SpringSoft

Certitude Functional Qualification System

The Certitude™ Functional Qualification System is the only solution that removes the uncertainty of the effectiveness of your verification environment. It identifies verification weaknesses that allow bugs to go undetected and lead to functional problems, ASIC re-spins, and delays to market. The Certitude system does this with unique automation technology that:

- Objectively measures the quality of the verification environment
- Identifies verification holes that could hide design bugs

Confidence In Your Verification Environment

The Certitude system provides detailed information on the ability of your verification environment to activate, propagate and detect potential bugs in your design, exposing significant weaknesses that have gone unnoticed by other tools. The system provides data to identify vulnerabilities in the stimuli, observability, and checkers as well as holes in your verification plan. With the uncertainty removed, your verification efforts will be more reliable.

Operation Modes

The Certitude system works in two modes:

- *Verification improvement mode* evaluates the verification of your design blocks, including connectivity between blocks in an SoC design
- *Metric mode* objectively measures the overall quality of your verification environment

Verification Improvement Mode

The primary method of using the Certitude system identifies weaknesses and holes caused by incomplete or missing results checkers and test scenarios. It provides you with a complete report of the results in HTML format. This mode is used to highlight shortcomings and guide improvement in the verification of your block-level components and can also be used to evaluate the verification of connectivity between blocks during SoC integration.

Metric Mode

An additional way to use the system is to produce the Certitude metric, a global score that objectively measures functional verification quality. The metric mode is used to analyze the overall quality of your block-level verification environment, allowing:

- High confidence IP exchange
- Better SoC predictability
- Refined allocation of resources where they will be most effective

The Certitude system assigns separate scores for the ability of your verification environment to activate, propagate, and detect potential bugs.

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How It Works

The Certitude Functional Qualification System works with a new, patent-pending technology that combines mutation-based techniques and static analysis to measure and help improve all aspects of quality for HDL-simulation-based functional verification. Certitude is the first industrial implementation of mutation-based analysis for hardware design.

The Certitude System introduces mutations (also called faults) into your existing HDL code, for example:

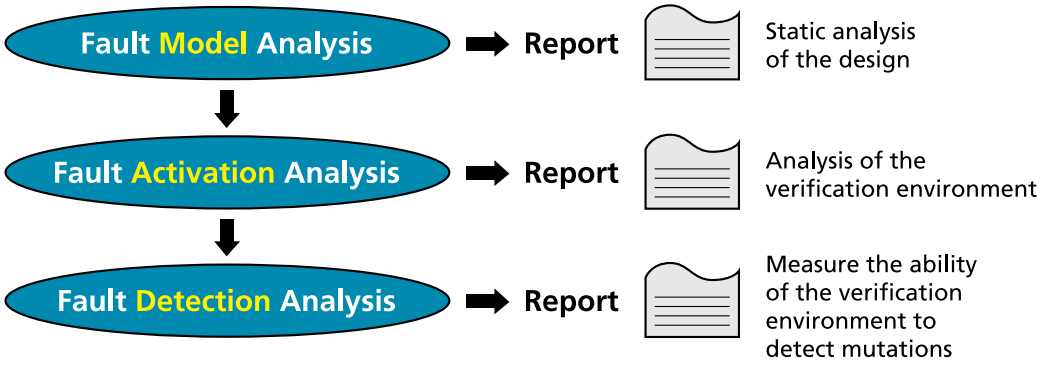
a = b ***or*** c; (original code)

a = b ***and*** c; (faulty program code)

In three phases the system then determines whether the verification environment can activate the faulty code, propagate the effects to an observable point and detect the error(s).

- The ***fault model analysis phase*** analyzes the HDL design and selects the mutations to be induced.
- The ***fault activation phase*** runs a complete regression simulation and analysis of the behavior of the verification environment with respect to the mutations.
- The ***fault detection phase*** runs selected tests from the verification environment to measure the ability of the verification environment to detect the mutations.

The Certitude system uses proprietary technology to achieve high detection levels with a small number of regression runs instead of applying the entire verification suite to each mutation.



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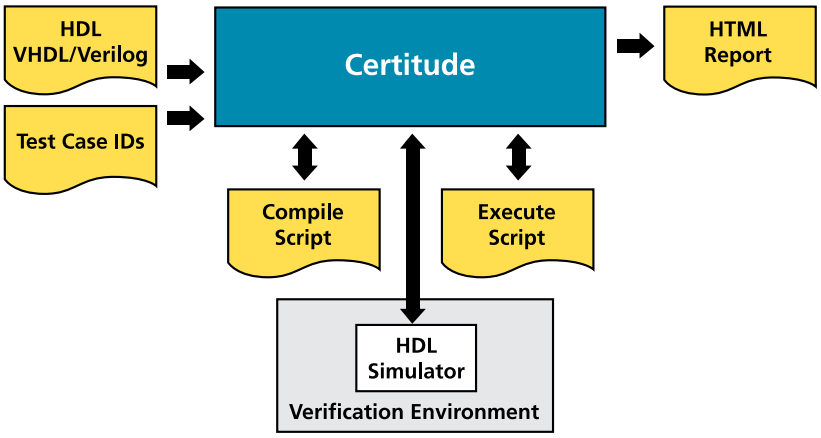
Interoperability

The Certitude system is tightly integrated with the most commonly used commercial simulators and is easy to integrate into existing functional verification flows. It is fully compatible with all current verification methodologies such as directed random stimulus generation and assertion-based approaches.



The Certitude Functional Qualification System removes the uncertainty of the effectiveness of your verification environment. Its unique automation technology objectively measures the quality of your verification environment and helps to identify weaknesses. The Certitude system is interoperable with existing verification tools and easy to integrate into your current flow providing even greater efficiency. The Certitude Functional Qualification System is yet another way that SpringSoft is Accelerating Engineers.

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