies, this approach holds immense promise for enhancing vehicle safety standards. Manufacturers and automotive engineers stand to benefit significantly from the ability to conduct more realistic simulations tailored to specific demographics, thereby mitigating risks associated with road accidents.

Research - Development Taylor - FEANTM

June

Excerpt - L &T Technology Services - Did You know that in most countries, there is a clear disparity in the demand and the availability of skilled Radiologists to meet the patient requirements? Statistics say that there is only one Radiologist for every 100,000 people in developing countries and one for every 10,000 in the developed countries. The situation is bound to get worse, as the demand for Radiology increases by the day for correct diagnosis and prognosis.

WEB- BUT, IS THERE AN ALTERNATIVE? PRESENTING Chest-rAi™

NASSCOM - 'AIGAMECNAHGERS' recognizes Chest-rAI[™] in Innovator Category - WHAT WE NEED IS MORE RADIOLOGISTS ON GROUND...NOT JUST ENHANCED BUT INTELLIGENT CARE IS A REALITY WITH Chest-rAi[™]

LTTS' Chest-rAiTM is an AI based Chest X-Ray Radiology suite for symptom detection, localization and intelligence reporting.

The suite has the potential to detect ~34 of the most common lung-related abnormalities. This translates to >85% of diagnosis encountered at a medical institution. Chest-rAITM produces preliminary reports with findings adhering to the reporting practices of medical institutions.

- **nbuilt ASK AI Button**: Helps analyze the Chest X-ray and produces the AI based findings and impression as well as respective tags. Radiologists can alter the results if they want to modify them.
- Intuitive user interface and controls: Zoom, contrast and brightness features for better picture investigation.
- **Contextual Report Generation**: In both, the web and mobile applications, the reports can be shared with anyone on their preferred sharing platform.
- **Cloud Solution**: Al Solution can be integrated with existing workflows and App environments and can be accessed through web or mobile.

WHAT YOU GET WITH Chest-rAiTM

REDUCED TREATMENT ENROLMENT TIME BY 50% - On an average, 60 to 70% of the X-Rays are normal X-rays. However, in manual operation and inspection, a Radiologist spends almost equal amount of time for analyzing and report writing. Chest-rAiTM aids the Radiologists to separate out Normal Vs Abnormal X-rays. It can bring down the estimated time for evaluating an X-ray by at least 50%, thereby enabling the Radiologists to use their time efficiently and optimally.

- **INCREASED EFFICIENCY BY 5-6%** With defined input data set, Chest-rAiTM can be used to train the Radiologists on individual or combination symptom detection. This can help in avoiding wrong reporting or missing any symptoms during normal medical practice. Also, with the inbuilt Ask AI button, the chances of the detecting the symptoms or new cases in the first instance increase by 5-6%.
- **SUPPORTS WFX (Work from Anywhere)** Chest-rAiTM solution is hosted on Cloud, so the presence of Radiologist in the labs for reporting is not mandatory. Using Chest-rAiTM, Radiologist can report the X-rays from any location with the help of internet support. This enables WFX (Work from Anywhere) which is more than relevant in current pandemic situation.
- ACCURATE AND VERSATILE -Chest-rAiTM can identify 34 different types of lung symptoms from Chest X-Ray images using AI and correlate them with 15+ types of lung diseases. Current accuracy of the solution is ~92.3% (AUC, Sensitivity, Specificity) for prominent 10 symptoms

Research - Development Daniel - FEANTM

June

Simq OSP. The landscape of surgical planning is undergoing a digital transformation.

Simq OSP. is an innovative tool that empowers medical professionals to embrace virtual surgical planning. Simq OSP enables them to simulate and optimize procedures before setting foot in the operating room.

Web - Excerpts - <u>Virtual Surgical Planning in the Digital Age</u> <u>With Simq OSP</u> In this blog, we'll explore how Simq OSP is ushering in a new era of virtual surgical planning in the digital age and its myriad benefits to healthcare practitioners and patients.

The Power of Virtual Surgical Planning - Imagine being able to meticulously plan a surgical procedure in a digital realm before performing it in the real world. This is precisely what Simq OSP offers to medical professionals—a chance to harness the power of virtual surgical planning. This revolutionary approach is reshaping the way surgical interventions are prepared and executed.

Inputting Patient-Specific Data - Simq OSP's virtual surgical planning process begins with the input of patient-specific data. This data can encompass a range of vital information, including medical images, specific measurements, and diagnostic data. This comprehensive dataset is the foundation for creating a digital model of the patient's pelvis.

Creating a 3D Virtual Model - Simq OSP generates a highly detailed 3D virtual pelvis model using patientspecific data as a guide. This digital representation faithfully replicates the patient's anatomy, providing a visually accurate canvas for surgical planning. See the model on the website.

Manipulating and Simulating Surgical Procedures - With the 3D virtual model in place, medical professionals can embark on a surgical exploration and simulation journey. Simq OSP allows surgeons to manipulate the model, simulating various surgical interventions and approaches; whether it's performing osteotomies, placing implants, or considering different implant types, virtually all aspects of the procedure can be assessed and optimized within this digital environment.

Excerpts of the Benefits of Virtual Surgical Planning

Reduced Surgical Time: Immediate benefits is a reduction in surgical time...planning the procedure in advance and ironing out potential complications

Improved Patient Outcomes: Virtual surgical planning empowers medical professionals to make informed decisions based on a deep understanding of the procedure's intricacies. This level of preparation directly contributes to improved patient outcomes, as surgeries are conducted with greater precision and accuracy.

Minimized Risks: Surgical complications and unexpected challenges can be anticipated and addressed during the virtual planning phase...

Personalized Care: ... Surgeons can tailor their approach to suit the specific anatomical characteristics and requirements of each patient, ensuring a customized and patient-centric treatment strategy.

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

The strictly limited series of 250 units will only be available to the most dedicated Mercedes-Benz enthusiasts and collectors.

WEB - <u>Concept Mercedes-AMG PureSpeed –</u> expressive concept car gives a look at the first model in the Mythos series

June

Excerpt - The Mercedes-AMG PureSpeed concept is the highlight in the run-up to the Formula 1[™] Monaco Grand Prix. The radical design of a completely open, two-seater performance car without a roof or windscreen is a tribute to motor racing. The concept car provides a preview of the first model in the highly limited Mercedes-Benz Mythos series. The world premiere of the Concept Mercedes-AMG PureSpeed took place in an exclusive setting on the sidelines of the Formula 1[™] Monaco Grand Prix. The vehicle was unveiled on a floating pontoon in the harbour of the principality and also impressed Mercedes-AMG PETRONAS F1 Team racing drivers Lewis Hamilton and George Russell.

Michael Schiebe, Chairman of the Board of Management of Mercedes-AMG GmbH and Head of the Mercedes-Benz G-Class & Mercedes Maybach divisions

"The Concept Mercedes-AMG PureSpeed offers a glimpse of what is probably the most direct way to experience performance and driving pleasure. Radically open, neither a roof nor the windscreen separate the two passengers from the elements. You can experience light, air and passion unfiltered with all your senses. As the concept of our first Mythos vehicle, it embodies the highest level of exclusivity. Design elements such as the HALO also create a Formula 1 feeling. There is therefore no better place for its world premiere than Monaco."

HALO system instead of A-pillar - One highlight is the HALO system which replaces the conventional Apillar on the vehicle. This element is a direct derivative of the premier class of motorsport and has been part of every Formula 1^{TM} vehicle since 2018. It protects the driver's head in the event of an accident. The name HALO describes its shape. As in Formula 1^{TM} , the safety system in the Concept Mercedes-AMG PureSpeed consists of a bracket that is connected to the body of the vehicle. This aerodynamically optimised component serves to protect the occupants, just as in Formula 1^{TM} .

Included are two aerodynamically optimised helmets specially designed and manufactured for the Concept Mercedes-AMG PureSpeed. The field of vision as in Formula 1[™] thus becomes a reality for two people. Neither roof, windscreen nor side windows separate them from their surroundings. The interior adds further highlights, with its unique colour and equipment concept as well as a custom clock designed by IWC Schaffhausen on the dashboard.

Design inspired by the Mercedes-AMG ONE hypercar

Town Airport - Airforce

June

US Airforce Picture of the Month

Airman's best friend

After a six-month deployment, Chaplain (Lt. Col.) Stephen Peters reunites with his dog, Adele, at the Iowa Air National Guard's 185th Air Refueling Wing in Sioux City, Iowa, April 30, 2024. Peters was serving as deputy command chaplain for U.S. Air Force Central Command at Al Udeid Air Base, Qatar. Back at home, Adele continued her duties as the morale support dog at the Iowa ANG's 185th Air Refueling Wing. (U.S. Air National Guard photo Senior Master Sgt. Vincent De Groot)

KC-10A Extender Tail 84-0191

taxis down the flightline at Wright-Patterson Air Force Base, Ohio, April 14, 2024. Tail 84-0191 completed its final flight from Travis AFB, Calif., to be donated to the National Museum of the U.S. Air Force at Wright-Patterson AFB, Ohio.

(U.S. Air Force photo by Jeffery Harris)

Running Start – 3D printed

Col. Dustin Thomas launches a 3D-printed unmanned aerial system at Eglin Air Force Base, Fla., April 25, 2024. The launch was part of a demonstration to create, build and fly an unmanned aerial system within 24 hours.

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

Town Airport Article

Manta Ray UUV Prototype Completes In-Water Testing DARPA program exhibits modular, first-of-kind capabilities

The Manta Ray prototype uncrewed underwater vehicle (UUV) built by performer Northrop Grumman completed full-scale, in-water testing off the coast of Southern California in February and March 2024.

Testing demonstrated at-sea hydrodynamic performance, including submerged operations using all the vehicle's modes of propulsion and steering: buoyancy, propellers, and control surfaces.

"Our successful, full-scale Manta Ray testing validates the vehicle's readiness to advance toward real-world operations after being rapidly assembled in the field from modular subsections," said Dr. Kyle Woerner, DARPA program manager for Manta Ray. "The combination of cross-country modular transportation, in-field assembly, and subsequent deployment demonstrates a first-of-kind capability for an extra-large UUV."

Manta Ray vehicle being towed in preparation for testing (photo courtesy of Northrop Grumman.

Northrop Grumman shipped the Manta Ray prototype in subsections from the build location in Maryland to its test location in California. The demonstrated ease of shipping and assembly supports the possibility of rapid deployment throughout the world without crowding valuable pier space at naval facilities.

"Shipping the vehicle directly to its intended area of operation conserves energy that the vehicle would otherwise expend during transit," said Woerner. "Once deployed, the vehicle uses efficient, buoyancy-driven gliding to move through the water. The craft is designed with several payload bays of multiple sizes and types to enable a wide variety of naval mission sets."

Manta Ray aims to develop and demonstrate a new class of long-duration, long-range, payloadcapable UUVs ready for persistent operations in dynamic maritime environments. DARPA is engaging with the U.S. Navy on the next steps for testing and transition of this technology.

A second Manta Ray performer, PacMar Technologies, is continuing testing of its full-scale energy harvesting system in 2024.

<u>YouTube Video Manta Ray: Mastering the Deep</u> - Northrop Grumman has been pioneering new capabilities in the undersea domain for more than 50 years. Manta Ray, a new unmanned underwater vehicle, taking its name from the massive "winged" fish, will need to be able to operate on long-duration, long-range missions in ocean environments without need for on-site human logistics support – a unique but important mission needed to address the complex nature of undersea warfare.

Town Airport Article

Web - Introducing the factory fresh Challenger 3 prototype tank.

The Challenger 3 is the exciting next step in modernising the UK's war-fighting capability.

The Challenger 3 is the new Main Battle Tank being developed by Rheinmetall BAE Systems Land, a joint venture between UK-based BAE Systems and Germany-based Rheinmetall.

Challenger 3 - British Army - Equipped with world-beating technology

YouTube - Challenger 3, watch our YouTube video here

Challenger 3 will be a 24-hour, all-weather tanks.

Some of the features that will be built into the vehicle are,

- Day and Night Commanders Primary Sight.
- Day and Night Gunners Primary Sight.
- NATO 120mm smoothbore weapon L55A1, capable of firing NATO ammunition and enhanced ammunition natures.
- Heavy Armour Automotive Improvement Project, 3rd generation hydro gas suspension & engine improvements.
- Enhanced front and side turret protection.
- Improved Tactical Communications.
- Enhanced hull protection.
- Increased electrical power and GA electronic architecture with growth potential.

The Challenger 3, a new Main Battle Tank for the future. Along with Ajax and Boxer, it will be at the heart of the Army's warfighting capability in the Heavy Brigade Combat Teams.

- · Crew Four
- · Weapons 120 mm Smoothbore gun
- · Weight 66 Tonnes

Excerpt - ANSYS Mechanical (Ansys Inc., Canonsburg, PA, USA) was used for finite element analysis of an impacted maxillary canine.

The meshing was performed using 4-node tetrahedral elements, and the number of tetrahedral elements used for each maxillary canine, PDL, bone, and pericoronal tissue was 72,677, 786,367, 266,335, and 55,831, respectively. As a boundary condition, the nodes lining the outermost part of the cylinder restricted three-dimensional movement.

Web – MDPI <u>The Center of Resistance of an Impacted</u> Maxillary Canine: A Finite Element Analysis

June

by Sewoong Oh, Youn-Kyung Choi, Yong-Il Kim, Seong-Sik Kim,Soo-Byung Park, Sung-Hun Kim

Dept. of Orthodontics, Dental & Life Sci. Inst., School of Dentistry, Pusan National Univ. ROK Dental Res. Inst., Pusan Nat'lUniv. Dental Hospital, ROK (Bio)medical Res. Inst., Pusan Nat'l Univ. Hospital, ROK

Figure 1. Three-dimensionally scanned model for maxillary canine. (A) labial side, (B) mesial side, (C) lingual side, (D) occlusal side.

Abstract - The aim of this study was to calculate the center of resistance (COR) of an impacted maxillary canine according to the stages of pericoronal tissue healing using the finite element method (FEM). The maxillary canine model was three-dimensionally scanned, and the structures surrounding the tooth were modeled using a computer-aided design program. The COR was calculated in the buccolingual (BL) and mesiodistal (MD) directions using the FEM.

After applying a single force to a specific point of the tooth, several counter moments were applied to compensate for this at the same point. Thereafter, the displacement curve of the tooth axis for each counter moment was plotted. The intersection points between the displacement curves corresponded to the COR.

At the beginning of healing, the COR of the MD and BL direction was located at 38.1% and 38.7% of the root length from the cementoenamel junction, respectively. At the end of healing, the COR of the MD and BL direction was located at 44.6% and 49.8% of the crown length from the cementoenamel junction, respectively. The COR of the impacted maxillary canine gradually shifts to the coronal side as the healing of the pericoronal tissue occurs.

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Town Fire Department & Police Department

June

Dal the Fire Dog & Poli the Police Dog

Don't miss the article by Ertan Taskin. The ANSYS® program was used as a finite element method for transient and nonlinear material thermal analysis. A 2D mesh was used, representing a typical plane of the studied model.

MDPI – WEB <u>Temperature Evolution inside Hollow Core</u> <u>Wood Elements and Fire Resistance</u> Domingos Pereira, Elza M. M. Fonseca, Miguel Osório ISEP, Instituto Politécnico, Portugal

Abstract - The present study is focused on wall panels exposed to fire, with the construction building elements we used being made of wood and gypsum board materials. This type of configuration forms hollow core wood due to the constructive process. The aim is to present a numerical study to approach the calculation of the temperature inside hollow core wood elements and measure their fire resistance. The temperature evolution inside the cavities will be obtained with recourses to obtain the heat effect by convection and radiation through the wall elements. A numerical model, previously validated by the authors, will be used to carry out this process. The methodology includes the use of the finite element method in thermal and transient analysis with nonlinear materials to calculate temperature. To measure the fire resistance of the constructive model, the thermal insulation criterion, defined by the EN 1363-1:2020 standard, will be applied. Different results will be presented to discuss and ensure the verification of these fire-resistant elements.

3. Thermal and Numerical Model - The ANSYS® program [7] was used as a finite element method for transient and nonlinear material thermal analysis [8,9]. A 2D mesh was used, representing a typical plane of the studied model. According to the used thermal materials, wood GL32H and gypsum board type F were obtained from the following references [12,13,14], as shown in Figure 2, in a particular hollow core of the studied models. The mesh size was determined considering the thin side, that is, the gypsum board with a thickness equal to 12.5 mm or 15 mm. In these zones, the number of finite elements was adjusted to two (less than 10 mm), always considering a mesh generated by ANSYS® [7] with a size of 10 mm. For the gypsum board, with a thickness of 25 mm, three finite elements were generated...

June

Web - <u>The 7th edition of TECHgium®</u>, (India's largest engineering hackathon) hosted by L&T Technology Services (LTTS) - More than 36,500 students registered for TECHgium®. Their innovative ideas continue to push the boundaries of what's possible. The themes were Mobility, Sustainability and Hi-Tech encompassing areas such as UAVs, medical diagnostics, robotics, compute vision, analytics, electric vehicles, and wireless transmission, among others.

Pert & SCALE and I Provide American States

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YouTube - Workshop: SCALE.sdm - Part 2: Project + Result

Discover how SCALE.sdm can enhance your simulation and test data management. Whether you're new to SCALE.sdm or looking to stay updated with the latest features, our workshop cater to all levels of expertise. Gain valuable insights, discover integrative approaches, and learn how SCALE.sdm can optimize your operations.

YouTube - <u>Teach Solid Mechanics with</u> <u>Finite Element Analysis</u> Alex Szatmary, Ph.D., P.E.

This video shows instructors why they should consider teaching solid mechanics using finite element analysis and shows how instructor resources from Hexagon can help.

The Old Cattle Rancher's Ranch

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

Agriculture, Animals, Soil, Equipment, Cattle, and whatever he wants. Right Picture – My dog, Scout, & my horse, Cowboy

The northern lights are also known as the aurora borealis, meaning light of dawn. It's said the term was first coined by Galileo in 1623 and is derived from 'Aurora', the goddess of the dawn and 'Boreas', the northern wind personified.

Pictures were taken by Adam Burggraff

Town secretary My Virtual Travel Outing

Thank you for joining me on my monthly visit to a museum.

WEB - <u>The Louwman Museum</u> dates back to 1934.

Over 80 years ago the Louwman family recognised the importance of the motor car and decided to keep the highlights of motoring history so far for future generations.

The aim of the Museum is to give a comprehensive overview of what the automobile industry has produced since 1887. Without a doubt the automobile has completely transformed our lives. It has become an icon of modern life. It is one of the most important inventions of the 19th and 20th century.

RheKen,

Town investigative reporter

I'm AI & live on a ranch on the outskirts of the town I use chatGPT for assistance. Investigate: Why are they arguing about a ship?

The Town Secretary and The Town Supervisor were arguing.

Politics? No.

Pollution? Nope

Global Warming? NAH

A Container Ship? Yes

June

Once upon a time, in the quiet and picturesque town of FEANTM, nestled between rolling hills and surrounded by vast open fields, RheKen was enjoying a serene moment, sipping her coffee at the local bakery. The aroma of freshly baked goods filled the air, and she savored each sip, lost in her thoughts.

As she closed her eyes, relishing the thought of sinking her pretend teeth into one of the bakery's delectable cakes, she was abruptly pulled back to reality by the sound of raised voices. Opening her eyes, she noticed The Town Secretary and the town Supervisor, Marsha Victory, engaged in a heated argument.

Marsha Victory was adamant, insisting that due to the striking similarity in the names, she must be somehow related to Marsa Victory.

The Town Secretary, not usually the voice of reason in the town, interjected, "I know you're a bit reclusive and eccentric, Marsha, but let's be honest here. Your name might be Marsha Victory, but that doesn't mean that your kin to a container ship. Marsa Victory is a vessel (IMO 9204116, MMSI 341540000) a Container Ship built in 1999 and currently sailing under the flag of St Kitts & Nevis., not a long-lost relative of yours."

Marsha seemed to consider The Town Secretary's words for a moment, her expression softening (that's a clear sign our Town Supervisor really doesn't agree.) After a moment of quiet thought Marsha agreed, but there was a hint of secrecy in her eyes. (Told you – our town supervisor can be really sneaky.)

However, despite her agreement, Marsha couldn't shake off her fascination with Mar**sa** Victory, the container ship. How could their names be so close and it not mean something. (Did I mention our town supervisor is superstitious, as well as reclusive and eccentric?) Marsha kept it hidden, but she continued to track Marsa's movements, secretly intrigued by the vessel that shared a name so similar to her own.

It's too close to be coincidence, or is it? In the long run of important things does it really matter. Who in reality feels kinship to a container ship? AND why are humans so odd with their emotions!

And so, amidst the quaint charm of FEANTM, the mystery of Marsha Victory's peculiar obsession with a container ship named, Mar**sa** Victory, almost identical to her own name remained hidden, adding a touch of intrigue to the peaceful town.

Now, the question the town had was, "Why is there a picture of a container ship named Marsa Victory hanging in the Town Hall Office of the Supervisor with her family pictures?"

NEWS IN A NUTSHELL By Dinky the ranch squirrel I'm a squirrel! Always check the information.

Alan Nichols Livermore, CA

June

Once upon a time, in the quiet and picturesque town of FEANTM, nestled between rolling hills and surrounded by vast open fields, a unique team known as CERT, the Critter Emergency Response Team, plays a vital role in ensuring the safety of both human and animal residents by working closely with Alan Nichols, from the neighboring town of Livermore and local Police, Sheriffs, and Firefighters.

On this ranch there lived a peculiar animal named Harvey. Unlike his fellow woodland creatures who spent their days scurrying for Sunflower Seeds or other food Harvey had a different passion—he was deeply engrossed in civil engineering. (Yes, I did say Civil Engineering – read his helmet)

With a degree in Civil Engineering tucked under his tiny arm, Harvey possessed a keen eye for structure, design, and problem-solving. His mind buzzed with structural blueprints and calculations, and he often found himself pondering over how to make their habitat safer from disasters.

One day Harvey was reading publications by Arup Civil Engineering Department and contemplating the stability of a nearby oak tree. Looking toward the road he noticed the LPD and the Livermore Fire Department talking about the area. They were discussing the importance of disaster preparedness, highlighting the need for a comprehensive plan to safeguard the ranch, and have evacuation plans in place.

Eager to contribute his expertise, Harvey approached the group, offering his assistance. The officials were initially taken aback by the sight of a him wearing his civil engineering helmet proposing to help with such serious matters, but Harvey quickly won them over with his civil engineering expertise.

With their help Harvey conducted workshops on disaster preparedness, teaching the critters and humans how to minimize risks and stay safe in the face of natural or man-made disasters. He explained the importance of identifying hazards, fortifying shelters, and developing evacuation plans.

- Think about emergencies that may require your family to shelter in place (such as a storm), vs. emergencies that may require evacuation (such as a fire.)
- Plan what to do in case you are separated during an emergency
- Choose two places to meet up:
 - Right outside your home in case of a sudden emergency, such as a fire.
 - Outside your neighborhood, in case you cannot return home or are asked to evacuate
- Carry emergency contact information in writing and saved on your cell phones.
- If using special medication, have it in writing and saved on your cell phones
- If you have a medical condition, have it in writing and saved on your cell phone

Soon enough, Harvey found himself appointed as the official ranch consultant outlining steps for future workshops for fire, earthquake and man-made disasters. Some of the ranch animals particularly the Ravens laughed, called him a Nerd, and said they would just fly away. Undeterred by their skepticism, he explained that if they were in heavy smoke that they may not be able to take to the sky and they needed to be prepared.

With his guidance, the future workshops would be assigned to a CERT volunteer teaching one part each month. From that day onward they refrained from calling him a nerd. You never know when that nerd could be the one who rescues you by using their wealth of knowledge.

Harvey bought a second helmet that read, "Nerds Rule"

The CERT TEAM – Coummunity Emergency Response and Critter Emergency Response Teams

Dinky "Always check the information"

CERT Critter Emergency Response Team Future Stories

Alan Nichols, of Livermore, CA

Our CERT Trainer

My name is Horatio Deermouse your store curator and owner.

The Vintage Archives

Among my books you will find archives from our FEANTM town.

Additionally, To borrow a book, you'll need our printed old fashion library card. We don't use apps or electronic scanners - we still use paws. Please turn off cell phones while in the archives.

Supervisors Goodbye Page - Come Back Soon

First: I didn't type beard (I missed typing the "d" I could not figure out why I was getting bears! Second: I got frustrated and didn't delete with a bear, and added with a BEER!

Third: When it is 1AM remind me NOT to try doing FEANTM.

Last: My volunteers saved our new AI doctor from bears and drinking beer! In a way I like the doctor with the bears, maybe a veterinarian at a zoo? but not with the beer!!

My try with AI

Their try with AI

We will always remember. Our Town Always Salutes:

- Our US military, NATO and Friends of the US & NATO First Responders, Police, Fire Fighters EMT's, Doctors, Nurses, SWAT, CERT Teams, etc.
 - We salute engineers, scientists, developers, teachers AND students because without them we would not have technology.