

Objectives

The experience that the Technical Centre for Simulation of Renault's Vehicle Engineering Development has gathered through its participation in European projects such as Prometheus, TRaCS (TRuck and Coach Simulator) and CARDS (Comprehensive Automobile R&D Simulator) has been the base for the development of the SCANeR[®] II comprehensive driving simulation software system.

SCANeR[®] II is a set of application software allowing the user to build either a light or heavy vehicle simulation. SCANeR[®] II brings a full set of simulation tools, ranging from database creation, to real-time interactive simulation and to replay and post-processing.

Application areas include vehicle and road traffic R&D as well as driver training.



Software description

User oriented

- ✓ SCANeR[®] II offers an interface for user's proprietary modules
- ✓ The user can add new view points, additional driving stations and intelligent traffic
- ✓ The user invests only in the modules needed for the target application
- ✓ SCANeR[®] II is scalable according to available computational power

Modular Software

- ✓ Distributed architecture
- ✓ Ethernet based communication back-bone.
- ✓ Multi-platform (Windows[™], Linux[®])
- ✓ Centralised, user-friendly, supervising application

Application areas

- ✓ Vehicle systems ergonomics and safety studies (ACC, ABS, multimedia interface),
- ✓ Vehicle Behaviour (handling, power train),
- ✓ On board system safety studies,
- ✓ Perceptual studies (navigation, orientation),
- ✓ Accident-prone situations studies,
- ✓ Vehicle architecture,
- ✓ Basic and advanced driver training,
- ✓ Road infrastructure (crossings, horizontal and vertical signalisation).

Configurable software

SCANeR[®] II standard set of parameters can be modified by the user.



Main features

- ✓ Traffic set-up and intelligent vehicles behaviour
- ✓ Accurate vehicle dynamics (car or truck)
- ✓ Driving station interface
- ✓ Motion platform simulation strategy
- ✓ Surrounding environment and virtual driving cockpit
- ✓ Visual animation of the virtual driving station behaviour

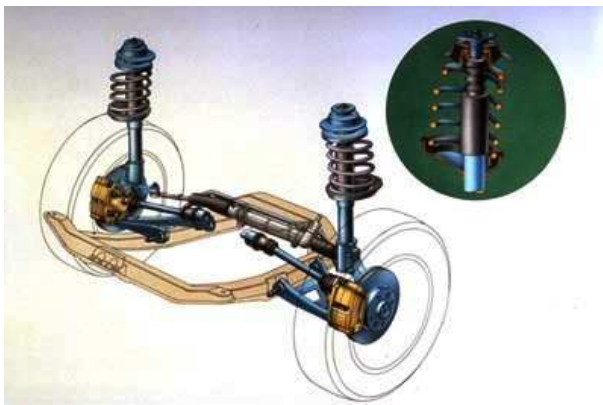




SCANeR® II visual module runs on several 3D API (supporting OpenGL®) and displays environmental world and traffic, and if needed, virtual cockpit and corresponding animated cockpit elements.

The module can be interfaced with a head motion tracker to generate HMD-compatible stereo images as well as vehicle-related or fixed observer-related 3D views.

Based on Renault's extensive experience in vehicle dynamics, SCANeR® II dynamics model is based on multi-body analysis and real world measurements. The configuration capability allows to simulate the complete range of cars and trucks behaviours. The dynamics model is interfaced with an advanced road surface definition based on Bezier patches and including variable adherence, noise and road-type factors.



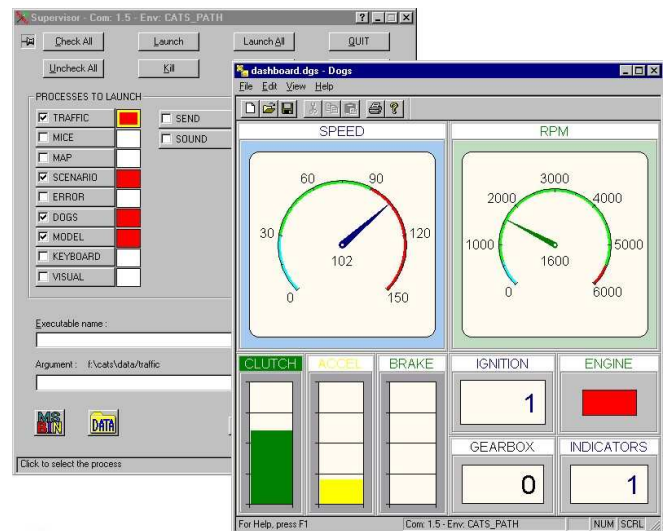
Beyond the accurate driving simulation environment, SCANeR® II provides supervision and analysis tools. The experimenter (or teacher) has a view of the vehicle and simulation data through real-time update of dials and maps. A driving session can be recorded and replayed. The scientist has access to the recording of vehicle behaviour and environment data (traffic, road infrastructure) of interest to experiments.

The supporting database structure of the simulation software (road network, road surface, 3D view of the world) is configurable through specific or commercial database tools.

Traffic generation is at the heart of SCANeR® II with a comprehensive traffic generation engine handling all types of road infrastructures (motorways, main and secondary roads).

An intuitive graphical interface allows to set-up traffic conditions and complex events beyond a back-ground traffic scenario, to fit the application.

The traffic generation is using a generic environment description database (TRaCS public format).



User group

Audi, CIDAUT, CTAG, DECOMA, Fraunhofer, Hyundai, INNO Simulation, Japan Automobile Research Institute, Musashi Institute of Technology, Nissan NRC, Nissan NTC, OKTAL, OKTAL Japan, PSA Peugeot Citroën, Renault Development Team, Renault CTS, Road Traffic Safety Authority, SINTEF, TRL, University of Minnesota, University of Napoli, Renault HMI Department, Volvo 3P

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