

THETA: Portfolio of CEGAR-based analyses

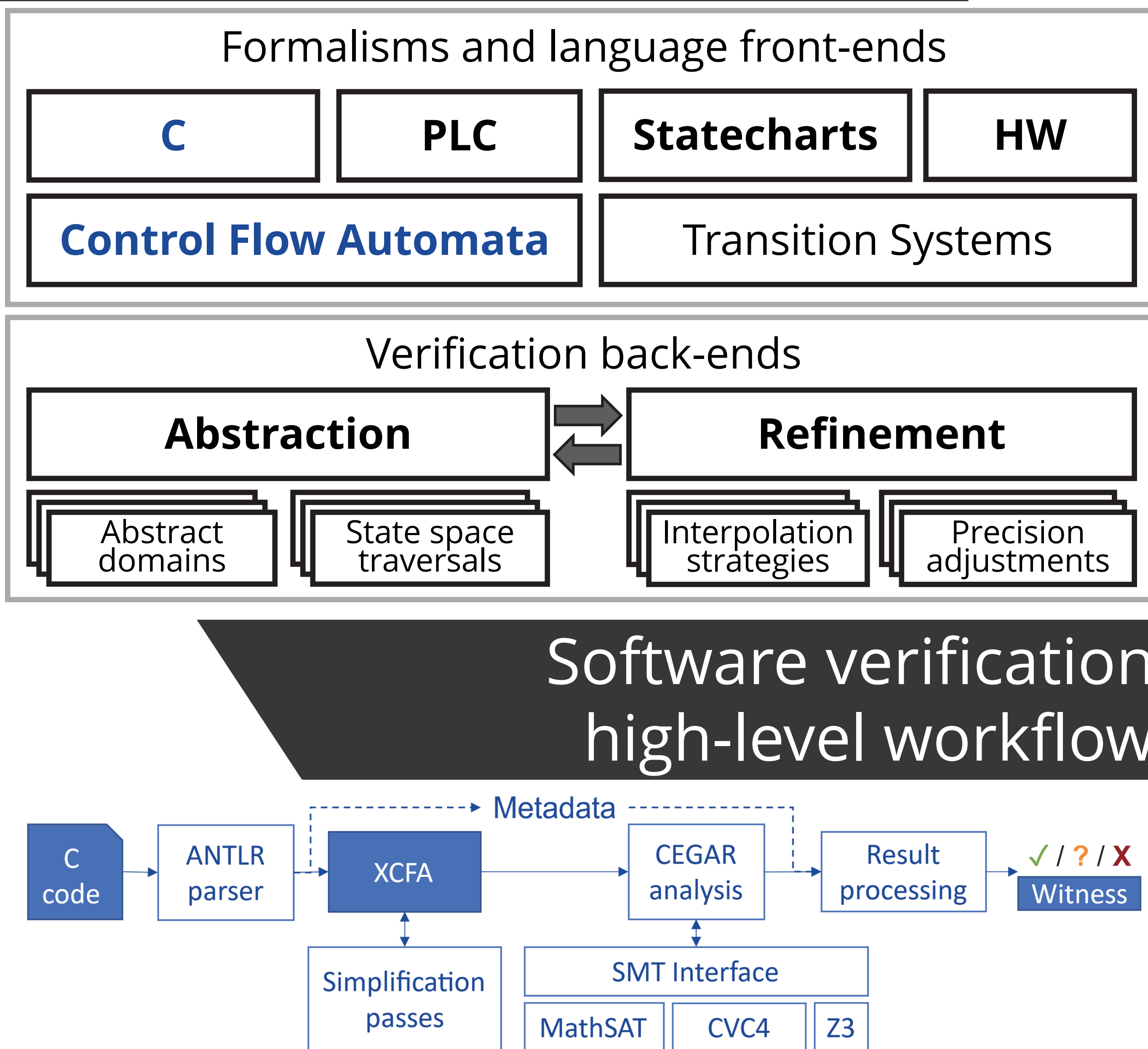


Software Architecture

Portfolio & Algorithm Selection

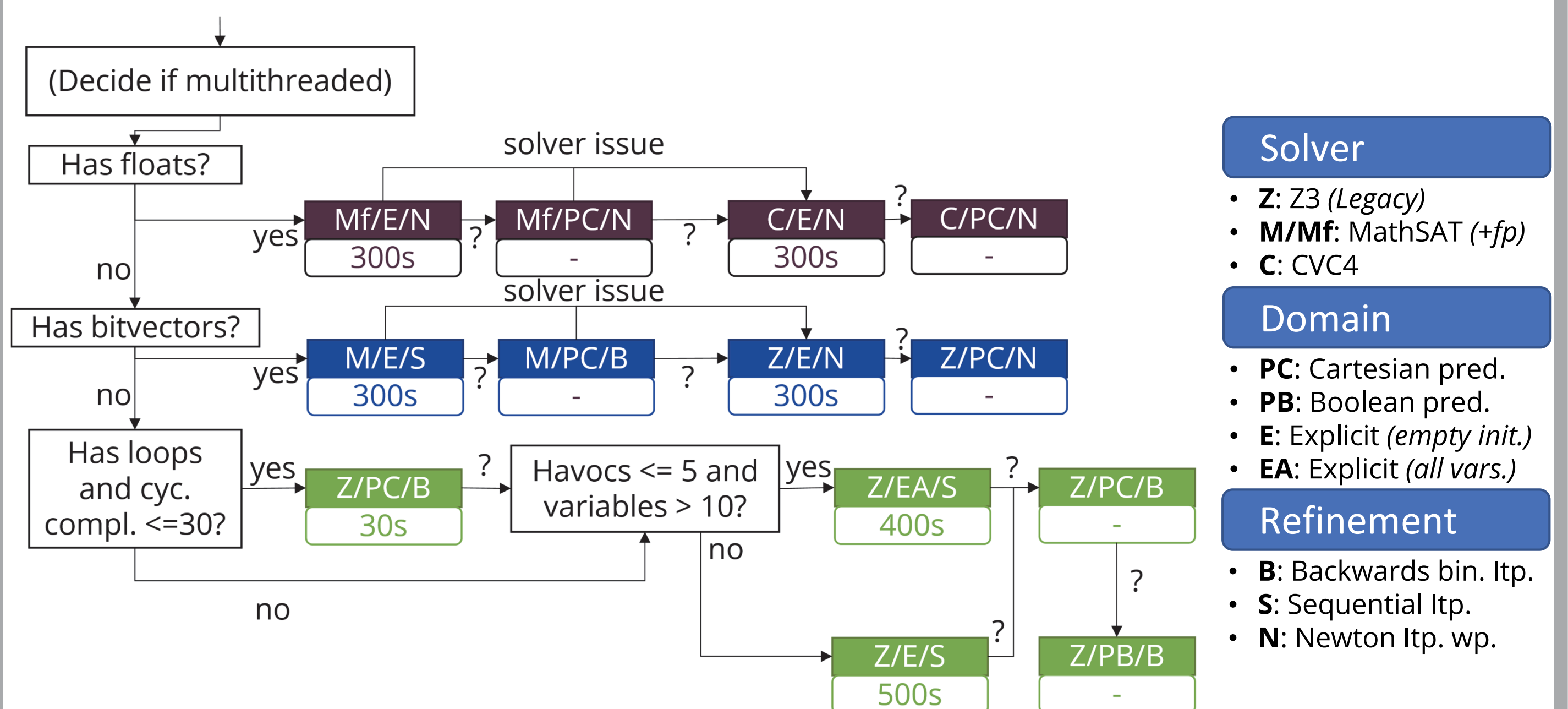
Efficient, domain-specific verification

Generic, modular and configurable framework



Dynamic and adaptive verification

Utilizing the most adept configuration candidates



Efficient verification of challenging problems

- **Novel** algorithms
- **Well-grounded** approaches
- Continuous **academic** development
- Theoretical **advancements** for practical **results**



github.com/ftsrg/theta

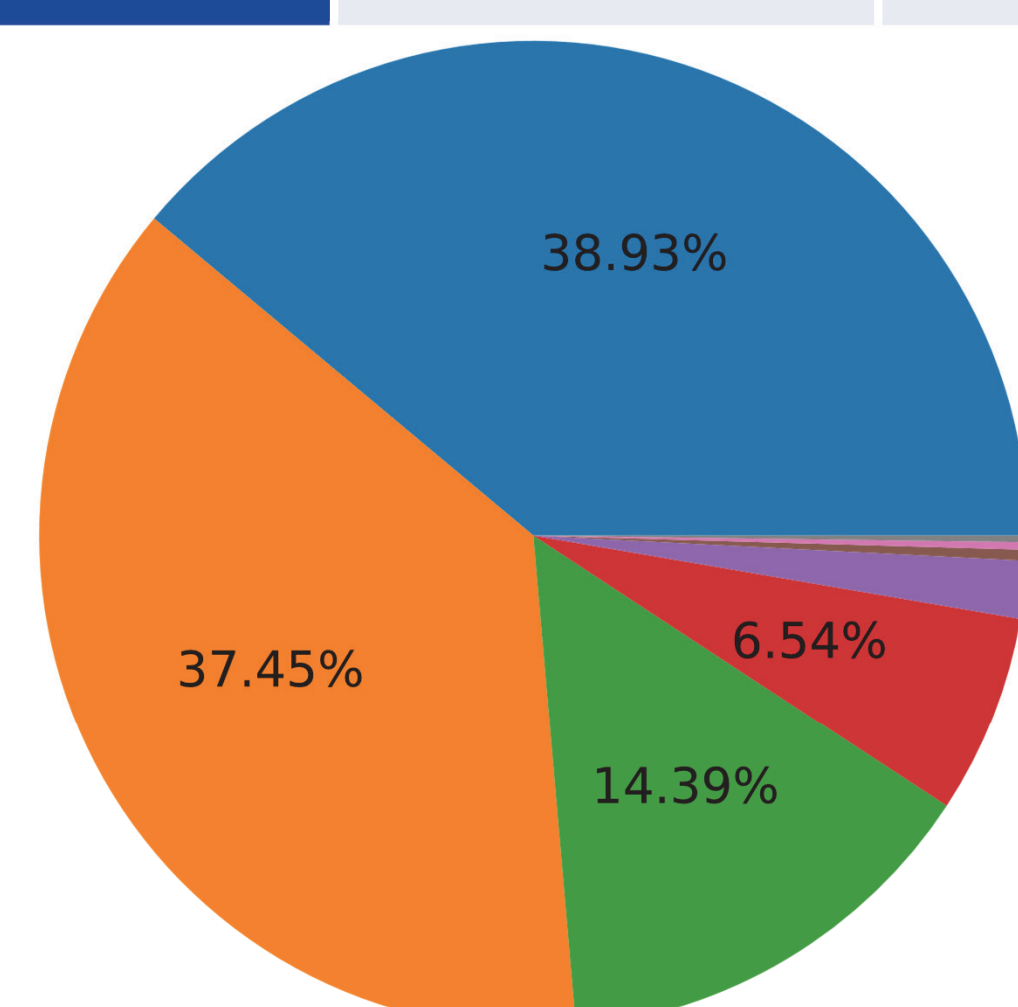
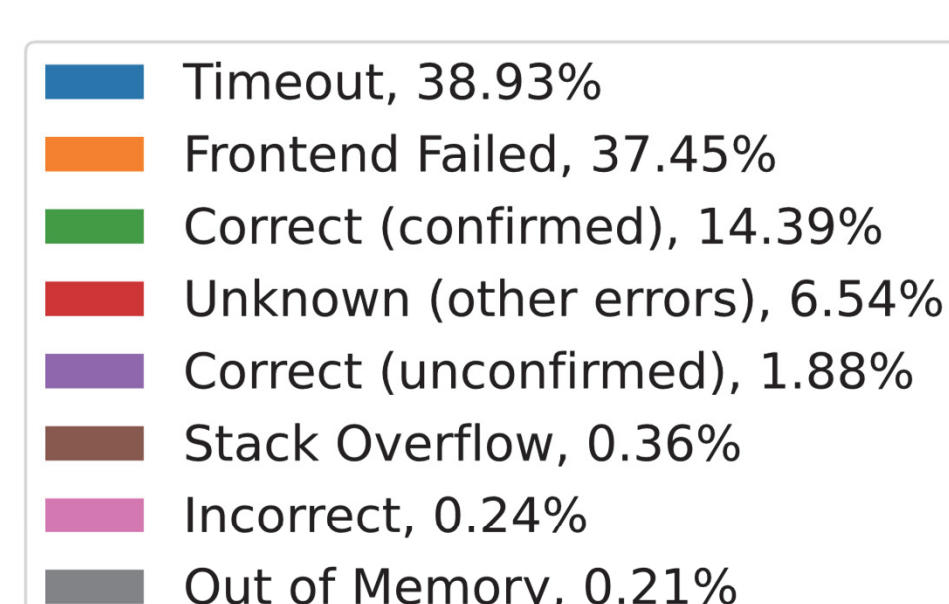
Competition results and real-life applications

Overall	Safe	Unsafe
True	541 (563)	4
False	11	346 (440)

Raw score: **1124**

Concurrency	Safe	Unsafe
True	17	0
False	5	32 (41)

ReachSafety	Safe	Unsafe
True	524 (546)	4
False	6	314 (399)



PLCVerif

- Verification of **PLC** programs
- Encode **industrial control code** as CFA

- Verify **engineering models**
- Encode **SysMLv2** models as transition systems

Gamma



- [1] Tóth, T., Hajdu, A., Vörös, A., Micskei, Z., Majzik, I.: Theta: A framework for abstraction refinement-based model checking. In: Proc. FMCAD. pp. 176–179 (2017). <https://doi.org/10.23919/FMCAD.2017.8102257>
- [2] Ádám, Z., Bajczi, L., Dobos-Kovács, M., Hajdu, Á., Molnár, V. (2022). THETA: portfolio of CEGAR-based analyses with dynamic algorithm selection (Competition Contribution). In: Fisman, D., Rosu, G. (eds) Tools and Algorithms for the Construction and Analysis of Systems. TACAS 2022. Lecture Notes in Computer Science, vol 13244. Springer, Cham. https://doi.org/10.1007/978-3-030-99527-0_34
- [3] Hajdu, Á., Micskei, Z. Efficient Strategies for CEGAR-Based Model Checking. J Autom Reasoning 64, 1051–1091 (2020). <https://doi.org/10.1007/s10817-019-09535-x>

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