

Rising to the Task of Better Car Safety

With cars become ever more computerised, there is an increasing need for robust real-time embedded software to maintain the effectiveness and safety of critical onboard systems.

([PRWEB](#)) July 1, 2005 -- The EU-funded RISE project, which ended in February 2005, set out to address this demand by developing a software toolset specifically geared to the automotive industry.

RISE succeeded in delivering on all of its principal objectives and answers a genuine need in the automotive industry, according to project coordinator, Bernard Dion, Chief Technical Office of Esterel Technologies, the main partner in the project.

“Real-time embedded automotive software is more and more needed to implement basic functions such as efficient engine control, drivers assistance functions such as the Electronic Stability Program (ESP) or Line Departure Warning (LDW) that warns the driver when he/she is leaving the right lane or more comfort functions such as a Seat Memory feature,” he says.

Pointing out that modern high-end cars currently have a complex network of up to 60 computers communicating along many different bus systems, Bernard Dion notes that a number of these functions, such as engine control or ESP, are safety related.

“That means that any failure in these systems can potentially cause an accident. Due to the increase in the number and complexity of these systems, it becomes necessary to provide automotive manufacturers and their suppliers with the necessary tools to develop these systems in a safe and cost-effective manner,” he says.

Explaining the advantages that the RISE toolset brings over existing technologies, Bernard Dion says that the software development tools developed as part of the project allows for a number of improvements, including:

- the efficient development of the software by using model-based development, a technique that allows automatic generation of the software code from a high-level model of its functionalities;
- the generation of efficient code on the target processors that can meet stringent cost constraints, in this instance in the automotive industry;
- the validation that software is safe by providing efficient means such as formal verification of safety properties;
- safe and efficient communication over new kinds of buses that have started to appear in the automotive industry (TTA or Flexray).

Among the principal challenges to be overcome in making the project a success, Bernard Dion cites the fact that model-based design and development is a relatively new concept in automotive applications. Another barrier was the relative lack of regulation to precisely describe the processes that are mandatory to follow in the development and verification of safety-related applications in cars.

“This has been regulated in the aeronautics industry for many years but is not yet the case in the automotive industry. Also, the adoption of new standards for buses (TTA or FLeXRay) will still take a few years,” he says.

Despite these difficulties, the project partners were pleased with the performance of the toolset when it was tested in a real-world environment.

“The RISE toolset was successfully tested by AUDI on a prototype car with a Drive-By-Wire system, where electronic controls are used to supplement the driver controls or even provide full authority over the vehicle functions, thus exercising all of the functionalities of the toolset,” says Dion.

With interest burgeoning in real-time embedded systems in automotive applications, the commercial prospects for RISE are plentiful, according to Bernard Dion.

“The RISE toolset is currently in use at several automotive sites, at least partially, both with automotive manufacturers and suppliers, for production cars,” he says.

The progress made in the RISE project will also find new life in the IST project DECOS, which deals with the development of dependable architecture for domains such as the automotive or aeronautics sectors.

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