Bachelor/Masterprojekt: Instance Generation in the Multi-level Modeling Tool

Institut für Informatik und Wirtschafts-informatik (ICB)

Lehrstuhl für Wirtschaftsinformatik und Unternehmensmodellierung

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Semester: Wintersemester 2021

Sprache: Deutsch/English

Motivation:

The term multi-level modeling refers to modeling approaches aiming at representing multiple classification levels within a single body of model content. Different multi-level modeling approaches have been proposed, among them the Flexible Meta-Modeling and Execution Language (FMML^x) with the modeling and execution environment XModeler.

Similarly like in case of testing AI models and algorithms, or business process simulation and execution, also here, a demand for automatic generation of (reasonable) instances and values of properties emerges.

Description:

The main aim of this bachelor/master project is to investigate and, depending on the agreed upon scope of the project, implement, an instance generation module in the modeling and execution environment XModeler. To this aim the students should:

(1) Make themselves familiar with basic ideas of multi-level modeling, instance data generation in the field of data mining and statistical testing, business process simulation and execution etc.
(2) Formulate a set of requirements towards the instance generation module in question.
(3) Investigate possible sources of instance values freely available on the Internet, e.g., dictionaries of names/last names, linked data/Wikipedia (e.g., data on producers, product types or classifications). Check the possibilities of automatic acquisition of such data, e.g., availability of APIs, possibility to obtain data dumps.
(4) Propose an instance generation module/method (and the way it should be integrated with the XModeler tool)
(5) Depending on the agreed upon scope of the project, implement and test the proposed method.

Expected outcomes:

A report pointing to the conducted state of the art analysis (cf. point (1) and (2)), requirements and rationale for the proposed instance generation

module/method, a detailed description of the proposed solution, a recommendation regarding its integration with the current version of XModeler/implementation of the module/method in the XModeler environment. In addition, a final presentation of the project results is expected.

Exemplary Introductory Literature:

- Frank, U.: Multilevel modeling – toward a new paradigm of conceptual modeling and information systems design. BISE 6(6), 319–337 (2014)
- Atkinson, C., Gerbig, R., Metzger, N.: On the execution of deep models. In: EXE2015: Proceedings of the 1st International Workshop on Executable Modeling co-located with ACM/IEEE 18th International Conference on Model Driven Engineering Languages and Systems (MODELS 2015) Ottawa, Canada, September 27, 2015, vol. 1560, pp. 28–33. RWTH, Aachen (2015).

Group member: 2-3 students

Application procedure: Please apply via email to the supervisor. Please attach a short letter of motivation (app. ½ A4 page) and a recent performance record ('Leistungsnachweis'). You can apply individually or in a group of 2-3 participants (in this case each person should still send a separate e-mail, however point to the other members of the group). In case you are applying also for other projects, please mention it in the email.

Bewerbungsfrist: 20. Oktober 2021; 23:59 Uhr