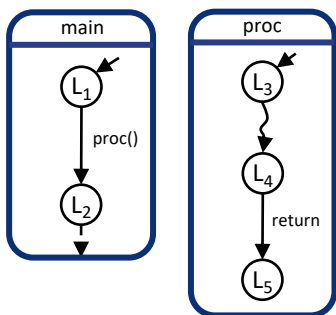


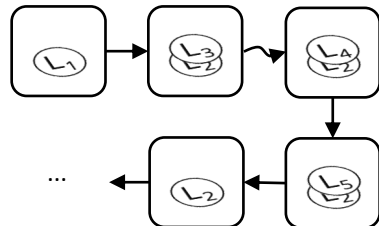
Interprocedural Verification

Verification of programs with procedures:
Location stack is part of the program state

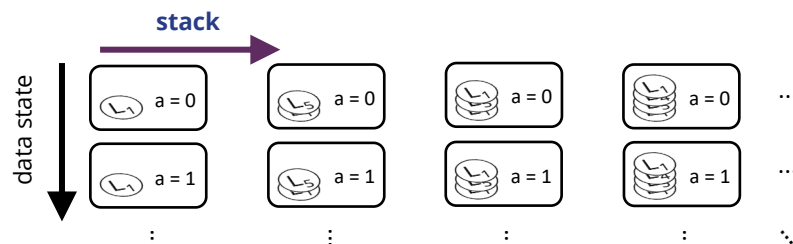
CFA (Control Flow Automata)



ARG with stacks
(Abstract Reachability Graph)



Challenge: further state-space explosion

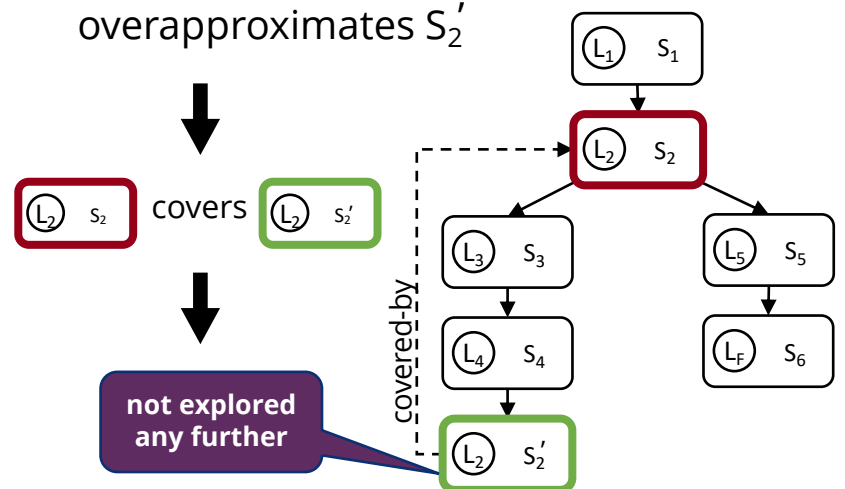


Abstraction-Based Verification

Abstract state: overapproximation of a set of concrete program states.

Covering: reduces size of state-space representation, rules are as follows:

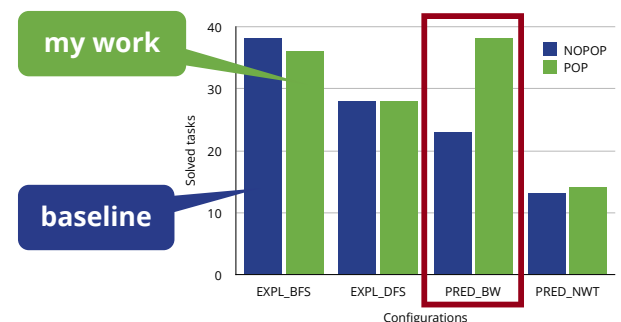
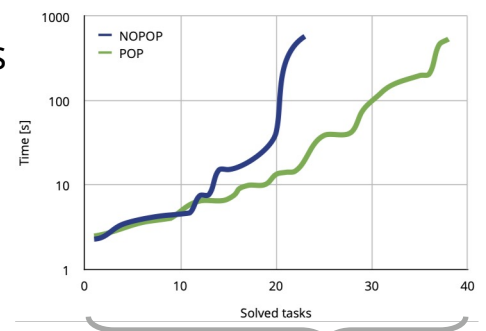
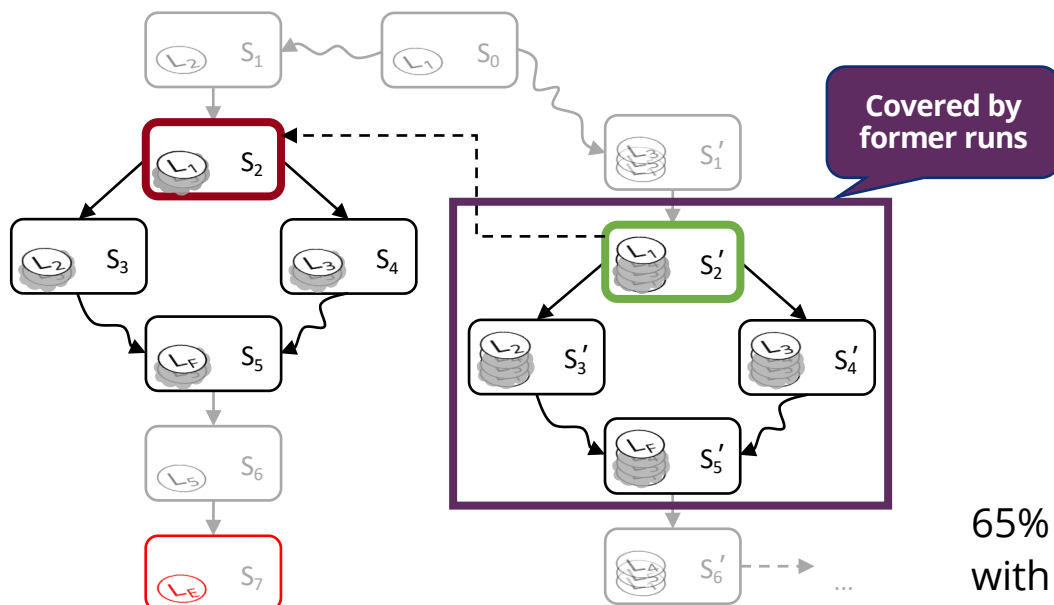
- same locations
- abstract data state S_2 overapproximates S_2'



Extending Covering by Applying Abstraction to Location Stacks

Novel reduction technique for interprocedural verification:

- **Cover relation:** overapproximation only until procedure returns
- **Abstraction** of the **bottom of the location stack**
- exploration continues after the procedure call



65% improvement in verified tasks
with predicate abstraction in **theta**