

1st Competition on Software Testing

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Supported by:



The content of this presentation is available in the description of Test-Comp:

https://doi.org/10.1007/978-3-030-17502-3_11

Motivation - Goals

1. Community suffers from unreproducible results
→ Establish set of benchmarks
2. Publicity for tools that are available
→ Provide state-of-the-art overview
3. Support the development of verification tools
→ Give credits and visibility to developers
4. Establish standards
→ Specification language, Test-suites,
Benchmark definitions, Validators

Schedule of Sessions

Session 1:

- ▶ Competition Report, by organizer
- ▶ System Presentations, 10 min by each team
- ▶ Short discussion

Session 2:

- ▶ Open Jury Meeting, Community Discussion, moderated by organizer

Three Steps – Three Deadlines:

- ▶ Benchmark submission deadline
- ▶ System submission
- ▶ Notification of results (approved by teams)

Test Problem

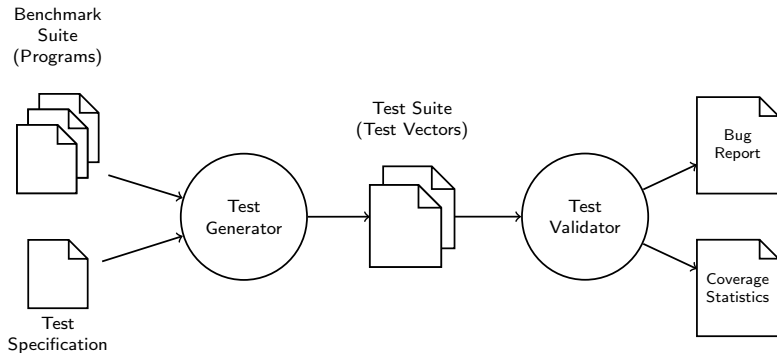
Input:

- ▶ C program → GNU/ANSI C standard
- ▶ Test Specification:
 - Coverage of function call
 - Branch coverage

Output:

- ▶ Test suite

Flow of the Test-Comp execution



Machines (1000 \$ consumer machines):

- ▶ CPU: 3.4 GHz 64-bit Quad-Core CPU
- ▶ RAM: 33 GB
- ▶ OS: GNU/Linux (Ubuntu 18.04)

Resource limits:

- ▶ 15 GB memory
- ▶ 15 min CPU time

Scoring Schema (2019)

Common principles: Ranking measure should be

- ▶ easy to understand
- ▶ reproducible
- ▶ computable in isolation for one tool

Test-Comp:

- ▶ Coverage of call to function: 1 point or 0 points
- ▶ Coverage of branches: gcov coverage value (between 0 and 1)

Jury:

- ▶ Team: one member of each participating candidate
- ▶ Term: one year (until next participants are determined)

Systems:

- ▶ All systems are available in open GitLab repo
- ▶ Configurations and Setup in GitHub repository
→ Integrity and reproducibility guaranteed

9 Competition Candidates

Qualification:

- ▶ 9 Qualified
- ▶ One person can participate with different tools
- ▶ One tool can participate with several configurations (frameworks, no tool-name inflation)

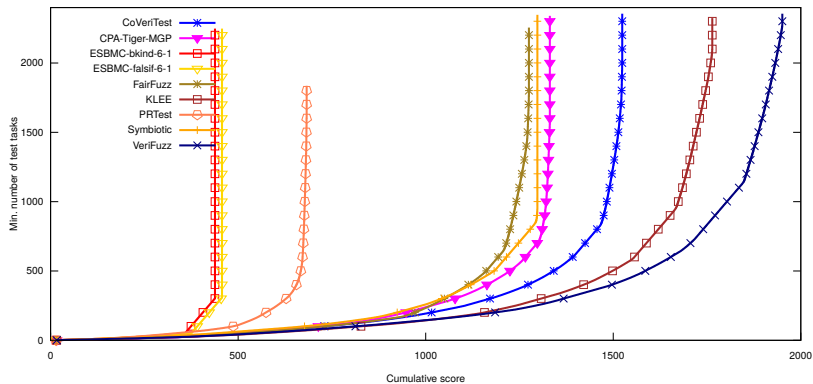
Benchmark quality:

- ▶ Community effort, documented on GitHub

Role of organizer:

- ▶ Just service: Advice, Technical Help, Executing Runs

Results – Example: Overall



Open Issues for Test-Comp 2020

- ▶ License
- ▶ More programs

Thanks to:

- ▶ Jury (10 people)
- ▶ Participants
- ▶ Sponsors: LMU Munich



Additional material follows ...

Benchmark Definition

```
<?xml version="1.0"?>
<!DOCTYPE benchmark PUBLIC "-//IDN sosy-lab.org//DTD BenchExec benchmark 1.9//EN"
"http://www.sosy-lab.org/benchexec/benchmark-1.9.dtd">
<benchmark tool="cpachecker" timelimit="15 min" hardtimelimit="16 min"
  memlimit="15 GB" cpuCores="8">
<require cpuModel="Intel Xeon E3-1230 v5 @ 3.40 GHz" cpuCores="8"/>
<resultfiles >*.graphml</resultfiles >
<option name="-svcomp19"/>
<option name="-heap" >10000M</option>
<option name="-benchmark"/>
<option name="-timelimit" >900 s</option>
<rundefinition name="sv-comp19-prop-reachsafety">
<tasks name="ReachSafety-Arrays">
<includesfile >../sv-benchmarks/c/ReachSafety-Arrays.set</includesfile >
<propertyfile >../sv-benchmarks/c/properties/unreach-call.prp</propertyfile >
</tasks>
<tasks name="ReachSafety-BitVectors">
<includesfile >../sv-benchmarks/c/ReachSafety-BitVectors.set</includesfile >
<propertyfile >../sv-benchmarks/c/properties/unreach-call.prp</propertyfile >
</tasks>
```


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