Tools for the Analysis of Simulation Dumps and the Evaluation of Burn-In Techniques

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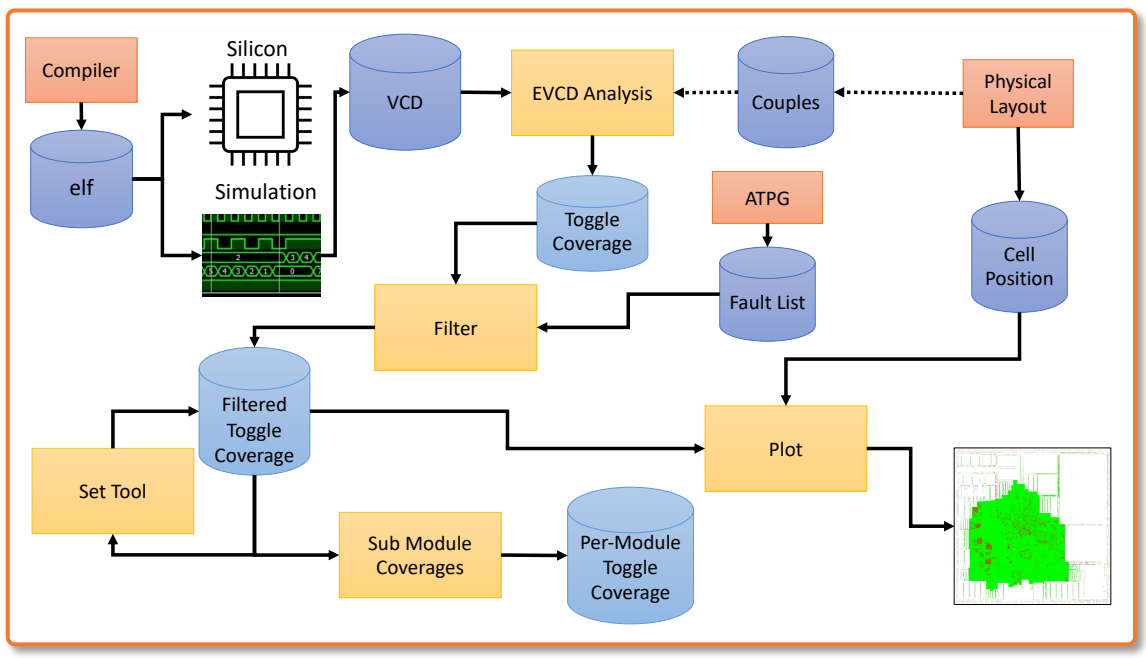
In this work, we present a toolchain designed with performance in mind for the analysis of simulation dumps, including toggle statistics, redundancy filtering, verifying the usefulness, and merging different simulations and plotting the results. It can be expanded if needed and is optimized for speed and memory usage.



EVCD analysis and Filter Tools

Given an EVCD file resulting from a simulation, the analyzer performs:

- Toggle coverage analysis (Statistical and Extended)
- Multiple-point stress metrics analysis

The Statistical toggle coverage analysis is used to assess the controllability of the circuit on the SoC. Results are later filtered for avoiding redundancy of gates and buses.

The Multiple-point stress metrics can assess the controllability of a couple of neighbor gates, implying a causality effect.

We will focus on the Statistical analysis.

Set Tool

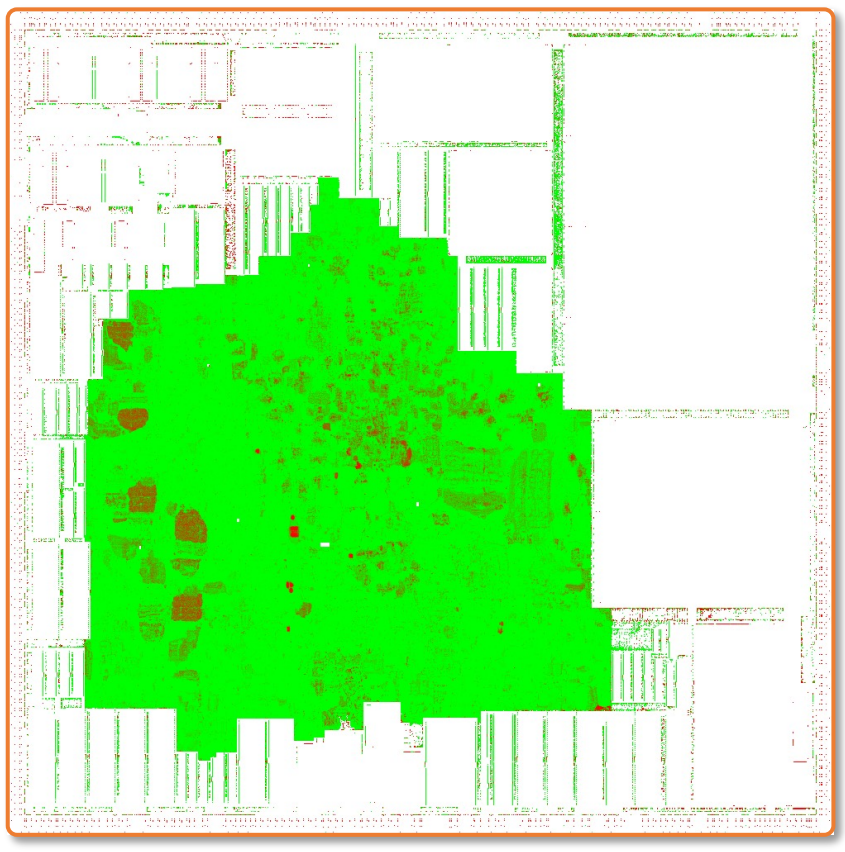
Given a set of results from the analysis and filtering, the set tool provides:

- A display of a confusion matrix showing the percentage of unique toggle coverage for each file.
- A set of files showing unique toggles for each gate or bus.
- A set of files grouping gates and buses by number of toggles up and down.
- A single merged coverage file, providing the overall coverage.

Plot and Sub Module Coverages Tools

Given the mapping of buses and gates into cells, it plots the toggle coverage for each one of them.

The Sub Module Coverages tool provides the coverage for selected sections in the results. It shows agglomerate information of different approaches on specific sectors of the circuit.



Conclusions

We propose a toolchain for Burn-In metrics based on post-processing of the simulation results.

This toolchain is flexible and uses an internal standard file to pass data, allowing to add more and more tools if needed.

We carefully optimized the most critical tools for speed and memory, reducing the time needed for the evaluation from days to hours.