



Immenstaad (visitable at short notice)

DOMAIN-SPECIFIC AUTOMATED GENERATION OF SOFTWARE SYSTEMS

Application for manufacturing industry - Embedded systems, critical/reliable systems

SUMMARY

The aim is to demonstrate the efficiency potential of end-to-end automated software development processes that are implemented on the basis of existing process knowledge (domain know-how).

CURRENT SITUATION

At present, manual activities still determine software development time and costs. Despite the use of code generators and verification tools, manual interventions are still required all along the process chain, from specification through to product acceptance, and these significantly reduce the efficiency of the entire process. The reason for this is discontinuity in how information is represented from one development phase to another, requiring manual intervention. Specifications in text form which are NOT machine-interpretable, are an example of this.

PROJECT DESCRIPTION

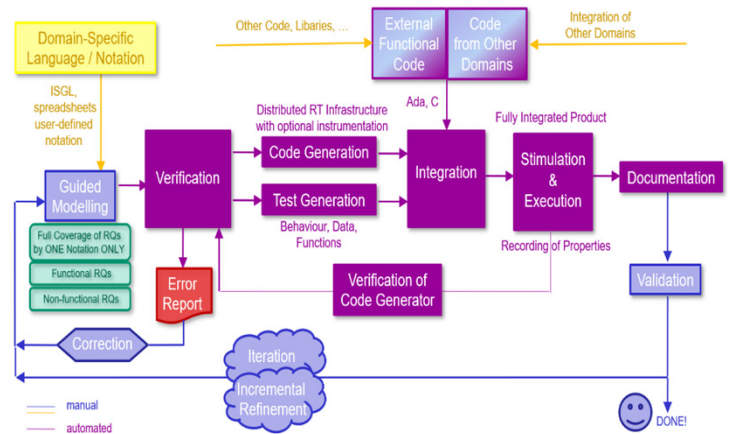
The aim is to demonstrate the significant increase in efficiency achieved by domain-specific processes. For selected domains, a standard for a machine-interpretable specification and architecture description will be defined in each case, to enable a complete description of a (software) system for the domain. From the specification, the specified system (product) will be generated and verified/validated by an associated fully automated process without manual intervention. The verification and validation tools will be generated by the process, together with the product.

REFERENCES

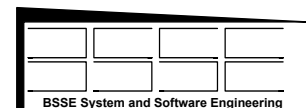
Material Science Laboratory in NASA-part of the ISS (distributed real-time infrastructure) in operation since 2009.

INDUSTRY 4.0 FEATURES

Automation of the software development process in order to reduce costs and development time on the basis of semantic approaches.



PARTNERS



SOLUTION

Faults in software can be reduced, if a domain-specific approach is taken. A domain is a self-contained subarea with similar use cases, for example “distributed and/or real-time systems” or “control systems”. Restriction to a single domain enables existing knowledge to be used in order to be able to define the process completely. Verification and validation are part of this. By using appropriate notation, the information needed to create the product can be provided in machine-interpretable form. The result is a software process where manual interventions are not required. More complex systems are integrated automatically from subsystems of the relevant application areas. This enables short turnaround times and iterative product development.

CONTACT

Dr. Rainer Gerlich
BSSE System and Software Engineering
Rainer.Gerlich@bsse.biz

Prof. Dr. S. Montenegro
Würzburg University
sergio.montenegro@uni-wuerzburg.de

STANDARDIZATION APPROACHES

International standardization work on the administration shell and the submodels enables the necessary machine-interpretable specification in the relevant domain.