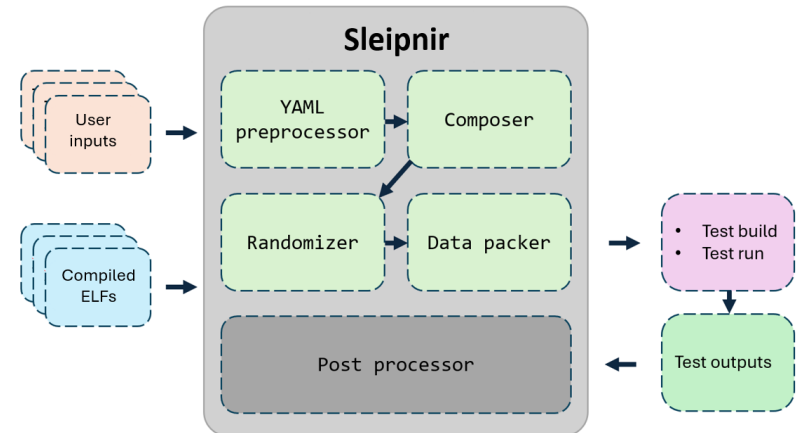


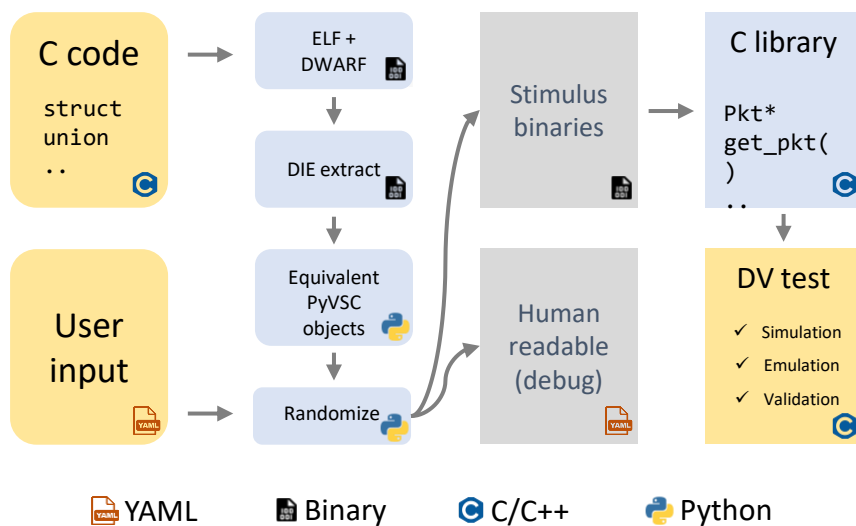
MOTIVATION

- Low level software-based tests are increasingly used for functional verification of complex SOC's.
- Stimulus randomization for C/C++ tests continues to be a challenge.
- We present a *python library* that can randomize complex C/C++ data types based on constraints and distributions and a *C++ library* to efficiently consume it.
- Proven to save developer time and improve verification quality.

OVERVIEW



KEY IDEA



EXAMPLE

```
#include <stdio.h>
// Define the Frame struct
struct Frame {
    int width;
    int height;
    int depth;
    int count;
};

sleipnir:
num_frames: 8
constraints_frames:
    small_height: frame.height < 128
    odd_width_only: frame.width[0] == 1
```

C test

```
INIT_TEST()

RUN_TEST()
frame* fr =
get_next_frame()
push_q(fr)

CLEANUP_TEST()
..
```

RESULTS

Successfully used by SS and SoC level DV teams for multiple projects.
Top 3 outcomes with their corresponding impact listed below:

Outcome	Impact
Enable complex constraints that dictate generation of valid, randomized samples of C data types.	10x more randomized test cases in end-end test cases.
Enable efficient C++ tests to exercise the design that work in simulation emulation and validation platforms.	35% reduction in simulation time due to efficient tests.
Help maintain single source of truth (SSOT) across software and DV teams.	60% lesser turn around time for DV tests when design changes

REFERENCES

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