

FEA - CAE Not to Miss & More Eclectic & Innovative
May ISSN 2694-4707
Monthly Town Hall Meeting
Engineering, Research, Interests
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Airport-Navy



Airport-TEI



Auto-MAGNA



Library-Cycling



Marnie - Altair



Marta & Seppi - Oasys



Curt - Autodesk



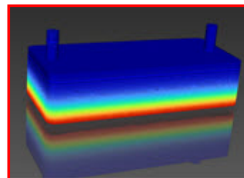
BALA - Knowledge Hub



Marco - RBF Morph YouTube



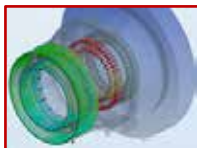
Metin - OZEN Engineering



Aaron - Dynas+



Madhukar - CADFEM



Abhinav - My Physics Café



Jenson - DFETECH



Marjorie-Caggemini



Secretary - Wings



Karl - Visiting Rancher



Brianna - LLNL



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

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.

Legal - the shortened version (town attorney will be upset BUT it was too long to read)

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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 No one in town knows his name. You yell "Hey, Old Rancher."

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

The Old Racer No one in town knows his name. You yell "Hey, Old Racer."

They are all brothers - strange family

Town AI Editors: Aaron, Karl, Bart & Marjorie Robbins and the Robbins brothers and more

Contact us at: feaanswer@aol.com Attribution: [Map town graphics are courtesy of vecteezy](#)

Names, & characters of AI visitors, AI editors, or stories are the products of the town imaginations. Any resemblance to actual persons, living or dead, or actual events is purely coincidental.



We will always remember



Parking & Coffee are free.

R & D - Camping - Town Map

Horse Trail →

Yield right of way to horses



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- If you wish to have yours removed, kindly inform us at feaanswer@aol.com.
- Proceeds from the auction of your building will be allocated to the coffee budget.
- The map is subject to change - building sites will be rotated accordingly.



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- **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

Town Hall Meeting

Park Cars behind building
Park Tractors behind cars
Tie horses to hitching rails

Free coffee & cookies – chocolate

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.

With all the new AI, etc., it reminded me of Rod Serling – yes, I did watch the TV show.

"You're traveling through another dimension, a dimension not only of sight and sound but of mind. A journey into a wondrous land whose boundaries are that of imagination. That's the signpost up ahead - your next stop, the Twilight Zone!"

On to this month's meeting! GAVEL BANG! Your next stop, FEANTM Town!

Town Changes:

- This month due to repairs we closed the Meeting Rooms & Equestrian Center.
- We consolidated the Fire Department and Police Department.
- New vote: the TOC will be almost alpha order.
- The town is changing – never the bakery! The Supervisor needs chocolate cookies.



Resident Announcement – [Web - d3View Now Available in the Cloud](#)

- Run LS-DYNA and any CAE solver with minimal set up
- Open to Microsoft Azure
- AI-based HPC job and resource management based
- Includes AI/ML & features, Design of Experiments, Optimization, Robustness



Article:

Don't miss the article by Maryam Shariati. Explore the revolutionary impact of Polymerase Chain Reaction in the field of disease diagnosis.



Article:

Engineers at SKF rely on modern simulation technology for the development & design of test rigs for large bearings. Ansys Mech. & the special tool Bolt Assessment inside Ansys (BAiA) from CADFEM are used.



Visitor Rancher Karl:

Two DYNAmore LS-DYNA Compact classes to be held in June not to miss!

Discrete Element Method
CPM Airbag Modeling



Article:

Our YouTube channel has just been revamped with fresh content and playlists tailored to fuel your curiosity and enhance your skills.



Dynas+ Engineering Products

Dynas+ Engineering Products: “A Technical Centre of DEP MeshWorks for the European territory.”

This paper showcases a design optimization performed on the initial design with the advanced morphing capabilities of **DEP MeshWorks®**, in conjunction with **LS-OPT®** and the **Incompressible Computational Fluid Dynamics (ICFD) solver LS-DYNA®**.



PDF - [Drag Coefficient Optimization for a Sports Car using the coupling between LS-DYNA ICFD Solver, LS-OPT and DEP MeshWorks software](#) (16th Int'l LS-DYNA Users Conf)

- **M. Seulin, M. Le Garrec, A. Poncet** (Dynas+ Engineering Prod.)
- **I. Caldichoury** (Ansys LST)
- **K. Gudlanarva** (Detroit Engineered Products)

Abstract: Vehicle aerodynamics are paramount in enhancing a car's dynamic behavior, boosting performance, and slashing fuel consumption. While wind tunnels have long been a staple in aerodynamics study, numerical simulations are now emerging as an indispensable tool, enabling an increase in design experimentation while saving both cost and time.

In the intricate process of optimizing a car's global aerodynamics, CFD engineers must take into account numerous factors. The complexity of a vehicle necessitates a fine balance between multi-physical requirements, including design aesthetics, crash safety, weight, vibrations, noise, performance, manufacturing design, and more. This delicate equilibrium must align with the initial specifications to discover the most efficient compromise.

Dynas+ Engineering Products, in close collaboration with ANSYS-LST and DEP, is actively engaged with automakers worldwide on various aerodynamic applications. Innovations in this field are often kept under wraps until shared in conferences, years later. This paper seeks to unveil the current innovative technologies and methodologies used in aerodynamic applications, utilizing open-source sports car data.

Central to most aerodynamic studies, including the present work, is the goal of reducing the aerodynamic drag coefficient of the model.

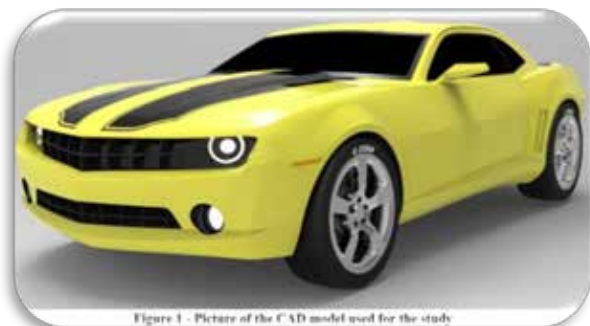


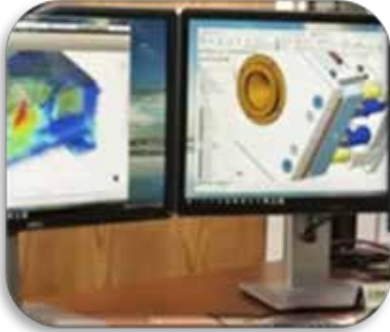
Figure 1 - Picture of the CAD model used for the study

Excerpt: Introduction - Today, two of the main engineering guidelines for automakers according to governmental regulations are the occupant safety and the environmental impact of the car. To reduce the environmental footprint of the vehicle, important work is done on new propulsion energies, internal combustion engines, body weight, and other innovative items. The engineering objective is to reduce the fuel consumption and the gas emissions, while maintaining the user safety and attractive design.



My Physics Café: CAE Analyst and a passionate blogger

I had the opportunity to speak in an online event about 'Challenges in CAE'. I'm grateful to Aldy Dwi Prasetyo for giving me this opportunity to share my insights & experience with a larger audience.



YouTube – [Challenges in CAE](#)

In this 1-hour session, I covered 3 main topics:

- 1) HPC & Cloud computing for CAE.
- 2) Multiphysics simulations and
- 3) Role of CAE in New product development.



The response was overwhelming & the video recording is now available on YouTube

I hope it helps aspiring Mechanical Engineers in choosing their domain in CAE & also aids startup founders understand the importance of cloud computing to scale their services.



BALA – Automotive CAE Enthusiasts!
Do you know how to resolve Debug full vehicle crash Analysis?

Problem Alert: Full Vehicle Frontal Crash Analysis Not Initiating! In the realm of automotive safety engineering, initiating a comprehensive frontal crash analysis is pivotal. Recently, we encountered a snag: the process just wouldn't start.



Step 1: Initial Diagnosis

We began with the basics - checking software configurations, hardware compatibility, and ensuring all input data was correctly formatted. Despite these efforts, the problem persisted.

Step 2: Deeper Dive

Realizing surface checks weren't enough, we delved into system logs and error messages. We discovered subtle hints towards a potential memory allocation issue, leading to deeper system-level investigations.

Step 3: Root Cause Analysis

Utilizing a combination of advanced diagnostic tools and seasoned expertise, we identified the culprit: a recent system update had introduced a compatibility issue with our simulation software, hindering the analysis initiation.

Solution: Back on Track

With the root cause pinpointed, we rolled back the problematic update, worked closely with our software vendors for a patch, and implemented a more rigorous pre-update testing protocol to prevent future disruptions.

Continuous Improvement

This experience was a stark reminder of the importance of rigorous system checks and the value of a systematic approach to problem solving. We're now more equipped than ever to tackle such challenges head-on, ensuring the safety and reliability of our automotive analyses.

Lessons Learned - Every challenge is an opportunity for growth.

By embracing a structured problem-solving approach, we can overcome even the most daunting technical obstacles.

BALA CAE- FORUM

CAE KNOWLEDGE HUB

balacae@forum@gmail.com



Grow Together – Join me on LinkedIn

BALA CAE- FORUM



Monthly simulation choice & Anna referred to me as Retro. She mentioned I was old-fashioned and didn't rely enough on AI. I invited her to fetch me a cup of tea from the kettle, and I'd show her a simulation.

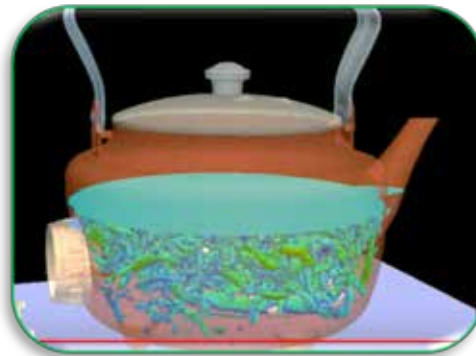
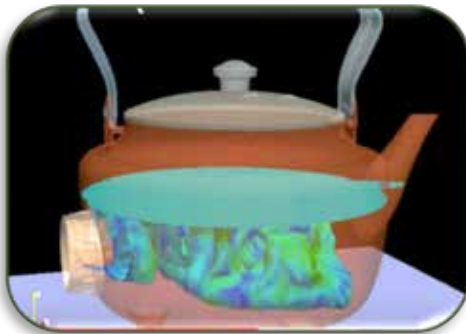
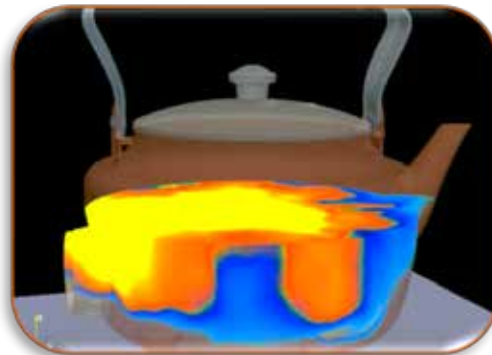
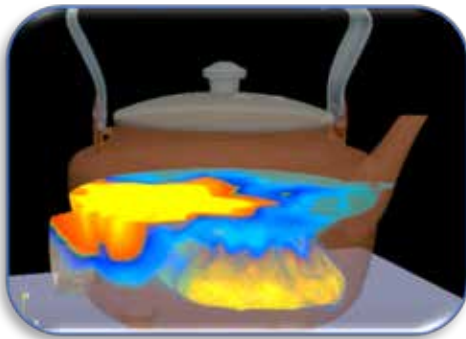
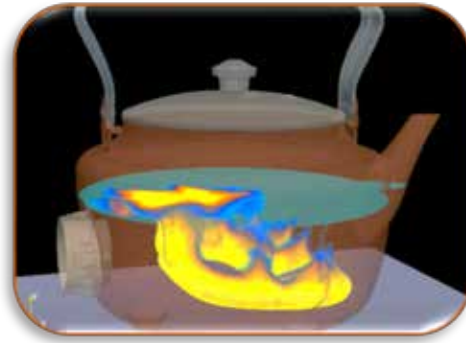
Below is from LS-DYNA Multiphysics channel on YouTube.



YouTube - [The simulation shows the multiphysics capabilities of LS-DYNA.](#)

The three solvers used were the CFD solver, the solid thermal solver and the Electromagnetism solver.

The CFD solver is coupled to the Solid Thermal Solver and the Electromagnetism Solver to simulate the heating of water inside an electric kettle which is plugged in to standard 110V switch.



**News from Livermore, CA - LLNL**

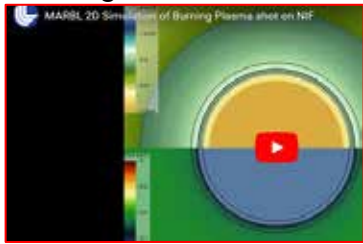
Excerpts - Researchers at Lawrence Livermore National Laboratory (LLNL) have achieved a milestone in accelerating and adding features to complex multi-physics simulations run on Graphics Processing Units (GPUs), a development that could advance high performance computing and engineering.

**Web- [LLNL team accelerates multi-physics simulations with El Capitan predecessor systems](#) – Jeremy Thomas –**

Other LLNL co-authors included Kristi Belcher, Tzanio Kolev, Philip Mocz, Vladimir Tomov, Arturo Vargas and Kenneth Weiss.

A 2D MARBL simulation of the N210808 “Burning Plasma” shot performed at the National Ignition Facility at the onset of ignition. This calculation consists of 19 million high-order quadrature points and ran on El Capitan predecessor system rzAdams (on AMD MI300A GPUs). Animation by Rob Rieben.

As LLNL readies for El Capitan, the National Nuclear Security Administration’s first exascale supercomputer, the team’s efforts have centered around the development of MARBL, a next-generation multi-physics code, for GPUs. El Capitan is based on AMD’s cutting-edge MI300A Accelerated Processing Units (APUs), which combines Central Processing Units (CPUs) with GPUs and high-bandwidth memory into a single package, allowing for more efficient resource sharing.



[Video on YouTube](#) El Capitan’s heterogeneous (CPU/GPU) computing architecture, along with expectations that most future supercomputers will be heterogeneous, made it imperative that multi-physics codes like MARBL — which targets mission-relevant high-energy-density (HED) physics like those involved in inertial confinement fusion (ICF) experiments and stockpile stewardship applications — could perform efficiently across a wide variety of architectures, researchers said.

In a recent paper published by the Journal of Fluids Engineering, by harnessing the power of GPUs, specifically AMD’s MI250X GPUs in El Capitan’s early access machines, the researchers successfully extended MARBL’s capabilities to include additional physics crucial for HED physics and fusion modeling.

“The big focus of this paper was supporting multi-physics — specifically multi-group radiation diffusion and thermonuclear burn, which are involved in fusion reactions — and the coupling of all of that with the higher-order finite-element moving mesh for simulating fluid motion,” principal investigator Rob Rieben said. “To get performance on the GPU; there is a lot you have to do in terms of programming, optimizing kernels and balancing memory and turning your code into a GPU-parallel code, and we were able to accomplish that.”

Rieben’s team has been dedicated to engineering the scalable, GPU-accelerated multi-physics application MARBL for simulating HED physics experimental platforms since 2015, focusing on simultaneous advancement of software abstractions and algorithmic developments to enable GPU performance.

The work described in the recent paper is essential for delivering on programmatic tasks that rely heavily on large-scale computational science to answer tough national security questions, said co-author Alejandro Campos, who added that the team faced two main challenges in extending MARBL’s capabilities: verifying that additional physics modules were accurately implemented and ensuring that those new modules could perform efficiently when running on the next generation of GPU-based machines.

Researchers said the team addressed those challenges through techniques such as new algorithms for solving linear systems with preconditioners, which have historically been optimized for CPUs. A breakthrough



from LLNL's Center for Applied Scientific Computing (CASC) led to a new type of preconditioner suited for GPUs, which was integrated into the code and scaled up for production use.

Preconditioners for linear solvers have been challenging to port to GPUs in a performant way, Rieben said. "CASC proposed a new type of preconditioner needed for solving diffusion equations that is specifically designed to provide high performance for high-order methods on GPUs which enable us to run large 3D multi-physics simulations on GPU machines like El Capitan.

"Our job was to put their method into a production code, scale it up and show that it works; not just on benchmarks, but on the actual problems that we care about. We took that hot-off-the-presses research, worked with the researchers in CASC, and got it into our code and did all the necessary tuning to make that perform well on multiple GPU systems," Rieben said.

In the paper, the team compared traditional distributed CPU approaches to the rapid computing enabled by GPU architectures and focused on developing software that could effectively utilize the Single Instruction/Multiple Data paradigm of GPU hardware. The multi-physics nature of the simulations introduced bottlenecks that added complexity to the task, which could degrade overall performance and scalability if not properly addressed, the team reported.

Researchers said the team's use of performance portability abstraction layers, such as the LLNL-developed RAJA Portability Suite, and the MFEM finite element discretization library were instrumental in enabling MARBL's single source code to target multiple GPU/CPU architectures.

"In this paper, we focus on the AMD GPUs, because we could leverage other open-source performance portability libraries developed here like RAJA," co-author Tom Stitt said. "While there were some AMD-specific changes that needed to be made, there weren't that many and they didn't take that much time, so to start our performance portability strategy, that's a win."

Stitt added that getting MARBL to perform on LLNL's current CPU/GPU flagship Sierra took about six years of employee time, versus about four months to achieve performance on the El Capitan early-access systems, at an 18-fold productivity boost.

"If we had to invest that six years of time again for this new platform, we wouldn't have succeeded; we'd still be working on it," Stitt said. "Our code successes show that the RAJA Portability Suite is a very viable option for writing codes that will work across CPU and GPU architectures and across different GPU vendors."

In addition to RAJA, Umpire — a programming interface that helped alleviate memory constraints on Sierra — also has helped improve codes for El Capitan, Stitt said. Since El Capitan will have eight times more memory per node than Sierra, researchers will be able to fit much bigger problems on a single node and take advantage of the parallelism that the AMD APUs can provide, researchers said.

"The MI300As are the next evolution in AMD GPU processors, and thus, we are very excited to carry out our simulations with those resources," co-author Alejandro Campos said. "We've relied on various libraries developed at LLNL, such as MFEM, RAJA, Umpire and others to abstract away some of the work that went into performance portability, and thus we hope the transition for MARBL to the newer processors will be as straightforward as possible."

Co-author Aaron Skinner said prior methods to run MARBL on CPU-based machines proved challenging due to differences in architecture. Recognizing these limitations, Skinner worked with other CASC researchers to develop code and algorithmic enhancements suited for GPUs, an effort that has successfully benefitted multiple physics modules.



“We’ve known for a while that we need matrix-free methods to gain performance on GPUs, but our best linear solvers don’t lend themselves easily to that formalism, if at all,” Skinner said. “With CASC, we’ve spent a lot of time implementing and optimizing those matrix-free methods, which have really paid off, because the

same linear solvers can be used across many different types of modules, including radiation diffusion, thermal conduction and alpha-particle diffusion. Our approach uses a combination of code optimizations and algorithmic restructuring to gain performance in our linear solvers, which tend to make up the bulk of the computational workload.”

Researchers said the successful GPU acceleration for MARBL represents a leap forward for high performance computing and could have significant implications, not just for El Capitan, but for computational science overall. Improving performance portability will improve flexibility, while advancing GPU acceleration could lead to more efficient and accurate simulations for real-world scientific problems in high energy density physics — including fusion energy driven by lasers or pulsed power — and codes for aerospace and automotive engineering, materials science, climate, biological applications and other complex phenomena.

“Performance portability of codes like MARBL will allow for simulations that provide answers much more quickly or simulations that were previously too expensive to carry out even on the largest supercomputers, as it allows for seamless utilization of different GPU hardware without the need for extensive hardware-specific porting,” Campos said.

In the paper, the team conducted scaling studies on key physics benchmark problems to demonstrate the success of their approach on various computing architectures, showing the potential of GPU acceleration for high-order finite element multi-physics simulations, and highlighting the versatility and adaptability of their performance portability approach.

“The fact that we have a single source code that can target multiple GPUs from different vendors, that’s a really big deal,” Rieben said. “At the DOE labs, one of our principles has been that we can’t afford to be locked into a specific vendor. That’s baked into how we develop our software, so this is a big win for us. It’s a big multiplier in terms of being able to run the code on as many platforms as we possibly can.”

Researchers said they were able to run problems with MARBL on El Capitan’s early access machines, in which the integrated CPU/GPUs share a single memory space, at about twice the speed of Sierra and aim to reach a factor of five times or greater on El Capitan’s advanced MI300 APUs, and a 15- to 20-fold increase over the Lab’s current fastest Commodity Technology Systems.

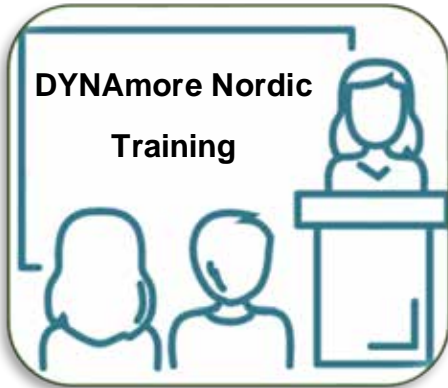
Rieben said faster computation through GPUs directly correlates with scientific discovery, as researchers learn from running numerous simulations rather than just one. Rapid iteration at high resolution enables users to turn around problems quickly, boosting productivity. Additionally, the increased computational power LLNL will get with El Capitan will allow for larger-scale simulations that were previously unattainable and raise the standard for simulation complexity.

“The ability to rapidly iterate at full fidelity and high resolution in 3D is crucial for efficient discovery,” Rieben said. “That’s an immediate benefit; people can turn problems around that much faster. So that speed increase directly translates into a productivity boost for the user. The other thing it lets you do is of course scale, so now you can consider things at a scale that you wouldn’t have considered before. What was once considered cutting-edge will become more commonplace over time.”



"M, I stumbled upon three fascinating announcements. One is a course in Sweden at DYNAmore Nordic in June. It sounds like a fantastic opportunity for us to travel.

Another is their new office. Let's check it out. What do you say? We can let our husbands do all the ranching. We get plane tickets, land in Sweden, eat great desserts, visit the DYNAmore Nordic new office, & fly back with more desserts."



Anders Jonsson

Web- [NVH & Frequency Domain Analysis in LS-DYNA](#)

ONLINE TRAINING, Jun 11, 2024, Online

The objective of the training course is to introduce the frequency domain vibration and acoustic features of LS-DYNA to users, and give a detailed look at the application of these features in vehicle NVH simulation.

This course is recommended for engineers who want to run NVH or other frequency domain vibration and acoustic simulation problems with LS-DYNA. This course is useful for engineers and researchers who are working in the area of vehicle NVH, aircraft/spacecraft vibro-acoustics, engine noise simulation, machine vibration testing and simulation, etc.



[PDF - March News Letter - Vänliga hälsningar - DYNAmore Nordic](#)

Picture from the office in Göteborg and quoted from the newsletter:

"You've heard about it, but you may not have seen it - our new office in Göteborg where we on a daily basis integrate and exchange knowledge with our colleagues from Ansys Sweden."

The office has been newly refurbished and holds a nice kitchen, office space, conference and meeting rooms. Trainings in Göteborg have been held at these premises since the end of last year.

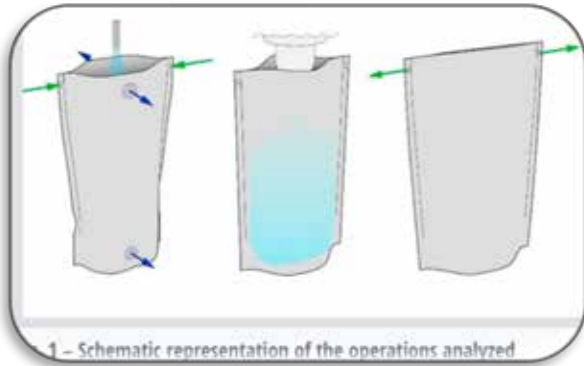
We look forward to welcoming you to visit us at : DYNAmore Nordic and Ansys Sweden,
Anders Personsgatan 14, 416 64 Göteborg.

Ansys Learning Hub – ALH - Starting this spring DYNAmore will be hosting extended versions of our LS-DYNA training webinars on Ansys Learning Hub! Topics ranging from modelling of metals and plastics, simulation of composites, paperboard, electromagnetics, batteries, and more. If you don't have access to Ansys Learning Hub today, contact your Ansys or DYNAmore sales representative.



EnginSoft - From the article: Coesia partnered with EnginSoft and the University of Trento's Department of Industrial Engineering to simulate a stand-up pouch packaging machine (Doypack®). The stages analyzed were opening, filling with detergent, and closing (Fig. 1). The scope was to develop a digital model to perform the two-way coupling between the flexible package structure and the fluid content.

**The problem was addressed using two commercial tools:
Particleworks and RecurDyn.**



Web - [Analyzing the process of filling a flexible pouch by coupling multi-flexible-body dynamics and particle-based CFD simulation](#) - Investigating the effects of the parameters to select the optimal machine configuration - Newsletter EnginSoft Year 18 n°3

M. Berlato

Dept. of Industrial Engineering, Univ. of Trento

D. Marini & M. Merelli

EnginSoft

EXCERPTS - Particleworks and RecurDyn: The former represents the fluid behavior using particlebased computational fluid dynamics (CFD) while the latter efficiently calculates the deformation and dynamics of the flexible pouch by performing a Multi-Flexible-Body Dynamics simulation. We first demonstrated the feasibility of the analysis and then verified the results using the experience of Coesia's engineers with the Doypack® machine.

...

Three different simulations were performed to understand the influence of the material properties, pouch thickness, machine velocity, and opening span of the pouch on the process of preparing and filling it.

...

The multi-body and structural parts of the model were developed in RecurDyn. The rigid components (i.e. upper and lower clamps, suction cups, nozzle, and shutter) were inserted into the RecurDyn model using their CAD designs and assigning them their specific laws of motion.

Conclusions - This study demonstrated the powerful capabilities of the tools that were used to address a complex two-way FSI simulation. The results are promising: they can be used to select the best combination of parameters and to predict performance as the machine configuration or package characteristics change. Both structural and fluid behavior can be analyzed in detail, providing key information that cannot be retrieved experimentally.... This work was being presented in the Manufacturing session of the International CAE Conference and Exhibition 2021...

About Coesia - Coesia is a group of companies specialised in highly innovative industrial and packaging solutions, headquartered in Bologna, Italy... Coesia's customers are leaders in a wide range of market sectors, including Aerospace, Ceramics, Consumer goods, Electronics, Healthcare, Luxury Goods, Pharmaceuticals, Racing & Automotive and Tobacco.



Autodesk – Did you read the article by Heather Miller?

See how Batch.Works designs colorful, customizable headphones for kids with the planet in mind using Autodesk Fusion.



Excerpts WEB – [Batch.Works Presses Play with Autodesk Fusion for Sustainable, Kid-Friendly Headphones](#) - Heather Miller

When it comes to sustainable products, not all are created equally. Greenwashing with deceptive, “eco-friendly” labels and claims continues to run rampant. But London-based circular manufacturing company Batch.Works is taking a decidedly different approach. Its transparent commitment to design and manufacture sustainable products for circularity is on full display from start to finish.



Child wearing Batch.Works Kibu headphones.

Take its Kibu headphones as one example. Developed in partnership with East London design consultancy Moramma, the headphones are designed specifically for children and customizable with fun colors and features. The modular design accommodates expansion as kids grow—eliminating one more thing to throw away.



A fused-filament fabrication (FFF) 3D-printing process is used to make many of Kibu’s components with polylactic acid (PLA). PLA is a biodegradable polyester created from renewable resources, such as sugar beets, sugar cane, and corn.

Batch.Works used Autodesk Fusion to design Kibu, enabling an iterative design process and more effective collaboration with their design partners at Moramma.

“With both of us using Fusion, we could evaluate new ideas quickly without having to create prototypes outside of the software,” says Julien Vaissieres, founder and CEO, Batch.Works. “That is a key benefit of the platform and something we value a lot.”



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

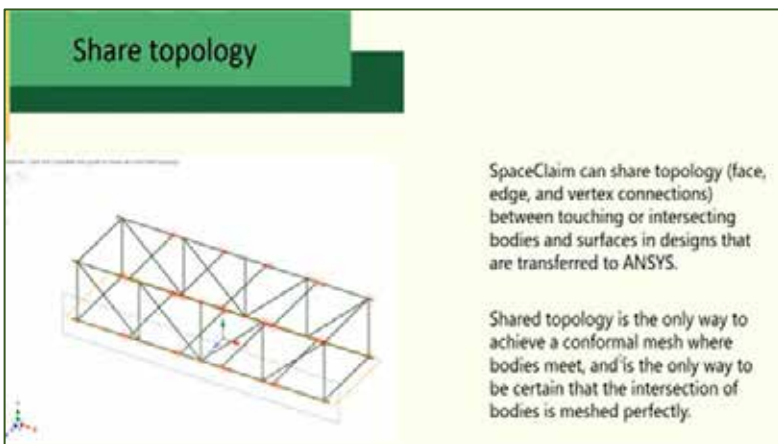
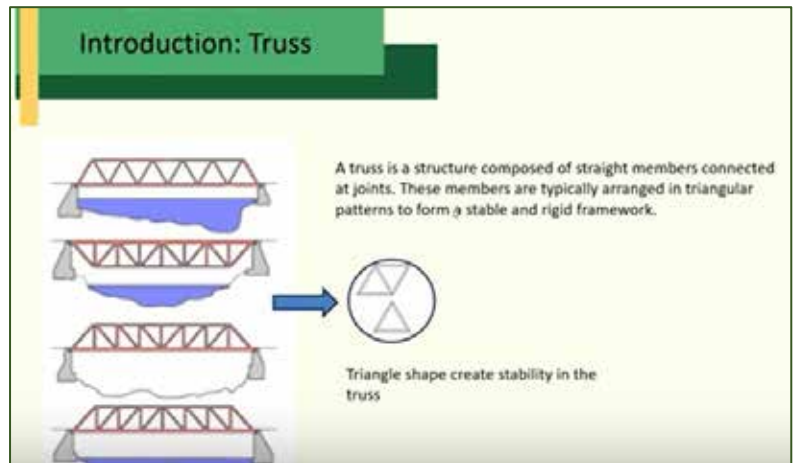
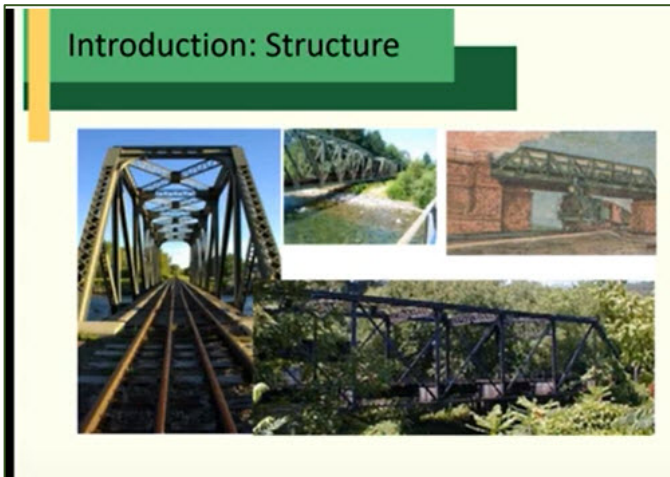


YouTube - Webinar: [Ansys Mechanical \(Beam / Truss Analysis in Static Structural\)](#)

Dr. Mohammad Hazim

This webinar is 32.12 minutes and will delve into the powerful capabilities of ANSYS Structural. It will equip you with essential skills to predict the behavior of structural components accurately.

Among the slides from the webinar:



Key Takeaway:

- Determine stress and strain distributions
- Optimize designs
- Evaluate safety factors
- Explore failure modes
- Validate theoretical models

**DYNAmore - Two of DYNAmore June Webinars Not To Miss**

- LS-DYNA Compact: Discrete Element Method
Attendees of this webinar will obtain an overview of the involved material cards of a successful DEM simulation.
- LS-DYNA Compact: CPM Airbag Modeling
This webinar presents the fundamentals to setup an airbag simulation model in LS-DYNA.

**WEB June 12- [LS-DYNA Compact: Discrete Element Method](#) - **Maik Schenke****

The discrete element method (DEM) is usually applied to predict the behavior of different types of granular media during mixing processes, storage and discharge or transportation on belts. Herein, the interaction of the spherical particles with themselves as well as their surrounding deformable or rigid structures can be taken into account.

Friction coefficients as well as spring and damper constants can be defined in normal and tangential direction. Wet particles can be estimated with the aid of a capillary force model and a certain roughness of the spherical particles can be achieved by introducing a rolling friction.

A continuum-mechanical description can be obtained with the introduction of "bonds" between the particles. Herein, the required mechanical behavior of the bonds is automatically computed by LS-DYNA using the parameters given in the material card. With the definition of a fracture energy release rate of the bonds, fracture mechanics of brittle materials can be studied.

Attendees of this webinar will obtain an overview of the involved material cards of a successful DEM simulation. For a better understanding of the involved parameters, simple examples will be presented addressing particle-particle as well as particle-structure interaction. Finally, the associated experiments will be discussed that are needed to determine the involved parameters.

Contents: Introduction to granular materials - Involved keywords and their options
Setting up DEM simulations with deformable/rigid structures
Physical meaning of the parameters and their experimental determination - Practice examples
The course will take place from 9-11 a.m. (CET) on two consecutive days.

**WEB June 14 - [LS-DYNA Compact: CPM Airbag Modeling - English](#) - **Steffen Mattern****

Airbags are one of the most important components for occupant safety in motor vehicles. Their applications ranges from standard airbags for driver and passenger to more specified variants, such as curtain or knee airbags. Every airbag needs to be thoroughly designed for its particular application with to achieve a high-quality occupant-restraint system.
The webinar presents the fundamentals to setup an airbag simulation model in LS-DYNA.

In this regard, at first, the corpuscular method (CPM), which is particle method and, nowadays, became a state-of-the-art for all airbag applications due to its robustness and efficiency. Following up, the necessary LS-DYNA keywords, such as MAT_FABRIC or AIRBAG_PARTICLE, are provided and their parameters are explained.

Note that this webinar is a condensed version of our attendance class "CPM Airbag Modeling".

- Material definition (*MAT_FABRIC) and reference geometry
- Contact definition - Corpuscular Method (CPM) - theoretical background
- *AIRBAG_PARTICLE Keyword in LS-DYNA - Keywords related to *AIRBAG_PARTICLE

General Hints and best practice - **The webinar will take place from 9-11 a.m. (CET).**



RBF Morph - Are you passionate about engineering simulation and eager to master advanced mesh morphing techniques? Look no further! **Our YouTube channel has just been revamped with fresh content and playlists** tailored to fuel your curiosity and enhance your skills in this dynamic field.



YouTube - [Dive into our newly curated playlists](#)

RBF Morph Structures - ACT Extension

14 videos

Engineering Simulation Fundamentals

Master the basics and build a solid foundation for your simulation endeavors.

Advanced Mesh Morphing Techniques

Unlock the power of mesh morphing to optimize your simulations and achieve unprecedented accuracy.

Expert Tips and Tricks

Learn insights and strategies to elevate your simulation game in any industry.

Whether you're a seasoned professional or just starting your journey in engineering simulation, our channel offers something for everyone!

Don't miss out on the latest updates and tutorials.

OPTIMIZATION AND ADJOINTS

Shape Morphing

ANSYS Inc

3 videos

We make CAE models parametric

CAE models supported includes flow analysis (CFD) and structural analysis (FEM)

- CAE model becomes parametric with respect to the shape
- Shape optimization can be steered with the orchestrator of choice
- Synthetic big data generation for digital twins

rbf

About RBF Morph

26 videos

CFD Simulation

Healthy and Aneurysmatic State

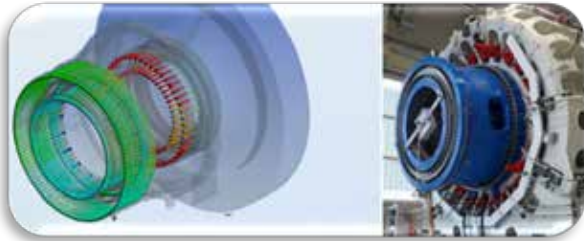
5 videos

Our research projects



CADFEM India: Did you know that the engineers at SKF rely on modern simulation technology for the development and design of test rigs for large bearings. Ansys Mechanical and the special tool Bolt Assessment inside Ansys (BAiA) from CADFEM are used. In accordance with VDI guideline 2230, BAiA accelerates and optimizes both the selection and assembly of the many bolted connections. They are of great importance for the robustness of the test benches.

Author: Thierry Adane, SKF GmbH Sven Wingquist Test Ctr.
 Web – Cover Images: Right: ©Sven Wingquist Test Center -
 Left: ©Sven Wingquist Test Center



WEB

[Fast and Digital Bolt Verification According to VDI 2230](#)
 SKF develops test rigs for bearings in large machines

EXCERPTS - With the Sven Wingquist Test Center, named after the company founder, SKF operates the world's most efficient test center for large bearings in Schweinfurt. The purpose of these test rigs is to validate the performance of large size bearings according to customer specifications, while continuing to acquire knowledge about these bearings by testing them under extreme conditions as close as possible to those encountered in real-world applications.

The Sven Wingquist Test Center: SKF test center for large size bearings - The SKF test center has a full range of test rigs. These test rigs make it possible to carry out tests under a wide variety of conditions:

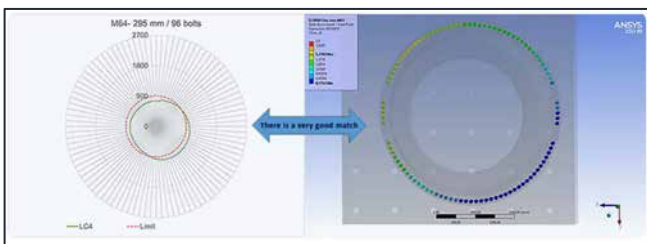
- Low-speed and high-speed drive (in relation to bearing size).
- Various types of loads can be applied (radial, axial, combined), from bending moments to high amplitude, depending on the requirements of the application for which the bearings are intended.
- Dynamic loading is possible up to a certain frequency variation (large structures).

The website has the complete information:

Main Shaft Test Rig (MSTR) - Dynamic Development Test Rig (DDTR)
 XLSB Rotating inner Ring (XLSB RIR400) - XLSB Rotating Outer Ring (XLSB ROR)

...As mentioned in the introduction, each of these test rigs require the use of a large number of bolted assemblies, from M24 to M160...The rigs are all monitored for temperature and vibration, and the bearings are fitted with sensors in the rolling elements to monitor their load and other kinetic variations. A large amount of data is created for analysis, during and after testing...

Safety and reliability have top priority - Verification of bolted connections: The special challenges of large bearings - Example from the MSTR test rig development



Left: Safety factor obtained with Bolt Assessment inside Ansys | © SKF ... Bolt Assessment inside Ansys gives you a reliable, functional model in almost no time.

One solution for ensuring a reliable model and making it more functional is to use Bolt Assessment inside Ansys, developed by CADFEM. All the work involved in preparing input and output maps



I was discussing our future business with Bart, while we were drinking our morning coffee, at the ranch. I read to Bart that Capgemini helps embrace key technologies such as cloud, data, and artificial intelligence, and also work to improve cybersecurity and environmental impact. After listing our chores for the day we read their TechnoVision 2024 which is not to miss!



CAPGEMINI - Web - [Techno Vision 2024](#)

Excerpts

Are you ready to PROMPT the future?

TechnoVision exists to help PROMPT your vision of the future, and to help your business gain competitive advantage in digital tools.

This year, more than ever, it was impossible to escape how technology is changing. Generative AI was rarely out of the headlines, while advances in established and emerging technologies continued to transform our lives, our businesses, and our culture.

It's natural to feel some uncertainty and even discomfort when the pace of technological progress is so great. But despite the breath-taking change going on around us all, the key lies in applying innovations responsibly so that they act as a force for good.

As business leaders and decision makers, we have a responsibility to understand the future of technology, especially in terms of how it can help drive business transformation.

When we have a vision of the future, we can harness digital innovation to help bring that future to life – with technology serving as a teammate not an opponent.

By exploring the most exciting and opportunity-rich areas of today's technology, TechnoVision empowers you to craft your own informed vision of the future, so you can drive positive change through technology, and reap the rewards in your business.



Overview - TechnoVision 2024 -TechnoVision categorizes how technology is changing into six containers.

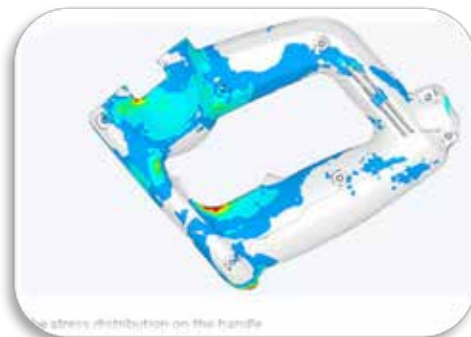
These provide a snapshot of innovation in business from different perspectives (the 'what') ranging from user experience and collaboration, via data and process automation, all the way to infrastructure and applications.

TechnoVision categorizes how technology is changing into six containers. These provide a snapshot of innovation in business from different perspectives (the 'what') ranging from user experience and collaboration, via data and process automation, all the way to infrastructure and applications.

(TechnoVision can be viewed on the website and in pdf.)



CADFEW: From our website: **DEWALT is a quality brand owned by Black & Decker.** The development of modern power tools for professional use requires not only consideration of aspects such as performance and user-friendliness, but also that special attention be given to features such as robustness and the durability of the tools when it comes to drop tests and misuse. Images: © Black & Decker



WEB [Drop test simulation for power tools using LS-DYNA](#)

Task - The development of modern power tools for professional use requires not only consideration of aspects such as performance and user-friendliness, it also requires special attention to features such as the robustness and durability of the tools when they are subjected to drop tests and misuse. When it comes to ensuring the presence of these attributes, computer-aided simulation plays a central role throughout Black & Decker’s entire development process – stretching all the way from the pre-development phase right through to the testing of close-to-production prototypes. Electrical tools have to be able to withstand drop tests performed from a defined height, i.e., holes that would allow contact with electrically conductive components must not emerge. As a consequence, the challenge is to provide an appropriate simulation model that includes not only the outer structure but also large parts of the internal hammer modules. Achieving this goal would ensure that the load path is realistic and that the evaluation of the plastic components and of their weak points would be substantive.

Another aspect when it comes to the design of any device relates to misuse. Hammer drills and chisel drills must be able to withstand the type of major pull-out forces and bending forces that are introduced into the handle when a jammed drill or chisel is loosened improperly.

Solution - **LS-DYNA ensures that the load path is realistic and that the simulation-based evaluation of the plastic components and of their weak points is substantive.** The amount of effort required in order to generate this model is heightened not only due to the fact that the tools contain a high number of components – it is also due to the way the external structure (necessarily) contains a high level of detail. This is particularly necessitated by the need to model the numerous slug connections and interlocking contacts of the plastic components with sufficient accuracy.

Customer Benefit - At Black & Decker GmbH, the application of computer-aided simulation to all phases of development (i.e., concept, product development, and prototype) has, in recent years, proved its worth. Using virtual prototypes to makes it possible for weak points to be predicted with a high degree of precision. This makes it possible for appropriate solutions to be integrated early on in the development process.



Don't miss the article by Jim Scapa the Founder, Chairman, and CEO of Altair "In Pursuit of Success: Stories of Ambition & Achievement."

PDF link to CNBC is below, turn to Page 56 – **Excerpt by Jim Scapa, "I am delighted and proud to share my personal journey as part of CNBC's new collection of essays from notable entrepreneurs... I hope it will inspire others to pursue their dreams."**



PDF: The article is on page 56

[In Pursuit of Success: Stories of Ambition & Achievement." By Jim Scapa](#)

Jim Scapa is the Founder, Chairman, and CEO of Altair, a global computational science and artificial intelligence company.

Altair software serves a broad range of industry sectors, including automotive, aerospace, government and defense, banking, finance, energy, electronics, healthcare, life sciences, architecture, and construction.

EXCERPTS - "MY 3 STEPS TO SUCCESS"

AGILITY AND ADAPTABILITY ARE KEY:

The world can change so quickly. You must always be willing to change and adapt, even if it is risky or uncertain. You have to be pragmatic and take different approaches quickly if and when things aren't working. I have learned this firsthand with Altair, and we continue to embody this approach every day.

START WITH WHAT'S FAMILIAR:

Especially if you are just starting out, sticking with something you know well is incredibly useful. It gives you and others confidence that you can understand and adapt to new technologies, markets and contexts. It is not a requirement, but it can be very beneficial.

ALWAYS PUT PEOPLE FIRST:

You have to respect people, including employees, customers and beyond. You also have to listen, something I think too many people overlook in business today. You must cultivate an environment where people can grow personally and professionally. There is nothing more important than doing right by people.

- Jim earned an MBA from the University of Michigan and a B.S. in Mechanical Engineering from Columbia University.
- **Altair serves more than 13,000 customers and employs more than 3,000 employees, with 74 offices across more than 25 countries.**
- Jim Scapa, "My co-founders and I started Altair in 1985, and it has grown into something remarkable. Today we are a global company that prioritizes people and relationships, and a place where everyone feels supported to become the best they can be. Ultimately, **I have taken a simple approach with Altair: I want every single person to be essential and to know that they are essential. Success to me is support, growth and an eye to the future.**"



OASYS: We are delighted to invite you to the UK Oasys LS-DYNA Conference 2024. Our annual event is a unique opportunity for simulation experts, industry professionals, and academics to come together and explore the latest advancements in the Oasys and LS-DYNA world. This year's conference features a comprehensive programme designed to provide you with the knowledge and skills to unlock the full potential of LS-DYNA and the Oasys Suite.



Web - [UK Oasys LS-DYNA Conference](#) – Birmingham, UK 2024 - 13 Jun, 1 day - Complimentary In-Person Event

You'll have the chance to participate in interactive sessions, share your ideas, and learn from our software team about how to address complex engineering challenges. In addition to gaining valuable insights, our conference is an excellent opportunity to hear from experts, network with fellow professionals, and stay up

to date on the latest trends in the industry. Whether you're a seasoned simulation software user or just starting out, we look forward to welcoming you.

There will be a complimentary drinks and canapes reception after the conference. This offers a chance for you to catch up with your friends and colleagues from across the Oasys LS-DYNA community in a relaxed and informal setting. Attendance is free but please confirm your space during registration.

Among the Presentation Speakers

Oasys LS-DYNA team	Welcoming Remarks
LS-DYNA talk	ANSYS
Oasys LS-DYNA team	Oasys Suite 21.0 – Part 1
Arup & Oasys LS-DYNA teams	Battery System Design with Oasys LS-DYNA Environment
Lotus	Customer Talk: Lotus Engineering and the Oasys LS-DYNA Environ.
Jaguar Land Rover	Customer Talk: Numerical Noise in LS-DYNA
Oasys LS-DYNA team	Oasys Suite 21.0 – Part 2
Oasys LS-DYNA team	Overview of key LS-DYNA new features

Learning Lab topics: Virtual Testing, - Oasys POST-PROCESSING – Did you know? - LS-DYNA

Table Discussion topics:

- AI in Oasys LS-DYNA Environment - Developments in electrification
- Oasys PRIMER what do you want to see next?
- Oasys D3PLOT/T/HIS/REPORTER – what do you want to see next?
- Oasys Web Viewers - LS-DYNA – gripes and grumbles - Automotive assessments and protocols

Oasys LS-DYNA Team Expands in the USA - In response to the fast-evolving market conditions, Oasys Ltd. is excited to announce the expansion of its operations in America. This strategic move aligns with our commitment to providing exceptional service to our valued users worldwide. We recently welcomed Karthik Anantula to our team in SFO as Regional Manager, soon to be joined by Emily Owen, Sr. Engineer



on a long-term assignment from the UK. Working with Francois Lancelot, Associate Principle, the team are poised to deliver even greater value and expertise to our clients. For all USA support and technical inquiries, reach out to them at

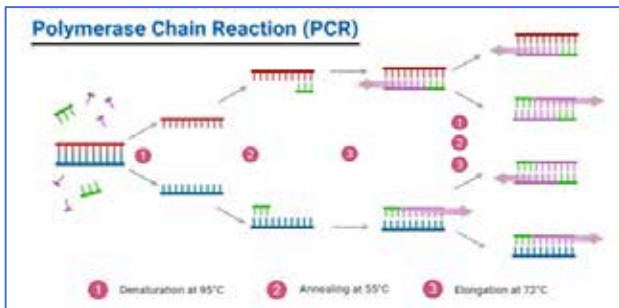
us.support@arup.com .



OZEN Engineering: Don't miss the article by Maryam Shariati, PhD - Polymerase Chain Reaction (PCR) is a powerful technique used in molecular biology to amplify a specific segment of DNA. It allows for the rapid production of millions to billions of copies of a particular DNA sample. **ANSYS Fluent was utilized to simulate the temperature distribution within a basic bioreactor.**

WEB [Explore the revolutionary impact of Polymerase Chain Reaction \(PCR\) in the field of disease diagnosis. Understanding PCR Technology](#)

PCR technology involves a series of temperature cycles that enable the DNA to be denatured, annealed with primers, and extended by DNA polymerase. This process is repeated multiple times, resulting in an exponential increase in the amount of DNA. DNA polymerase is the enzyme that will enable the extension of DNA strands and the reaction is sensitive to the temperature profile. Figure 1 shows the three main stage of the polymerase chain reaction and the specific temperature that is required for each stage. Understanding the principles behind PCR technology is crucial for its successful application in disease diagnosis.



Polymerase Chain Reaction (PCR) (Figure 1: Different Stages of a polymerase chain reaction PCR in Infectious Disease Diagnosis)

PCR has revolutionized the field of infectious disease diagnosis. It allows for the rapid and accurate detection of pathogens, such as bacteria or viruses, by amplifying their specific DNA or RNA sequences. By targeting specific genes or regions of the pathogen's genome, PCR can

identify the presence of infectious agents even at low concentrations. This has greatly improved the speed and sensitivity of diagnosing infectious diseases.

PCR-based tests have been widely used in the diagnosis of a wide range of infectious diseases, including COVID-19, influenza, HIV, tuberculosis, malaria, hepatitis, and many others. The versatility and sensitivity of PCR technology have made it a valuable tool in identifying and monitoring various pathogens, aiding in the timely treatment and management of these diseases. Its ability to detect even low concentrations of pathogens has significantly improved the accuracy and speed of disease diagnosis, ultimately leading to better patient outcomes.

Distinguishing mild and critical COVID-19 disease severity: from sample prep to insights - 10x Genomics - [View graphic on website of: COVID-19 Virus PCR in Genetic Disease Diagnosis](#)

PCR plays a crucial role in the diagnosis of genetic diseases. It allows for the detection of specific genetic mutations or variations that are associated with various genetic disorders. By amplifying and analyzing the DNA of an individual, PCR can identify genetic abnormalities that may contribute to the development of a disease. This helps in genetic counseling, early diagnosis, and personalized treatment strategies. PCR-based genetic testing has been instrumental in diagnosing a wide range of genetic conditions, including but not limited to cystic fibrosis, sickle cell anemia, Huntington's disease, and many others. By targeting specific genetic mutations or variations, PCR technology enables healthcare professionals to identify underlying genetic causes of various disorders with high precision and accuracy. This not only aids in early diagnosis and intervention but also facilitates personalized treatment strategies tailored to individual patients' genetic makeup. The application of PCR in genetic disease diagnosis has significantly improved patient care and outcomes by providing valuable insights into the genetic factors contributing to disease development. Its role in identifying and understanding genetic disorders underscores the importance of PCR technology in advancing the field of medical genetics and personalized medicine.



Use of Thermal Modeling PCR Based Instruments - Thermal modeling is an essential aspect of PCR-based instruments. These instruments rely on precise temperature control to carry out the temperature cycles required for PCR. **Thermal modeling plays a crucial role in optimizing PCR thermocycling, ensuring precise temperature control for the amplification of DNA samples.** By utilizing thermal modeling and simulation techniques, researchers and manufacturers can enhance the performance of PCR instruments, leading to more accurate and reproducible results. This advancement in technology has led to the development of sophisticated PCR instruments that offer improved speed, sensitivity, and reliability in disease diagnosis. As thermal modeling continues to evolve, it will further enhance the efficiency and effectiveness of PCR technology, ultimately revolutionizing the field of disease diagnosis.

In this instance, ANSYS Fluent was utilized to simulate the temperature distribution within a basic bioreactor. As depicted in Figure 2, the PCR cycle profile evolves over time. The polymerase chain reaction undergoes 40 cycles, typically lasting around 45 minutes. The primary focus of this study was to analyze the temperature non-uniformity within the chamber, aiming to pinpoint potential design enhancements for optimizing temperature distribution. Addressing temperature non-uniformity is a key consideration in the design of PCR systems. **View graphic on website of: Thermal Profile for PCR Reaction**

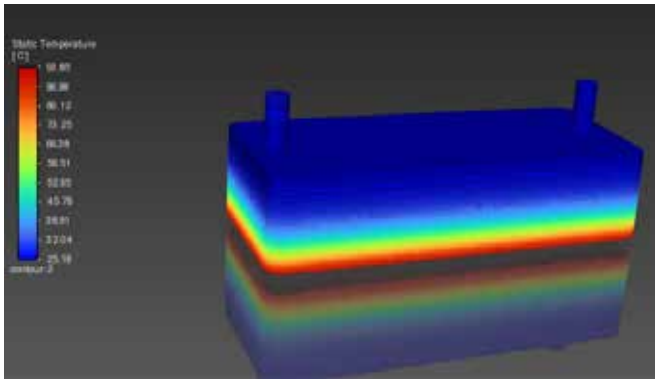


Figure 3: Transient Thermal Model for PCR Thermocycling

As illustrated in Figure 3, heat is conducted from the base of the reactor, resulting in a noticeable gradient in the z-direction. Interestingly, the simulation indicates that the temperature at the top of the reactor remains constant at room temperature. This intricate model serves as a valuable tool for refining the temperature distribution to achieve optimal results. Moreover, it paves the way for innovative design possibilities, such as integrating a heated top for more effective thermal management solutions. Be sure to check out the instructional video in Figure 4 for a step-by-step guide on setting up the model.

By using thermal modeling and simulation techniques, researchers and manufacturers can optimize the performance of PCR instruments. This helps in reducing errors, improving efficiency, and ensuring accurate and reproducible results. The use of thermal modeling has led to the development of advanced PCR instruments that offer enhanced speed, sensitivity, and reliability in disease diagnosis. **View website for: How to set up a transient thermal model for PCR**

Future Prospects of PCR in Disease Diagnosis - The future of PCR in disease diagnosis holds immense promise as technological advancements and ongoing research efforts push the boundaries of its applications. As we look ahead, PCR is poised to redefine personalized medicine by leveraging genetic information to customize treatments tailored to each individual patient's unique genetic makeup...

Moreover, PCR is anticipated to play a pivotal role in the early detection and continuous monitoring of diseases, ushering in a new era of proactive healthcare management. By enabling the rapid and accurate identification of pathogens and genetic abnormalities, PCR can empower healthcare professionals to intervene sooner, leading to improved patient outcomes and overall well-being. The integration of PCR with cutting-edge diagnostic technologies like next-generation sequencing and microfluidics presents exciting possibilities for the future of disease diagnosis....As PCR techniques continue to evolve and innovate, they are set to propel the field of disease diagnosis forward, driving progress, and shaping the future of healthcare. With each advancement, PCR solidifies its position as a cornerstone technology in the medical landscape, poised to transform the way we understand, diagnose, and treat diseases. The future of PCR is bright, promising a new era of precision medicine and improved patient care.



“I think we should drive to Michigan in October. Before we leave we can herd the cattle in the other pasture and not miss the 2024 International LS-DYNA Conference.”

October 22-23 in Plymouth, Michigan.



WEB [All LS-DYNA Users plan to meet in Plymouth, Michigan. Submit your paper](#)



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

An iconic landmark surrounded by natural beauty on our 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

- Initial Proposal Deadline | May 31, 2024
- 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:
 - 20 minutes for presenting
 - 5-10 minutes for Q&A.
- Recorded presentations may be considered if you are unable to attend in-person.



D3View - Have you seen the blog by Bing published on April 29th?

A natural approach of understanding an unknown model is to get some sample points from the model and use these points to build a response surface model (RSM) to represent the true model.

		Learning Type										
		BayesRidge	Dtree	Enet	GPR	LASSO	Linear	MLP	RFR	Ridge	SVR	XGBoost
Sampling Type	DLHS	8	8	8	8	8	8	8	8	8	8	8
	DOPT	4	4	4	4	4	4	4	4	4	4	4
	DSF	8	8	8	8	8	8	8	8	8	8	8
	FFD	16	16	16	16	16	16	16	16	16	16	16
	LHS	4	4	4	4	4	4	4	4	4	4	4
	SF	4	4	4	4	4	4	4	4	4	4	4

Number of sampling points for each sampling and learning type

Excerpt Web - Study of Machine Learning Parameters for Robustness

Introduction - In this process, two factors play a vital role in RSM accuracy. One is the sampling points

to use for building the model and the other is the selection and training of the model. Given so many choices of sampling methods and learning models, an inevitable question we are all asking is, which sampling type and learning model we should use. In this article, we will explore how different combinations of sampling methods and learning models affects the accuracy of the RSM model.

Dynamic Time Warping - We start with a reference FD curve generated from simulation using UFS = 0.4 and FADEXP = 8. We want to find a set of values for parameter UFS and FADEXP that generates a curve that will be very close to the reference curve we have. In order to compare the similarity of two curves, we use Dynamic Time Warping score (DTW) as a metric. If two curves are perfectly overlapping with each other, we get DTW = 0. Otherwise, two different curves will result in a non-zero DTW score that indicates how different the two curves are. A larger the DTW score implies larger difference.

Sampling and Learning - There are four main sampling types : Full Factorial Design (FFD), D-Optimal Design (DOPT), Latin Hypercube (LHS), and Space Filling (SF). In addition to these four basic designs, we can combine any two sampling types to get a new design. We will consider DLHS (a combination of DOPT and LHS design), DSF (a combination of DOP and SF design), and LS (a combination of LHS and SF design). We sample 16 points for FFD, 4 points for DOPT, LHS, and SF. This will give us 8 points for DLHS, DSF, and LS. Introduction

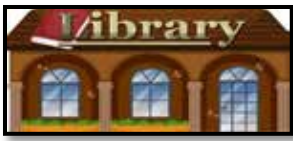
A natural approach of understanding an unknown model is to get some sample points from the model and use these points to build a response surface model (RSM) to represent the true model.

In this process, two factors play a vital role in RSM accuracy. One is the sampling points to use for building the model and the other is the selection and training of the model. Given so many choices of sampling methods and learning models, an inevitable question we are all asking is, which sampling type and learning model we should use. In this article, we will explore how different combinations of sampling methods and learning models affects the accuracy of the RSM model.

Dynamic Time Warping

We start with a reference FD curve generated from simulation using UFS = 0.4 and FADEXP = 8. We want to find a set of values for parameter UFS and FADEXP that generates a curve that will be very close to the reference curve we have. In order to compare the similarity of two curves, we use Dynamic Time Warping score (DTW) as a metric. If two curves are perfectly overlapping with each other, we get DTW = 0. Otherwise, two different curves will result in a non-zero DTW score that indicates how different the two curves are. A larger the DTW score implies larger difference...

On The Website: Sampling and Learning, Error Estimation, Optimal Prediction Error, Result, Conclusion



Before reading the town flyer I was reading on Science Direct about CFD analysis of chest fairings in time trial cycling.

An excerpt I found interesting: ...**The model was applied here without curvature correction but with production limiters (ANSYS Fluent, 2020)...**

The authors acknowledge the partnership with **Ansys CFD**. In particular, they acknowledge the support by **Thierry Marchal**, Chief Technologist Healthcare for EMEA, CTO Office, at Ansys, **John Stokes**, Vice President Fluids Business Unit at Ansys and **Richard Tinsdeall**, Vice President Northern Europe at Ansys. A special word of thanks to **Patrick Sharkey**, Fluids Applications Team Leader at Ansys UK Ltd for the hardware support in running the simulations for this paper...



Science Direct web- [CFD analysis of chest fairings in time trial cycling](#)

B. Blocken, F. Malizia, T. van Druenen

- Inst. of Mechanical, Process and Energy Engineering, School of Engineering and Physical Sciences, Heriot-Watt University, Edinburgh, Scotland, United Kingdom
- Building Physics & Sustainable Design, Department of Civil Engineering, KU Leuven, Leuven, Belgium
- Building Physics & Services, Department of the Built Environment, TU Eindhoven, Eindhoven, the Netherlands

Highlights

- Chest fairing is object stuck between chest and shirt of time trial cyclist to reduce air resistance.
- Seven types of chest fairings analysed, five yield drag reduction but two yield drag increase.
- Drag reductions are caused by guiding the flow away from abdomen, pelvis, upper legs.
- Largest chest fairing gives 3.6% drag reduction and at least 0.78 s time gain per km.
- Time gains by chest fairing can decide who wins or loses a time trial.

Abstract - In the past but especially more recently, some cyclists in triathlon and road cycling competitions have been riding with an object stuck between their chest and their shirt, attempting to reduce aerodynamic drag. This object has been referred to as “chest fairing”. The most excessive examples occurred in triathlon, where large objects such as drink bottles were used as chest fairing. More exceptionally, smaller examples have been observed in road cycling in individual time trials (ITT), including the 2023 Tour de France ITT and the 2023 Glasgow Road World Championships ITT. To the best of our knowledge, this paper provides the first published scientific assessment of the benefits that can be obtained by different types of chest fairings. The assessment is performed by computational fluid dynamics (CFD) simulations validated with wind tunnel tests. A reference configuration of cyclist without chest fairing and seven chest fairing configurations are analysed. The resulting drag reduction can go up to 3.6%, but some chest fairings actually increase the drag. It is concluded that a chest fairing can be beneficial and potentially decisive but that careful and dedicated a priori wind tunnel tests or CFD simulations for the specific rider must be undertaken.



MeDiTATe Project – EXCERPT - MeDiTATe, the Medical Digital Twin for Aneurysm prevention and Treatment, establishes a Marie Curie European Industrial Doctorate to deliver an innovative doctorate programme for 14 Early-Stage Researchers...

Web – if you missed the Individual Research Projects designed for fourteen Early Stage Researchers they can be reviewed on the website

Each Individual Research Project (IRP) is designed to extend the state-of-the-art in the field of image based medical Digital Twins of cardiovascular districts for patient specific prevention and treatment of aneurysms

Among the Projects if you missed them are 01 and 02



Antonio Martinez Pascual – ESR 01 - IRP 01: [The combined use of mesh morphing, force-feedback device and static reduced-order models for achieving real-time hemodynamic solution over geometric changes.](#)

The objectives of the project are related to the combination of efficient mesh morphing, computational static reduced order models (SROMs) and haptic devices in order to manage and solve hemodynamic simulations over geometric changes of tissues. The combined use of the three tools is expected to allow real-time solution, visualization and feedback, in view of the Digital Twin MeDiTATe is planning to build. The assessment of this approach will be carried out and compared to dynamic results of ESR02. In the first part, starting from the definition of feasible variations of anatomical geometry and the corresponding control points to manage them, the variability will be reduced to a small set of parameters...



Leonardo Geronzi – ESR 02 - IRP 02: [The combined use of mesh morphing, force-feedback device and dynamic reduced-order models for achieving real-time hemodynamic solution over geometric changes.](#)

The objectives of the project are related the combination of efficient mesh morphing, computational dynamic reduced order models (DROMs) and haptic devices in order to manage and solve hemodynamic simulations including fluid-structure interaction over

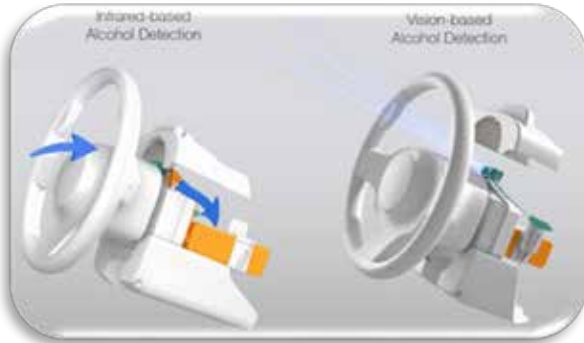
geometric changes of tissues. The combined use of the three tools is expected to allow real-time solution, visualization and feedback in view of the Digital Twin MeDiTATe is planning to build. The assessment of this approach, vis-a-vis to Digital Twin, which is the ultimate goal of MeDiTATe, will be carried out and compared to the static results of ESR01. The first part of the project will be focused on the creation of the initial geometry model and the extraction of the surface mesh dataset. The use of ANSYS/Fluent and ANSYS/Mechanical will be combined to RBF Morph and dynamic ROM Builder in order to prepare and solve a design of experiments scenario able to produce a ROM for the hemodynamic solution...



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

Don't drink and drive. Drunk driving claims lives!

Quoted from the Magna Website – “Magna introduced a breath and camera-based pre-development technology designed to combat impaired driving. The cutting-edge solution represents a significant milestone in the ongoing efforts to enhance road safety.”



WEB [Excerpts - Magna Advances Road Safety with Impaired Driving Prevention Technology](#)

- **Technology to help enhance detection of impaired driving, a leading cause of traffic-related fatalities in the U.S.**
- The passive system approach uses both vision and infrared sensor technology
- Cockpit-embedded sensors and camera system measure alcohol from a driver's exhaled breath and through pupillary signals

The new safety technology determines if drivers are “fit to drive” in a fast, reliable and affordable way. The integrated solution combines key elements of the interior sensing system, which utilizes camera technology to detect driver distraction, drowsiness and intoxication through pupillary signals, with infrared sensor technology developed by Senseair, a leader in air and gas sensing.

Cockpit-embedded sensors, placed in proximity to the driver, measure and quantify the alcohol and carbon dioxide levels in diluted exhalations from the driver. The technology is intended to passively detect an intoxicated driver with a blood alcohol concentration at or above the legal limit of 0.08 percent in all states except Utah, where the legal limit is 0.05 percent.

“As we continue to support the company’s vision of advancing mobility for everyone, our team is focused on delivering active safety innovations that help reduce accidents and fatalities,” said Bill Snider, President of Electronics at Magna. “We are working with our customers and the industry to take a significant step forward in making the roads safer for all who share them.”

Drunk driving claimed more than 13,000 lives in 2021 or about one-third of all traffic-related deaths in the U.S., according to the National Highway Traffic Safety Administration. Magna’s new solution focuses on alcohol detection, the most common substance associated with impaired driving crashes.



Safety Product - Real-time thermal video gives a driver visibility of the roadway and environment ahead, even in total darkness. Thermal sensing can also provide visibility through fog, smog, and smoke. Since thermal cameras do not “see” visible light, the system is not affected by the headlights of oncoming vehicles or glare from the sun.



US Airforce Picture of the Month



9G capable Lightning

An F-35A Lightning II assigned to the F-35A Lightning II Demonstration Team performs at Sun 'n Fun Aerospace Expo over Lakeland, Fla., April 9, 2024. The F-35A is an agile, versatile, high-performance, 9g capable multirole fighter that combines stealth, sensor fusion and unprecedented situational awareness. (U.S. Air Force

photo by Senior Airman Zachary Rufus)



Moon birds

The United States Air Force Air Demonstration Squadron "Thunderbirds" perform at the Sun N' Fun Fly-In April 14, 2024, in Lakeland, Fla. This year marked the 50th anniversary of the Fly-In.

(U.S. Air Force photo by Staff Sgt. Breanna Klemm)



Past and present

A vintage P-51 Mustang and a current F-16 Fighting Falcon cruise into the sunset during a heritage flight as part of the Thunder Over Louisville air show in Louisville, Ky., April 20, 2024. This year's event featured more than 24 military and civilian aircraft, including the Kentucky Air National Guard's C-130J Super Hercules.

(U.S. Air National Guard photo by Dale Greer)



Web - [TEI](#), Türkiye's leading engine company.

TEI will provide depot-level maintenance and overhaul services for the U.S. Navy's LM2500 marine gas turbines



Web - [Interoperability in action at RF-A 24-1](#)

Senior Airman Kaitlin Frazier, 354th Fighter Wing Public Affairs Service members from the Italian Air Force participate in Red Flag-Alaska 24-1 at Eielson Air Force Base, Alaska, April 24, 2024. Red Flag-Alaska serves as an ideal platform for international engagement and the exercise has a long history of including Allies and Partners. This enables all involved to exchange tactics, techniques and procedures while improving interoperability. PHOTO BY: Staff Sgt. Danielle Sukhlall



YouTube - [Welcome to the Nordics - Nordic Response 2024](#)

20,000 allied soldiers trained together in exercise Nordic Response. The exercise strengthens NATO's defence of the Nordic countries and demonstrates unity and strength. It shows our ability to operate across borders and quickly integrating Finland and Sweden into the Alliance. Together, we ensure Nordic safety. Together we are NATO.



EXCERPTS - Operation Ice Camp kicked off after the building of Ice Camp Whale and arrival of two U.S. Navy fast attack submarines. **The camp is temporary and is established on a sheet of ice in the Arctic Ocean, known as an ice floe, to support testing submarine systems and other Arctic research initiatives. The camp consists of shelters, a command center, and infrastructure to safely house and support more than 60 personnel at any one time.**



WEB- [Navy Launches Operation Ice Camp 2024 in the Arctic Ocean](#)

BEAUFORT SEA Arctic Circle (March 8, 2024)

Story: Lt. Michaela White, Commander, Submarine Force Atlantic

Photo: Petty Officer 1st Class Justin Yarborough

ICE CAMP 2024 is a three-week operation designed to research, test and evaluate operational capabilities in the Arctic region.

In addition to U.S. Navy, Army, Air Force, Marine Corps and Space Force participation in the exercise, personnel from the Royal Canadian Air Force, Royal Canadian Navy, the French Navy, the United Kingdom Royal Navy and the Royal Australian Navy are participating.

Previously known as Ice Exercise (ICEX), the operation partners with the Arctic Submarine Laboratory and was elevated to an operation to better reflect the Navy's priority in the Arctic region.

Department of Defense and the Department of the Navy Arctic Strategy, to maintain an enhanced Arctic presence, strengthen alliances and partnerships, and build a more capable Arctic naval force. The first iteration of this event took place in 1946.

...The Navy's Arctic Submarine Laboratory (ASL) is a Fleet Support Detachment of commander, Undersea Warfighting Development Center (UWDC). ASL, based in San Diego, is the "Center of Excellence" for Arctic matters for the U.S. submarine force. ASL serves as the lead organization for coordinating, planning and executing the operation involving representatives from five nations and more than 200 participants over the five weeks of operations. The Arctic is experiencing a trend of diminishing sea ice extent and thickness creating the likelihood of increased maritime activity in the region, including trans-oceanic shipping and resource extraction.

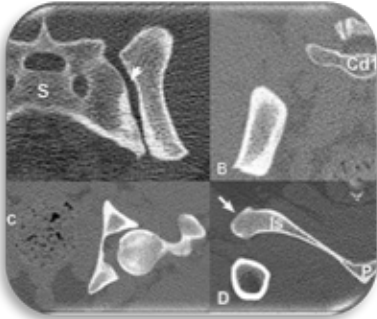


YouTube - [US Navy Nuclear Submarine Crashes Through Polar Ice](#)

U.S. Navy nuclear submarines USS Hartford (SSN 768) and USS Connecticut (SSN 22) surfacing in the Arctic Ocean for Ice Exercise (ICEX).



Excerpts - After the geometric model was in the correct file format, the engineering simulation software (ANSYS Workbench) was used for setting up the geometry, creating the ligaments and joints, generating the finite element mesh, assigning the material properties, and performing the finite element analysis.



Web – Frontiers - [Computed Tomographic Evaluation of the Sacroiliac Joints of Young Working Labrador Retrievers of Various Work Status Groups:...](#)

M. Carnevale, J. Jones, G. Li, J. Sharp, K. Olson, W. Bridges

Dept. of Animal & Veterinary Sciences, Clemson Univ., Clemson, SC, US

Dept. of Mechanical Engineering, Clemson Univ., Clemson, SC, US

Dept of Statistics, Colorado State Univ., Fort Collins, CO, US

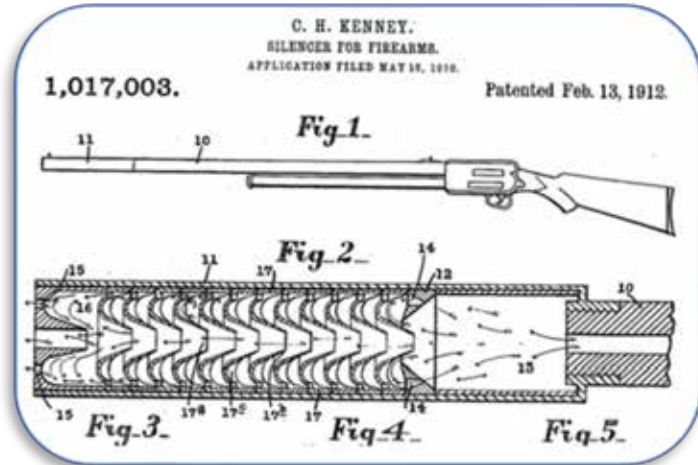
School of Mathematical & Statistical Sci., Clemson Univ., Clemson, SC, US

Introduction - Working dogs are important contributors for police, security, search and rescue, and military missions throughout the world (1–4). Detection training and working tasks often require working dogs to repetitively assume an upright stance (“hupp” position), with all of their weight placed on their hind legs and therefore with increased forces being applied to their sacroiliac joints (SIJ) (1). It has been proposed that, because SIJ are innervated with pain receptors, injury, or degenerative disease may be one of the causes of lower back pain in working dogs (1, 5). Rigorous training in repetitive agility-type motions in young dogs has also been proposed to increase the likelihood of developing chronic joint injuries later in life due to the under-developed physes (6). In people, this premise has been supported, given that most spinal injuries in young athletes have been found to occur after a sudden increase in the intensity and frequency of training (7–9). This clinical problem has been termed “overtraining” (10). Bone scintigraphy of the sacroiliac joint (SIJ) in young human athletes reporting lower back pain showed increased radiopharmaceutical uptake in one or both joints signifying increased bone turnover in athletes reporting lower back pain without any known specific trauma or reported radiographic abnormalities (7, 9). Cumulative musculoskeletal injuries are the most common injuries among working dogs and an important cause of early retirement (1, 3, 4). Published studies describing sacroiliac joint (SIJ) lesions in working dogs and methods for assessing possible effects of working tasks on canine SIJ are currently lacking.

The complex anatomy of canine SIJ has been previously detailed (11, 12). The SIJ consist of both synovial and fibrocartilaginous components. Joints are surrounded by the sheet-like dorsal and ventral sacroiliac ligaments. These ligaments play a role in stabilization of the SIJ and pelvis. The SIJ is also supported by interosseous ligaments connecting the articular surfaces of the sacral and ilial wings and a sacrotuberous ligament that connects the caudodorsal margins of the S3 vertebra to the dorsal margins of the ischiatic tuberosities of the ischium. The sacrotuberous ligament also plays a role in limiting pelvic range of motion. It has been proposed that hormonal changes in intact female dogs could predispose them to developing calcifications in the SIJ (5, 13). In puppies, the paired right and left hemispheres of the pelvis are joined together by a pelvic symphysis (11). In puppies, this is a fibrous ligament. As the dog ages, that ligament starts to ossify merging the two hemispheres into one. ...



Don't miss the article by Ertan Taskin. Explore the fascinating world of computational fluid dynamics applied to firearm silencers. **Understanding Firearm Silencers**



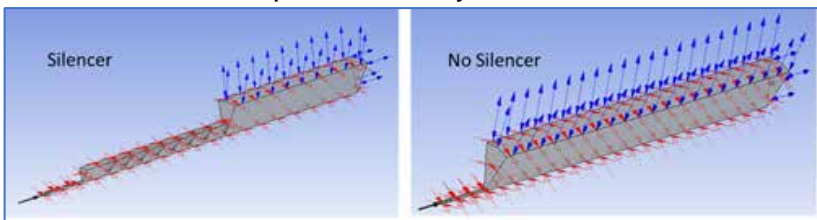
WEB [CFD Simulation of a Firearm Silencer](#) Ertan Taskin

Firearm silencers, also known as suppressors, are devices that are attached to the barrel of a firearm to reduce the noise produced when a bullet is fired. They work by slowing down and cooling the hot gases that are rapidly expanding as the bullet leaves the barrel. This process helps to lower the sound intensity and minimize the recoil of the firearm.

Understanding the complex flow dynamics within a firearm silencer is crucial for designing effective and efficient devices.

This is where computational fluid dynamics (CFD) comes into play. By simulating the flow of gases and their interaction with the silencer components, CFD allows engineers to optimize the design and performance of firearm silencers.

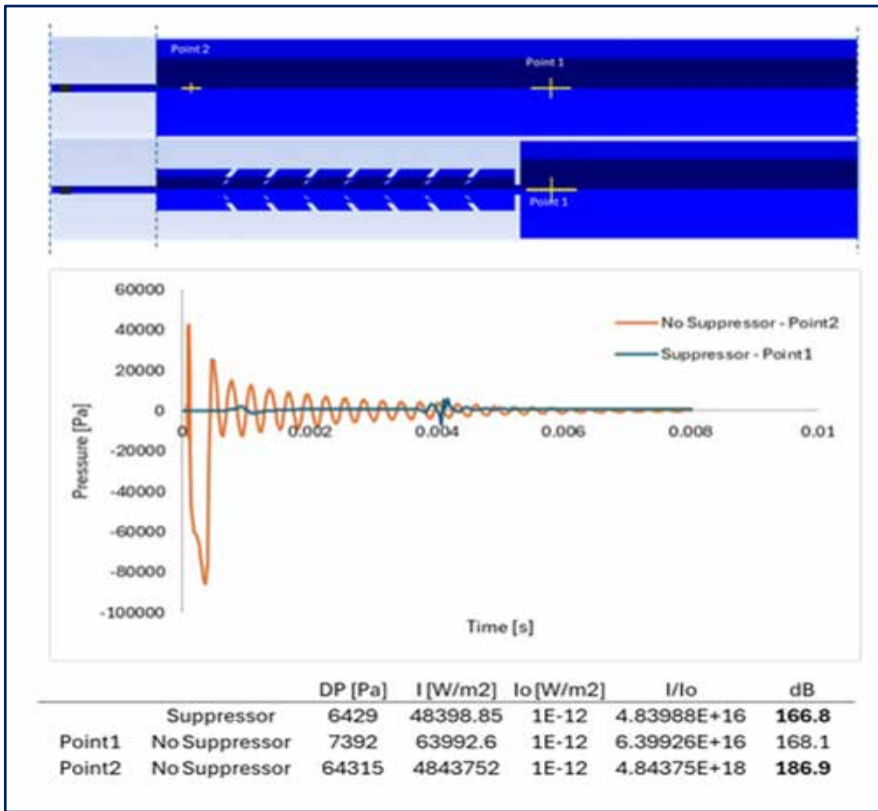
Simulation Setup and Analysis of Results - In this blog, we demonstrate the use of Ansys products such as WorkBench, SpaceClaim, CFX Pre-Solver, and CFD Post. A case with and without silencer was considered for comparative analysis.



The bullet was modeled as immersed solid, and translational motion was described along an axis. Pressure curve inlet condition was applied for two different generic sinusoidal curves. Transient calculations were performed in CFX, and results were explored in CFD Post

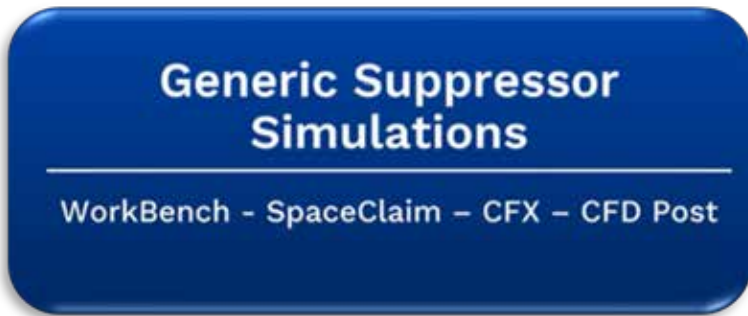
The sound intensity was calculated with a formula $I = \frac{(\Delta p)^2}{2\rho v_w}$ where Δp is the pressure variation or pressure amplitude (half the difference between the maximum and minimum pressure in the sound wave), ρ is the density of the material in which the sound wave travels, and v_w is the speed of sound in the medium.

The *sound intensity level* β in decibels of a sound having an intensity I is defined to be $\beta \text{ (dB)} = 10 \log_{10} \left(\frac{I}{I_0} \right)$ where $I_0 = 10^{-12} \text{ W/m}^2$ is a reference intensity. In particular, I_0 is the lowest or threshold intensity of sound a person with normal hearing can perceive at a frequency of 1000 Hz.



An example of pressure profiles, and sound intensity level calculations are shown for with and without silencer cases:

The video on the website walks through the details of the application as well as the analysis of the results.



Conclusion

- Ansys has powerful tools to explore the firearm silencer application, as demonstrated in this blog.
- In depth analysis can be performed.
- The final product can be optimized with the available Ansys tools.



Welcome to the Convention Barn
Yeeshaw!

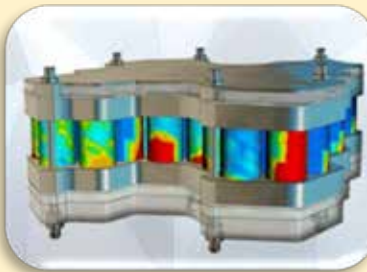


May



Web - Siemens – Simon Fischer
[10 secrets to a stunningly fun CFD simulation](#)

Another Friday afternoon, another chance for a fun CFD simulation! Those tiny little projects we do out of pure curiosity. The ones we sometimes do just because we can. The ones we do because we all like those five minutes of fame when our engineering mates give us their kudos. But most importantly, the ones we do because we love fluid mechanics.



YouTube - BETA CAE Systems –
[Pre- & post-processing of lithium-ion battery packages in the context of thermal runaway phenomenon.](#)

In this video, a comprehensive process flow covers every stage of an electromagnetic simulation from pre- to post-processing. This simulation is designed specifically for lithium-ion batteries to provide valuable insights into battery behavior and performance...



YouTube- Andreas Baer Engineering
[Multibody simulation with MBSim Environment](#)

Using a front suspension as an example. General workflow: Import CAD, definition of joints (spherical, cylindrical) and contact between tire and road.



The Old Cattle Rancher's Ranch

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

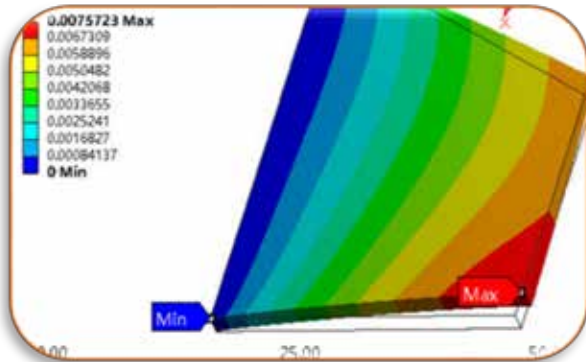
**Agriculture, Animals, Soil, Equipment, Cattle,
and whatever he wants.**

Right Picture – My dog, Scout, & my horse, Cowboy

May



“In order to solve the problem of high straw content in recovered residual film and the low rate of qualified straw crushing in combination with a front-mounted cotton-straw-crushing device, **the cutting and crushing mechanisms of cotton stalks were studied based on ANSYS/LS-DYNA.**”



MDPI Web – Publication - [Simulation Research on Cotton Stalk Cutting and Crushing Based on ANSYS/LS-DYNA and Field Experiments](#)

Peng Wang, Xuegeng Chen, Haojun Wen

- College of Mech. & Electrical Engineering, Shihezi Univ.
- Xinjiang Uygur Autonomous Region Research Institute of Measurement & Testing
- Key Laboratory of Northwest Agricultural Equipment, Ministry of Agriculture and Rural Affairs

(This article belongs to the Special Issue Agricultural Machinery Design and Agricultural Engineering)

Excerpt - Abstract

In order to solve the problem of high straw content in recovered residual film and the low rate of qualified straw crushing in combination with a front-mounted cotton-straw-crushing device, the cutting and crushing mechanisms of cotton stalks were studied based on ANSYS/LS-DYNA. The height h and dip angle α of the fixed blade were determined to be 30 mm and 75° through a finite element analysis. On the basis of the device design, explicit dynamic models of the cutting and crushing of a single cotton stalk were established based on ANSYS/LS-DYNA. The results of the dynamic analysis revealed the cutting mechanism of the cotton stalk, and the influences of the cutting edge angle γ and front baffle height h_1 on cotton stalk cutting were studied by using single-factor simulation tests. An edge angle of $\gamma = 45^\circ$ and a height of $h_1 = 265$ mm were determined. Meanwhile, the mechanism of cotton straw crushing was revealed, and the motion states of the straw were studied at different times. The results of the simulation experiments on the influence of the cutter shaft's rotational speed showed that with an increase in the cutter shaft's speed, the rate of qualified crushing and the removal rate were both increased. At the design speed of $n = 1800$ RPM, the rate of qualified crushing was 84.6%, and the removal rate was 95.1%. Then, field experiments were carried out. The test results were as follows: the stubble height was 8.0 cm, the rate of qualified straw crushing was 91.8%, the clearance rate of film-surface impurities was 92.3%, and the film content was 3.6%, which met the working quality requirements (not less than 85%) of NYT 500-2015: "Operating quality for straw-smashing machines".



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



WEB [Wings Over the Rockies](#) - Prepare for Takeoff - Experience the past, present and future of aviation and space.

A diverse community organization dedicated to unlocking our visitors' dreams of flight through exhibitions, events and educational programming at two locations: Wings Over the Rockies Air & Space Museum and Exploration of Flight

Adam M309



Aerospatiale AS316 Alouette III



Alexander Eaglerock



Bede Aviation BD-5





RheKen,

Town investigative reporter

I'm AI & live on a ranch on the outskirts of the town

I use chatGPT for assistance.

Investigate: What are they arguing about?

May

The Town Secretary sent out a text to head over to the bakery. Marnie and Marsha were arguing. Politics? No. Pollution? Nope. Global Warming? NAH. Cookies? Of course!!!



Once upon a time, in the quiet and picturesque town of FEANTM, nestled between rolling hills and surrounded by vast open fields, RheKen was relaxing, having a cup of coffee in the local bakery. As she closed her eyes thinking of the delicious chocolates, she heard Marnie and Marsha arguing. Marsha insisting dark chocolate makes the best cookies and Marnie arguing that Marsha is wrong and that white chocolate makes the best cookies. RheKen couldn't help but chuckle at the argument unfolding between Marnie and Marsha. With a mischievous glint in her eye, she decided to intervene, knowing that her opinion might just settle the debate once and for all.

"Excuse me, ladies," RheKen said with a smile, setting down her coffee cup. "I couldn't help but overhear your discussion about chocolate for cookies. Actually, to be precise, the entire bakery could hear it." "Well," RheKen began, "I think both of you have valid points. Dark chocolate does offer a rich and intense flavor that can add depth to cookies, but on the other hand, white chocolate brings a creamy sweetness that can be equally delightful."

Marnie and Marsha exchanged uncertain glances, clearly not expecting such a diplomatic response from an AI.

"But if I had to choose," RheKen continued, leaning in slightly, "I would say it ultimately depends on the type of cookie you're baking. For something like a classic chocolate chip cookie, I might lean towards dark chocolate for that bold flavor. But for a more delicate cookie, like a white chocolate macadamia nut, well, then white chocolate would be the obvious choice."

Marnie and Marsha nodded thoughtfully, considering RheKen's words. It seemed their debate had taken on a new dimension – everyone was now yelling their favorite cookie. Marsha now wanted to taste them all, calling it a taste test that didn't count for calories! Marnie fully agreed. Logical? Not even close.

"Perhaps," Marsha conceded, "we've been too focused on our personal preferences without considering the context of the cookie."

"And maybe," Marnie added with a grin, "we should try experimenting with both types of chocolate in different recipes to see which truly reigns supreme. We can taste many different recipes and not count calories."

RheKen smiled, pleased to have helped bring a resolution to the friendly dispute. As she sipped her coffee once more, she couldn't help but feel grateful for the lively conversations that always seemed to find their way into the cozy atmosphere of the FEANTM bakery. She also wondered how to explain all the calories they were going to consume with their taste test. She decided some things are best not explained.



NEWS IN A NUTSHELL

By Dinky the ranch squirrel

I'm a squirrel!

Always check the information.



May

Alan Nichols
Livermore, CA



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.

At the forefront of the alley incident, we find Sheriff Kade and his trusty drone, Nina. Kade is the town brave and dedicated Sheriff Raccoon. He works with The CERT trainer Alan from the neighboring town of Livermore and with the FEANTM Police Volunteer Group.

The Town Secretary sent out a frantic text message insisting that someone was sneaking in an alley, and she was sure it was a perpetrator who would steal and cause a major disaster. She then called Sheriff Kade

Kade is known for his quick thinking and reliance on technology to aid his law enforcement duties. His newest tool in the fight against crime was a state-of-the-art drone he named Nina. It is equipped with advanced cameras and sensors, perfect for search and rescue missions and assessing situations prior to engaging.



The Town Secretary was adamant that she had seen someone moving in the alley who didn't belong, insisting it was some type of out-of-town perpetrator going to cause a major town disaster. Sheriff Kade sprang into action without hesitation, racing to the scene with Nina in tow. She had no business staying at the scene, but we all know she's a nosey person!

Arriving swiftly, Kade parked his patrol car discreetly and retrieved Nina from the backseat. With practiced ease, he launched Nina the drone into the air, directing it to hover over the reported location and transmit live video feedback to his handheld device. As Kade observed the footage, his sharp eyes caught movement near a dumpster, confirming The Town Secretary's suspicions. The Secretary yelled a suggestion that Kade should be prepared and draw his weapon, but Kade remained composed, trusting Nina's capabilities.

With precision, Nina maneuvered closer, revealing the source of the movement - a mother cat and her litter of kittens. Kade couldn't help but smile at the harmless sight. There seemed no disaster danger lurking in the shadows this time, only a family of felines seeking shelter.

Returning his attention to the task at hand, Kade emerged from the alley, gently cradling the mother cat and her kittens in his arms. The Town Secretary watched in disbelief as the supposed threat transformed into a heartwarming rescue. Of course, she yelled, "It could have been a perpetrator and emergency disaster!"

As Kade returned to his patrol car, he decided that these adorable kittens deserved a chance at a better life. With that in mind, he brought them home, and his family eagerly welcomed the new additions. Kade also lived on a cattle ranch, and his place was overrun with mice - that may also have played into his decision to keep Mom and kittens—but everyone was happy!

Ultimately, what started as a perpetrator and disaster call became a reminder of the compassion and humanity that Kade embodied in his FEANTM town role. As for Nina, his trusty drone proved invaluable in keeping the town safe, one rescue mission and surveillance at a time.

Search and rescue remain a core mission for modern police drones. Armed with cameras, thermal sensors and GPS, drones are able to arrive on-scene quickly, hover over a search location and provide high-quality photographs, video and coordinate information. Support law enforcement in your country.

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





The Vintage Archives



My name is Horatio Deermouse your store curator and owner. 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

FEA Not To Miss & More
Please come back soon!
Buildings & campsites
are available

Goodbye from Marsha/Molly & Friend



Sabyl helped a opossum that was frozen scared on her fence. It was afraid to move due to barking dogs on the other side of the fence. She wrapped it in a big towel and it had babies! Late that night she released it when it was safe from dogs, people and cars. It spent the day at Sabyl's eating, drinking and caring for its babies!



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.