www.feantm.com Issue DECEMBER 2022 ISSN 2694-4707

FEA Not To Miss+ Town

Software & Engineering Solutions

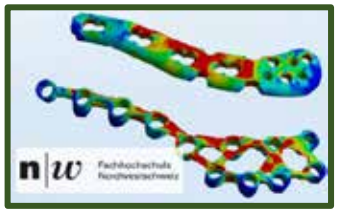
Town Hall Meeting, Blog & Gossip

HAPPY HOLIDAY TO ALL OUR FRIENDS

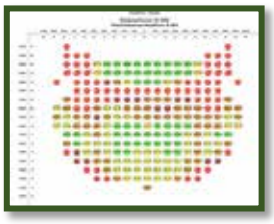
AEROSPACE -Bayraktar

AUTOMOTIVE - MAGNA

CADFEM



D3VIEW



DYNAmore France

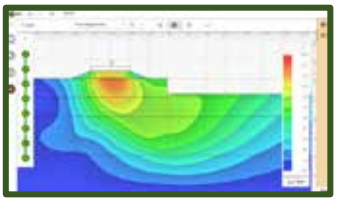
DYNAmore Germany

DYNAmore Nordic

Enginsoft

MSC - Hexagon

OASYS



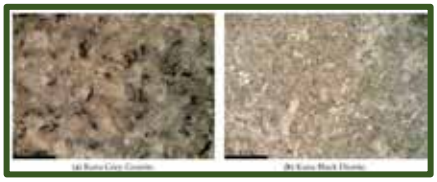
OZEN

Booth – JITHESH

Museum – Germany

Research Hospital
2023 opportunities

Poster Board-A. Wessling



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Goal

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

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

Town Pretend to be Editors

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

Contact us at feaanswer@aol.com

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

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First author or person using social media, or information on the company website

- **The websites used will have the complete articles, and higher resolution graphics/videos.**
- **We always reference and link to the source listed below.**
- **This blog/magazine is a positive venue for editorial purposes and not revenue driven**

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

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Town Library – papers (first named author) & The DYNAmore Reference Desk

Cattle Rancher – Whatever he wants

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Supervisor – Anything, never sure what will show up!

Center Booths

This blog/magazine is a positive venue, for editorial purposes, and not revenue derived

Serving coffee & cupcakes – all flavors!

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

Gossip is at the local coffee shop.

Pets are welcome. (Small pets, horses stay outside)
(Pet goats or pigs also stay outside)

Announcement – **DYNAMORE NORDIC – New Course – Feb 07 – See our Booth**
Human Body Models and Injury Prediction
Available onsite at our office in Gothenburg, and online for worldwide participation

As presiding town Supervisor, I call this meeting to order:

1. Why are there wood rails in the parking lot and who ordered them on the coffee budget?
2. That's nice that they will blend in with the environment but who ordered them?
3. Why are you all looking at the ceiling fan? The fan didn't place the order!
4. Please have the Building Dept. pick them up. WAIT – why are you all running to get a rail?

SEE Enginsoft - Woodrail Road Barrier Impact Analysis

Why is there a military transport at the airport?

1. The Secretary requested transport from California to Nevada!
2. She personally asked the old retired Pilot for transport – She meant by private plane!
3. Why is everyone running out of my meeting to the airport to fly to Nevada?

SEE Airport Quiz – if you know the answers you can board the plane

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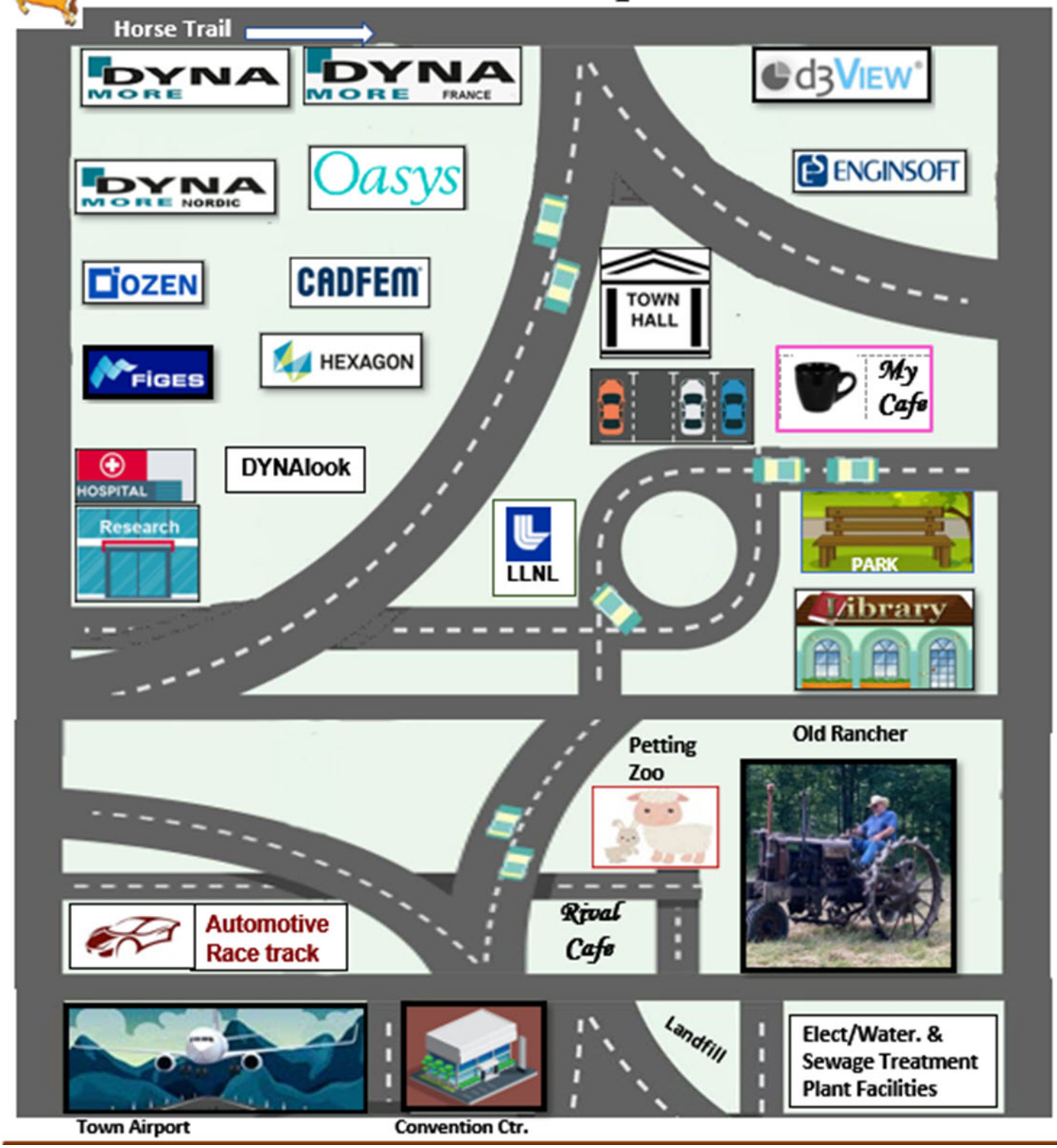
We want to take this opportunity to thank all our town residents, our authors, our pretend to be authors, and everyone who wrote articles. We want to thank the companies that let us share their information. We are thankful for 2022 and that it's been fun at our town hall meetings doing this publication.

Most importantly, we thank our US Military and allies, NATO and friends of NATO. Additionally, all the companies and people who design and manufacture for military use to keep freedom. We also remember all lives lost fighting for the right to be and remain free.

1. Summer research opportunities
   Wake Forest Univ. School of Medicine Biomedical Engineering Dept.
   & Ctr. Biomedical Informatics

1. Eighty Years of the Finite Element Method: Birth, Evolution, and Future
2. Stochastic modelling of continuous glass-fibre reinforced plastics–considering material uncertainty in microscale simulations

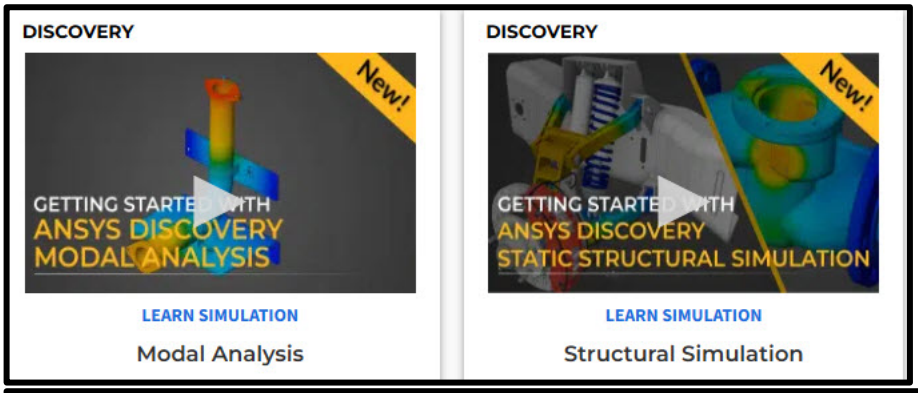
Town Map



* **The logos displayed, of content in our magazine, do not represent their endorsement.**
* **To be removed, please notify feaanswer@aol.com with the request.**
* **Your town lot will be auctioned, with the Town applying all proceeds to the coffee budget.**
* **The town map changes pending information, and rotational building rentals.**

Eduardo V.S. Ramirez, freelance digital marketing

ANSYS has available 10 new Discovery 3D Design Innovation Courses

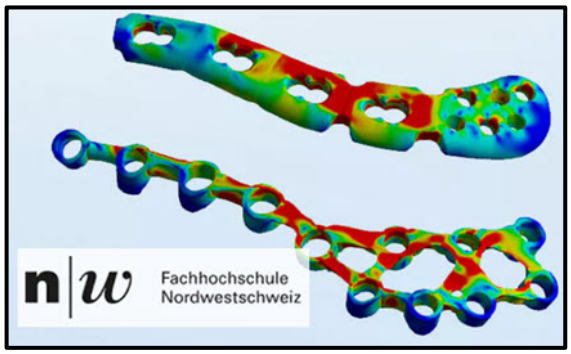


[December is to learn about Ansys 3D Design Courses] - ANSYS Innovation Courses are free, online physics and engineering courses designed for educators, students and engineers to enhance simulation and physics learning

View the videos on their website

“With the help of ANSYS density based topology optimization, it was possible to challenge historical standard implant designs and develop load-optimized structures based on real world daily use cases.” M.Sc. Janick Zehnder, Fachhochschule Nordwestschweiz, School of Life Sciences, Biomedical Engineering

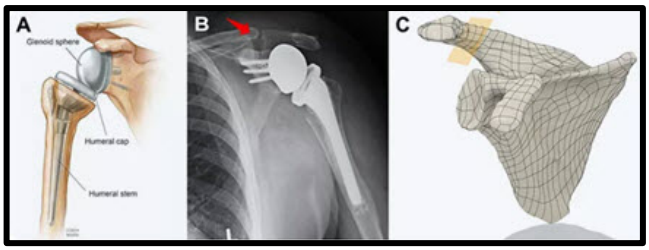
Images: © Fachhochschule Nordschweiz



Load-optimized implant design - Design of an optimal patient-specific implant using ANSYS topology optimization

In-silico comparison of acromion levy type ii implants for a patient-specific example

Sector: Medical technology
Specialist field: Biomechanics, Structural mechanics

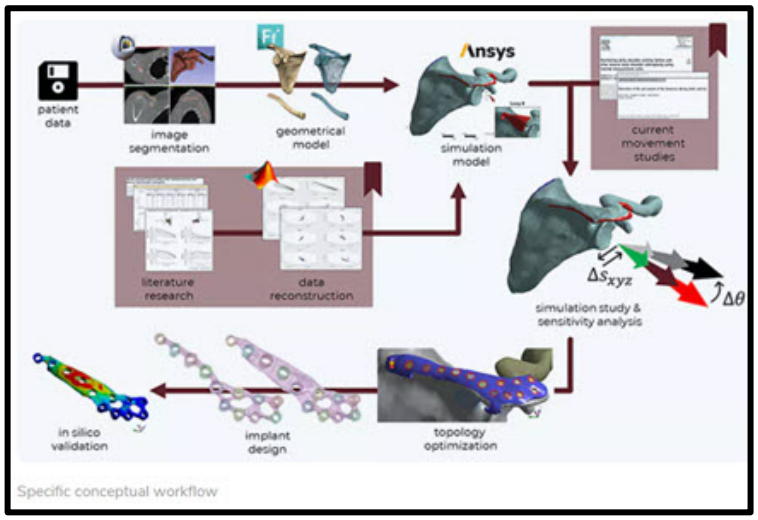


Grammont implant design for Reverse Shoulder Arthroplasty (A). Exemplary acromion Levy type II fracture (B: red arrow). Schematic representation of fracture plane (C).

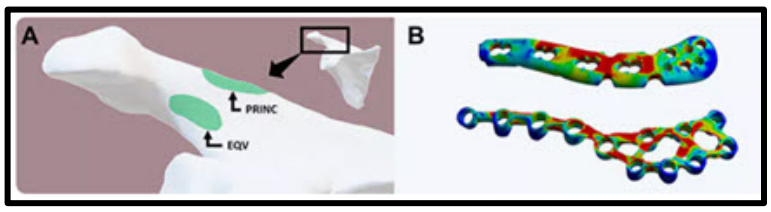
Task - Optimizing performance is a well-established basis in the process of general product development. However, in the field of biomechanics, complex shapes, various superimposed loading scenarios and patient-specific differences complicate the development of suitable implant designs for the treatment of specific bone fractures. Topology optimization is a tool based on the finite element method, which allows for the automated generation of optimized structures for specific load scenarios. This tool has great potential to increase efficiency and creativity in patient-specific implant design.

In this project from the University of Applied Sciences and Arts Northwestern Switzerland, in collaboration with PD Dr. Karim Eid of the Cantonal Hospital of Baden, the acromion Levy type II fracture following reverse shoulder arthroplasties will be analyzed. The exact mechanisms leading to such a fracture are still not fully understood. In addition, there are no implants specifically developed to treat this fracture. This work aims to qualitatively explain the causes of an acromion Levy type II fracture with the help of a structural mechanical in-silico analysis, develop specific implant designs using topology optimization, and compare the performances of optimized implants with classic designs (lateral clavicle plate)

Solution - A patient-specific 3D cortical bone model for a simplified shoulder complex (scapula and clavicle) based on CT data was built. Muscle force vectors for the anterior, middle and posterior deltoid muscles were extracted from the literature in order to generate the load cases for a patient-specific finite element model which describes the biomechanical behavior for abduction and flexion in the range of 15-120°. **Automated parameter driven analyses were conducted using ANSYS optiSLang in order to analyze angle dependent stresses and deformations in the Levy type II region.** This was extended by a sensitivity analysis based on changes in magnitude, orientation and origin of muscle forces. Based on the resulting critical load scenarios, a topology optimization of a patient-specific implant was set up. The muscle forces of the analyzed abduction and flexion angles were weighted based on their frequency of occurrence throughout a day. The performance of the resulting implant designs for preventive (pre Levy type II fracture) and curative (post Levy type II fracture) treatment was compared to standard lateral clavicle plates.



Specific conceptual workflow

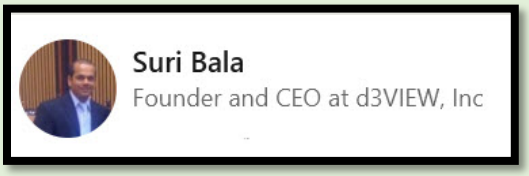


Location of potentially critical maximum equivalent stresses (EQV) and maximum principal stresses (PRINC) (A). Comparison of maximum equivalent stress distribution during abduction at 65° for standard (top) and optimized (bottom) preventive implant.

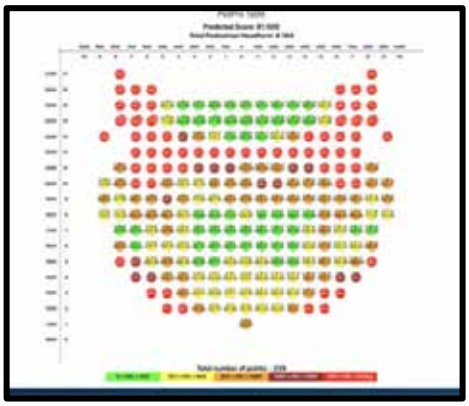
Customer Benefit - The simulation studies showed that potentially critical equivalent stresses can occur below the acromion arc, whereas critical maximum principal stresses develop on the superior-anterior border on the acromion, which may promote the onset of a Levy II fracture.

Compared to a conventional clavicle plate, the topology optimized implant designs showed better or improved performance with respect to maximum stresses and deformations. In addition, they had several other advantages: better anatomical fit, better mass exploitation, and more homogeneous stress distribution, which might lead to improved fatigue behavior.

Finite element analyses and topology optimization are powerful tools for the evaluation of complex biomechanical problems. The latter can deliver valuable insights into truly compliant and stress optimized designs of implants, without relying purely on historically justified implant designs.



"Did you know that d3VIEW provides extensive capabilities to help in running large-scale design-of-experiments, sensitivity analysis and optimization for LS-DYNA simulations."



Design Optimization solutions in d3VIEW for LS-DYNA
DOE, Sensitivity Analysis and Optimization

With built-in extractors for BINOUT/D3PLOT/D3HSP/EIGOUT/D3EIGV, all necessary data can be extracted in parallel and aggregated. With d3VIEW's-ML capability that now includes regression and classification, models can be built, from the extracted data and explored further to find the the optimum values. Below are a list of supported capabilities and applications

Current Capabilities

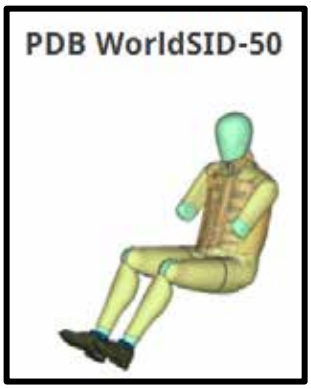
- Workflow driven HPC Job Submission to submit, extract, analyze and report
  - With multiple connection types available, you can connect to on-premise, AWS, AZURE, OCI clusters
- Intermediate Preview of Results
  - You can preview intermediate results as the simulation is progressing to view results from GLSTAT/D3PLOT/BINOUT
- Extract results and aggregate from the simulations
  - Extract results in parallel and aggregate data from BINOUT/D3PLOT/D3HSP
- Build model using d3VIEW-ML
  - Build regression models using LINEAR/POLYNOMIAL/LASSO/RIDGE/DESICION-TREE-REGRESSION
- Reporting and Sharing
  - Export PPT, PDF, or share a HTTP link to the results with no data-transfer

Example Applications

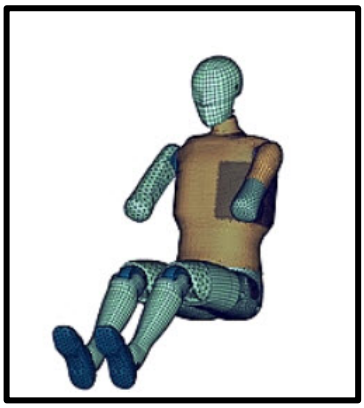
- Material calibration
  - Run uni-axial, shear, notch to determine the optimal failure and damage cards for *MAT_ADD_EROSION for metals. Use similar technique for foams, rubber and thermoplastics
- Airbag leakage optimization
  - Run a design of experiment to build a model and optimize the best leakage coefficients for Airbags
- Pedestrian protection HIC optimization
  - Run a full-sweep of simulations, identify opportunity target points, and optimize them to improve overall score
- Design Sensitivity for material and thickness selection for large-scale front-impact simulations
  - Run early stage models, to select optimum material grades and thicknesses for critical parts
- Joining calibration and selection
  - Select joining methods for large scale impact simulations

EXCERPT - Side Impact Dummy Models - The finite element models of the FAT are developed in conjunction with the German Association for Automotive Research (FAT) by DYNAmore. In the FAT the German automotive industry joins parts of their research activities.

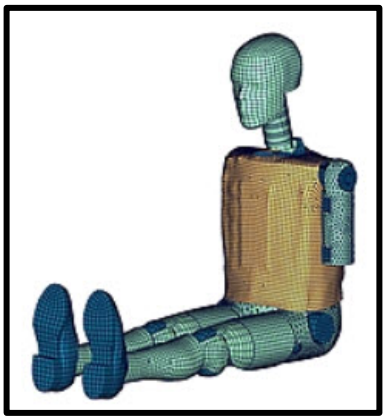
The models are permanently improved and highly validated in accordance to the physical dummies. The model of the SID-IIs has been developed by Humanetics…



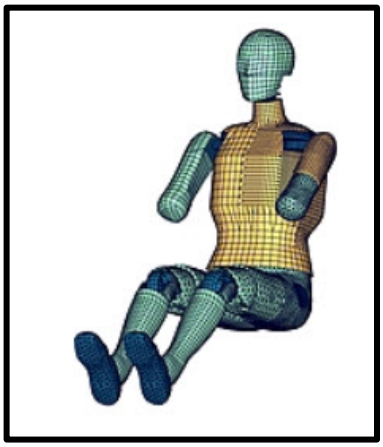
PDB WorldSID-50 - DYNAmore has developed a model of the WorldSID 50%. The model is validated with material, component and sled tests. The model was developed with a consortium of the German OEMs (PDB: Audi, BMW, Daimler, Porsche, and VW). The methods applied are the same as in the previous projects with the FAT for the ES-2, ES-2re, USSID, and BIORID model. The current release of the WorldSID 50th percentile male model is v7.1, it was released in July 2020.



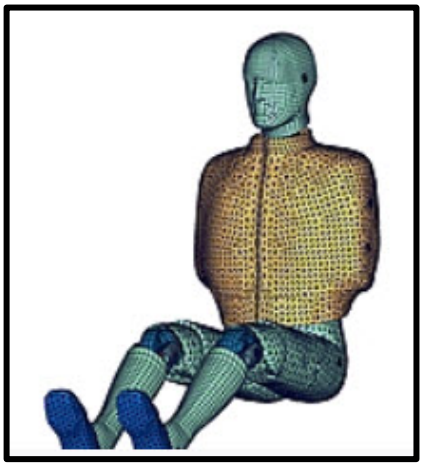
FAT ES-2 und ES-2re Dummy-Modell - The ES-2 and ES-2re dummy is used in side-impact-assessments of the automotive industry for many years. Among others the dummy is currently utilized in the legal authorization in Europe (UN R95), Japan (Art. 18) and the USA (FMVSS 214). Additionally the dummy is used in consumer-protection-tests in America (f.e. U.S. NCAP) and Asia (f.e. ASEAN NCAP). Initially the dummy was developed within the FAT (consortium of the german automotive industry). The most recent version is v8.0.2, it was released in February 2020.



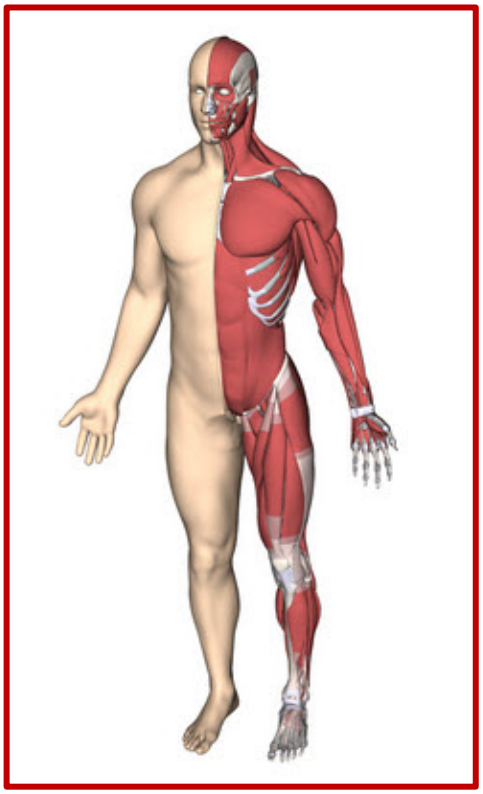
Humanetics SID-IIs Model - The current release of the SID-IIs SBL-D is version 4.3.3. The dummy represents a small female body and is used in legal authorization and consumer-protection. Examples are FMVSS 214, IIHS and U.S. NCAP.



FAT EuroSID Model - The ES-1 dummy is the previous model of the ES-2 and ES-2re. In some extend the ES-1 is used for legal authorization in India (AIS-099) and South Korea (KMVSS 102).



FAT US-SID and SIDHIII Model - The latest model of the FAT US-SID is version v5.0. The modified version, the SIDHIII v5.1 is used in lateral impact to a pole. For both dummies a detailed model is available.



DYNAmore Human Body Model - HANS

DYNAmore is currently developing its own new human model.

HANS will be available in summer 2023.

We will keep you informed about features and development steps.

Thanks to Elizabeth Mäki Björklund for bringing this to our attention on social media.

Axel Hallén - M.Sc. Student in Mechanical Engineering - Applied Mechanics Linköping University - DYNAmore Nordic

"For some time now, I have been working on creating a page on our website at [dynamore.se] dedicated to students looking to learn LS-DYNA. I am glad that it has now been launched, and it is freely accessible to anyone at [dynamore.se/en/training.] I have recorded some tutorial videos to help people get started with using the program which are posted there."

Excerpts **LS-DYNA Student Software** - Download a free student license and get started with LS-DYNA today!

You will find information for students who are looking to use LS-DYNA in their master's thesis. We at DYNAmore Nordic AB see great value in the innovative power of students, and we therefore freely offer support and technical assistance to master's thesis students that use LS-DYNA for their work.

Additionally, our aim is to gather up employment advertisements for thesis work that involves the use of LS-DYNA. We will republish them on this page to make it easier for students to find such opportunities. Feel free to share this with students looking for a master's thesis within the field of applied/computational mechanics or really just anyone who wants to get started with LS-DYNA!

LS-DYNA is freely available to students, and downloading the software is just a few clicks away. At the website of Ansys, you are able to download the student version of LS-DYNA, along with LS-PrePost and LS-Run. With this version, you get access to all the functionality in LS-DYNA which you can use to run models containing up to 128 k nodes/elements and on up to four cores.

Ansys LS-DYNA Student offers free access to the world's most-utilized explicit simulation program, capable of simulating the response of materials to short periods of severe loading. Students can work through simulations involving materials failure and look at how the failure progresses through a part or through a system. Applications include automotive, aerospace, incompressible fluids, compressible fluids and shock waves, electromagnetics and more.

Master's Thesis Involving LS-DYNA – All students globally have access to the tutorial videos I recorded, as well as the rest of our video library. With the importance of these tutorials, we have made this area accessible to anyone. You will also find links to available thesis work involving LS-DYNA.

For our students in the Nordic and the Baltic states contact DYNAmore Nordic to receive free support and learning resources.

DYNAmore Nordic sells LS-DYNA, and offers training and support within the Nordic and Baltic states. As mentioned above, we also do this for students that use LS-DYNA in their thesis work; by gathering all master's theses that are carried out using LS-DYNA, offering initial guidance, and establishing contact with students.

In our previous experience, assisting thesis students this way has proven most successful, allowing the work to quickly pick up speed, giving students access to industry experts, but it has also been highly rewarding to us, being involved in interesting and innovative applications of numerical simulation.

We received many registrations in the past and were able to help students with tutoring and support, which we believe contributed to several successful theses. Do not just take our word for it, read some of the comments from previous students:

> "Through Volvo Cars we had contact with Dynamore Nordic that provided technical assistance during this project. We would especially like to thank Anders Bernhardsson for the support during this thesis work. "
>
> "I would like to express my gratitude to DYNAmore Nordic AB, Sweden especially Mikael Schill for the valuable support and help for LS-DYNA"
>
> "Ph.D. Mikael Schill, David Aspenberg, among others, from DYNAmore Nordic AB, Linköping. Thank you for letting me take part in the introduction course and taking Your time to answer all of my questions regarding the software LS-DYNA."

Depending on the topic and how many people perform a thesis on the respective universities we can offer:

- Joint LS-DYNA introduction course for the master's students at the university or at our office
- LS-DYNA introduction Webinar
- Simple but explanatory examples to show modeling methods
- Direct support contact person for discussion and technical help throughout the thesis
- Master's thesis publication on our media channels

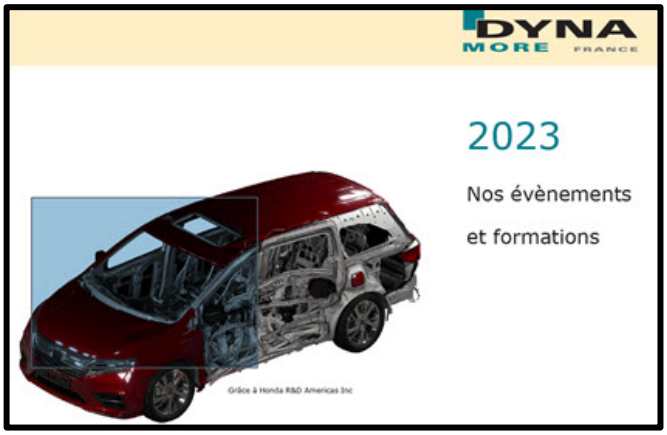
A condition for this is that we get an idea of how many and what types of master's theses are carried out at the respective universities. We have created a web form where students can register their thesis. In good time before the work starts, contact will be established to discuss how we can offer support and aid during the initial phase as well as throughout the project.

Introductory Tutorial to LS-DYNA - This tutorial aims to provide a basic introduction into running LS-DYNA simulations with the help of LS-PrePost and LS-Run.

The tutorial features an example of a tubular structure with a square cross-section that is crushed against a flat, rigid plate, and is divided into four distinct videos, each with a different topic. In the tutorial, the 4.9 version of LS-PrePost and the 1.0 version of LS-Run are used, which are free to download.

Visit our student area for additional information and how we can assist your learning experience

Charlotte Keisser - DYNAmore France – Happy Holidays for December.
Our 2023 brochure is now available.



The brochure of our 2023 French events and courses is now available on our website.

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

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

And our 3rd French LS-DYNA User Day will occur.

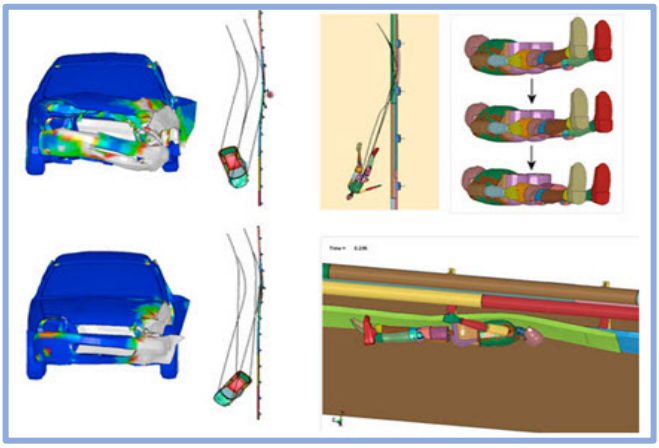
Evènement / Formation	Janvier	Février	Mars
Introduction à LS-DYNA	25-27		*27-29 (compacte*)*
Introduction à LS-PrePost		02	
Introduction aux technologies de la simulation		09	
L'analyse implicite avec LS-DYNA			09-10
Contacts dans LS-DYNA			17
Mise en forme à froid avec LS-DYNA			
Modélisation des matériaux métalliques			
Introduction et optimisation avec LS-OPT			
Introduction et identification de paramètres avec LS-OPT		*14 (compacte*)*	
La méthode ALE et le couplage fluide-structure dans LS-DYNA			
La méthode SPH (Smoothed Particle Hydrodynamics) dans LS-DYNA			
Demi-journée d'Information			23
3ème Journée Utilisateurs LS-DYNA France			

Toutes les formations ont lieu dans nos bureaux à Versailles.

**Formation en ligne*

Our full seminar brochure can be downloaded at:

https://www.dynamore.eu/en/homepage-news/eu/brochure-2023



Woodrail Road Barrier Impact Analysis

ABSTRACT - The Woodrail® road barrier is designed to improve vehicle safety blending in with the surrounding environment. The barrier has been thoroughly tested and certified against car and bus impact conditions. Since road barriers are built to improve safety of larger road vehicles, they are potentially very dangerous for motorcyclists. For this reason, Woodrail designed a protection system to explicitly account for impact of a human sliding on the road surface and hitting the road barrier; the system can be easily integrated with an existing barrier.

Comparison of total plastic strain and wheels trajectory with and without the motorcyclist protection system installed

Impact Analysis using Numerical Simulation

Woodrail needed to test the road barrier with the motorcyclist protection system installed for:

- car and bus impact conditions
- the consequences of a human impact on the modified road barrier

EnginSoft provided consultancy in extending the certification of the barrier to the new configuration with the motorcyclist protection system installed. This was efficiently achieved using numerical simulation with a significant cost reduction compared to physical testing.

The study included:

- simulation of car and bus impact scenarios
- an adapted numerical dummy model provides biometric results including head acceleration and neck moments

Although the simulations were quite demanding from a computational standpoint we ran them within hours exploiting the EnginSoft Cluster and other in-house high performance computing resources.

Thanks to the results obtained through this study, the Woordrail safety barrier was approved as a Level I protection system for motorcyclists following the UNE135900 code.

The Tofaş measurement team uses a variety of Hexagon metrology equipment, including 3 Global model CMM systems. These systems were installed in 2016, paired with Hexagon's PC-DMIS inspection software, and are particularly used to assess the quality of small parts brought in from third-party suppliers. The team also has two Bravo HP CMM systems, one with four arms and one with two. The former of these is used as part of a comprehensive body-in-white diagnosis system, while the latter is used for statistical process control measurements for the Fiat Egea passenger car models.

Automated perfection in automotive - A comprehensive automated inspection system based on laser tracker measurement and advanced 3D scanning is just the beginning at Tofaş

Tofaş is a Turkish automotive manufacturer established in 1968 in Bursa, where the company's manufacturing plant is located.

Tofaş manufactures Fiat Egea sedan, hatchback, and station wagon models at its Bursa plant. Marketed under different brand and model names in different parts of the world, Tofaş's Egea line is sold as the Fiat Tipo in Europe and as the Dodge Neon in Mexico. Besides manufacturing for Fiat, Fiat Professional and RAM under its new Doblò project, Tofaş is also a distributor, handling the domestic sales of six brands (Fiat, Fiat Professional, Alfa Romeo, Jeep, Maserati, Ferrari) in Turkey. Tofaş exported 118 000 units to 80 countries in 2020 and fulfils 19 percent of total automotive production in Turkey.

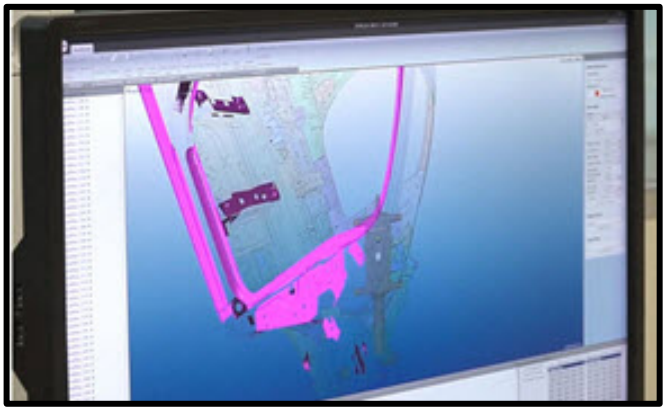
The main business of the team in Bursa is currently production of the Fiat Egea passenger car model, along with the Fiat Doblò commercial vehicle, both in short- and long-wheel-based versions. They currently produce approximately 1000 vehicles per day, which requires a dedicated measurement centre team tasked with maintaining stable geometries in their processes and products.

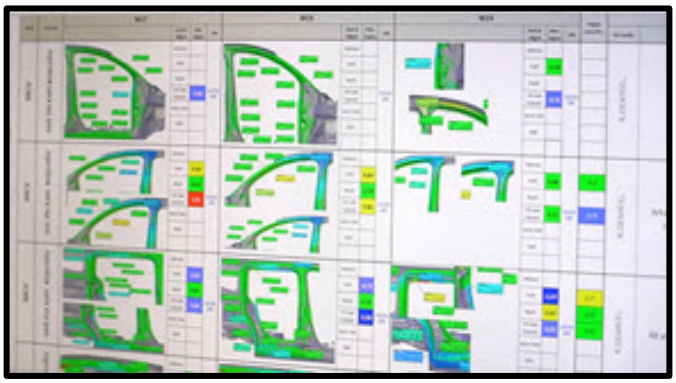
While these systems have achieved excellent results, the Tofaş measurement team has begun the transition to working with scanning systems, in order to capture some of the wide-ranging benefits of non-contact measurement processes. This revolution was begun with the Hexagon white light system installed for closures inspection, also installed in 2016 and powered by the CoreView software.

The team's most recent metrology installation is a fully automated inspection cell powered by Absolute Tracker and Leica T-Scan 5 measurement technology, which is used to measure the commercial vehicles in production at Bursa. Established in 2020 and powered by PolyWorks inspection software, the cell has proven to be a success for the team, and looks set to be only the beginning for Tofaş in terms of investment in automated inspection solutions.

"Instead of CMM we are using scanning technology, and there are so many advantages," says **Utku Erdem Kaynar, Metrology Lab Leader for Tofaş in Bursa**. "We can see so many areas of the vehicles or parts with this system. We are especially measuring body in white and closures with these devices, with features such as surfaces, trimlines, nuts, slots, holes – all kinds of parts related to body in white can be easily and reliably measured with these systems."

All kinds of parts related to body in white can be easily and reliably measured with these systems. The Tofaş measurement team has been impressed not only by the quality of Hexagon's metrology equipment, but also by the expertise of the local team in Turkey, who have been supporting them now through the planning and installation of numerous inspection projects.





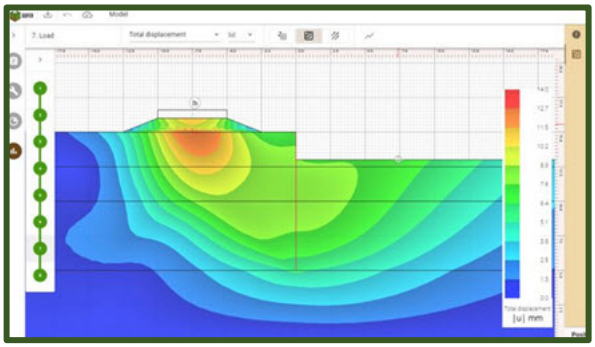
Reporting is fast and clear using the PolyWorks platform - "We are working very closely with Hexagon Turkey," explains **Recep Boylu, Measurement Centre Administrator at Tofaş.**

"They have very capable people who have a talent for solving issues and creating solutions according to our problems. And of course, they have the agility to perform maintenance activities as needed without delay, minimising our downtime.

TOFAS - The company manufactures both passenger cars and light commercial vehicles, and is by now one of the largest automakers in the sector, with some 7000 employees and an annual production capacity of 450 000 vehicles.

Marta Kempa, MBA - Marketing Coordinator & Seppi
Oasys LS-DYNA
Oasys Software, Tutorials & Classes Not To Miss

Built with convenience in mind, Gofer offers a new geotechnical FEA experience, combining a modern user interface with powerful cloud computing.



Welcome to geotechnical FEA reimagined, with OasysGofer!

From flexible and gravity retaining walls, to slopes, excavations and bearing capacity problems, #Gofer makes modelling some of the most common geotechnical analysis situations effortless, making the everyday, easier.

Welcome to geotechnical FEA reimagined, with OasysGofer!

What is Gofer?

New from Oasys, Gofer is our cloud-based geotechnical finite element analysis software that lets you build, analyse, and collaborate on geotechnical models.

Why Gofer?

Gofer is the first step forward in an exciting new era for Oasys' geotechnical software. Accessible, innovative and effective - modelling has never looked better:

Gofer - next generation geotechnical analysis

Gofer brings the advantages of cloud computing to geotechnical FEA. Easy to use and easy to learn to use, Gofer offers a seamless process, from first soil blocks to final results.

Unlock the benefits of automation with Gofer's API. Endpoints let you create and edit models, request analyses and query results, conveniently and efficiently from your own code.

Intuitive modelling –

Start building models sooner, with Gofer's all-new, accessible interface. Drawing models is easy and intuitive, helping you define even the most complex model features. Gofer's versatile drawing tools allow you to import, draw, drag, snap and manipulate shapes and features. Gofer offers a seamless process, from first soil blocks to final results.

Go-to solution

From flexible and gravity retaining walls, to slopes, excavations and bearing capacity problems, Gofer makes modelling some of the most common geotechnical analysis situations effortless, making the everyday, easier.

Cloud-based software

Out of office? No problem! Gofer's cloud-based software allows you to access your models from wherever you have an internet connection. Work is saved instantly as Gofer detects your changes, so you're free to work on results for completed stages, while other analyses are still running.

There's no need to invest in a powerful machine as we do the hard work, leaving your device free to focus on other tasks. You can even run multiple analyses, simultaneously.

Collaborative working

The clone model option allows you to create multiple, editable versions of your model. Cloned models can be worked on simultaneously, without changing the original version of the model, or impeding analysis time.

Automated workflows

Unlock the benefits of automation with Gofer's API. Endpoints let you create and edit models, request analyses and query results, conveniently and efficiently.

Sustainable outlook

Gofer's cloud processing is provided by AWS. We believe that by being cloud based Gofer could contribute to your carbon reduction efforts. For more information on sustainability relating to AWS cloud services, click here.

Metin Ozen
Principal & CEO at Ozen Engineering, Inc. and Mallett Technology, Inc.

OZENCON

Register Now! For February 23, 2023

Our conference is FREE to attend, register early to reserve your spot. Breakfast and Lunch will be provided. Complimentary parking is available

" Join us for our Annual Simulation Conference! This one-day conference will provide detailed insight into how leading companies are utilizing simulation to advance their product development. We will bring together ANSYS users, partners, developers, and industry experts for networking, learning, and sharing of new ideas. The Largest Annual Ansys Simulation Conference in Silicon Valley"

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

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EMA

"**Our scalable transmission technologies aid our customers in their transition to vehicle electrification which help to achieve regulatory targets. The transmission enhances both efficiency and performance. We are excited that Stellantis has awarded Magna this hybrid transmissions business across multiple vehicle models, a testament to our expertise and capabilities," said Tom Rucker, President Magna Powertrain.**

Magna's 48 Volt Hybrid Transmission System Started Production

- Magna's 48-Volt hybrid dual-clutch transmission made its debut on the Jeep Renegade and Compass e-Hybrid, Fiat 500 X and Tipo
- Production taking place in Magna's Slovakia facility
- Agreement includes additional hybrid models in the future for Europe

Magna's 48 Volt hybrid transmission hit the market on the Jeep Renegade, Compass e-Hybrid, Fiat 500 X and Tipo, the first models from Stellantis to be equipped with a 48-Volt hybrid system. The two companies have signed a multi-program agreement.

Hybrid technologies are an important step on the path to lower emissions. Magna's hybrid transmission achieves stringent CO2 targets and offers improved driving dynamics due to electric torque vectoring and traction support.

Magna's 48V 7-speed dual-clutch transmission for hybrids provides a maximum torque of 320 Nm and torque-split technology to optimize the efficiencies of the combustion engine (ICE) and the e-motor. The e-motor is capable of providing propulsion to the vehicle even when the ICE is switched off. This new transmission features independent on-demand cooling for the clutch and e-motor with a single oil circuit for cooling and lubrication, resulting in significant CO2 reductions in WLTC and real-world driving.

Magna is producing the 48V hybrid transmission at its division in Kechnec, Slovakia.

Further 48V hybrid transmissions are expected to be adopted in additional future Stellantis models.

Military Insider - YouTube - Turkish unmanned fighter aircraft, Bayraktar Kızılelma

The Turkish Company Baykar, Have Successfully tested a new Unmaned Aerial Vehicles in the last month. Turkish unmanned fighter aircraft, Bayraktar Kızılelma, has been showcased at Teknofest, Türkiye's largest aerospace and technology festival, attracting great attention despite ongoing design and development efforts.

Kızılelma will be able to carry 1,500 kilograms of payload. Its flight range is 930 kilometers, while the operating altitude was declared as 10,668 meters. It can operate in the air for five hours and has a maximum speed of 900 km/h.

The quiz was left in the suggestion box by The Old Retired Pilot. We are sending it out to the residents and guests. No one in town knows his name. You yell, "HEY, Old Pilot."

The Old Pilot and the Town Secretary were arguing on the airport runway.

The Old Pilot yelled, “You said you wanted transport.”
The Secretary did scream her answer, “I thought you would rent a private jet.”
Our residents quickly drove to the airport to see what the Pilot was using for her transport.
And that proved transport to the pilot was not transport to the secretary!

Quiz - can guess the names of the transport?

(The answers are at the bottom of the Goodbye page)

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B_____</td>
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C_____</td>
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D_____</td>
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Courtesy of and Copyright to USAF Photo

US Airforce Week in Pictures

Keen Sword - **U.S. Air Force F-22A Raptor**s assigned to the 3rd Wing, fly alongside a KC-135 Stratotanker assigned to the 909th Air Refueling Squadron, during exercise Keen Sword 23 over the Pacific Ocean, Nov. 15, 2022. Keen Sword is an example of the strength of the U.S.-Japan Alliance, which has been the foundation of peace and security in the Indo-Pacific region for almost 75 years. The relationships built and maintained during these training events are critical to the collective capability to respond to crises or contingencies.

(U.S. Air Force photo by Airman 1st Class Tylir Meyer)

(Over the desert **- A U.S. Air Force** KC-10 Extender assigned to the 908th Expeditionary Air Refueling Squadron, flies over an undisclosed location in the U.S. Central Command area of responsibility, Nov. 10, 2022. The KC-10 delivers global aerial refueling capability to support joint and coalition aircraft, providing war-winning airpower throughout the CENTCOM area of responsibility.

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

Flying colors - A **U.S. Air Force Academy cadet from the Wings of Blue demonstration team displays the American flag** during the Aviation Nation 2022 opening ceremony at Nellis Air Force Base, Nev., Nov. 4, 2022. The primary mission of the Wings of Blue is to run the U.S. Air Force Academy's Basic Freefall Parachuting course, known as Airmanship 490.

(U.S.A.F photo by Airman 1st Class Makenna Gott)

Applications will be accepted up until the deadline January 25, 2023, on a rolling basis until positions are filled. Students will be notified of their acceptance into the summer research program no later than April. Biomedical Engineering and Informatics Summer Research Program

The research internship program will be offered between May 29 and August 4, 2023.

Wake Forest University School of Medicine

2023 Research Opportunities -

The Biomedical Engineering Department and Center for Biomedical Informatics at Wake Forest University School of Medicine will offer several summer research opportunities in 2023 to undergraduate and master's students.

Application Process

Submit an application online, including a 1-pg personal statement, resume, academic transcripts and one academic reference for an optional letter of recommendation.

The program is funded by an NSF Research Experience for Undergraduates (REU) award: Imaging and Mechanics-based Projects on Accidental Cases of Trauma (IMPACT), an NIH R25 award: Culturally Augmented Learning in Biomedical Informatics Research (CALIBIR), and other sources. A broad array of biomedical engineering and informatics projects are offered. Students selected for this program will receive a stipend and on-campus housing.

Exciting projects are offered on topics including:

- Injury prediction model development
- Military, sports and spaceflight safety
- Osteoporosis prevention
- Biomechanical characterization of injury mechanisms
- Diagnostics and therapies for cancer patients
- Biomedical informatics

Visit the website

- to learn more and view our program's research project descriptions (PDF).
- to View our 2023 Summer Brochure (PDF).
- To learn about informational sessions and to learn more about the Virginia Tech - Wake Forest School of Biomedical Engineering & Sciences graduate program…

We thank K. Srinivas for bringing this to our attention using social media

For the complete article follow the link to Springer Website (Below are partial excerpts of a few paragraphs.

Eighty Years of the Finite Element Method: Birth, Evolution, and Future

Wing Kam Liu
Northwestern Univ.
Evanston, IL
Shaofan Li
Univ. of California
Berkeley, CA,
Harold S. Park
Boston University
Boston, MA

Abstract - This document presents comprehensive historical accounts on the developments of finite element methods (FEM) since 1941, with a specific emphasis on developments related to solid mechanics. We present a historical overview beginning with the theoretical formulations…

…the finite element method (FEM), which has become the computational workhorse for engineering design analysis and scientific modeling of a wide range of physical processes, including material and structural mechanics, fluid flow and heat conduction, various biological processes for medical diagnosis and surgery planning, electromagnetics and semi-conductor circuit and chip design and analysis, additive manufacturing, and in general every conceivable problem that can be described by partial differential equations (PDEs).

The FEM has fundamentally revolutionized the way we do scientific modeling and engineering design… In this paper, we present a historical perspective on the developments of finite element methods mainly focusing on its applications and related developments in solid and structural mechanics, with limited discussions to other fields in which it has made significant impact, such as fluid mechanics, heat transfer, and fluid–structure interaction. To have a complete storyline, we divide the development of the finite element method into four time periods: I. (1941–1965) Early years of FEM; II. (1966–1991) Golden age of FEM; III. (1992–2017) Large scale, industrial applications of FEM and development of material modeling, and IV (2018–) the state-of-the-art FEM technology for the current and future eras of FEM research. Note that this paper may not strictly follow the chronological order of FEM developments, because often time these developments were interwoven across different time periods.

Partial Excerpts of 4 of the many developers

- **T. Belytschko – (1943-2014)** An important development came in the late 1970s when T. Belytschko, K. C. Park, ...proposed using explicit or implicit-explicit, or implicit time integration with damping control to solve nonlinear structural dynamics problems…

- **R. H. MacNeal** - The first version of NASTRAN was called COSMIC Nastran, which debuted in 1969, with a key figure in its development being R. H. MacNeal...In 1971, MSC Software released a commercial version of Nastran, named MSC Nastran.
- **J. A. Swanson** - About the same time in 1960s, J. A. Swanson worked at Westinghouse Astronuclear Laboratory in Pittsburgh, and he was responsible for stress analysis of the components in NERVA nuclear reactor rockets....He left Westinghouse and developed the initial ANSYS FEM code.
- **J.O. Hallquist - …**at Lawrence Livermore National Laboratory also developed a 3D nonlinear FEM code called DYNA3D, which was extensively used impact, dynamic contact, and failure analysis of structures, which later evolved to LS-DYNA. LS-DYNA is the major FEM software used in automobile design and crashworthiness analyses…

Christian Liebold
Project Engineer bei DYNAmore

Together with the DLR, we've published a paper on microscale simulation considering material uncertainties through stochastic distribution for continuous fiber reinforced composites

Stochastic modelling of continuous glass-fibre reinforced plastics–considering material uncertainty in microscale simulations

Authors: Mathieu Vinot, Christian Liebold, Tolga Usta, Martin Holzapfel, Nathalie Toso, Heinz Voggenreiter

Abstract

This paper presents a probabilistic micromechanics-based approach to simulate the influence of scatter sources in composite materials as an alternative to deterministic approaches. Focus is given to the effect of microscopic and macroscopic voids, material inhomogeneity induced by manufacturing processes and stochastic fibre patterns on the mechanical properties of continuous glass-fibre reinforced polymer components. Various periodic unit cells of neat resin and embedded fibre clusters are generated with random distributions of the abovementioned scatter sources, while the voids are represented by degrading locally the pristine properties in an element-wise manner. Subsequently, the models are mechanically loaded under transverse tension as an exemplary case and the resulting responses are correlated with the stochastic inputs. In particular, the relative influence of pore size, porosity and fibre/resin interface strength on the transverse tension modulus and strength of unidirectional composites are numerically investigated. The present approach is suggested as a computational efficient but reliable alternative to geometrical representations of imperfection in composite materials.

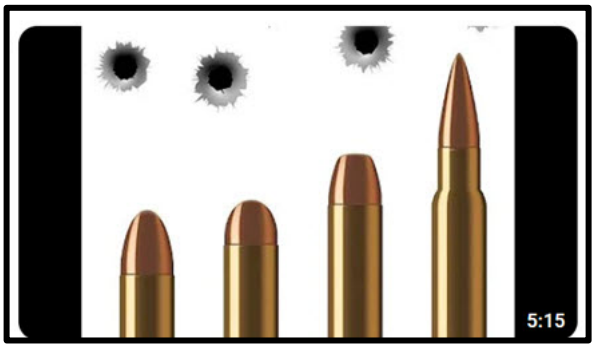
Introduction (Excerpt)

Composite materials have increasingly replaced metallic structures in many industrial applications due to their high mass-specific mechanical properties and the weight reduction possibilities they offer. In the field of transportation systems, they are used in structures sustaining crash or impact loading because of their good energy absorption capability under certain loading conditions.1

However, the mechanical behaviour of composite materials is inherently influenced by multiple sources of scatter which result from the raw materials and the manufacturing processes (draping, forming, infiltration), and may hardly be described in a deterministic way. Additionally, the load spectrum during the service life can neither be assumed to be deterministic and may strongly vary depending on operative conditions. While the stochasticity is not mostly critical for the structural stiffness, its influence grows when considering structural failure and even more fatigue. The application of high safety margin in the sizing of composite structures has been widely accepted in industrial applications to cover the abovementioned uncertainties, thus reducing the lightweight efficiency of composite materials.2,3

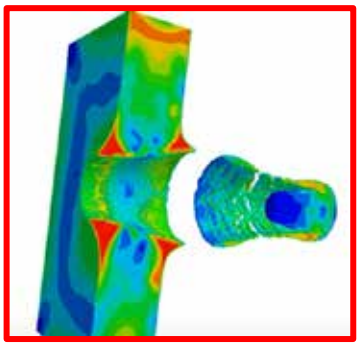
No one knows his name.
You yell, "HEY, old rancher."

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



Ameen Topa - [Generate Solid Bullet Mesh from Scratch!]
LS-DYNA

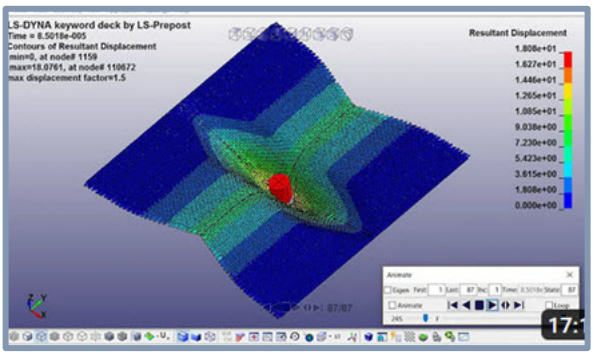
A short and light tutorial on how to generate solid mesh of a simplified bullet model from scratch. You can use the same concept in this video if you have more detailed dimensions of the bullet.



BeenuZz (HEY BeenuZz – where are you now?)

[LS-DYNA bullet impact on steel plate Simulation done using LS-DYNA eulerian/ SPH methods]

The steel plate is 20 cm thick ; initial velocity is 1400 m/s



[LS-DYNA tutorial | Ballistic Impact on Woven Fabric]

BWEngineering

My Virtual Travel Outing

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

Stiftung AutoMuseum Volkswagen - The past becomes tangible, memories are revived, emotions are brought to life, historic automobiles set the pulse racing, and a marque with history has one thing over its competitors – its credibility based on many years of trust.

The saying at Volkswagen – it goes on and on and on – from the Beetle era continues to apply to the Golf in the modern age.

Only a few hundred metres separate the past and the future here. The Volkswagen AutoMuseum is situated near the Volkswagen factory where the latest Volkswagen models are produced. On an exhibition space covering some 5,000 square metres, a total of 130 vehicles provide a fascinating insight into the product history of Volkswagen. Among the main exhibits are many rare concept vehicles, prototypes and one-off models.

Especially appealing is the fact that rare concept vehicles and prototypes stand alongside mass-produced Volkswagen models, thereby allowing direct comparisons to be made. Which details were used in mass production and which were discarded? Besides mass-produced vehicles and prototypes, the exhibits also include curious one-offs, such as the film star Herbie, a wooden Beetle and the 'See Golf' – a seafaring Golf with hydraulic pontoons.

This photo is about an hour after Don told me he wouldn't take the tractor up on the hill.

The quiz for the day is does that gate open up to the hill?

I was going to yell why are you going up the hill when you told me you wouldn't drive up the hill today? BUT then he would have had to turn off the tractor to answer me and realize I was taking a picture.

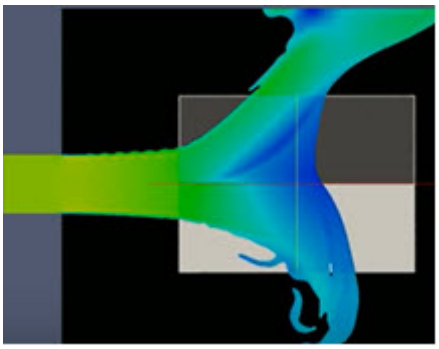
SO, I totally pretended I didn't see him GOING UP THE HILL!

And here we have Minow (blind horse) and his friends.

Actually, they are all waiting for breakfast.

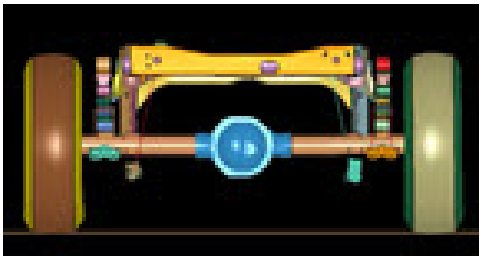
11/14/2022 - Splashing! That is important when you drink coffee, OR in the below oil splashing simulation it is more important. Off we go to the MultiPhysics LS-DYNA Channel.

LS-DYNA ISPH : Oil Splashing simulation - In this simulation, a gearbox model is used for demonstration of the incompressible SPH solver capabilities (automatically included in LS-DYNA).



11/07/2022 - Do you believe they are using coffee in this video? No? Okay, you are correct but let's go visit YouTube and watch it.

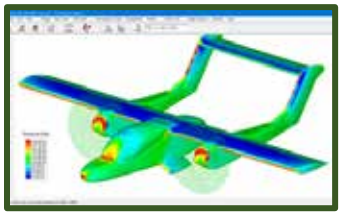
LS-DYNA CFD: Flow through porous media (Resin Transfer Molding problem)



10/31/2022 - Why is a suspension needed you ask? Because you need to be able to drink coffee in the truck.

LS-DYNA SIlverado Suspension

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



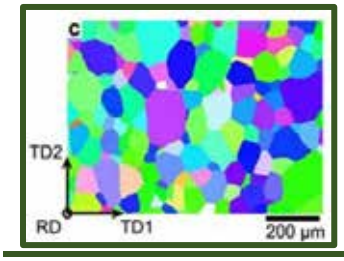
Hanley Innovations - **Discover the most accurate 2D and 3D Aerodynamics & CFD software solutions for desktops and laptops.**

Accurate, easy-to-use and accessible 3D Aerodynamics and computational fluid dyanamics (CFD) simulation apps. The software runs directly on an ordinary Windows PC so you currently have all that you need to accurately analyze your designs.

PUBLICATION Thanks to Rasmus for highlighting this on social media

Albin Wessling, Researcher|Simulation|Predicting Rock Drilling & Mining

"I am pleased to share my latest publication **"Dynamic Compressive and Tensile Characterisation of Igneous Rocks using Split-Hopkinson Pressure Bar and Digital Image Correlation**", written together with Jörgen Kajberg. The paper covers dynamic characterisation of two rock materials - Kuru Granite and Kuru Diorite - using a high-speed camera with 671,000 frames per second and a subsequent Digital Image Correlation analysis.



NEWS LLNL **physicist probes causes of life-shortening 'dwell fatigue' in titanium** (Jeremy Thomas)

"Dwell fatigue" is a phenomenon that can occur in titanium alloys when held under stress, such as a jet engine's fan disc during takeoff. This peculiar failure mode can initiate microscopic cracks that drastically reduce a component's lifetime.

Meditate-project A new project publication

Francesco Bardi, ESR 10 of the MeDiTATe project, published the paper titled **A Hybrid Mock Circulatory Loop for Fluid Dynamic Characterization of 3D Anatomical Phantoms** on the IEEE Transactions on Biomedical Engineering journal.

Thanks to Syn Schmitt for bringing this to attention on social media

Jens Anders • Full professor and Director of the Institute of Smart Sensors at University of Stuttgart, Director at IMS CHIPS

"An important step towards chip-integrated, low-cost, high-field DNP: The IIS team will present the world's first chip-integrated 263 GHz DNP source for high-field DNP at 9.4 T at **ISSCC 2023**"

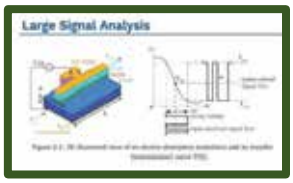
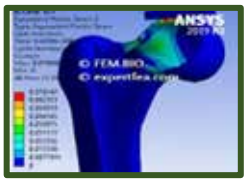
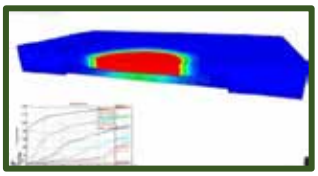
CONVENTION CENTER
YouTube Booths

December

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

Current videos
from our booth visits:
On November 30

Free Coffee for
visiting our exhibitors

LS-DYNA Multiphysics			**ANSYS**
Vivian van der Hert			**Oasys LS-DYNA**
Ozen Engineering			**LEAP**
Expert FEA			**MSC Software-Hexagon**
MEETING ROOM			**A. TOPA**

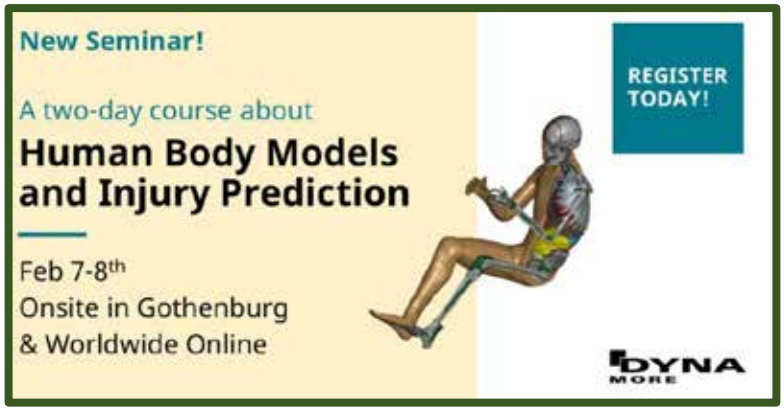
If you have a YouTube Channel, send us the URL feaanswer@aol.com

Axel Hallén DYNAmore Nordic

Selected trainings may be joined either Onsite or Online. In the "Comment" field in your course registration you can specify if you prefer to take part on site or online.

Seminars - 2023 – check our website for current information and additional seminars

Jan 31st	Introduction to LS-DYNA	Dynamore staff member
Feb 7th	Human Body Models and Injury Prediction	Karin Brolin
March 07	Parameter Identification with LS-OPT -	David Aspenberg
March 08	LS-OPT - Optimization & Robustness	David Aspenberg
March 14	Introduction to LS-DYNA	Dynamore staff member
March 14	From Explicit to Implicit Simulation Models in LS-DYNA	Anders Jonsson
March 21	Simulation of continuous fiber reinforced composites	Christian Liebold
March 23	Parameter Identification with LS-OPT	David Aspenberg
March 28	Digimat Material Model for Fiber Reinforced Plastics	Mats Landervik
March 31	LS-DYNA, Simulation of sheet metal forming processes -	Mikael Schill



This seminar covers the topic of injury biomechanics needed to use Human Body Models (HBM) for injury prediction. This is done for state-of-the-art full-body HBMs, such as PIPER, THUMS, SAFER-HBM, GHBMC, and VIVA, giving you an in-depth understanding of their pros and cons for different applications. It is also an opportunity to discuss your applications during the interactive parts of the course.

Instructor

Development of numerical human body models (HBMs) was initiated in several parts of the world with the introduction of advanced automotive safety systems, in response to the need of a repetitive tool with increased biofidelity and anatomical detail compared to the crash test dummies. Today, HBMs are suited to study human biomechanics in applications in varying fields, including but not limited to automotive, aeronautics, sport injuries, and medical applications.

Designing products today require complex solutions to make them right. Suboptimal performance validation and decision-making done too late in the development cycle can cost time and money. They may even result in a product's failure.

What's New: Simcenter Testlab 2206

The newest release Simcenter Testlab 2206 enables you to accurately model the complexity of your products' digital twins, to make your measurement campaigns go faster, and to integrate your testing and simulation processes through a unified data management system. This release offers test and simulation teams new capabilities to develop innovative products faster, and with tighter collaboration.

Disconnected processes for data intake, processing, and analysis, as well as difficult-to-maintain in-house solutions, are challenges that must be tackled to ensure efficient operations. Physical testing teams performing multi-physics measurements need efficient data acquisition, processing, validation, and certification tools; tools that can easily allow working together with simulation engineers.

Read the full Simcenter Testlab 2206 Fact Sheet on our website

Highlights in Simcenter Testlab 2206 - Innovate smart products faster by strengthening the collaboration between testing and simulation teams with Simcenter Testlab 2206. Discover below a little taste of what you can do with this release.

Did you know that BIAS Engineering is the representative of Oasys PRIMER Turkey, the preprocessor designed for the fastest preparation of LS-DYNA models. BIAS Engineering supports the latest LS-DYNA features.

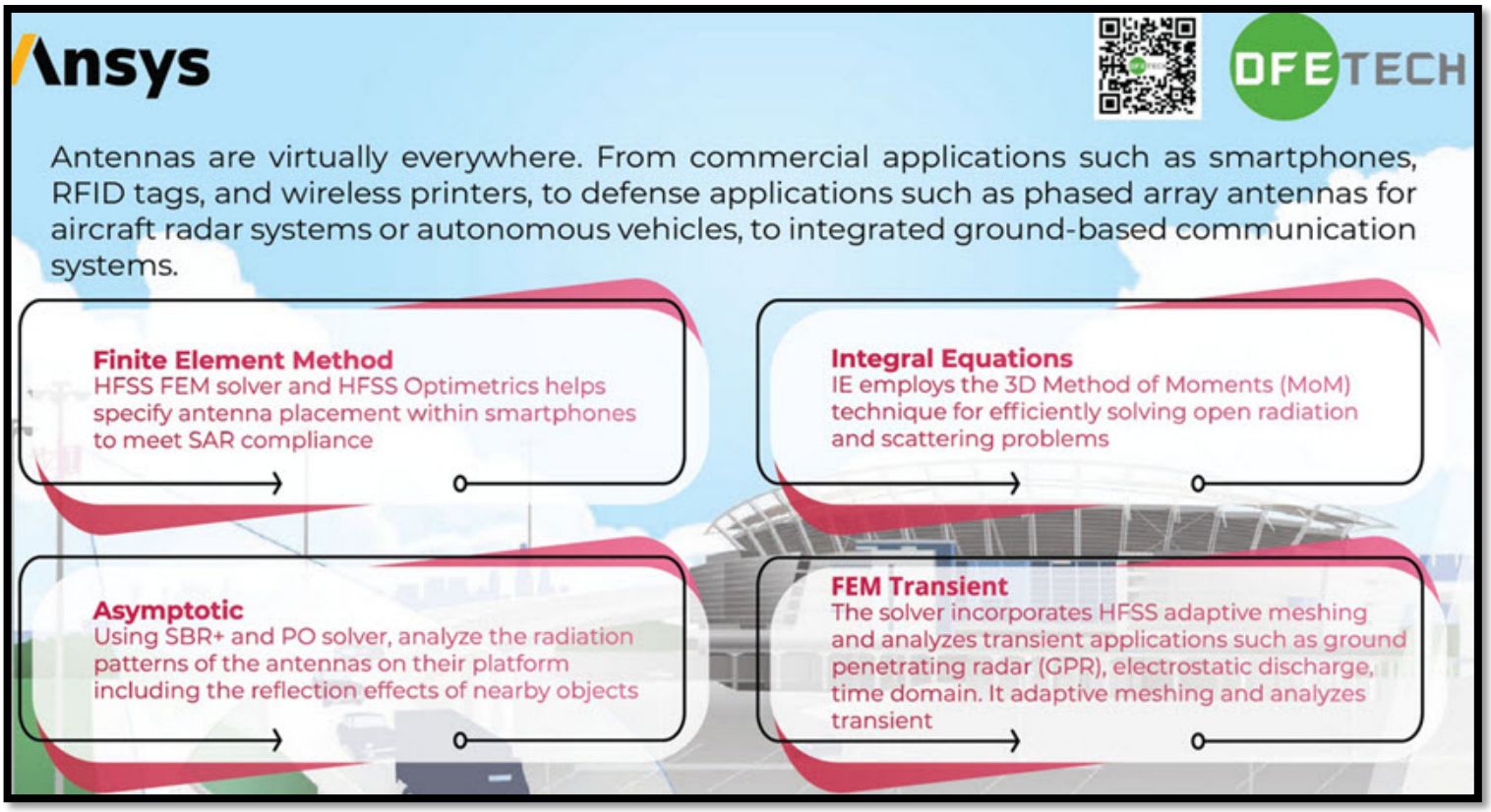
Oasys Software Turkey Representative
BIAS Engineering

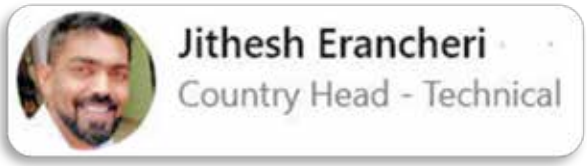
Oasys PRIMER is the pre-processor designed to make preparation and modification of LS-DYNA models as quick and as simple as possible. With support for every LS-DYNA keyword, you can read and write models with the confidence that no data will be lost or corrupted.

Jenson Chen - Dyna Forming Engineering & Technology DFETECH

Did you know that Ansys HFSS (High Frequency Structure Simulator) is a 3D EM (electromagnetic) simulation software for designing and simulating high-frequency electronic products such as antennas, antenna arrays, RF or microwave components, high-speed interconnects, filters, connectors, IC packages and printed circuit boards.

The Ansys HFSS simulation suite consists of a comprehensive set of solvers to address diverse electromagnetic problems ranging in detail and scale from passive IC components to extremely large-scale EM analyses such as automotive radar scenes for ADAS systems. Its reliable automatic adaptive mesh refinement lets you focus on the design instead of spending time determining and creating the best mesh.





Kaizenat Features Videos Kaizenat Website

Dr. Ramesh Venkatesan, Jithesh Erancheri, Nanda Kumar

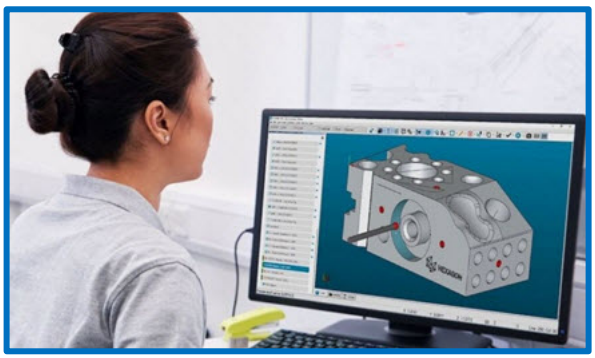
"Kaizenat Technologies Pvt Ltd is very proud of being partnered with Wipro 3D."

"Wipro 3D is a made in India, Industrial Grade Flagship 3D Printer. The synergy between Kaizenat and Wipro 3D will help companies to embrace this state of art product through our strong distribution network across India."

YouTube Intro - Wipro's Fused Filament Fabrication technology printer, Wipro 3D F300-2 comes with a robust system design meant for reliability and quality. This machine provides excellent print quality and outstanding performance. This best in class Industrial Grade 3D printer is designed and manufactured in India.

Wipro 3D Wipro 3D serves as the best 3D printing company in India providing complete 3D printing solutions for businesses. Outstanding as the leading 3D printing company in India, Wipro 3D ensures improved functional performance and reshaping of the business. Employing the additive manufacturing technology in various industries is deeply analysed by our experts assuring the improvement in the overall performance of the system. Being the finest 3D printing company in India, Wipro 3D ensures tangible and sustained business outcomes.

If you caught us this year at IMTS, you likely have noticed our excitement for MyQuality, our newest aftermarket offering to US-based Hexagon customers. If you missed us in Chicago, don't worry – we're bringing MyQuality to you – a one-stop portal for your programming and inspection needs.



EXCERPT - Enhancing your productivity with a customised quality solution

In the world of instant gratification, same-day delivery, and a multitude of online tools, we must change the way we work. With that in mind, we want to help solve your problems in a unique way – reduce downtime and enhance productivity. Welcome to MyQuality, the only custom portal in our industry, created with you in mind.

This initiative started in 2020 as a launch pad from another project to improve how quickly we create programs for inspection. Our goal was to modernise our business practice and meet customers where you are. In looking at our data, we realised that we asked you for the same information over and over. We needed to find a better way. By expediting workflow and consolidating information gathering, we can now create a place where projects, parts, files, data – you name it – can live and be accessed easily. Now, we have a quicker and more efficient process for you when a new project is submitted.

The idea of reduced downtime and enhanced productivity is embodied on the site. By creating a profile and saving project data, you'll save more time each time you come back, while ensuring you will get exactly what you need.

We can pull up your history and specs in just a few seconds, saving everyone time in their day-to-day workload. MyQuality allows you better access to on-demand programming, inspection help and an online quoting system – you can message us on your time. Gone are the days of waiting for business hours; you can log in and check on your project at any time, at any stage, and stay in communication with the applications team with just a few clicks of the mouse.

The more data we collect through your profile about your machine, the more refined we can make your quotes and streamline your experience with our MyQuality portal. With its instant price estimations, project history, and easy access, the capabilities to aid you with your inspection and programming needs are unmatched. Get started at MyQuality today! If you're not based in the US, contact your local Hexagon team to see how we can support you in your location.

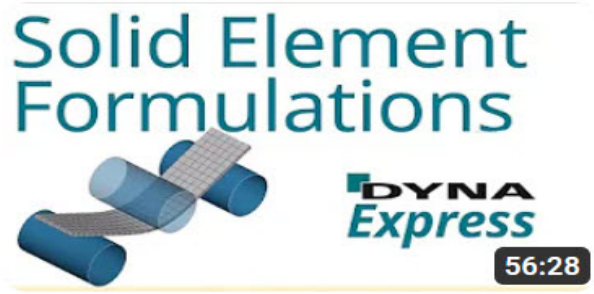
Kathleen Fritz - DYNAmore GmbH

Recap of a few of our many 2022 YouTube Channel videos
On our channel, you will find example simulations, tutorials and much more. Subscribe to the channel now and activate the bell to not miss any of the upcoming videos.

[DYNAmore YouTube Channel] -

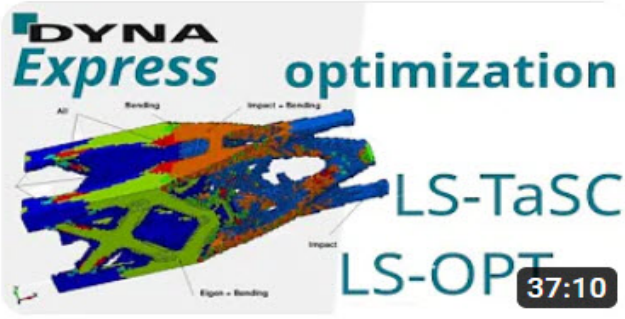
DYNAmore Express: Short Overview of Damage and Failure Models in...

DYNAmore Express: Beyond FEA: Arbitary Lagrangean-Eulerian (ALE...



DYNAmore Express: Solid Element Formulations in LS-DYNA

DYNAmore Express: DynaXtend - Flexible and short-term LS-DYNA...



DYNAmore Express: Topology optimization with LS-TaSC and...

DYNAmore Express: LS-PrePost: News, Tips and Tricks

Madhukar Chatiri, CEO at CADFEM India, Simulating to Engineer a better World

Ansys Gateway powered by AWS is a cloud platform which is used to provision virtual machines or clusters and install pre-configured computer aided engineering or CAE and computer aided design or CAD applications on it.

YouTube
HPC Cluster in Ansys Gateway powered by AWS

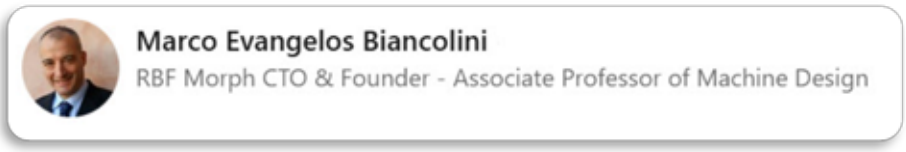
Product Information - Introducing Ansys Gateway powered by AWS, the solution for developers, designers, and engineers who want to manage their complete CAD & CAE workflow in the cloud. Access cloud computing resources from anywhere via your web browser. You can create, customize, and connect cloud applications with minimal technical skills. Manually install your 3rd party applications alongside Ansys applications.

Innovation - Accelerate innovation by removing on-premises hardware barrier for High Performance Computing (HPC) using the power of AWS cloud.

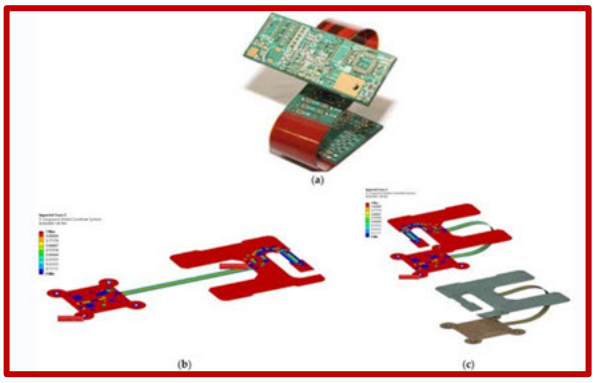
Expertise	Expertise
Leverage Ansys expertise in configuration and deployment of Virtual Desktop Interface (VDI) and High Performance Computing (HPC).	Leverage Ansys expertise in configuration and deployment of Virtual Desktop Interface (VDI) and High Performance Computing (HPC).

Parth Gandhi Territory Sales Mgr.|Tech. Sales Consultant|Customer Onboarding&Support|Digital Mrktg.

The 1st CADFEM Ansys Simulation Conference, Gujarat was a great success for us & it gave us the opportunity to give others a glimpse of our world-class business simulations in-person. Thank you to all the amazing audience who participated in our conference. Looking forward to working with you to develop next-generation products using Ansys.



We are pleased to announce that our paper entitled RBF Meshless Approach to Evaluate Strain Due to Large Displacements in Flexible Printed Circuit Boards has been published on Micromachines 2022.



[RBF Meshless Approach to Evaluate Strain Due to Large Displacements in Flexible Printed Circuit Boards]

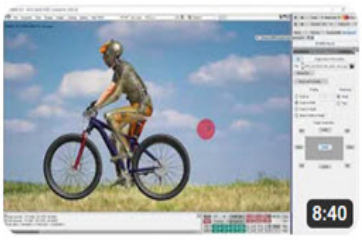
Abstract

Thin plates are very often employed in a context of large displacements and rotations, for example, whenever the extreme flexibility of a body can replace the use of complicated kinematic pairs. This is the case of the flexible Printed Circuit Boards (PCBs) used, for example, within last-generation foldable laptops and consumer electronics products. In these applications, the range of motion is generally known in advance, and a simple strategy of stress assessment leaving out nonlinear numerical calculations appears feasible other than desirable. In this paper, Radial Basis Functions (RBFs) are used to represent a generic transformation of a bi-dimensional plate, with all the derivate fields being analytically achieved without the need for a numerical grid for large-displacement applications. Strains due to bending are easily retrieved with this method and satisfactorily compared to analytical and shell-based Finite Element Method (FEM) benchmarks. On the other hand, the computational costs of the juxtaposed methods appear far different; with the machine being equal, the orders of magnitude of the time elapsed in computation are seconds for the RBF-based strategy versus minutes for the FEM approach.
Reach us with a message.

Marta Kempa, MBA - Marketing Coordinator Oasys LS-DYNA

2022 catch up of a few of our latest videos on our YouTube Channel

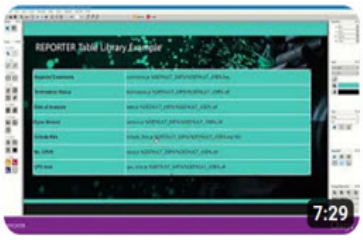
YouTube Channel - [Oasys LS-DYNA Environment]



Positioning THUMS model on a bike

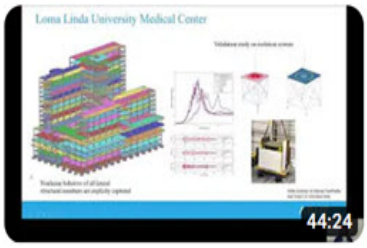
Top Tip: how to write your own scripts in Oasys REPORTER and...

Pedestrian Safety Tools Series: #2 Oasys REPORTER Templates

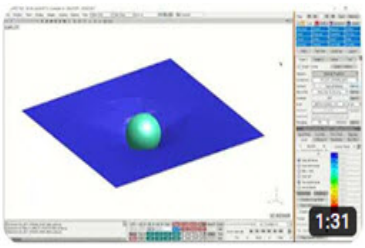


Top Tip: Oasys REPORTER - library scripts

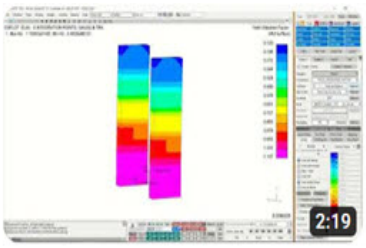
Pedestrian Safety Tools Series #1 Pedestrian markup and pedestrian...



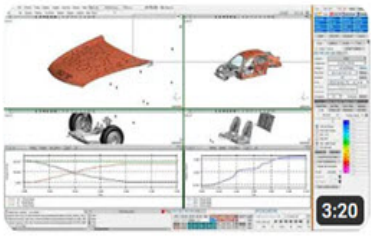
LS DYNA for Civil Structural Applications



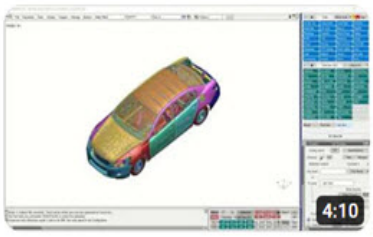
Ease of use and performance - MAT_Glass history variables



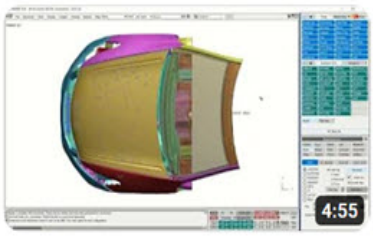
Ease of use and performance - yield utilisation factor and percentage



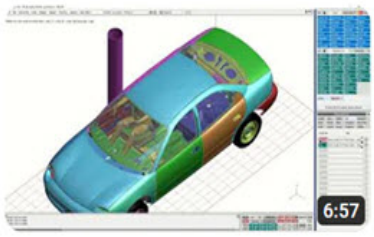
Ease of use and performance - window positioning



Ease of use and performance - cut sections



Ease of use and performance - pedestrian mark-up tools

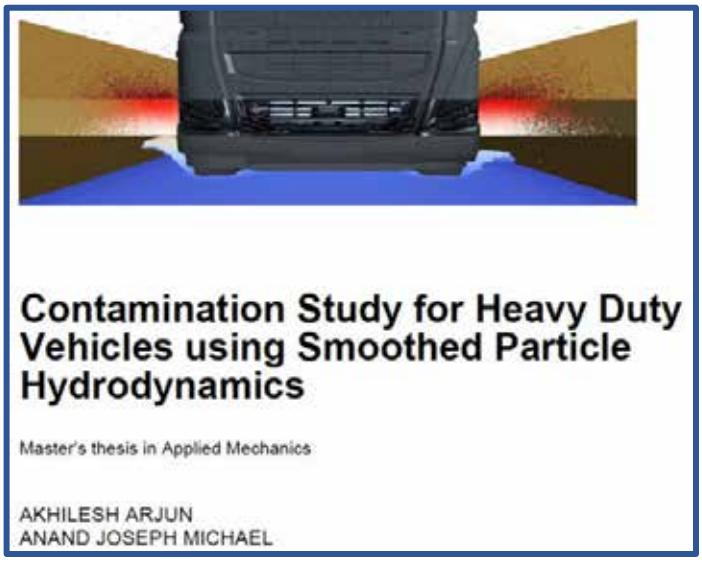


Ease of use and performance - crash test setup

Rasmus Schutzer - DYNAmore Nordic AB

In their work, "Contamination Study for Heavy Duty Vehicles using Smoothed Particle Hydrodynamics," they utilized LS-DYNA's multiphysics capabilities and the ISPH solver to study the physics of fluid contamination as a truck is running through a water channel. Thank you for a great work and a great master thesis report! It has been very interesting and fun to support you guys with all kinds of good questions and thoughts.

Every year, many master's students use LS-DYNA for their thesis work, for which we offer free classes and personal support. We are happy that we got to work with two talented students, Anand Joseph Michael and Akhilesh Arjun, from Chalmers University earlier this year.



Contamination Study for Heavy Duty Vehicles using Smoothed Particle Hydrodynamics

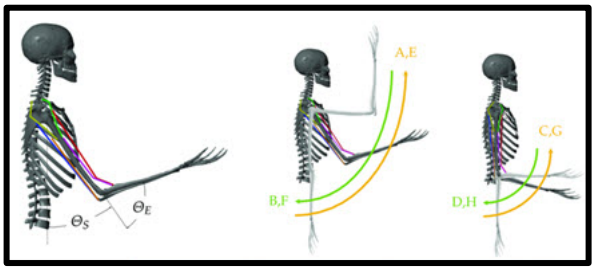
One excerpt from the thesis:
"While in LS-DYNA, the kinematics was incorporated implicitly using prescribed motion assigned to different truck parts, gravity loading, and friction. LS-DYNA thus allows for the inclusion of multi-physics which is not implicitly supported by the other two software."

This is a comprehensive study where they compared, among others, spray patterns, dynamic fluid behavior, and the usability of LS-DYNA, Preonlab, and Simcenter SPH. The work was conducted for Volvo Trucks and Volvo Group.

Abstract Excerpt: Advancement in automobile technology has lead to increasingly complex driver assistance technology. Many of these involve the placement of sensors on the external surface(s) of vehicles. In the case of heavy duty vehicles, these sensors could be exposed to harsh driving conditions which could lead to contamination or soiling of their surfaces. Sensors must perform reliably and safely in such extreme conditions and must be kept clean for optimal performance. Additionally, contamination can also adversely affect the visibility of the driver as well as other road users. The durability and lifetime of components are also affected by contamination. Thus, studying contamination is vital. Contamination study for heavy duty vehicle development includes a combination of physical testing and numerical simulations. Traditional numerical simulations use a computational mesh, which makes the inclusion of multiphysics and replication of vehicle kinematics a formidable task. An alternative to the current method, broadly known as purely particle based methods, removes the need for a computational mesh and allows various topological changes to be captured more easily. The purpose of this thesis was to evaluate particle based methods for studying contamination, in particular Smoothed Particle Hydrodynamics (SPH).

Syn Schmitt Professor at University of Stuttgart

Exoskeletons are powerful tools for aiding humans with pathological conditions, in dangerous environments or in manually exhausting tasks.



Paper - Design and Scaling of Exoskeleton Power Units Considering Load Cycles of Humans

Authors:
Marcel Waldhof, Isabell Wochner
Katrin Stollenmaier, Nejila Parspour
Syn Schmitt

Typically, they are designed for specific maximum scenarios without taking into account the diversity of tasks and the individuality of the user. To address this discrepancy, a framework was developed for personalizing an exoskeleton by scaling the components, especially the electrical machine, based on different simulated human muscle forces. The main idea was to scale a numerical arm model based on body mass and height to predict different movements representing both manual labor and daily activities. The predicted torques necessary to produce these movements were then used to generate a load/performance cycle for the power unit design. Considering these torques, main operation points of this load cycle were defined and a reference power unit was scaled and optimized. Therefore, a scalability model for an electrical machine is introduced. This individual adaptation and scaling of the power unit for different users leads to a better performance and a lighter design.

Download Demoa

A biophysics simulator for muscle-driven systems.

- demoa is a powerful simulator
- demoa provides all necessary functions to build neuro-musculoskeletal body models and simulate their behaviour.

Takahiko Miyachi, Division Director at JSOL Corporation

December 13 - 20, 2022 is the JSOL CAE Forum

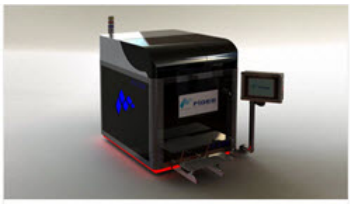
The latest technologies of various CAE packages provided by the Engineering Technology Div. The forum will, again, be held online.

Keynote Speeches – See our website for full information, Guest Speakers and Sponsors

	Ansys LS-DYNA Roadmap **Mr. Madhu Keshavamurthy** ANSYS, Inc.
	Study on Crack Propagation in High-Strength Steel Plates Using BEXT Solid Elements **Mr. Kenji Takada** Expert Engineer Honda Motor Co., Ltd.
	The evolution of manufacturing DX that strengthens the foundational core manufacturing technology **Mr. Katsusuke Fukasawa** Panasonic Connect Co., Ltd.
	Study of polymer rheology by corase-grained simulations **Prof. Jun-ichi Takimoto** Yamagata University
	Visualization and multi-scale modeling of adhesion phenomena **Associate Prof. Tetsuo Yamaguchi** The University of Tokyo

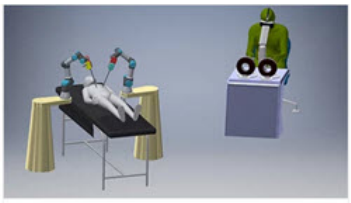
Research is performing scientific and technological activities for the purpose of discovering, learning, and knowing the unknown. Development, on the other hand, is directing the available information or technology further with new adjustments. Research and Development is the creative efforts based on a systemic ground focusing on improving the scientific and technologic knowledge, and to put the knowledge into use in new applications.

Among our Projects highlighted in 2022



Metal Fusion 3D Printer

Bionic Hand



Surgical Robotic Arm

Molten Salt Reactors

1. 3D Printing is the process of producing a virtual, 3D designed object by subjecting materials such as polymer, composite, or resin to a thermal or chemical process. The devices performing this process is called 3D printers. Various types of raw materials can be used for the prints.

2. Bionic Hand - FİGES Bionic Hand is a new generation upper extremity prosthesis. With the tactual technology brought to the world by FİGES Bionic Hand, the prosthesis that realistically imitates the human hand has now arrived..

3. Surgical Robotic Arm - It is widely agreed that an important short-coming of the currently available surgical robotic arms is the inability to transmit the sense of force to the master console. With the Master Robot, which provides force and pressure feedback, developed under this project, a critical technology that can be implemented in the new generation surgical robots has now been developed with national resources.

4. Molten Salt Reactors - By using the ANSYS software FİGES conducted the calculations and design of the heat exchanges of the Molten Salt Reactors. The heat exchanger design suggested by FİGES was found appropriate by the SAMOFAR consortium.

The results and outputs of the SAMOFAR Project offer great advantages to the developing countries, including Turkey, intending to improve their investments in the nuclear technology, reclaim their independence in the energy production, and invest in the environment-friendly systems.

Please visit the website for complete information and additional graphics

Marko Thiele, Scaling Simulation, SCALE.SDM, **LEGO Mercedes AMG GT3 crashing at 30kph into rigid wall**

Mercedes AMG GT3 by @legotuner33 crashing at 30kph into rigid wall

Accident or murder? One of the most famous criminal cases of the past 15 years is reopened. Scientists from the SimTech Cluster of Excellence at the Univ. of Stuttgart provided the essential prerequisites

Prof. Syn Schmitt explains how the biomechanical simulation method is able to reconstruct the incident. (Photo: Univ. of Stuttgart/Kovalenko)

DYNAmore Nordic Team - Case study: **Analyses of orthopedic fixation devices with LS-DYNA** **-** In order to aid the healing process of bone fractures, the bone segments can be immobilized by external or internal fixation.

20 Year anniversary of DYNAmore - How it all began –

In 1987 Dr. John O. Hallquist founded LSTC in Livermore, California. At the same time the founders of DYNAmore started as freelancer to sell and co-develop LS-DYNA in Germany.

CADFEM - **HEAD Sport AG - With simulation models to the desired skiing behavior**

Sensitivity analysis and calibration leads to valid ski simulation models

Graphics Courtesy of Vecteezy

Goodbye and Come Back Soon

QUIZ ANSWERS

A Lockheed Martin C-130J Super Hercules
B. Kawasaki C-2
C. Lockheed Martin C-5M Super Galaxy
D. Bicycle - the usual transport for our town secretary.

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