

Task C — Accelerations and Coverability Sets for VASS Extensions

Grégoire Sutre

LaBRI, CNRS & University of Bordeaux, France

BraVAS Kick-Off — October 2017

C.1. Karp and Miller Algorithm for VAS Extensions

Decomposition Theorem / CEGAR approach for reachability in VAS

⇨ Adherence membership ... ⇨ Boundedness properties

Objectives

- Generalize Karp-Miller to VAS extensions
- Powerful enough to decide the required adherence membership

BVAS, UDPN

- Karp-Miller generalizations proposed in [VGL05] and [HLLLST16]
- (Very-)well structured transition systems [BFGL17]

PVAS

- Basic Karp-Miller adaptation for global boundedness [LPS14]
- Coverability as hard as reachability

C.2. Reachability for VASS Extensions in Small Dimensions

[Karp, Miller 1969]

○ adds (ω, ω) to the marking

[Hopcroft, Pansiot 1979]

○ adds $(2, 5)$ to the periods

Objectives

- Focus on small dimensions (1, 2)
- Try to solve reachability through cycle acceleration

Cycle acceleration used for

- Coverability in 1-PVASS [LST15]
- Reachability in 1-BVASS [GHLT16]

These problems are open in dimension two

Planning

