

Tool support for Event-B abstractions

Context

In Event-B, a state-based formal language. Modeling is done by creating a so-called machine - a state automaton representing a program and its actions. We can verify and validate properties of interest with the representation as a machine. Enrichment of an existing model is done by so-called refinement. In this rigorous process, one has to show that the added behavior and enhanced variables do not violate existing constraints. In vanilla Event-B refinement, the hierarchy is rather strict, where one machine can only have one parent.

Event-B is supported by tool platforms, most notably the Rodin* platform, which allows interacting with machines in writing, proofing, and model checking. Rodin is Eclipse-based and can be extended via plugins**.

Task

The task is to implement tool support for the existing concept of Abstractions for Event-B. Abstractions allow breaking out of the existing one-parent policy without breaking existing refinement chains. This offers advantages for the validation of Event-B models. Currently, Abstractions are created solely by hand, which is cumbersome and error-prone.

Goals

- Functioning plugin which adds support for Event-B abstraction to Rodin
- The plugin is maintainable, e.g., there are tests and a GitHub CI
- The plugin is publicly available

Requirements

- Proficiency in Java programming language
- (Optional) knowledge of foundations of formal methods

Advantages

- Working in a developing area of research and contributing meaningful and directly to the research progress

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* <http://www.event-b.org/platform.html>

** https://wiki.event-b.org/index.php/Rodin_Plug-ins