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# CPACHECKER

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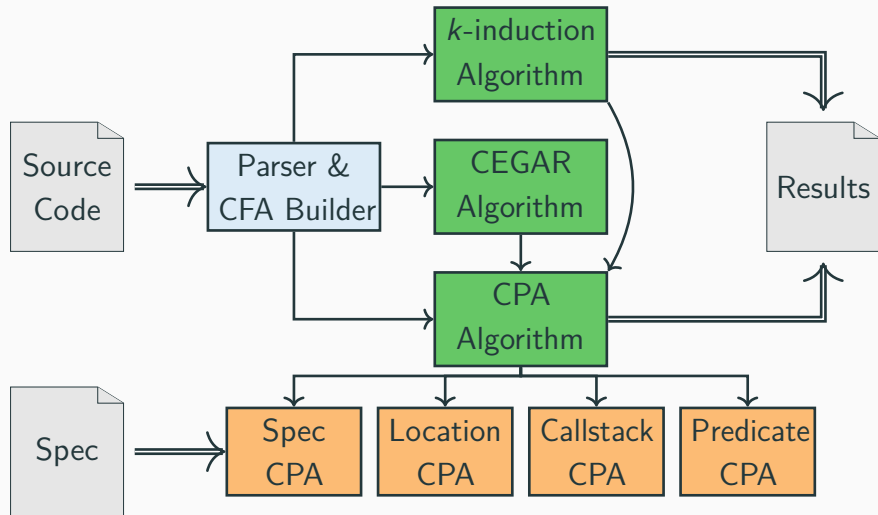
# Overview

CPACHECKER is a modern and versatile framework for building software-verification and witness-validation analyses.

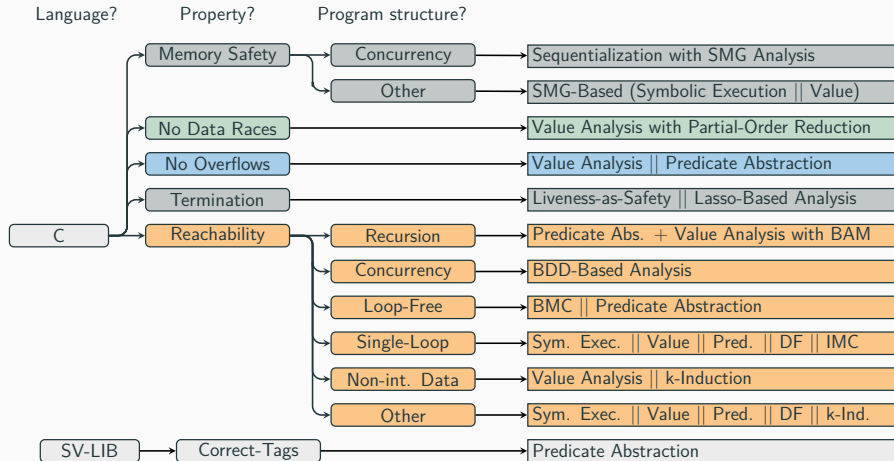
- supports all SV-COMP properties and categories of C programs
- can validate all witness types and formats
- utilizes many different algorithms



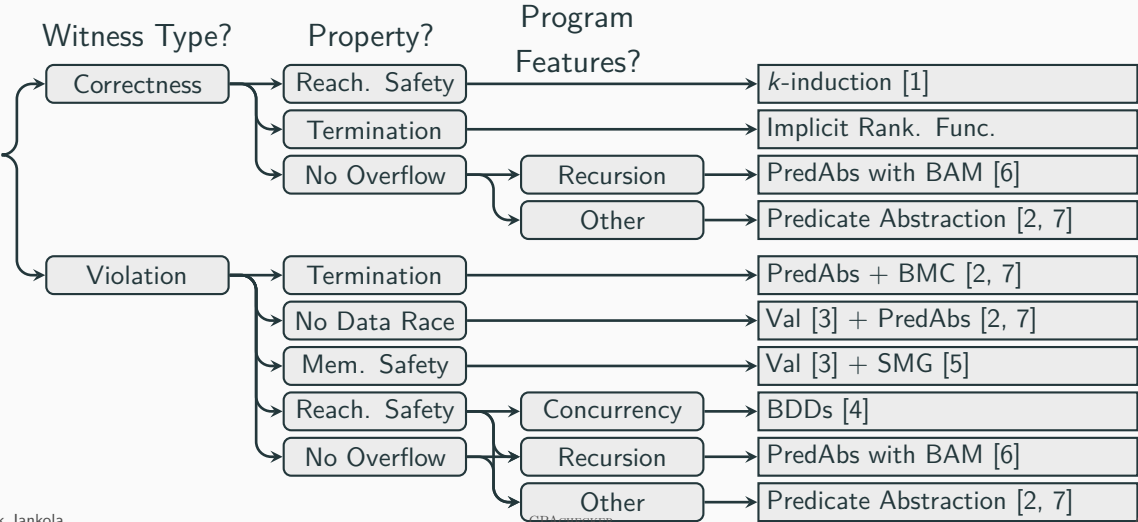
# Architecture

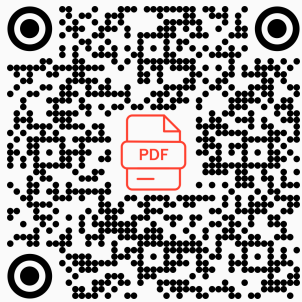


# Strategy Selection: Verification



# Strategy Selection: Validation

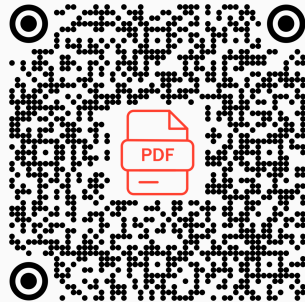




CPACHECKER tutorial  
paper

New this year:

- support for SV-LIB
- validation for  
(non-)termination  
witnesses
- improved concurrency  
analyses



CPACHECKER validator  
paper

## References i

- [1] Beyer, D., Dangl, M., Wendler, P.: Boosting k-induction with continuously-refined invariants. In: Proc. CAV. pp. 622–640. LNCS 9206, Springer (2015). [https://doi.org/10.1007/978-3-319-21690-4\\_42](https://doi.org/10.1007/978-3-319-21690-4_42)
- [2] Beyer, D., Keremoglu, M.E., Wendler, P.: Predicate abstraction with adjustable-block encoding. In: Proc. FMCAD. pp. 189–197. FMCAD (2010), [https://www.sosy-lab.org/research/pub/2010-FMCAD.Predicate\\_Abstraction\\_with\\_Adjustable-Block-Encoding.pdf](https://www.sosy-lab.org/research/pub/2010-FMCAD.Predicate_Abstraction_with_Adjustable-Block-Encoding.pdf)
- [3] Beyer, D., Löwe, S.: Explicit-state software model checking based on CEGAR and interpolation. In: Proc. FASE. pp. 146–162. LNCS 7793, Springer (2013). [https://doi.org/10.1007/978-3-642-37057-1\\_11](https://doi.org/10.1007/978-3-642-37057-1_11)

## References ii

- [4] Beyer, D., Stahlbauer, A.: BDD-based software model checking with CPACHECKER. In: Proc. MEMICS. pp. 1–11. LNCS 7721, Springer (2013).  
[https://doi.org/10.1007/978-3-642-36046-6\\_1](https://doi.org/10.1007/978-3-642-36046-6_1)
- [5] Dudka, K., Peringer, P., Vojnar, T.: Byte-precise verification of low-level list manipulation. In: Proc. SAS. pp. 215–237. LNCS 7935, Springer (2013).  
[https://doi.org/10.1007/978-3-642-38856-9\\_13](https://doi.org/10.1007/978-3-642-38856-9_13)
- [6] Friedberger, K.: CPA-BAM: Block-abstraction memoization with value analysis and predicate analysis (competition contribution). In: Proc. TACAS. pp. 912–915. LNCS 9636, Springer (2016).  
[https://doi.org/10.1007/978-3-662-49674-9\\_58](https://doi.org/10.1007/978-3-662-49674-9_58)

- [7] Henzinger, T.A., Jhala, R., Majumdar, R., McMillan, K.L.: Abstractions from proofs. In: Proc. POPL. pp. 232–244. ACM (2004).  
<https://doi.org/10.1145/964001.964021>