

Visitor Research Report

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Area of Research: Spacecraft Autonomy for In-Space Operations

Period of Visit: October 6, 2008 – November 14, 2008

Goal:

To extend the current code generator with more language constructs. This allows for the translation of models in the PVS specification language into an executable Java program, using an intermediate language. The current implementation not yet fully supports all functional language constructs of the specification language.

Strategy:

By using a specific model; Airstar's communication protocol the needed language constructs are formulated and implemented in a pvs2why translation (Why is the intermediate language) and a translation from the Why language to Java is subsequently implemented.

Accomplishments:

A prototype code generator for PVS that is able to translate the GDP part of Airstar's communication protocol into Java code. With a hand-written graphical user interface, the generated code can easily be used for simulations or for model checking using the Java Pathfinder toolset.

Future Work:

In order to externally verify that the generated code is indeed correct, annotations can be generated from the PVS specification. These annotations can be used to (semi)-automatically prove that the generated code satisfies certain requirements. A first step would be to generate specifications for the predicated types that are used in the PVS specifications.

Pending Publications:

None

Seminar Presented:

A seminar on mechanisms behind the translation from PVS to Java was given on November 14. This included a demonstration of the generated program.