

 Content archived on 2024-06-18



Methodology and supporting toolset advancing embedded systems quality

Results in Brief

Improving embedded systems software

An EU team created tools assisting the development of embedded systems software. The tools help European small and medium-sized enterprises (SMEs) compete in the sector, improving the quality of such software created using formal description techniques (FDTs).




DIGITAL ECONOMY



© Thinkstock

Software quality is important to the development of embedded systems, which may often be used in safety-critical applications. Despite widespread use of software development tools, achieving the required quality remains challenging – particularly for SMEs that lack the necessary resources.

The EU-funded 'Methodology and supporting toolset advancing embedded systems quality' ([MODUS](#))  project aimed to help SMEs compete in the embedded systems market. The 12-member consortium aimed to develop a set of methodologies and tools that improve the quality of embedded systems when using FDTs. The tools were intended to allow model verification, interface with standard simulation platforms, performance optimisation and customisable source code generation. The project ran between October 2011 and March 2014.

Researchers achieved a system allowing use of existing model verification techniques that are dispersed across various modelling frameworks and tools. The project further developed a tool guiding selection among candidate verification techniques, using automated analysis of the input system's models and properties.

The consortium developed a methodology and tool for formal representation of coding conventions, plus a tool for customisable generation of code that respects the representations. Hence, software developers can automatically acquire quality source code without having to manually reapply coding rules.

A further project tool for performance optimisation facilitates improvement of algorithm complexity in software design, and is applicable across various platforms. The team's approach, in combination with its code generation tools, allows easy creation of optimised source code.

The MODUS project produced development tools enabling European SMEs to compete against larger companies in terms of embedded systems software. The developments also offer commercial opportunity.

Keywords

[Embedded systems](#)

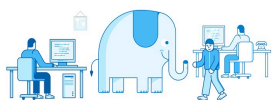
[formal description techniques](#)

[software development](#)

[source code generation](#)

[software design](#)

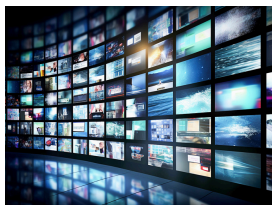
Discover other articles in the same domain of application



Driving change within the insurance industry

21 May 2021





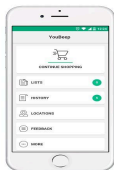
New tool aims to revolutionise the media monitoring market

20 October 2023 



Preserving today’s digital data for tomorrow

15 October 2021 



Mobile app revolutionises in-store shopping and checkout experience

14 April 2020 

Project Information

MODUS

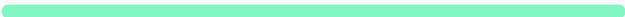
Grant agreement ID: 286583

[Project website](#) 

Project closed

Start date
1 October 2011

End date
31 March 2014



Funded under
Specific Programme "Capacities": Research for the benefit of SMEs

Total cost
€ 1 814 132,00

EU contribution
€ 1 318 500,00

Coordinated by

Last update: 30 July 2015

Permalink: <https://cordis.europa.eu/article/id/166152-improving-embedded-systems-software>

European Union, 2025