Enabling Architecture Based Verification and Validation of Mission-Critical Systems

Results in Brief

Boosting software verification and validation

New verification and validation (V&V) strategies to streamline software used in industry, particularly in the car-making sector, are set to enhance quality and competitiveness in Europe.

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Virtually every appliance or system today seems to operate on some kind of software, from elevators and microwave ovens to banks and space rockets. As the quality of software is crucial to the success of the final product or system, the process of V&V is key to enhancing software function.

This holds especially true in the car industry, which was the focus of the EU-funded project 'Enabling architecture based verification and validation of mission-critical systems' (ABV). Project members conducted research and developed tools to improve V&V. They focused in particular on validating the design and architecture of a system, a process that helps determine 80 % of costs involved.

Led by the Mälardalen University Sweden (Mälardalens högskola), the team sought ways to leverage these earlier phases of systems development to support V&V in

order to upgrade overall system quality. The project's main objective was to investigate how to reduce the cost and schedule dimensions of mission critical systems development while increasing confidence in the implemented system.

To achieve its aims, the project team developed semantics and algorithms for the architecture analysis and design language (AADL) in order to improve V&V. It also developed architecture-based algorithms to assess the integration of components at both the specification level and the implementation level, in addition to handling regression testing of systems.

Overall, the project's results could prove very useful to industry, thanks in part to engaging different industry stakeholders. This was bolstered by visits to major carmakers in Sweden. Importantly, the project team has also produced technical reports that highlight the application of architecture description languages to the automotive sector and support the concept of adaptive cruise control.

With improved V&V, the automotive industry in Europe is set to produce better software for systems and by extension better products. The implications of these advances on safety and on competitiveness will certainly be good for the car industry, and can eventually be adapted for software in other key areas.

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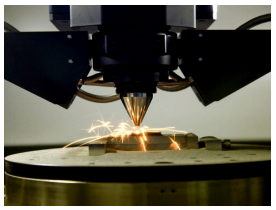

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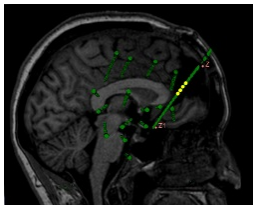

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Project Information

ABV

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