

# transitivity

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November 1, 2016

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## 1 Resolution steps for transitivity

- Introduce also reachability predicate  $reach(x)$
- Have sets  $\mathcal{R}$  and  $\mathcal{S}$
- initially,  $\{R\}$  is equal to  $\{reach(s)\}$ , where  $s$  is the initial state
- every rule with conclusion  $(M)$  is added to  $\mathcal{R}$ , every rule with conclusion  $(x, y)$  is added to  $\mathcal{S}$
- Add transitivity rule  $seq(x, y) \wedge seq(y, z) \supset seq(y, z)$
- Add also rules  $reach(x) \wedge seq(x, y) \supset reach(y)$  and  $reach(x) \supset seq(x, x)$ .
- All three rules are applied in stages:
  - Let  $R = H \supset C$  be the rule obtained by composition with this particular rule.
  - Let  $\mathcal{C}$  be the set of rules obtained by composing  $R$  with all rules in  $\mathcal{R}$ .
  - Let  $\mathcal{C}'$  be the set of all rules obtained by composing all rule in  $\mathcal{C}$  with all rules in  $\mathcal{S}$  if the original rule has  $seq(x, y)$  as a hypothesis.
  - The set  $\mathcal{C}'$  is the result of the composition with the transitivity rule.

## 2 Modification to translation

To be done.

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