Towards Automatic Verification of Structural Code-Coverage Preservation *

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Embedded Systems are often used in safety-critical environments. Thus, thorough testing of them is mandatory. To achieve a required structural code-coverage criteria it is beneficial to derive the test data at a higher program-representation level than machine code. Higher program-representation levels include, besides the source-code level, languages of domain-specific modeling environments with automatic code generation. This enables for a testing framework with automatic test-data generation to achieve high retargetability.

Within the project "Sustaining Entire Code-Coverage on Code Optimization" (SECCO) we address the challenge of ensuring that the structural code coverage achieved at a higher program representation level is preserved during the code generations and code transformations down to machine code [1, 2]. We define the formal properties that have to be fullfilled by a code transformation to guarantee preservation of structural code coverage. Based on these properties we will formalize code transformations to automatically prove whether a given code transformation preserves the code coverage of interest.

References

[1] Raimund Kirner. Towards preserving model coverage and structural code coverage. *submitted to the EURASIP Journal on Embedded Systems*, 2008. Research report 49/2008.

[2] Raimund Kirner and Susanne Kandl. Test coverage analysis and preservation for requirements-based testing of safety-critical systems. *ERCIM News*, (75):40–41, Oct. 2008.

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