ARTEMIS Call 2010 Project
269335

MBAT

Combined Model-based Analysis and Testing of Embedded Systems

EXECUTIVE *summary*

MBAT will provide Europe with a new leading-edge Reference Technology Platform (RTP) for effective and cost-reducing validation and verification (V&V) of Embedded Systems in the transportation domain.

CONTRIBUTION *to SRA*

MBAT will contribute to the following SRA high-level targets:

- Validation and verification costs will be reduced significantly by at least 20% by combining and extensively automating model-based analysis and testing techniques
- Costs of certification and qualification will be reduced by at least 20%
- Detection and removal of errors early in the development will be increased by the MBAT approach
- High quality and safety of embedded systems will be strongly supported by increased analysis and test coverage of at least 30%
- A higher error detection rate will be made possible by the MBAT approach due to an effective combination of analysis and testing
- Time to market for embedded systems products will be shortened by at least 20%
- Management of steadily growing systems and test complexity will be enabled by using T&A models
- Effective transfer from research domain to industrial practice by integrating model-based V&V technologies
- The impact of the new V&V technologies will be measured in MBAT
- Provision of a MBAT Reference Technology Platform (MBAT RTP) and contributing to the overall ARTEMIS Standard RTP supporting overall embedded systems development
- Supporting cross-domain fertilisation, starting within the transportation domain and preparing the MBAT RTP for adaption in other application domains such as telecom and manufacturing
- Strongly involving European SMEs and tool vendors in the project
- Building an eco-system of technical expertise around the MBAT RTP
- Contributing to guidance for the usage of MBAT technologies and processes in the context of existing and emerging software and safety standards such as ISO 26262 and DO-178C and providing feedback for future standards maintenance

MARKET INNOVATION *& impact*

MBAT will increase the competitiveness of European key players in the transportation domain by *

- reducing V&V costs for embedded systems by at least 20%
- shortening time-to-market by at least 20%
- increasing the coverage of the embedded system under V&V by at least 30%
- significantly increasing error detection
- enabling higher quality embedded systems
- contributing to and implementing the common ARTEMIS interoperability standard
- making new (research and commercial) tools available for integration as part of industrial processes and tool chains

** compared to actual state-of-practice*

RELEVANCE & CONTRIBUTIONS *call 2010 objectives*

MBAT will contribute to the ARTEMIS ASP1 objectives as described in the AWP 2010 by

- strongly supporting the highest quality of safety-critical embedded systems and thereby the EU goal of zero traffic fatalities by 2020
- focusing on the key strategic industrial sector for Europe: the transportation domain (automotive, aerospace, rail)
- significantly improving a model-driven process for the development of safety critical systems, focusing on model-based validation and verification
- providing a basis for rapid re-qualification or certification of compositionally designed transportation systems
- delivering a Reference Technology Platform for the validation & verification of embedded systems as well as connecting it to other ARTEMIS RTPs

R&D INNOVATION *and technical excellence*

The V&V technologies already in industrial use are still too expensive while at the same time often ineffective or even insufficient. MBAT will provide European industry with a new leading-edge V&V technology in form of a Reference Technology Platform (the MBAT RTP) that will enable the production of high-quality and safe embedded systems at reduced cost in terms of time and money. This will be made possible by a new and very promising approach in which the most advanced model-based testing technologies will be combined with static analysis techniques. Besides this combination, a further new approach will employ (and re-use) test & analysis models as the basis for model-based V&V and lead to a more effective and, at the same time, cost-reducing approach. In addition, the MBAT RTP will be connected with other ARTEMIS RTPs (e.g. the CESAR, iFEST, pSafeCer RTPs) to extend these platforms pursuing the ARTEMIS goal to provide a European RTP for the development of Embedded Systems.

PROJECT *partners*

AIRBUS, IBM, ALL4TEC, Infineon technologies, AVL, OFFIS Institute for Information Technology, TUM Technische Universität München, ALSTOM, Rockwell Collins, TU Graz, Dassault Systèmes, RICARDO, THALES, AIT Austrian Institute of Technology, virtual vehicle, DAIMLER, AnsaldoSTS A Finmeccanica Company, SELEX Sistemi Integrati, cea, ENEA, SIEMENS, AMET, MBtech, AIRBUS DEFENCE & SPACE, KTH Royal Institute of Technology, ELVIOR, Fraunhofer IESE, VOLVO, AALBORG UNIVERSITY, BTC, PIKETEC, AbsInt Angewandte Informatik, Mälardalens Högskola Eskilstuna Västerås, AIRBUS GROUP, AleniaAermacchi A Finmeccanica Company

ARTEMIS

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MBAT

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WEBSITE
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START
November 2011

DURATION
38 months

TOTAL INVESTMENT
€34.5 M

PARTICIPATING ORGANISATIONS
39

NUMBER OF COUNTRIES
8