

# The Static Analyzer Infer in SV-COMP

Competition Contribution

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INFER:

<https://fbinfer.com/>

INFER-SV:

<https://gitlab.com/sosy-lab/software/infer-sv>

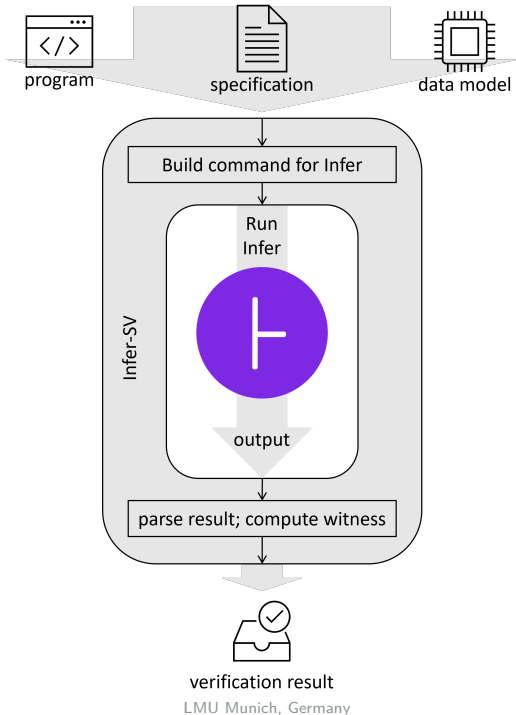
Tool Paper for more information:



- ▶ Used by large companies.
  - ▶ No recorded numbers on soundness and precision.
- ⇒ Perform objective comparison.



- ▶ Created at Facebook.
- ▶ Static analysis framework.
- ▶ Supports various languages: C, Objective-C, Java, ...
- ▶ Purpose: incremental results in CI.



# Imprecisions of INFER

Adaptions for reachability analysis:

- ▶ Insufficient native support for reachability.
- ▶ Developers suggest to deliberately inline overflow errors to error locations.

# Imprecisions of INFER

```
int main() {  
    if (0) {  
        int x = 0x7fffffff + 1;  
    }  
}
```

INFER correctly reports safety

```
void reach_error() {  
    int x = 0x7fffffff + 1;  
}  
int main() {  
    if (0) {  
        reach_error();  
    }  
}
```

INFER incorrectly reports an alarm

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```

INFER incorrectly reports an alarm

⇒ INFER-SV inlines calls to error functions.



# Imprecisions of INFER

```
int main() {  
    int x = 0x7fffffff;  
    int y = -1;  
    while (x > 0) {  
        x = x - 2*y;  
    }  
}
```

INFER correctly reports an alarm

```
int main() {  
    int x = 0x7fffffff;  
    int y = -1;  
    while (x > 0) {  
        x = x - 2*y;  
        y = y + 2;  
    }  
}
```

INFER incorrectly reports safety

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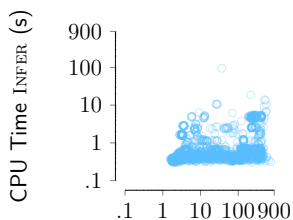
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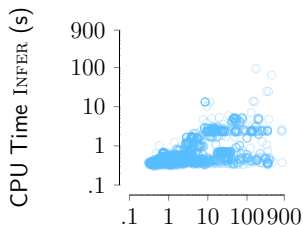
INFER incorrectly reports safety

⇒ Still a problem.

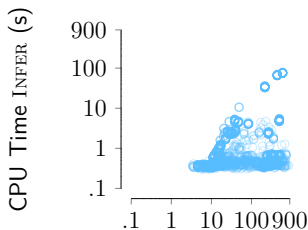
# INFER Run-Time Comparison



CPU Time CPACHECKER (s)



CPU Time SYMBIOTIC (s)



CPU Time VERIABS (s)

# Conclusion

- ▶ Very fast but often imprecise.
- ▶ Highly configurable framework.

# Final Results

	correct	incorrect	$\Sigma$
true	469	365	834
false	9	5891	5900
$\Sigma$	478	6256	6734

Correct and incorrect verification results<sup>1</sup>.

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<sup>1</sup><https://sv-comp.sosy-lab.org/2022/results/results-verified/infer.results.SV-COMP22.All.table.html>