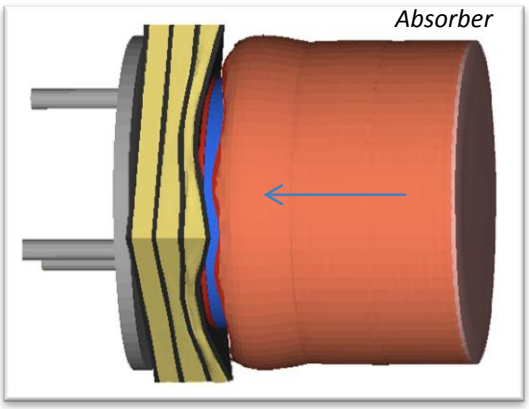
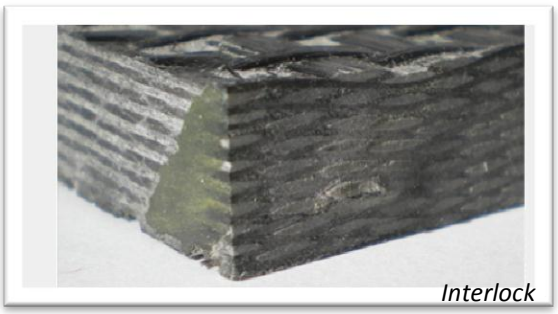
Trust CEDREM's expertise in advanced composite material to enhance your product's performance

A team of specialists

We have a great deal of experience with different types of applications and materials to improve **impact / crash / blast** design.
Our extremely flexible tools adapt to take on the shape of your needs.

- ✓ *Dynamic simulation integrating dedicated material laws*
- ✓ *Coupling of both meso and macroscale modeling to highlight specific behavior*

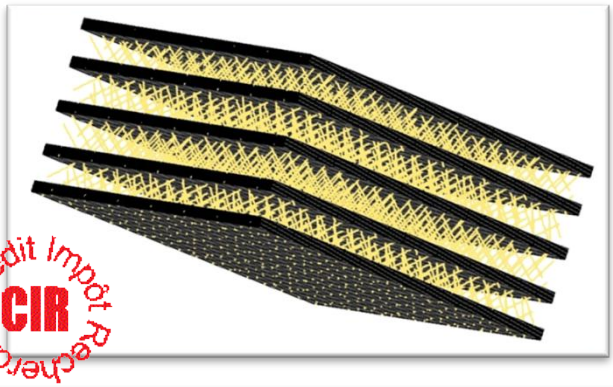




Innovation in materials

Cedrem is constantly working to bring new higher performance patented materials to the market.

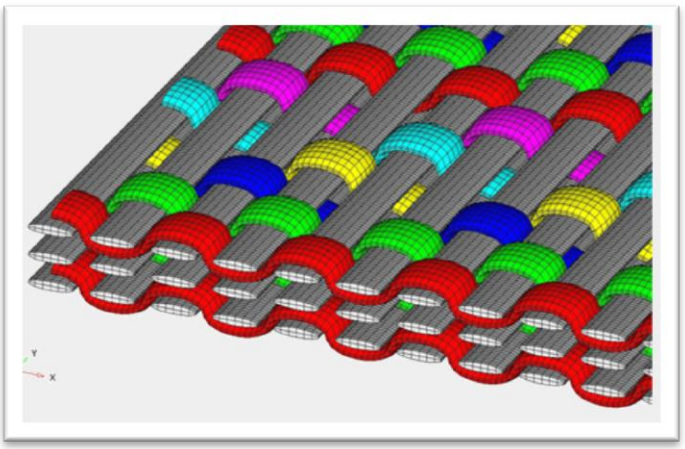
- ✓ *Better energy absorption*
- ✓ *Optimized design*



Innovation in software

Cedrem has developed groundbreaking mesoscale design software to give you the edge you need

- ✓ *Higher precision*
- ✓ *Closer to reality*



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Keep a step ahead of the competition, follow the innovation led by CEDREM

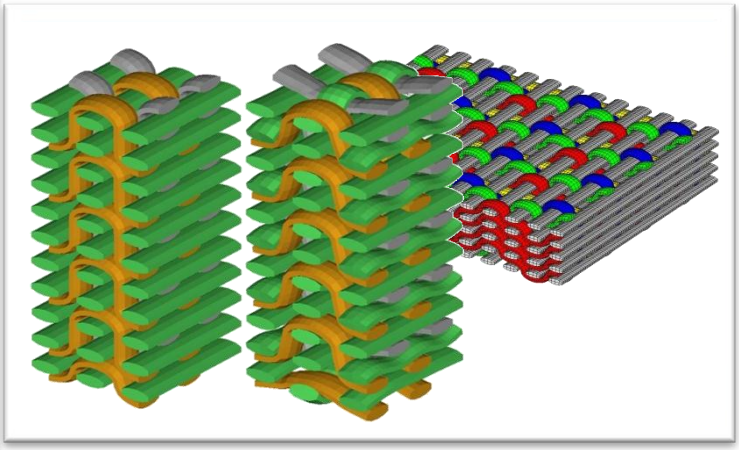
Industry and research come together

In an ever more challenging world, CEDREM integrates in-house talent and academic partnerships to lead forward thinking innovating research

- ✓ *Certificated CIR International R&D tax credit*
- ✓ *Pro-active attitude integrating all the players to accelerate development*
- ✓ *Create new technologies and new materials*
- ✓ *Participation in Europe-wide programs*

For universities

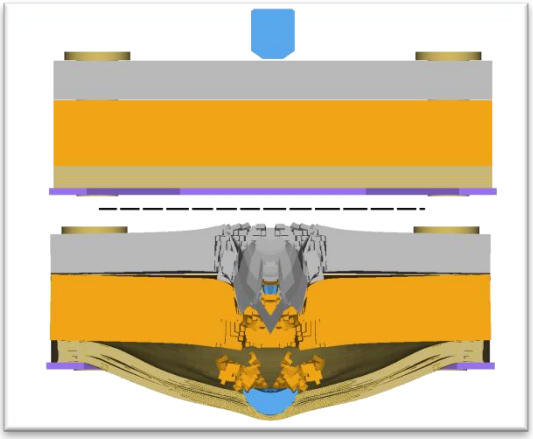
- ✓ *Provide subjects for theses, traineeships, student projects*
- ✓ *Enable students & research fellows to access real applied cases in industry*
- ✓ *Translate industry tools, language and standards into research programs*



University project: Make the link between weave process and numerical simulation.

For industries

- ✓ *Adapt pure science research to industrial applications*
- ✓ *Accelerate new product development by diversifying theoretical and applied the expertise*
- ✓ *Increase R&D flexibility by tapping into academic facilities and CIR tax credit*



European industrial project: Advanced lightweight protection for very high velocity impacts.

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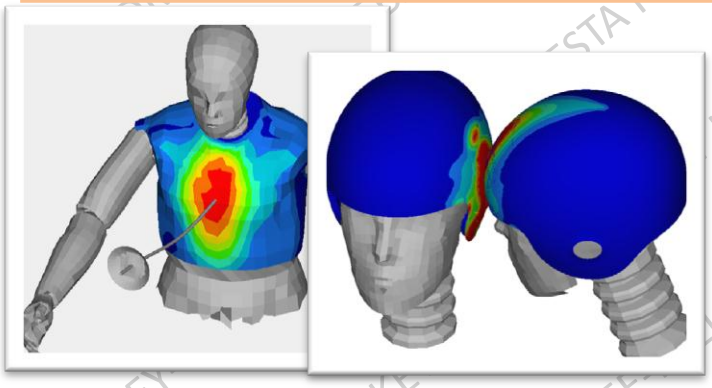
Focus on your performance, CEDREM takes care of your protection and gear

CEDREM's dynamic simulations give you access to all the data you have always dreamt of to improve product design, going far beyond the limits of testing or static simulations.
CEDREM is developing a new concept of FE human model to analyze the real effects that equipment has on all the body in action. It also enables us to quantify comfort and resistance levels.

New generation athlete's kit



- ✓ *Lighter*
- ✓ *Safer*
- ✓ *More flexible*

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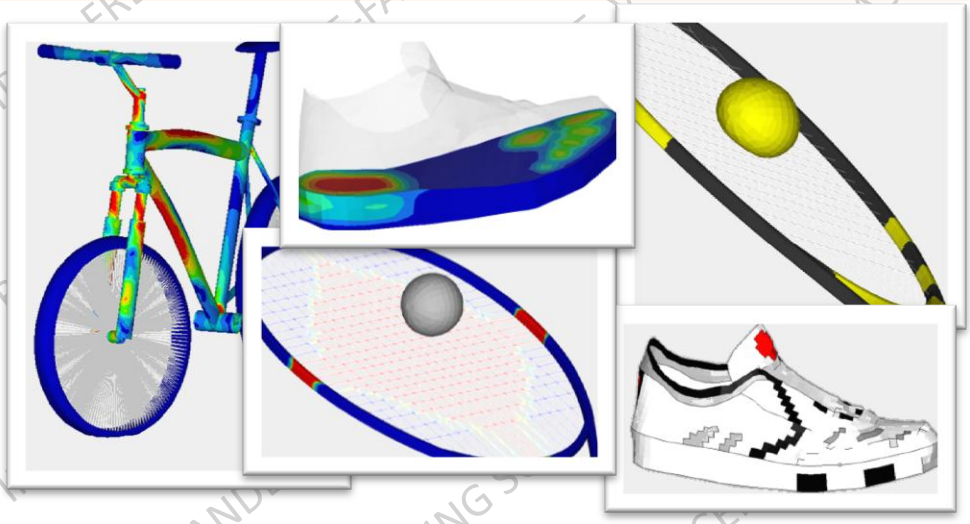
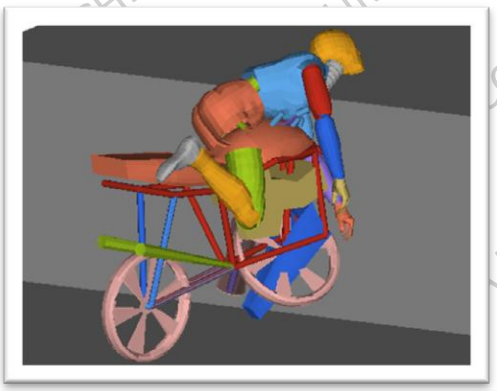
Pushing the limits of your gear

- ✓ *More efficient*
- ✓ *More precise*
- ✓ *More comfortable*



Safer venues



- ✓ *Better absorption of impacts*
- ✓ *Reduction of injuries*
- ✓ *Lighter furniture with equivalent safety levels*

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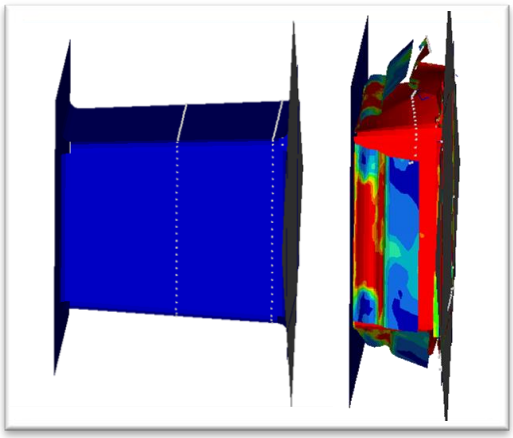
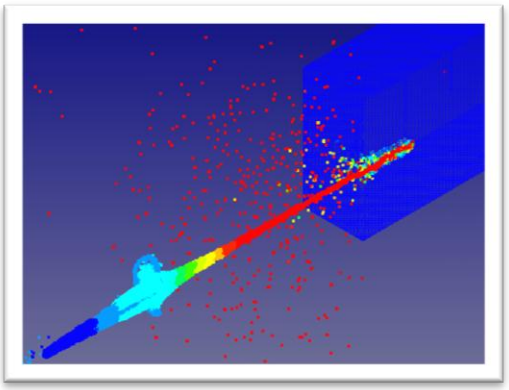
CEDREM Applications



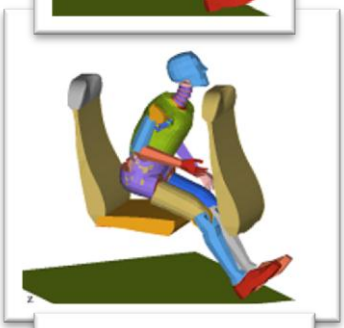
Crash box

Development of new generation advanced composite crash absorber



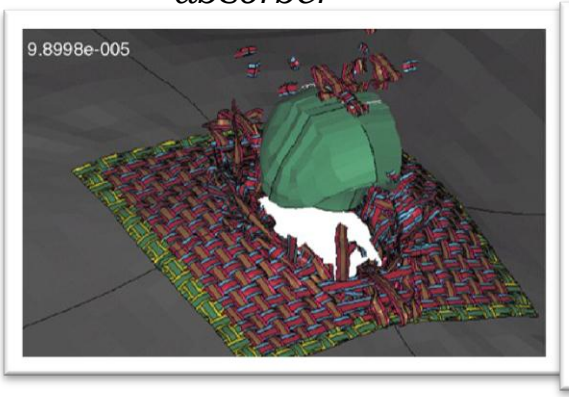
Hypervelocity material jet weaponry

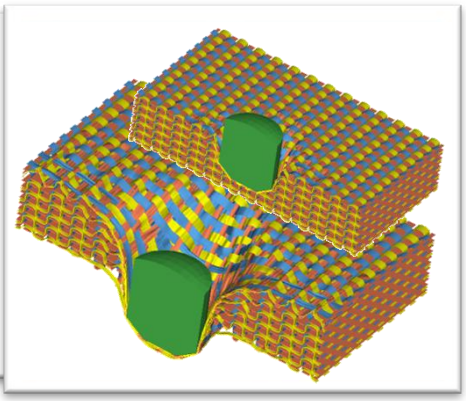
Enhance threat and protection efficiency



Seat crash

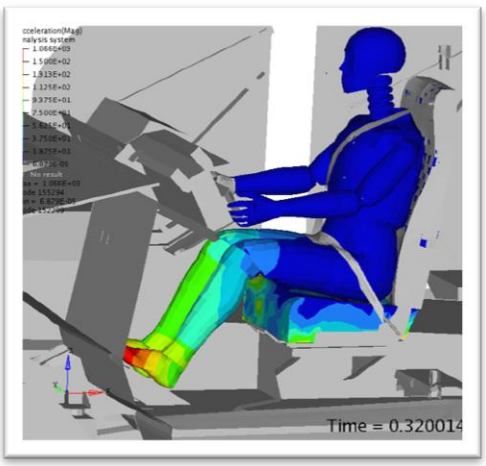
Redesign seats to reduce injuries

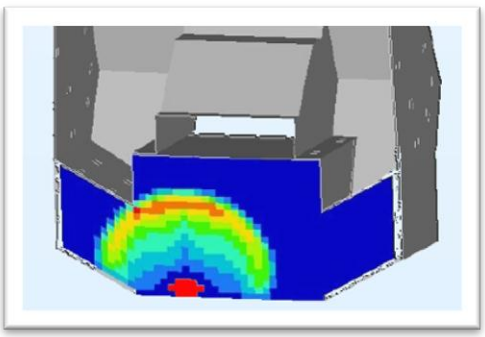




Bullet impact on weave

Research and design of future protection / 2D, 2,5D+, 3D weave (mesoscopic scale)





Blast under vehicle / Dummy behavior

Identify weaknesses and propose actions to increase protection and occupant safety

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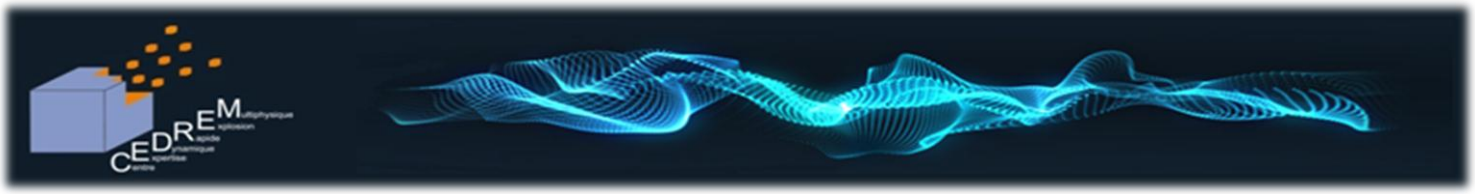

CEDREM's Expertise

Calculation and Finite Element Analysis

With Hyperworks tools (Hypermesh, Hyperview, Hypergraph) and the explicit hydrocode RADIOSS (Multimaterial, Multiphase, Eulerian, ALE, Lagrangian, SPH formulation) and implicit RADIOSS

Design and Optimization

With advanced composite materials
Choice of the material / Replace metallic structures into composites to reduce weight / Choice of process

Technical support related to numerical modeling

Choice and characterization of the material properties used in the model.
Design and organization of validation tests in various fields (explosion, hypervelocity impact, …)
Seamless technical follow-up with contributors involved in the project (characterization of materials, high speed video, tests, prototype manufacturers, material manufacturers, …)

Research in advanced composite materials

2D ; 2,5+ and 3D weave / sandwich panel / stitching foam / monolithic composite
Programming and calibration of specific material laws

Engineering Simulation Fields of CEDREM

Non linear transient simulation (dynamic)
Fluid Structure Interaction (FSI)
Drop test – Crash simulation
Detonation / Blast : Analysis of wave propagation
Confined explosion and effects on the structure
Impact Analysis – Terminal Ballistics
Multiphysics

Optimization studies
(Morphing, DOE, Response surfaces…)

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Who is CEDREM ?

Dr. Karine Thoral Pierre founded CEDREM in 2008. She worked for 12 years in engineering sciences from oceanography at ECA and CNRS to defense applications at Thales. She remains passionate about complex systems, composite materials and dynamic simulation.

"From my experience in customer/manufacturer relations, I could see the need to create a closer link between end users and industry. That's why CEDREM came into being."

Karine

Great quality can only be provided by creative and serious people

The CEDREM team have decided to become experts in dynamic simulation and drivers in the development of new numerical tools to increase the capabilities of commercial software. This state of mind implies a profound change of approach and a technological disruption. This is only possible through close collaboration with customers. The CEDREM team operate at a crossroads where design, R&D and product strategies meet. For CEDREM, innovation is an attitude, an ambition for team identity and performance.

Come to see us...

Less than two hours from Paris...

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