RAMSIS Cognitive Module

HUMANETICS

Digital ergonomics

The perception of information – in vehicles and in traffic

YOUR BUSINESS FIRST

Use information quickly

Drivers have to focus on the road, so they have to read instruments quickly and accurately – and where visual field and information perception meet, the requirements for visual design in the cockpit are high. RAMSIS Cognitive will help you to achieve this perfectly.

The RAMSIS module adds high levels of detail and realism to visual field analysis in RAMSIS Automotive, letting you see clearly the areas that the driver can perceive inside and outside the vehicle – and how easy or difficult it is to read the display characters and digits. RAMSIS Cognitive doesn't measure whether or not the occupants actually know the numbers and symbols, or how focused they are at that moment – but it does show how well they can see the displayed information, depending on the display, lighting conditions, positioning and other external conditions on the roads.

Your advantages with RAMSIS Cognitive:

- simulation of information perception in everyday traffic on a digital model
- securing of the basic perception of information
- optimal design of displays in the cockpit

ERGONOMICS ANALYSIS

Optimal conditions for perceiving information

RAMSIS Cognitive is a module for the analysis and optimization of information perception and operation in the vehicle.

Optimal conditions for the perception of information

The **Direct Vision Analysis** lets you create shadow areas as analysis geometry from the occupant's point of view. Among other things, it shows which areas in the vehicle are concealed for direct vision by other areas. With the explicit concealment analysis, you can see the impact of shadows on the readability of the display AND the resulting shadow effects caused by concealing elements in the vehicle.

Reflections in the vehicle affect the view of the instrument panel and the view to the outside. RAMSIS Cognitive helps to minimize unwanted reflection – and it also distinguishes between day reflections caused by sunlight and night reflections caused by the display backlights. Glossy surfaces and cover plates are also taken into consideration. The **reflection analysis** in the RAMSIS Cognitive module enables you to answer questions about the exact area of the reflection on reflective surfaces, about the course of the ray paths and about specific visual areas in the rear mirror, e.g. headrests, passengers in the rear seat or the road behind the vehicle. That saves a lot of time-consuming practical tests with mock-ups and prototypes.

With RAMSIS Cognitive's **360 degree analysis**, you can simulate the view around the vehicle, plus the obstructed view caused by the A, B and C pillars. Quantitative surface height can be weighted and evaluated – and armed with these results, you can then objectively compare the outer visual fields in different vehicle concepts.

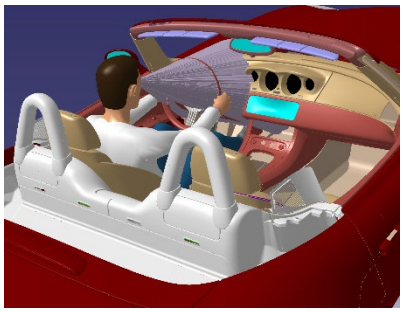

Fig. 1: Analysis of the direct visual field – the steering wheel rim is obscuring the view of the switch

Display design

A lot of thought goes into a really good display – and the **readability** and **minimum visual field** analyses give you the minimum character size and the minimum distance to the instrument panel. The readability quality of the LCDs in the vehicle depends on the position and orientation of the display in relation to the eye of the observer and the optical attributes of the display with regard to brightness and contrast. That's why RAMSIS Cognitive geometrically visualizes the limits of the angle of view in accordance with the specifications of the component and compares them with the eye positions of the

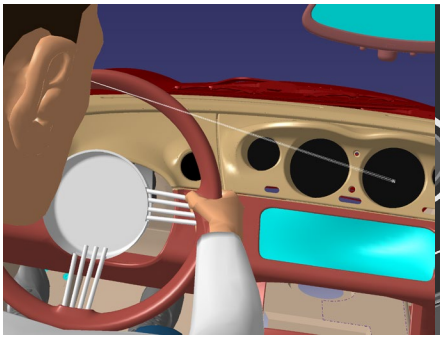

Fig. 2: Analysis of readability

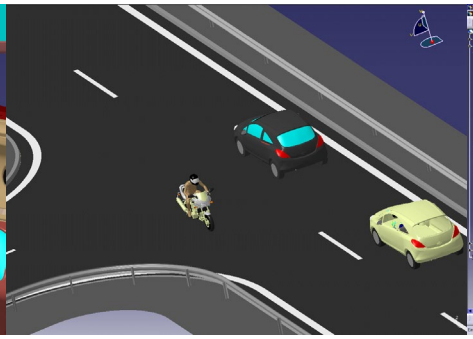

Fig. 3: Creation of a traffic scene

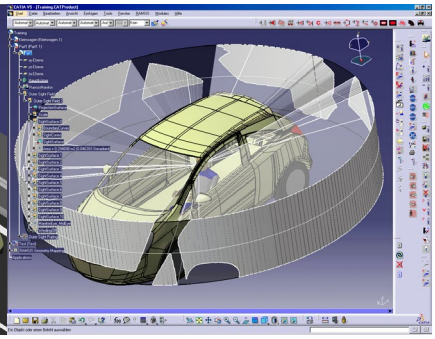

Fig. 4: Analysis of the external visual field

vehicle occupants. Areas that are too close and boundary zones are marked in color.

In the **Extended Visual Field Limits Analysis,** RAMSIS Cognitive shows you the areas upon which the eyes can be focused without the need for head movements. Here you can display the geometric boundaries of the visual field, the gaze field and the areas within the visual range – and evaluate the arrangement of the instruments to match. Particularly important displays like the speedometer must be in the central gaze field, while less important or less frequently used displays like the radio or air conditioning may lie at the edge of the gaze field or even outside it. You will still get a clear picture with RAMSIS Cognitive, even if the driver's view is impaired. Two selected types of spectacles with bifocals functions for both monocular and binocular vision are also included in the program, allowing you to analyze different visual fields and their boundaries with regard to the position of displays.

If the information is displayed on the windshield, the quality of the imaging is critical. The data display of a **head-up display** does lie within the driver's primary visual field, but the display's location and size affect his or her degree of perception. To prevent this information from becoming a distraction, RAMSIS Cognitive has a special analysis function for head-up displays. This function images even the basic projection conditions from every position inside the vehicle.

Simulation of the environment

If something in CAD is empty, you can fill it up with RAMSIS Cognitive. This Humanetics Digital Europe GmbH software lets you create various **traffic scenes** including roads, pedestrians, cars and motorcycles, making the view of the outside world more rea-listic. This makes it clear, for example, what a change of view on a three-lane freeway means or how well a curve in the road can be seen.

Vision in motion

RAMSIS Cognitive not only shows the single glance situation, the scenario when the glance direction is changed is also displayed. The spatial position of view-relevant objects in the vehicle also affects the **duration of the gaze change**, i.e. the time taken until the actual perception of information occurs. With RAMSIS Cognitive, you can calculate the gaze change duration for a particular situation and display it as circles around the fixation point. The program determines the duration of a gaze change to a specified target based on the current line of sight – and consequently how long the driver will be distracted. The corresponding numerical results are saved in a structure tree, allowing you to determine the screen orientation priority by clusters.

SPECIFICATION

Availability and platforms

RAMSIS Cognitive is a module for RAMSIS NextGen. It is available in RAMSIS NextGen Standalone and in the integrations of RAMSIS in CATIA V5, 3DExperience and Siemens NX.

Humanetics Digital Europe GmbH
Europaallee 10
D-67657 Kaiserslautern, Germany
P +49 631 343593-00
F +49 631 343593-10
www.humaneticsgroup.com