

# Automatic time measurement for UML modeling activities

## Abstract:

A basis for empirical studies is the measurement and protocollation of the probants' activities. In the area of object-oriented modelling, this requires dedicated CASE tool support. The Fujaba CASE tool aims to provide such support. Fujaba is an UML based CASE tool with an emphasis on executable specifications. Our goal is to avoid code level implementation at all and to program all behavior at UML level. In principle, adding protocol functionality to a CASE tool is pretty easy. However, to gain benefit from such a protocoll, sophisticated analysis functionality is required. First of all, it should be possible to group elementary editing actions with respect to certain criterias in order to reduce the sheer size of the protocoll. Next, statistic evaluations are needed that compute characteristic properties of typical editing steps. Based on such statistics, e.g. exceptional situations may be identified. Third, editing activities should be related to user tasks. This enables to measure effort related to certain activities within a project. This paper reports on the time measurement and analysis functionalities of the Fujaba CASE tool. These functionalities are used for empirical research in didactics of computer science as well as for research in software engineering.

## 3 major findings:

- can time measurement of UML based modelling activities be automatized
- what benefits of such a time measurement may be achieved
- first empirical results

## Overview of the research:

- This research is done by Albert Zündorf, Ira Diethelm, Leif Geiger, and Christian Schneider, software engineering research group, computer science, University of Kassel
- In the area of software engineering we try to develop a basis for project cost and time estimation and project planning and project tracking. In the area of didactics of computer science we try to identify weaknesses of our development method i.e. development steps that consume much time due to misunderstandings and lacking background of the users. In addition, we try to come up with measurements for grading students work.
- The research methodology is based on automatic time measurement build into the Fujaba CASE tool. The protocollated editing activities are automatically related to tasks specific to the Fujaba process. This allows to collect statistical data on different kinds of tasks and projects which in turn builds a basis for cost estimation and student grading.