From Event-B Models to Code

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Abstract

Event-B is a formal approach to modelling systems, based on set theory, predicate logic and arithmetic. To make developments tractable, various techniques are used, including refinement, and decomposition. This article describes an extension to the Event-B approach, which we call Tasking Event-B, that facilitates automatic generation of source code from annotated Event-B models. We believe that automatic code generation makes a useful contribution to the Rodin tool-set; by contributing a link in a coherent tool-chain. To validate the approach we have undertaken case studies and taken part in an industrial collaboration. We present a number of case-studies to illustrate our work, in this article.

1 Introduction

This article is about generating code from Event-B.

1.1 Formal Methods

1.2 Event-B Rationale

1.3 Code Generation Rationale

1.4 Related Approaches

– VDM
– Z

1.5 Targets for Code Generation

- Ada
- Java
- FMI-C

2 More about Event-B

2.1 Refinement

2.2 Decomposition and Composition

2.3 Theories

2.4 ProB

3 Tasking Event-B

3.1 The Language and Semantics

3.2 Theories for TEB

3.3 State-machines

4 Tooling

4.1 The Rodin Platform and Eclipse

4.2 IL1/CLM

4.3 Templates

4.4 Interfaces

5 Conclusions

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