

# Communiqué De Presse

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## Renault inaugurates a new interactive immersive 3D simulator at the Technocentre

In line with its digital validation strategy, Renault engineering in France has adopted a new 3D interactive immersive visualization system capable of the highest-quality imaging currently available.

- **Installed at the Renault Technocentre (Yvelines), the new simulator makes it possible to study and interact with a virtual vehicle from both interior and exterior perspectives.**
- **It uses CAVE™ (Cave Automatic Virtual Environment) technology with 70 million 3D pixels and boasts a powerful computing capacity of several tens of Teraflops.**
- **The new simulator uses design and engineering digital databases to generate full-scale virtual vehicle visualizations that can be analyzed in real-time and in fine detail.**
- **The simulator will contribute to the continuous improvement of the perceived quality and ergonomics of future Renault vehicles.**

*"Using this new simulator, engineers and designers of future Renault vehicles will be able to sit behind the virtual wheel of a new, as yet undeveloped model and take it for a drive in a highly realistic visual 3D universe. This is a new stage in the use of virtual simulation in automobile development,"* declared Andras Kemeny, head of the Immersive and Virtual Reality Centre.

Vast range of applications for the development functions

An integral part of the digital design and validation strategy, the new simulator will be used by development functions such as engineering and design in the development of future Renault vehicles. Working closely with teams from the Immersive and Virtual Reality Centre, engineers and designers are determining new application possibilities offered by the simulator and integrating them in the development process.

Various useful applications have already been identified:

- interior and exterior validation of a vehicle according to the reference plan within accelerated time frames,
- assessment of front and rear views from inside the vehicle,
- verification of the vehicle's exterior and interior appearance using realistic 3D imaging,
- visualization of customer-focused layout and features in the driving position,
- assessment of the ergonomics of the driving position,

- visualization and management of man-machine interfaces,
- subjective evaluations of vehicles to compile sensorial profiles and customer assessments,
- navigation in extreme detail (scale effect) to examine the assembly of minute components.

Further applications are being assessed with various functions interested by the new simulator.

#### A "state of the art" simulator

The realistic visual display is produced by 19 Sony very high definition 3D projectors positioned outside a system of concave screens. Stereoscopic projection allows a full-scale, 3D scene with depth to be displayed.

The image displayed is controlled by the physical movements of the user inside the CAVE™ space. This is achieved by a CAVE™ motion capture system that records the position of the user's head in real time. Compared with a wide-angle vision immersion headset, CAVE™ technology allows greater freedom of movement (no wires connecting the headset to computers). The image displayed depends on the head movements of the user and produces a sensation of complete immersion.

The new simulator is the most powerful in use in the automobile industry. Its five panels (three sides, ground and sky) display at a definition of 4096 x 4096 3D pixels per panel. Operating at 60 Hz, the simulator calculates 19 new images (there are 19 projectors) every 16 milliseconds. This real-time processing is handled by 20 extremely powerful PCs that together generate the equivalent of several tens of Teraflops.

#### Increasingly realistic immersion

The use of specific software applications increases the effects of color, light and texture on the virtual model. Another goal with the simulator is to reproduce numerous additional senses that will further increase the realism of the simulated scenario.

Examples of ongoing developments aimed at enriching the sense of immersion:

- touch, to improve spatial awareness and help in assessing the ergonomics of vehicle components,
- noise, to reproduce warning devices and compile data on collisions, traffic noise, road driving conditions or engine noise,
- vibrations under the seat, so that the effects of driving over for example cobblestoned or wet roads can be felt.

The new immersive interactive 3D simulator was created by Mechdyne and has been in service since April. It is already being used to develop future Renault vehicles.

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