



Jul 8-10:09

3-valued:
 $I = (I_1, F_1)$
 definite knowledge
 undef: undefined
 \Rightarrow some notion of "more knowledge"
 undefined is less knowledge than
 "true" or "false"

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Sl. 614

$I_0 = \emptyset$
 $I_1 = T_{P_0}^L(\emptyset)$

$P_0 = \{ \text{pos} \dots \text{move} \dots$
 $\text{wh}(a) \leftarrow \text{move}(a, b)$
 $\text{wh}(b) \leftarrow \text{move}(b, c)$
 $\text{wh}(c) \leftarrow \text{move}(c, d)$
 $\text{loc}(a) \leftarrow \text{true}$
 $\text{loc}(b) \leftarrow \text{true}$
 $\text{loc}(c) \leftarrow \text{true}$
 $\text{loc}(d) \leftarrow \text{true} \}$

$= \{ \text{wh}(a), \text{wh}(b), \text{wh}(c), \text{loc}(a), \text{loc}(b), \text{loc}(c), \text{loc}(d) \}$

not wh(d)

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$I_2 = T_{P_{I_1}}^L(\emptyset)$

$P_{I_1} = \{ \dots$
 $\text{wh}(c) :- \text{move}(c, d)$
 $\text{loc}(d) :- \text{pos}(d). \}$

$= \{ \text{wh}(c), \text{loc}(d) \}$

underestimate! → definitely true knowledge

$I_3 = T_{P_{I_2}}^L(\emptyset)$

$P_{I_2} = \{ \dots$
 $\text{wh}(a) :- \text{move}(a, b)$
 $\text{wh}(b) :- \text{move}(b, a)$
 ~~$\text{wh}(c) :- \text{move}(b, c)$~~ *not wh(c)*
 ~~$\text{wh}(c) :- \text{move}(c, d)$~~ *not wh(c)*
 $\text{loc}(a) :- \text{true}$
 $\text{loc}(b) :- \text{true}$
 ~~$\text{loc}(c) :- \text{not wh}(c)$~~
 ~~$\text{loc}(d) :- \text{pos}(a), \text{pos}(d)$~~

$= \{ \text{wh}(a), \text{wh}(b), \text{wh}(c), \text{loc}(a), \text{loc}(b), \text{loc}(d) \}$

overestimate

$\Rightarrow \neg \text{wh}(a)$
 $\neg \text{loc}(c)$ is definitely true

$\Downarrow \text{F}$

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$$I_4 = T_{P_{I_3}}^{\omega}(\emptyset)$$

$$P_{I_3} = \{ \dots \}$$

$$= \{ \text{win}(c), \text{lose}(d) \}$$

undezeichnete

= $I_2 \rightarrow$ stop here

$$U_p = \left(\underbrace{\{ \text{win}(c), \text{lose}(d) \}}_T, \{ \neg \text{win}(d), \neg \text{lose}(e) \} \right)$$

$$P_{I_3} = \{ \dots \}$$

$$\text{win}(c) := \text{move}(c, d), \neg \text{win}(d)$$
~~$$\text{lose}(a) := \text{pos}(a), \neg \text{win}(a)$$~~
~~$$\text{lose}(b) := \text{pos}(b), \neg \text{win}(b)$$~~
~~$$\text{lose}(c) := \text{pos}(c), \neg \text{win}(c)$$~~

$$\text{lose}(d) := \text{pos}(d), \neg \text{win}(d) \}$$

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Slide 624:
 Three-valued reduct of $\text{win} + \text{move}$
 for U_p from the previous slide

$P_8 = \{$

- $\text{win}(a) := \text{move}(a, b)$ undef 1) neg's false
- $\text{win}(b) := \text{move}(b, a)$ undef 2) in win/lose a, b
- ~~$\text{win}(b) := \text{move}(b, c), \neg \text{win}(c)$~~ 3) neg's true
- ~~$\text{win}(c) := \text{move}(c, d), \neg \text{win}(d)$~~
- $\text{lose}(a) := \text{pos}(a)$ undef
- $\text{lose}(b) := \text{pos}(b)$ undef
- ~~$\text{lose}(c) := \text{pos}(c), \neg \text{win}(c)$~~
- ~~$\text{lose}(d) := \text{pos}(d), \neg \text{win}(d)$~~ undef

$\} = P_{U_p}$

$T_{P_{U_p}}(\emptyset) \dots$

- $\text{win}(a)$ n
- $\text{win}(b)$ n
- $\text{win}(c)$ t
- $\text{win}(d)$ t
- $\text{lose}(a)$ f
- $\text{lose}(b)$ n
- $\text{lose}(c)$ n
- $\text{lose}(d)$ t

$\dots = T_p^{\omega}$

$$= \left(\{ \text{win}(c), \text{lose}(d) \}, \{ \text{win}(d), \text{lose}(e) \} \right)$$

$= U_p$
 \Rightarrow is stable

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EXERCISES:

- big win - move game from Slide 616:
 - give WP, show ^{3-valued} stability

- big win - move game:

Start AFP computation with

win (f), lose (c), lose (h)

lose (k), win (b)

these are wrong →

these are true →

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Sl. 627:

... two total 3-stable models:

({p(a)} , {q(a)})

({q(a)} , {p(a)})

↑ T ↑ F

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