SEP / HiWi Position
Acquisition Tool for
Natural Language like Requirements

within a joint research project with AUDI.

TUM

MQM
MODEL-BASED SYSTEMS &
QUALITATIVE REASONING

Background and Initial Situation

In order to drive on the development of requirement-based methods like for test generation, the Audi AG launched a joint research project with the MQM research group (TU München).

Here a requirement documents serves as starting point from where different tasks and methods can be applied on. In today's practise in industry those document are written informal in prosaic form. To enable computer-based processing, the requirement rules have to be brought into a form that is not only readable but also comprehensible to the machine.

We developed a formalism based on sentence templates (see figure 1) that offers an intuitive way even for someone not familiar with formal specification languages. This is necessary because usually requirement documents are created by the domain experts (e.g. engineers) themselves.

For a case study Audi AG delivered us a requirement document capturing the functional requirements of a real product, the Adaptive Cruise Control (ACC), as it is used in modern vehicles (see figure 2).

If
  soft-out button is down ▽ occured during
  ACC is in active mode ▽
then
  ACC is in soft-out mode ▽ holds
  immediately
until
  1 seconds elapsed.

Figure 1: An ACC requirement formulated with a sentence template.

The system regulates the vehicles velocity depending on the distance to the car in front and the set speed given by the driver. The distance is measured via Long-Range-Radar (LRR).
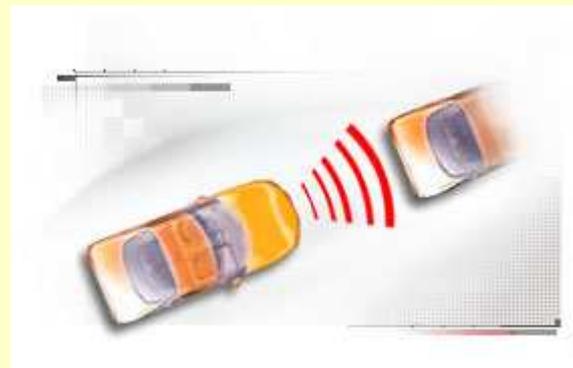
Figure 2: The Adaptive Cruise Control (ACC)

Objective and Task Definition

The objective of the SEP or HiWi position is to develop an Acquisition Tool that offers a set of sentence templates to the requirement engineer, where he can fill in the missing information to create a requirement. For selecting the proper templates intelligent techniques like constructing them from atomic building blocks, are offered.

The tasks are:

- Continuing the software specification (UML).
- Implementing the framework and GUI.

High value is set on a clear documentation of the mathematical descriptions, the design (UML) and the implementation.

Demanded Skills

- Programming skills in C# or Java, as well as
- Capability of analytical thinking
- Languages: English or German

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