MicroTESK Overview

MicroTESK is a specification-based framework for generating test programs in assembly language for microprocessors. The main advantage over similar solutions is that it offers a simple and flexible way to describe the target microprocessor architecture, thus, minimizing the effort needed to adapt the generation environment to new designs. Light-weight formal specifications used to configure the framework for a particular design also serve as a source of knowledge about situations to be covered by tests. A convenient Ruby-based test template description allows specifying test cases in terms of test coverage goals based on knowledge extracted from formal specifications, which helps improve test coverage and reduce the effort required to create tests.

Common Test Development Process

Usage of SPIN to Supply MicroTESK with Test Templates

PROMELA underlied in SPIN allows easy specifying cache coherence protocols. Then SPIN is used to receive test templates for MicroTESK as well as testbenches in UVM (or C++TESK, ISPRAS’ methodology for unit-level verification) to check cores stand-alone and/or to make the execution of the resulting test programs to be controllable and deterministic.

Having a test template with cache coherence protocols, MicroTESK processes it to get specific test programs which are executed together with the unit-level testbench to exactly reproduce the situation SPIN had found to be important for the protocol. As a result, the final test programs contain instructions to check general functionality, and instructions for difficult-to-approach shared memory subsystem of the microprocessor.