

# MicroTESK: Reconfigurable Open-Source Framework for Test Program Generation

<http://forge.ispras.ru/projects/microtesk>



<http://hardware.ispras.ru>

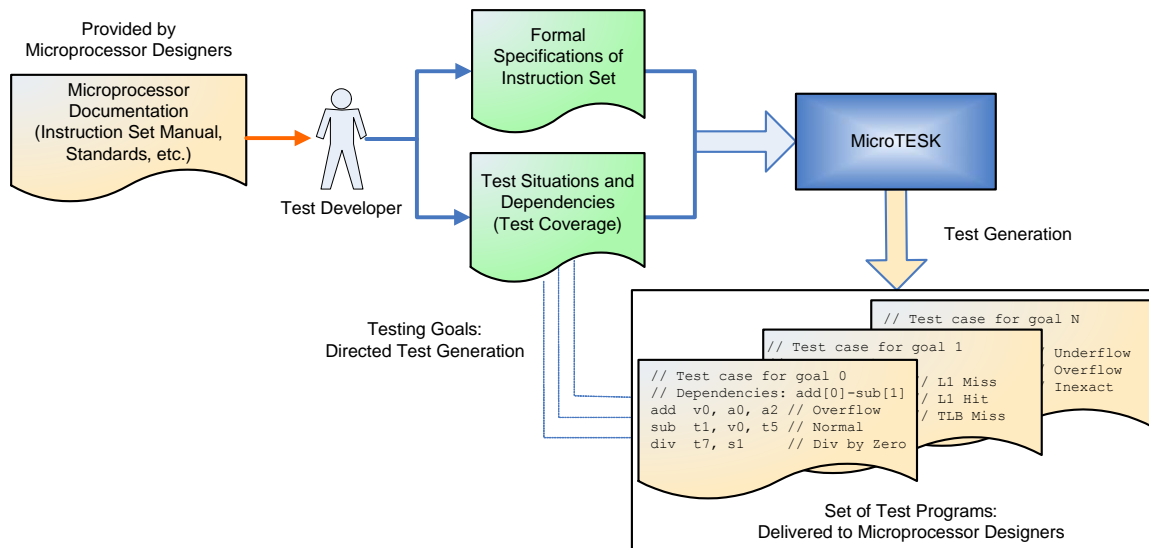
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## Overview

MicroTESK is a reconfigurable (retargetable and extendable) open-source 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 test program generation environment to changing 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 functional tests. A convenient Ruby-based test template description language provided by MicroTESK 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.

## Test Development Process



Microprocessor designers provide test developers with documentation on the target microprocessor: instruction set manual, standards, etc. Test developers create formal specifications and test templates that are based on test coverage goals expressed in terms of test situations (arithmetical exceptions, cache hit/misses, and other events) and dependencies between instructions (via registers or memory). Both descriptions are used as inputs for MicroTESK that automatically builds a set of test programs covering all specified testing goals.

## MicroTESK Features

- *Sim-nML specifications* – instruction set is described in the Sim-nML architecture description language that serves as source of ISA-related testing knowledge
- *Ruby-based test templates* – test cases are described in Ruby extended with MicroTESK libraries that facilitate describing complex scenarios
- *Cache memory models* – special formal language is provided to describe properties of microprocessor caches to be covered by tests
- *High automation* – MicroTESK provides a high level of automation
- *Directed test generation* – test programs are generated according to specified goals
- *Coverage model extraction* – information about test situations is automatically extracted from formal specifications

## About Us

The MicroTESK test program generation framework is developed at the Software Engineering Department of the Institute for System Programming, Russian Academy of Sciences (ISPRAS). The institute performs both academic research and industrial development projects as well as provides advanced services and consulting in various areas of software engineering, information technologies and computer science. More information about ISPRAS can be found at <http://www.ispras.ru>.