

Exam
ADSA: Model-Driven Engineering
Master CSc/IST/BIT

Module/course code: 192135450
Date: 01-02-2017
Time: 8:45-11:45 (+25% voor studenten met recht op extra tijd)
Teacher: L. Ferreira Pires

Type of exam: open book

Attachments: Questions sheet

Allowed resources:

- Book *Marco Brambilla, Jordi Cabot, Manuel Wimmer 2012. Model-Driven Software Engineering in Practice*, or other similar reference
- Copy of the sheets displayed during the lectures (without annotations)
- Paper *Dubois, E., Bortolaso, C., Appert, D., Gauffre, G. An MDE-based framework to support the development of Mixed Interactive Systems.*

Instructions:

- Exam contains 8 questions, with a total of 9 points (mark ranging from 1 to 10)
- Points of each question are indicated in the questions sheet
- Place your name and student number on each paper sheet with your answers that should be considered for marking

Final exam
192135450
ADSA: Model-Driven Engineering

1 February 2017

During this exam, the students are allowed to use the book *Marco Brambilla, Jordi Cabot, Manuel Wimmer 2012. Model-Driven Software Engineering in Practice* or other similar book, and a copy of the lecture sheets. The questions are based on the paper *Dubois, E., Bortolaso, C., Appert, D., Gauffre, G. An MDE-based framework to support the development of Mixed Interactive Systems*. You were instructed to bring a copy of this paper, and you are allowed to use it during the exam.

The questions of this exam have been designed to assess whether you can explain the MDE concepts and technologies, and reflect and critically discuss these concepts and technologies in the context of an application. Therefore, you should answer the question so that these aspects can be assessed, which means that you should answer the questions in your own words and in sufficient detail. Text literally copied from the book, the paper or the sheets or too brief will be ignored for marking.

Question 1 (1.0 points)

Why is MDE potentially suitable for coping with the typical MIS (Mixed Interactive Systems) requirements, particularly the multiplicity of complex interaction forms and the availability of a large amount of reusable implementation resources, like, e.g., devices and APIs?

Question 2 (1.0 points)

Why are some elements of an ASUR model not transformed into elements of the ASUR-IL model in the ASUR to ASUR-IL transformation? Illustrate your answer with the 'notepad assisted slideshow' example.

Question 3 (1.0 points)

Why did the authors introduce the ASUR-IL metamodel as an intermediate metamodel between the ASUR and the WCOMP metamodel? What are the benefits and drawbacks of such an intermediate model?

Question 4 (1.0 points)

How are 'alternative solutions' (e.g., the use of webcams or 3D cameras for page detection) handled in the transformation from an ASUR model to an ASUR_IL model? How is it possible to reuse these solutions?

Question 5 (2.0 point)

Fig. 14 gives in one picture the instances of the ASUR, ASUR-IL and WCOM metamodels for the transformation of the interaction path User → Notepad → PageDetector → Slideshow → PublicDisplay → Attendees, and the relations between these instances. Draw a similar picture for the path User → StepDetection → Slideshow → PrivateDisplay → User. Explain the elements you represented in this figure, especially how they relate to the elements of Fig. 14.

Question 6 (1.0 points)

Do you think it is possible to advance the modelling part (for example, by extending the ASUR metamodel) separately from the implementation part (for example, supporting a wider range of devices) with the GuideMe framework? If so, what would be necessary to achieve that? Properly justify your answer by referring to the elements of the framework.

Question 7 (1.0 point)

The author explicitly state in Section 8 that the GuideMe framework only supports top-down design, i.e., reverse engineering is not supported. However, reverse engineering is quite important in this kind of framework, mainly to 'harvest' existing components, transforming them into reusable models. Explain how reverse engineering could be added to the GuideMe framework based on our knowledge and experience with the EMF technologies. Don't forget to mention the tools and languages that could be used to do this, and how they would be used.

Question 8 (1.0 point)

Explain why it has been possible to successfully apply the GuideMe framework in different domains (homecare, museum, telescope monitoring, aeronautics) as mentioned in Section 9, although the starting point of this framework, namely the ASUR language, is considered to be a DSL (Domain-Specific Language), not a GPL (General Purpose Language). How was this possible?

Good luck!