
# Bubaak

## Dynamic Cooperative Verification

*Marek Chalupa* and Cedric Richter

May 5, 2025, SV-COMP'25

# About Bubaak

- Bubák = ,,boogeyman” in czech
- Created to frighten my PhD supervisor’s students (= Symbiotic team)
- But performs ok-ish also in SV-COMP



(Source: generated by Chat-GPT :)

# Dynamic cooperative verification

- Multiple tools cooperate on verification of a program

# Dynamic cooperative verification

- Multiple tools cooperate on verification of a program
- Tools can be dynamically invoked or destroyed based on the *state of verification*

# Dynamic cooperative verification

- Multiple tools cooperate on verification of a program
- Tools can be dynamically invoked or destroyed based on the *state of verification*
  - E.g., when a new reachable location or state is discovered, or
  - a tool has no progress.

# Dynamic cooperative verification

- Multiple tools cooperate on verification of a program
- Tools can be dynamically invoked or destroyed based on the *state of verification*
  - E.g., when a new reachable location or state is discovered, or
  - a tool has no progress.
- Tools share their findings continuously in real-time

# Architecture of Bubaak

- Every verifier (but also compilers and other programs) is a *task*

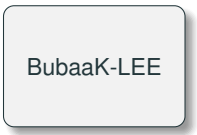
# Architecture of Bubaak

- Every verifier (but also compilers and other programs) is a *task*
- When a task finishes, it either yields a result or it *rewrites* itself into a new task(s).

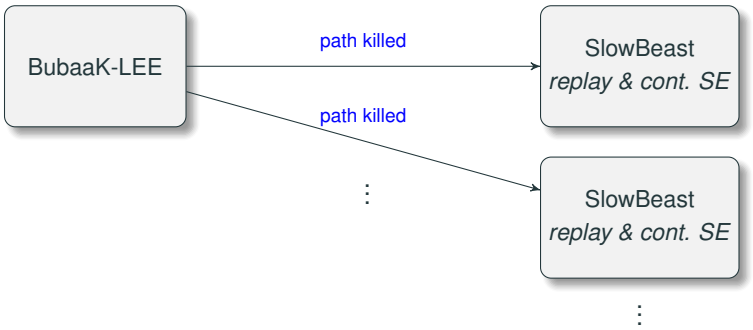
# Architecture of Bubaak

- Every verifier (but also compilers and other programs) is a *task*
- When a task finishes, it either yields a result or it *rewrites* itself into a new task(s).
- Tasks emit events that other tasks can listen to
  - a task started, finished
  - lines on `stdout` or `stderr`
  - invariants, reached states – requires instrumentation of the tools

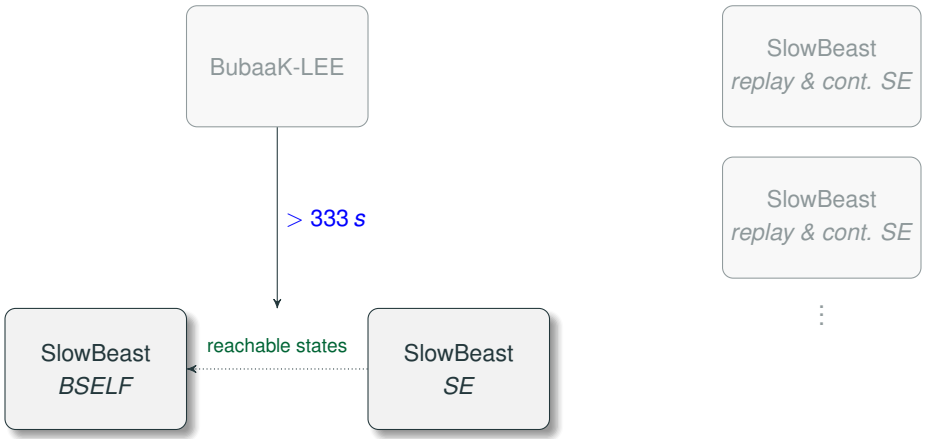
# Bubaak at SV-COMP'25 (ReachSafety)



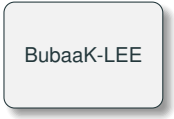
# Bubaak at SV-COMP'25 (ReachSafety)



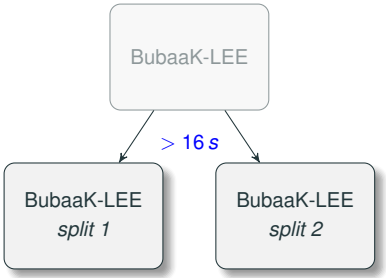
# Bubaak at SV-COMP'25 (ReachSafety)



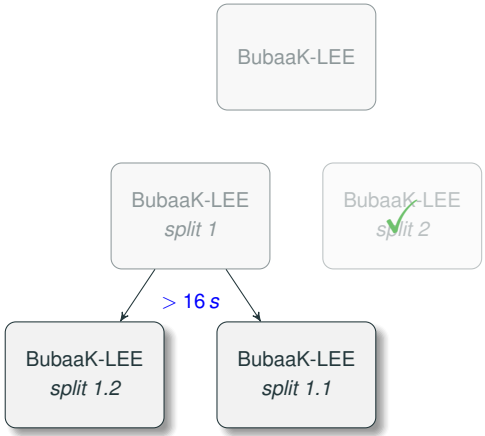
# Bubaak-SpLit at SV-COMP'25 (ReachSafety)



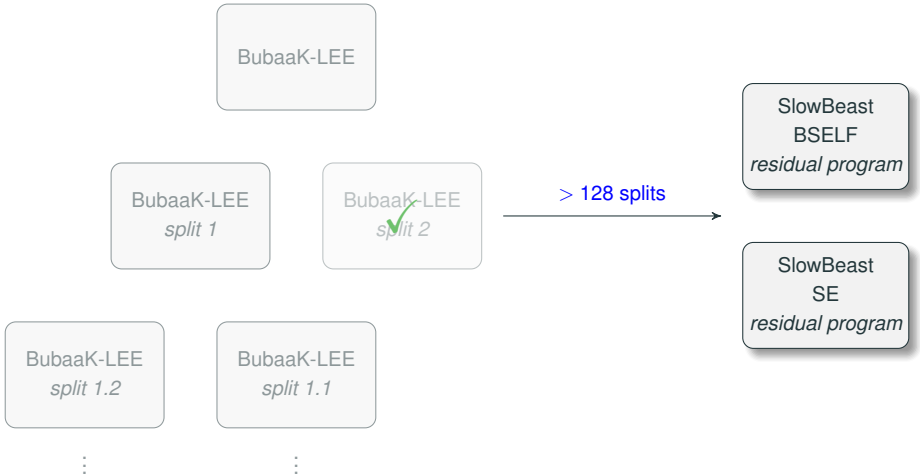
# Bubaak-SpLit at SV-COMP'25 (ReachSafety)



# Bubaak-SpLit at SV-COMP'25 (ReachSafety)



# Bubaak-SpLit at SV-COMP'25 (ReachSafety)




BUBAAK