

C++ FUNCTION BLOCK VERIFIER

LIT Cyber-Physical Systems Lab

Keywords: *Verification, C++, Java, [Eclipse 4diac IDE](#), [Frama-C](#)*

Current Situation

At the moment, there are no formal verification methods for function blocks in Eclipse 4diac IDE. We would like to include ACSL annotations to specify function contracts.

Background

Formal methods represent different techniques with which a system can be modelled mathematically. They can be applied throughout the software lifecycle stages. Furthermore, embedded software systems are becoming increasingly complex and we want to introduce formal methods to keep them more reliable. The first step towards this goal is to formally describe Function Blocks (FBs) so we can ensure they fulfil their requirements.

Content of the Thesis

- Develop a simple Eclipse editor which takes in ACSL statements
- Develop a view which can show the output of Frama-C
- Integrate the Frama-C++ generated code into an exporter
- Execute Frama-C within the Eclipse platform

Requirements

- Programming experience in Java and C++
- Basic knowledge of formal methods (or willingness to learn more about them)
- Excellent English skills

Learning Outcomes

- Contributing to the Eclipse open-source project
- Understanding a different programming language (ACSL)
- Firm grasp of the complete and partial specifications, when to use which
- Apply versioning systems in practice (Git)
- Ability to conduct scientific research

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