Beagle

Design and Architecture

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1 Architectural Overview

1.1 Overview of the entire system

1.2 Components' interaction

1.3 Communication between Beagle and external tools

1.4 Extension Points

The `Measurement Tools`, `Result Analysers` and the `Final Judge` are connected to Beagle via Eclipse Extension Points.

This means they can be developed as separate eclipse plugins and specify in their `plugin.xml` file the classes, which represent the `Measurement Tools`, `Result Analysers` or a `Final Judge`. When there are multiple plugins with a `Final Judge`, the user has to select one in the GUI.

This concept has the advantage, that everybody can write his own or select some existing `Measurement Tools`, `Result Analysers` and `Final Judges` and just install them into his eclipse to use them.

2 Component: Beagle Core

2.1 Overview

Controller classes

The classes `Beagle Controller` and `Measurement Controller` manage the invocation of `Measurement Tool` or `Result Analyser` components. `Beagle Controller#main` is the main control loop, managing the control flow throughout Beagle's measuring and analysis activity. There is always exactly one `Measurement Tool`, `Result Analyser` or `Final Judge` running at any given moment during the execution of `Beagle Controller #main` ("the main loop").

An iteration of the main loop starts by asking the `Measurement Controller` whether it wants to conduct measurements for the current blackboard state—which will usually be the case if there is something not yet measured—, and if so, calling its `#measure` method. The `Measurement Controller` will then decide which `Measurement Tools` to run. Usually it will tell every tool to measure as long as there is something left to be measured.

After that, the main loop invokes one arbitrary chosen `Result Analyser` reporting to be able to contribute. This analyser may then propose results for items that have measurement results. If there is no such analyser, the `Final Judge` will be called. It decides whether enough information has been collected and Beagle can terminate. If this is the case, it also creates or selects the final result for each item that has proposed results.

The main loop will then be repeated until the `Final Judge` was called and its `#judge` method returned `true`.

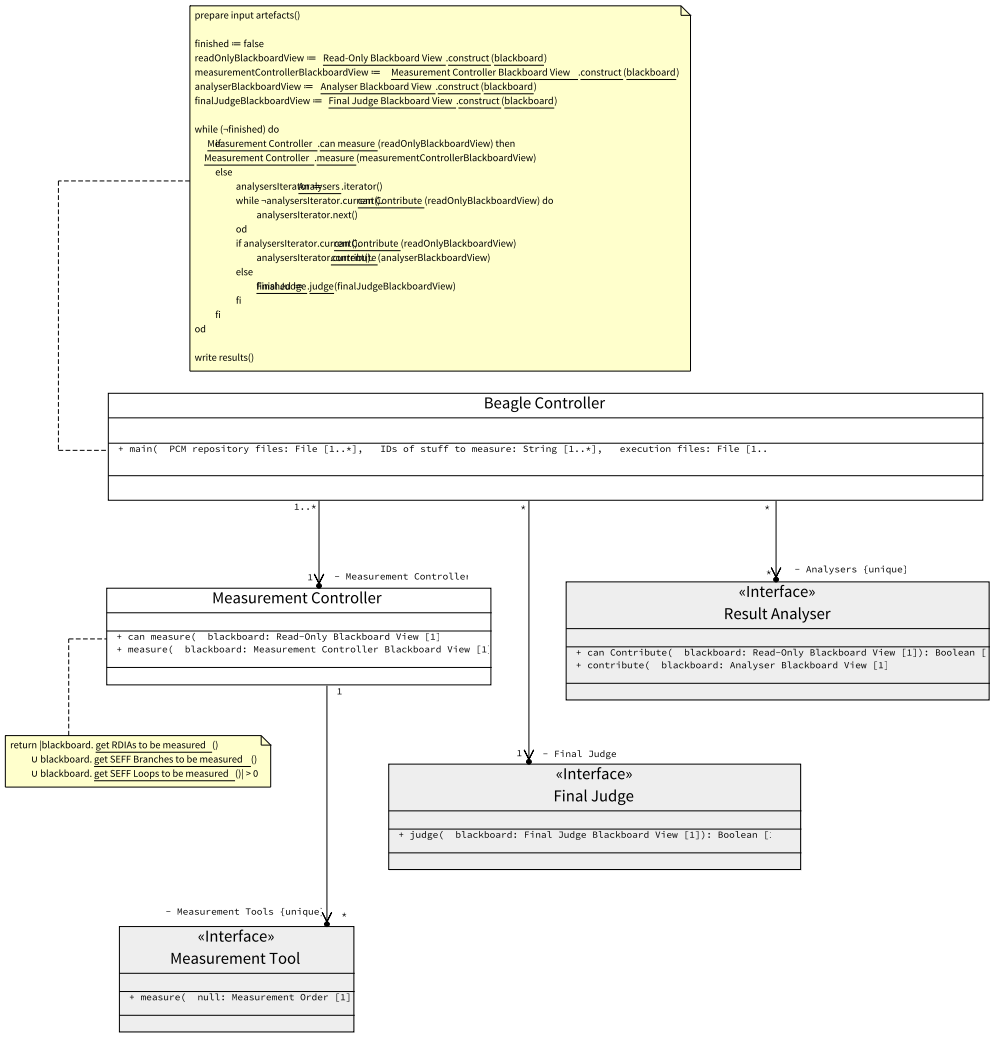

Figure 2.1: UML class diagram of the controller classes.

2.2 Reasons for chosen design

2.3 Chosen design patterns

2.4 Evaluable Expressions

2.5 Conversion from and to Palladio

3 Component: Beagle GUI

3.1 The most important classes

3.2 Reasons for chosen design

3.3 Chosen design patterns

4 Component: Measurement Tool

4.1 Reasons for chosen design

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5 Component: Result Analyser

5.1 Reasons for chosen design

6 Component: Final Judge

6.1 Reasons for chosen design

6.2 “Averaging” Final Judge