Research program:
"Rigorous model-based Development of Programmable Electronic Medical Systems (PEMS): from Requirements to code"

Annex C

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Research project
The development of Programmable Electronic Medical Systems (PEMS) is faced with several complex challenges. On the one hand, market forces demand for shorter time for deployment, reduced costs and higher return on investments. On the other hand, regulatory regimes explicitly demand such systems to be proven for stringent safety requirements before being operational. Such processes and development paradigms are therefore required which address these issues in effective and cost-efficient manners. The University of Bergamo is collaborating with the Software Competence Center Hagenberg (SCCH) in Linz (Austria) in a project called IntegR with the aim of developing a rigorous methodology that can support the development of such critical systems. The specific program of this project consists in studying the use of rigorous methods and Model-Driven Development (MDD) paradigm that can certainly provide assistance in this realm. The formal model of PEMS' requirements amenable to verification (mathematical proofs, model-checking) and validation (animation, prototyping) can provide a basis for agreement of both concerned parties. Stringent safety cases associated with products can be modeled and proved in more convincing ways in this fashion. The seamless translation and the automatic conformance checking of the formal model into a machine-deployable code will provide an argument for the dependability of the process and the product.