



network bulletin



Some of the workshop delegates at Renault

Autosim EC funded project to unite the European automotive industry has been launched

Thirty-two of Europe's leading automotive companies have joined forces to launch the EC funded Autosim project, which will ensure that the entire European automotive industry is making the most effective use of engineering simulation techniques.

The three-year project is supported by 600,000 euro of funding from the European Commission and is coordinated by NAFEMS, the International Association for the Engineering Analysis Community, an independent not-for-profit membership organization with more than 800 member organisations in over 30 different countries. The scope of NAFEMS activities encompasses all simulation technology, including Finite Element Analysis (FEA), and Computational Fluid Dynamics (CFD).

The project consortium consists of 32 companies from throughout Europe, each having a significant interest in

the use of simulation within the automotive industry. They include OEMs, Tier 1 and Tier 2 suppliers, consultants, researchers and software developers.

The fundamental objective of Autosim is to promote better and more effective use of simulation technology in the European Automotive industry. It has two complementary aims: firstly to develop best practices and secondly to identify the most promising potential breakthrough technologies of the future. These aims and objectives will be examined under three primary themes:

- **Integration of simulation into the development process**
- **Materials characterization**
- **Improving confidence in the use of simulation**

In order to address these issues, Autosim has established an international team of leading experts representing much of the European automotive industry. They will develop a preliminary set of best practice guidelines, standard analytical procedures

and research strategies. They will then consult with the wider automotive industry to gain feedback on these preliminary documents, in order to produce final documents which aim to provide definitive guidelines from an authoritative and credible voice.

These final versions will be disseminated internationally throughout the automotive industry. Their adoption will increase the efficiency and improve the quality of simulation, increase the efficiency of the supply chain, enable simulation to be practiced more effectively by a broad range of personnel, coordinate ongoing research by providing a focused set of priorities, assist industry to plan its future implementation strategy for simulation.

With these actions, Autosim will make a substantial contribution to the advance of design techniques in the European automotive industry.

For further information visit
www.autosim.org



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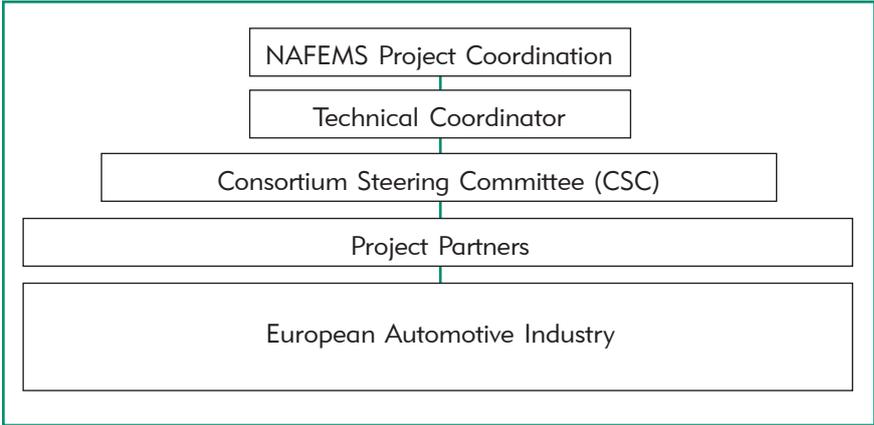
PROJECT OBJECTIVES

The broad objectives of AUTOSIM can be summarised as follows:

- To improve the quality and robustness of modelling and simulation in the European automotive industry within an integrated design and product development environment.
- To facilitate the use of advanced simulation technologies (finite element analysis, computational fluid dynamics, and related methods) within a multi-site, multi-organisational environment.
- To improve technology and knowledge transfer between engineering practitioners within the automotive industry.
- To identify potential breakthrough technologies which could have a profound effect on the use of simulation techniques for automotive applications.
- To identify technology gaps and areas where RTD activity is needed.

The detailed objectives are:

- To assemble and collate information which is focused on current practices in the application of modelling and simulation technology in the European automotive industry.
- To define best practices and standard procedures for the use of modelling and simulation.
- To identify barriers between current practices and best practices.
- To issue guidelines to help overcome the barriers.
- To ascertain areas in which breakthrough technologies could be of greatest use and prioritise their importance.
- To establish the current state of the art and its readiness to become state of practice.
- To promote RTD projects to address identified requirements.
- To actively and widely disseminate information about all the aspects listed above within the European automotive industry.



General structure of the Autosim project

CONSORTIUM MEMBERS

The Consortium members are drawn principally from industry, but there is also strong participation from research organisations, as well as representatives of the major software developers and vendors. Several tier 1 European automotive companies are represented, together with their tier 2 subcontractors and RTD suppliers. Collectively, it is estimated that their RTD spend in areas involving simulation is several hundred million euro per annum.

The consortium is comprised of companies from a wide geographical and cultural base who have extensive expertise in all of the major areas of automotive design.

NAFEMS	UK	EASi Engineering	D
Renault	F	Robert Bosch GmbH	D
Engin Soft Trading	I	Tarrc	UK
Labein	E	MSC.Software	F
CAEvolution	D	Mecas ESI	CZ
PSA Peugeot Citroen	F	Micado	F
Volvo Powertrain	S	P+Z Engineering	D
Faurecia	F	Pankl	A
Herbertus	E	DYNAmore	D
UTS-Comau	I	LMS	B
Abaqus Europe BV	NL	Componenta Pistons	FI
Imamoter Institute	I	Inprosim	D
Cadfem	D	Univ. of Manchester	UK
Arsenal Research	A	CD-adapco	D
TRL	UK	TWT	D
SFE GmbH	D	VIF	A

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	Integration	Materials	Confidence
Best Practices	Technology Leader 1	Technology Leader 2	Technology Leader 3
Breakthrough Technologies	Technology Leader 4	Technology Leader 5	Technology Leader 6
	Rapporteur 1	Rapporteur 2	Rapporteur 3

Topics and responsibility structure

TOPICS & RESPONSIBILITIES

At the first meeting of the Consortium Steering Committee (CSC) in Munich on November 30th 2005, a series of initial suggestions for topics to be covered by the project were developed.

An initial plan of the responsibilities for these topics was also drafted.

Initial Suggestions for Topics Autosim Should Cover

Integration

- Process integration
- Integration with suppliers
- Up front simulation
- Integration with CAD
- Simulation data management
- Optimisation

Materials

- Composites, foams, new materials
- Fracture mechanics & durability
- Manufacturing simulation
- Constitutive models and material data
- Modelling connections

Confidence

- Uncertainty / stochastics
- Robustness
- Validation
- How to eliminate 1 gateway?
- Correlation with test
- Standardisation

What are Best Practises and Breakthrough Technologie?

Best Practice

is defined as „How we currently make the best use of available technologies and procedures to tackle engineering problems with near-optimum results.“

Breakthrough Technologies

is defined as „Novel or revolutionary technologies and procedures required to successfully solve the engineering problems in our future vision“.

Definition by the Autosim Consortium Steering Committee, 2006

RELEVANT WEBSITES

www.fe-net.org

Website of the NAFEMS Coordinated FENet project, which was completed in July 2005. Of particular interest to the autosim project will be the findings of the Land Transport sector

www.simdat.org

SIMDAT focuses on four application areas: product design in the automotive, aerospace and pharma industry as well as service provision in meteorology.

www.eucar.be

EUCAR developed an Automotive R&TD Master Plan in 2000 in order to define a European approach to technologies for automotive develop-

ment. In 2001, a Position Paper was published, presenting the major R&D challenges the automotive industry. The members of EUCAR represent the major European motor vehicle manufacturers: BMW Group, DaimlerChrysler, Fiat, Ford in Europe, Opel, Porsche, PSA Peugeot-Citroën, Renault, Volkswagen Group, Volvo.

Cars21

The CARS 21 High Level Group has adopted a 10 year roadmap for a competitive EU car industry. The Group has agreed on a number of recommendations to make cars cleaner, safer and to simplify the legal environment for EU car makers.

OVERVIEW

Project start	September 1, 2005	
1 st CSC meeting	November 30, 2005	Munich, Germany
1 st Autosim workshop	January 17 - 18, 2006	Barcelona, Spain
2 nd CSC meeting	January 18, 2006	Barcelona, Spain
2 nd Autosim workshop	May 4 - 5, 2006	Sonnenhausen/Munich, Germany
3 rd CSC meeting	May 4 & 5, 2006	Sonnenhausen/Munich, Germany
3 rd Autosim workshop	November 23 - 24, 2006	Lisbon, Portugal
4 th CSC meeting	November 23 & 24, 2006	Lisbon, Portugal
5 th CSC meeting	January 23, 2007	Graz, Austria
4 th Workshop	July 5 - 6, 2007	Paris, France
6 th CSC meeting	July 5 & 6, 2007	Paris, France
5 th Workshop	Nov 15 - 16	Bilbao, Spain
7 th CSC meeting	Nov 15 & 16	Bilbao, Spain
Autosim Webinar	April 3, 2008	worldwide
8 th CSC meeting	April 21, 2008	Birmingham, UK
6 th Workshop	April 22 - 23, 2008	Birmingham, UK
9 th CSC meeting	end of June or early July 2008	tba

Workshops are open to all who are involved in numerical simulation methods in the automotive industry, and contributions from industry, research and academia are positively encouraged.

4th AUTOSIM WORKSHOP

The workshop was held 5th - 6th of July, Renault Technocentre, Guyancourt, near Versailles, pairs, France

The specific objectives of of the 4th Workshop were:

- Definition and Development of Best Practices
- Initial suggestions for Standard Procedures
- Identifying Potential Break-through Technologies within the State of the Art

Almost 40 delegates attended the workshop. The agenda as well as presentations can be downloaded at www.autosim.org.



Renault Technocentre at Guyancourt near Paris

5th AUTOSIM WORKSHOP

The workshop was held 16th - 17th of November, Labein, Parque Tecnológico de Bizkaia, Spain



Building of Labein tecnalia located in the Parque Tecnológico de Bizkaia

Presentations were given related to the the three key themes of AUTOSIM, the interaction between them, and the specific technology issues that are being focused upon, as well as to other connected issues. 36 delegates attended the workshop. The agenda as well as presentations can be downloaded at www.autosim.org.

AUTOSIM members were very keen to ensure that their findings are representative of the entire automotive industry, not just the consortium members. This is one of the reasons why workshop participants from outside the

consortium were warmly and enthusiastically welcomed.

The project has resources allocated to consult with the wider automotive industry. A White Paper was developed, which was one of the primary vehicles for communicating the findings of the project to a far wider audience during the consultation process. The contents of this White Paper were finalised during the course of this workshop.

An overview and the table of contents are listed on the following page.

AUTOSIM White Paper

During the project, the members of the AUTOSIM consortium review the current analytical procedures and research strategies and develop a preliminary set of guidelines for Best Practice and Breakthrough Technology. They will consult with the wider automotive industry worldwide to gain feedback on the preliminary documents in order to produce final documents. The final documents will be disseminated internationally throughout the automotive industry.

The general objectives of AUTOSIM are as follows:

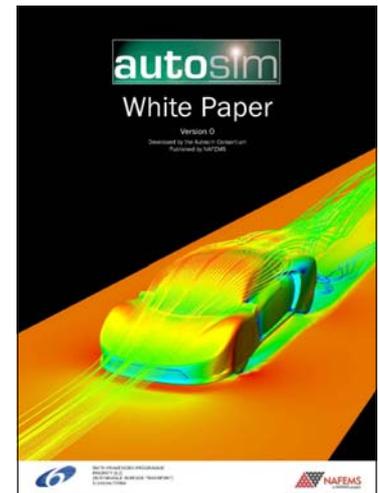
- Facilitate the use of advanced simulation and data management and its integration into the design process (such as loading knowledge up-front and increasing simulation during the conceptual design phase using new technologies like Symbolic CAE, Parametric Models, etc.).
- Improve the quality, confidence level, and robustness of modelling and simulation (such as physical model, human resources, data validity, digital model).
- Investigate the use of different, relatively new materials for different applications.
- Investigate material laws and material data in different design stages.
- Improve technology and the transfer of knowledge (training programs and education).
- Identify technology gaps and areas of needed research.

With these aims in mind, AUTOSIM should make a substantial contribution toward advancing design techniques by increasing the efficiency and quality of simulation. This paper makes continued references to the strong interrelationship among the three following key technology areas:

- Quality of material data affects confidence.
- Effects of material law selection impacts integration.
- Model sizes must be balanced within accuracy, predictability, and cost, bridging the gap between integration and confidence.

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AUTOSIM Questionnaire

Please take a moment to fill out a brief questionnaire (10 minutes) related to the AUTOSIM project. At the end of the survey, you will be provided with a link to download a FREE copy of the AUTOSIM White Paper.

<http://www.autosim.org/news/autosimwebinar>

Webinar:**Best Practices & Breakthrough Technologies in Automotive Industry, April 3, 2008**

For the past three years, major players in the European automotive sector have been working on a joint project to chart a course for the future role of simulation in automotive product development. Now they would like to share some of their findings with you. Senior representatives from OEMs such as Renault, Peugeot Citroen, Porsche and Volvo have played a key role, with assistance from leading Tier 1 suppliers such as Robert Bosch, Faurecia and Pankl. Software suppliers, consultants and several prestigious research organisations completed the picture, to ensure that the findings were truly representative.

The work has focused on determining what constitutes current Best Practice, and identifying future Breakthrough Technologies. This has been done in three key technology areas:

1. Integration of Simulation into the Development Process
2. Materials Characterisation
3. Improving Confidence in the Use of Simulation

A number of future goals have been identified and examined, including:

- Reducing the Number of Digital Prototypes
- Becoming Faster in the Conceptual Design Phase
- Accelerating the Model Preparation Phase
- Robust Design
- Design-to-Cost

During the webinar, a panel of speakers from the project provided a summary of the key messages from the project. During that hour, attendees gained an invaluable insight into how simulation is currently being used in the European automotive industry, and how this role will change in the years ahead. Following the presentations, delegates had an opportunity to put questions to the panel.

Agenda

- **Introduction**
(Tim Morris, NAFEMS)
- **CAE at Different Stages in Product Development**
(Hans Sippel, CAEvolution, Germany)
- **Integration of Simulation into the Product Development Process**
(Raimund Schweiger, Technostar Europe, Germany, and Gino Duffett, Aperio (Spain))
- **Materials Characterisation**
(Trevor Dutton, Dutton Simulation, UK, and Marian Gutierrez, Labein, Spain)
- **Improving Confidence in the Use of Simulation**
(Jean-Marc Crepel, Renault, France, and Fabiano Maggio, Enginsoft, Italy)
- **How to Move On:**
Reducing The Number Of Digital Prototypes, Becoming Faster in the Conceptual Design Phase, Accelerating the Model Preparation Phase, Robust Design, Design-to-Cost
(Hans Sippel, CAEvolution, Germany)
- **Questions and Answers**
(Panel)
- Closing

View the webinar:

You can download the recorded webinar (pdf or audio/video) at <http://www.nafems.org/projects/autosim/meetings/autosimwebinar08/>

Workshops:**6th Autosim Technology Workshops April 22 – 23, 2008, Birmingham, United Kingdom**

This workshop is the final workshop of the project. The primary purpose of the workshop is to present the findings of AUTOSIM and to invite and provoke discussion and fresh input about these findings before the conclusions are finalised. Come along and see for yourself a vision of the future of engineering analysis within the automotive industry, as defined by the collective wisdom of the AUTOSIM consortium!

The organisers would like to stimulate lively and thought provoking debate about the topics that have been identified. Whilst the themes for the workshop have been clearly defined based on the work done during the project to date, a fresh view on this from those that have not been heavily involved with the project is essential to the success of this workshop.

The topics that will be covered in the workshop are:

CAE at Different Stages in Product Development

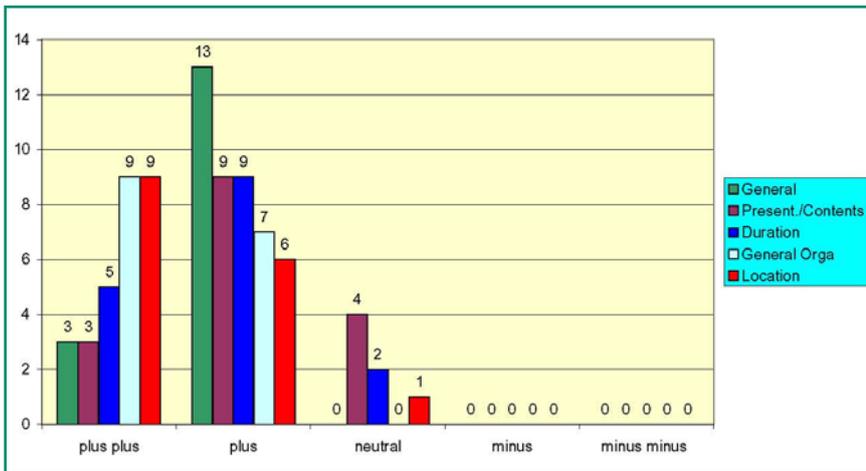
- Concept Stage
- Design Stage
- Design Improvement
- Production

Integration of Simulation into the Development Process

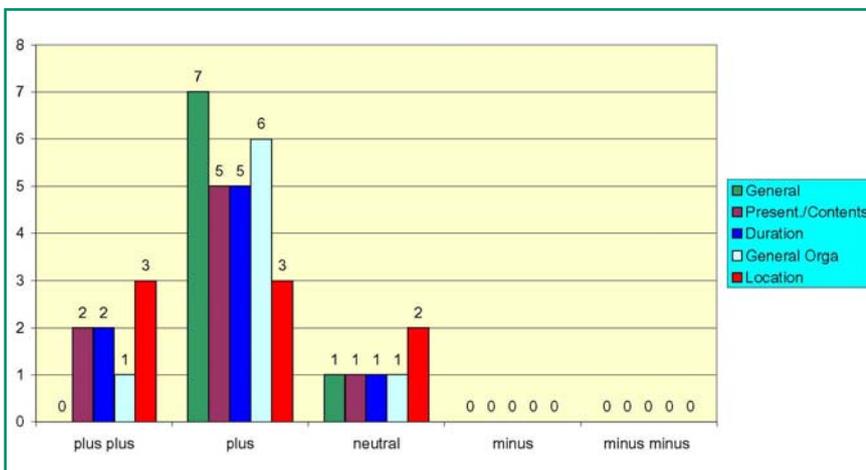
- CAD Integrated Tools
- Simulation Data Management
- Data Integration (CAD/CAE/CAM/CAT)
- Collaborative Product Development
- Conceptual Simulation Models
- Knowledge Data Mining
- Automatic Model Generation
- Multi-disciplinary Optimisation

Materials Characterisation through Simulation

- Procedure for material selection for a new vehicle programme
- Source of material data
- Robustness of data, error bands
- Material test methods, and associated costs



Results from the Paris workshop feedback forms



Results from the Bilbao workshop feedback forms

- Choice of material model
- Fitting test data to the selected model
- Quality Control, validation, and traceability of data
- Inclusion of other aspects (connections, effects of manufacturing)
- Cost implications for the CAE method used
- Accuracy achieved
- Verification and validation methods

Material Data (Data validity)
 Mesh Discretization (Digital model)

**Visions of the Future:
 How To Move On**

- Reducing The Number Of Digital Prototypes
- Becoming Faster in the Conceptual Design Phase
- Accelerating the Model Preparation Phase
- Robust Design
- Design-to-Cost

Improving Confidence in the Use of Simulation

- Current engineering perceptions and concerns in CAE confidence
- Current/Best Practices and Future Breakthrough Technologies in:
 Validation (Physical model)
 Staff training (Human resources and organisation)

All participants in the workshop were entitled to receive a free copy of the White Paper which accompanies the project.

I am interested in the Autosim project.

Please put me on the mailing list.

I am interested in NAFEMS. Please provide further information

- Membership
- Seminars
- Certification „Registered Analyst“
- EC-Projekts
- FEM Magazine „Benchmark“
- World Congress

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