Reference: Model Quality Assurance

Topic: Supporting Controlled Experiments in Crowd-based Model Quality Assurance

LVA-Type: Praktikum, Bakk-/Diplomarbeit

Start: Ab sofort

End: Nach Vereinbarung

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Background

During the design of software systems, a variety of models are created in the process of transforming the requirements and/or specification of the desired system into the corresponding software. These models include Extended Entity Relationship (EER) diagrams or UML model variants for designing databases and software system structures and behavior. The tasks of creating such models from software specifications and their subsequent verification to ensure their quality, i.e., through software model inspection [1], are cognitively intense tasks, that require significant time and effort investment from software engineers.

To address this issue, we defined and introduced a novel Crowdsourcing-based Software Inspection (CSI) process [1,2,3] (see Figure 1). CSI includes the following two main phases. During a Text Analysis phase (2), inspector crowds identify Expected Model Elements (EMEs) in the system requirements specification (2a). In the Model Analysis phase (3), inspector crowds verify the model itself (e.g., an EER diagram), or a subset thereof, while being guided by EMEs.

The CSI process (and its variations) was and is being tested with large groups of students at TUWien as part of controlled experiments. To support the experiment process, a platform has been implemented and is continuously extended with new functionalities which help the researchers running the experiments to more easily prepare, run and evaluate the experiments. This platform also allows providing
feedback to students on their inspection performance and therefore contributes to the
Software Engineering education at TUWien.

**Tasks**
The goal of this thesis will be to extend the available platform with new functionalities
needed to support the experiment process. These functionalities can support the
creation of experimental data, the evaluation of the collected data or the feedback
stage to students. The implemented functionalities will be tested as part of the large
scale controlled experiments executed at TU Wien.

**Experience and skills needed**
The following preconditions are recommended, but could also be learned during the
thesis itself.

- Java programming
- Databases
- Software engineering
- Defect detection in software engineering models
- (optional) Crowdsourcing (CrowdFlower, CML)

**References**

