

Editorial

A word from the

Vice President

The innovatory products and technology developed by Mov'eo's small and medium sized companies (SME's) are still relatively unknown.

By using these existing products and technology, the large European industrial companies could greatly reduce the time they spend on development by improving their product performance therefore increasing their competitiveness whilst reducing their costs.

The exploitation of this investment already made by the SME's and the inherent risks involved in the development of these products could represent a real alternative to the delocalisation of companies to "Low cost countries". In order to highlight these opportunities Mov'eo has developed this quarterly newsletter "Mov'eo Make or Buy" (MMB).

On the last page of the newsletter MMB have produced an in-depth summary on a key subject in the world of transport (see under heading "Trends").

Interesting reading,



Gérard YAHIAOUI
Vice President SMB

News

The Vice Presidents Schedule

- **14 Oct. 2008** : Presentation to Mathieu Louvot, technical adviser to the Ministry of Trade and Industry, of MOV'EO's plan for small and medium size businesses
- **20 Oct. 2008** : Presentation of MOV'EO's plan for small and medium size businesses to the SMB's and the competitiveness clusters organised by the CCI in Paris
- **13 Nov 2008** : Presentation of MOV'EO's plan for small and medium size businesses to supervisory council for the competitiveness clusters
- **18 Nov 2008** : Participation at Predit 4 strategic council at the National Assembly

The latest news of our innovating companies:

Busy schedule ahead for **Quertech Ingénierie** :

- Their partnership, announced in Japan with Bodycote the British world leader in protective coatings.
- Their involvement in the 7th PCRD NanoBioAll European project, awarded with both Eureka and MNT-ERANet label.
- The registration of their 14th patent maintaining their advance in nanotechnology coatings.

Quertech herewith proves the industry's interest in its products and has assured its place by its involvement not only in research but by its involvement with other International companies.

L'AcVS200 :

A quality, high performance sound and image system, easy to use.

Acoustic imaging is the way in which sound is represented by colours superimposed on video film.

Unlike the normal way to measure, AcVS200 can:

- Separate the origins of the noise and class them.
- Film these noise sources and communicate directly to other parties.

AcVS200 is used when the noise level is too loud or when a noise level needs to be improved. These assets in terms of portability, automatism and real time information make it a flexible tool for many applications, particularly in the automobile industry:

- The analysis of engines and gear boxes by acoustic imaging.
- In depth study of the propagation of a particular sound/noise in the interior (turbo for example).
- Classification of the impact of noise levels on passengers
- 3D Display
- Analysis of sharp short sounds (door closing, locking system etc...)

Advantages of the AcVS200:

- Battery operated
- Operated by wireless free command.
- Operational immediately
- Simplified investigation process.
- Real time transmission (like a video camera)
- Continual research in throughout the area without further adjustment being made.
- Results compatible with all computer systems in format avi or jpeg.

How does it work?

The AcVS200 works by means of a network of 32 microphones connected to a carbon epoxy antenna. Using the hypothesis of propagation 2 different algorithms are used to capture the signals and measure the sound levels of the noise. The man-machine interface allows the visualisation, adjustment and recording of the results directly onto a USB key, computer readable. The automatic focusing (as in a camera video) has an integrated distance of measure.

ACB's Customers

- Valeo, PSA, Nasa, Hyundai, Hutchinson, Cooper, Renault, General Electric, Alstom



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NaturePlast HR PLA

Heat Resistant Poly Lactic Acid

Natureplast is a reformed thermoplastic Poly Lactic Acid base (PLA). This Bioplastic is derived from 100% reclaimed plant material.

By 2012 car manufactures should have started to incorporate these new materials into their vehicles. Toyota and Honda have been working on this for several years and are particularly interested using composite PLA's and Kenaf (bamboo fibres) for their car interiors.

In October 2008 Toyota confirmed that their vehicles will contain 20% of these bioplastics by the year 2015.

PLA is a new material, the first manufacturing plant is less than 10 years old. The second plant went into production in 2007. Many more will be opened in the following years.

Unlike conventional plastics which have evolved over a period of 50 years, these new materials are yet to be fully exploited (production, mechanical properties etc...)

Today we are working on the **three main technical hurdles** for development (which are problems particularly within the automobile industry):

- **heat resistance 50°C**
- **poor machining properties**
- **limitative properties**

We offer various grades of PLA with improved heat resistance allowing for a much wider use in car components.

We are able to do a **feasibility study on the substitution of bioplastics** by evaluating **technical data or direct specifications**.

If the project is feasible our company and its network of partners (research centres, suppliers of raw materials and additives, compounder, transformer) can provide the material (modified or not) dependant on your process and product.

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VisiNex™ measures the visibility as seen through a vehicle windscreen. Visibility is of prime importance for road safety and comfort whilst driving. The windscreen wipers, de-fogging devices, lights, ... are all designed to keep visibility at an optimum.

VisiNex™ is used in car testing to measure the levels of visibility by the reproduction of bad driving conditions (e.g. rain, poor light etc...). VisiNex™ is the only system which can measure the efficiency of a certain system, wipers for example.

How does it work?

VisiNex™ uses a structured image taken through the windscreen. This is then analysed by a mathematical replica of the vision of the human eye which at each moment predicts:

- the distance to the detection of an object of reference (pedestrian, car, etc ...)
- the distance to the recognition of an object of reference
- the facility to comprehend the scene for the driver (contrary to a mental appraisal)



If VisiNex™ isn't used?

A tester drives in rainy conditions and evaluates the efficiency of the windscreen wipers by means of a reference index: but the conditions are never quite the same, different levels of rainfall, different light intensity, ... and it is expensive (finding and training an expert, use of a vehicle etc.). On top of which this procedure is incompatible with the complex structures of a vehicles' system: e.g. the wiper system is composed of 6 parts, each might have 10 different designs which can lead to more than 1 million results!

If we multiply this number by the amount of different road situations it is clear that the expert's way of testing is the equivalent of testing one drop of water in the ocean. VisiNex™ uses orthogonal arrays and displaying the rate score using reference scenarios (exiting tunnel, entering a wood, storm rain, ...)

By using VisiNex™

Reduction from 11/2 years to 2 months to integrate a rain sensor on a new vehicle with a greatly improved performance as the end result.

Clients and Testimonials

VisiNex™'s major clients are:

- PSA Peugeot Citroën (France)
- Robert BOSCH GmbH (Germany)

"In the development of a reproducible test environment for rain sensors VisiNex™ is used over year for visibility measurements", Mathias Mannhardt, Robert BOSCH GmbH

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AXSPAD

AXSPAD : calculation soft ware for the detailing of metallic structures or composites

The validation of digital design has become a major competitive stake in the industry in general and particularly in the automobile industry. The speed in which a product can be put on the market is an essential criteria in the clients choice and a key factor to a company's success.

The objective of AXS ANALYSXE DE STRUCTURES belonging to GROUPE INGELIANCE, is to speed up and improve digital simulations with the development of their AXSPAD software programme.

This software concentrates on the final stages of the finite element analysis: the interpretation of results and the calculations of the criteria of proportion: assemblages, fixtures, soldered joints, composites, static, metal fatigue, dynamics, temperature effects or partial redistribution etc... This phase has often been neglected by the software developers due to the almost unlimited number of particular instances in the rupture analysis of all technological configurations, leaving the research engineers to develop their own software, often costly, difficult to maintain and capitalise due to the high turnover of engineers in the profession.

AXSPAD structures the methods of the calculation unit by reducing to a strict minimum the number of uncontrolled Excel, Fortran and other macro programmes.

Advantages :

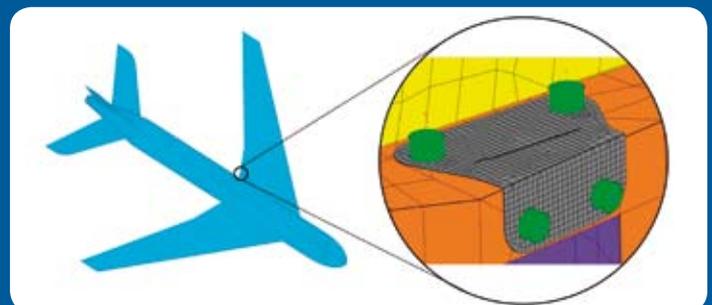
- 1) AXSPAD avoids confusion between the calculating method and the data.
- 2) Your developments on AXSPAD remain your property and are confidential. They don't tie you to a particular software publisher as the language is standard C++.

3) The modules of calculus in AXSPAD use a common base for the definition, keying-in and filing of entry data and methods,

4) AXSPAD has tools for formatting results depending on user needs.

The principle use of AXSPAD is a breakthrough with regards to conventional methods, based on the multiplication of numerous data masks, which don't facilitate the traceability of the calculus nor automation. Without giving up the advantages of ergonomic assistance, AXSPAD is the only tool capable of providing this level of automation of the complex processing of after treatment of measures on finished projects.

AXSPAD allows the maximum exploitation of information contained in a GFEM (Global finite element model) such as stress, by desynchronization of the information drawn from the calculation (GFEM, rupture points, loading spectrum...), the material (available) and the technological definition (thickness, tolerances ...). This approach limits the number of global repetitions of measure.



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Trends

3 wheeled vehicles

Environmental facts

Cars used for travel to work in the large urban areas are often unsuitable for the distance, the performance and in their passenger capacity. A large number of households having more than one vehicle, we can imagine the sense of having a car only for use in town. Here, weight is the most important factor in energy consumption, it is therefore necessary to find a better solution in terms of weight. Let's look at the alternative "3 wheeled vehicles" (3R).

The story of 3 wheeled vehicles

Initially, the manufacturers created the 3R for its simplicity. The first car to be manufactured is the proof of this, the "Fardier" of Cugnot in 1770 was a 3 wheeled vehicle and numerous 3Rs were made at the beginning of the 20th century. After the Second World War during the baby-boom these 3R vehicles were replaced by smaller, more economical cars (2CV, 4CV, Fiat 500, Volkswagen Beetle).

With their 4 seats they were better adapted to families and because of the large manufacturing quantities they were sold for the same price as before. An additional advantage was their safety, the 3R having a propensity to turn over, except the large American "Trike" and vehicles which can incline into the curve of a bend, e.g. a motorbike. In towns where width is an important mobility factor, research has been done in order to find realistic solutions for a tilting 3R.

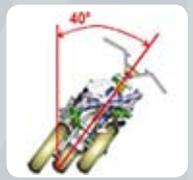


Feasible 3R designs

There are several different possible designs, dependent on the position of the two wheels either at the front (2F) or at the rear (1F), but also different set-ups of the chassis and suspension determine the number of tilting wheels. Two vehicles with the same geometrical parameters prove that the overturning of the vehicle does not really depend on the choice of the 2F or 1F, but on the angle of tilt and the distance between the centre of gravity (along the length of the vehicle) and the axle. Each system has its advantage: The F1 is more resistant to overturning on a corner due to its motor mounted in the rear suspension which brings its centre of gravity close to the large axle, whilst the 2F has a better breaking capacity, particularly in corners.

The Piaggio MP3 with 2 front wheels

The 3R Piaggio MP3 is the result of much research, carried out by the independent engineer TRAUTWEIN and the merger with the manufacturer Aprilia. Its design with 2 front wheels and its 3 tilting wheels is called 2F3T. Compared to its scooter equivalent it has a double front suspension linked by a freely rotating transverse parallelogramme, adding 50 kg to its weight giving a total weight of 200 kg. Actually this model has convinced the sceptics and has a true commercial success with customers from both the 2R and the 4R market. It has been marketed since 2006 with a combustion engine of 125 and 500 cm³ and is now available in a hybrid version.



The Vélis Prototype with 2 rear wheels

This is an accomplished prototype of the 2 rear wheel design, made popular by the Honda Gyro. It consists out of a horizontal chassis comprising motor and rear wheels, and a tilting chassis like a motorbike, carrying the front wheel, the passenger and the roll bar. The tilting is directly controlled through the driver's legs applying pressure on the horizontal chassis. When inclining into a curve of a bend, the horizontal steering axle produces a tilting of the front wheel until reaching the track of one of the outside rear wheels, which is decreasing the risk of turning over.



The Peugeot HY Motion 3

This conceptual bike was displayed during the Mondial 2008 car exhibition and improves the design of the Piaggio MP3 on 3 points:

- A double triangular transversal front axle combined with one single shock absorbing spring.
- With two electrical motors in the front wheels it becomes a „parallel hybrid“ vehicle with all wheel drive.
- Partial bodywork for protection against bad weather.



Outlook

The request for small cars for use in town will grow. Today's 3R need to have tilting wheels, the previous technological problems are now resolved. As the missing link between the 2 and 4 wheel vehicles, the 3R with their tilting wheels and their different designs are now a real alternative for the user:

- A 3R with tilting wheels is three times lighter than a small car, providing a greatly improved ecological potential (consumption, CO² emission, pollution)
- By means of a test series, Piaggio proved the 3R's gain in safety (fewer accidents) compared to 2R.
- With regarding to cars, the simplification and reduction of the width (quads) is potentially dangerous.

The design of a 3R with tilting wheels is very well adapted for electrical propulsion, being lightweight with enough space for transport of the batteries, and is more powerful than 2R combustion motors.

Comparison	VP	2R	3R	Comments
Ergonomics and comfort	★★★	★	★★	
Active road safety	★★★	★	★★	depending on the design
Passive road safety	★★★	★	★★	depending on the equipment (belts, rollbar, airbag)
Energy and environment	★	★★	★★	according to engine
Mobility and service				Road worthiness certificate, depending on size and mechanical homologation