

Vorlesung 2

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Kapitel 1

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```
sprite( advance (advance (advance (loop [s1,s2,s3,s4,s5,s6])))=
= sprite (advance advance loop [s2,s3,s4,s5,s6,s1])=
= sprite (loop [s4,s5,s6,s1,s2,s3])=
= s4.
```

```
sprite (delay a) = sprite a
advance (delay a) = a
sprite (halfspeed a) = sprite a
advance (halfspeed a) = delayed a
    where
        sprite (delayed a) = sprite a
        advance (delayed a) = halfspeed (advance a)
sprite (doublespeed_e a) = sprite a
advance (doublespeed_e a) = doublespeed_e (advance (advance a))
sprite (doublespeed_o a) = sprite (advance a)
advance (doublespeed_o a) = doublespeed_o (advance (advance (delay a)))
```

1.

$R \subseteq \text{Animation} \times \text{Animation}$ mit $sRt \implies$

i) $\text{sprite}(s) = \text{sprite}(t)$

ii) $\text{advance}(s)R \text{ advance}(t)$

gilt R bisimulation $sRt \implies s = t$.

2 a)

$\forall a. \text{doublespeede}(\text{halfspeed } a) = a$

$R = \{(\text{doublespeede}(\text{halfspeed } a), a) \mid a \in \text{Animation}\}$

Zeige R Bisimulation, $(\text{doublespeede}(\text{halfspeed } a)) R a$

i) $\text{sprite}(\text{doublespeede}(\text{halfspeed } a)) = \text{sprite}(\text{halfspeed } a) = \text{sprite}(a)$

ii) $\text{advance}(\text{doublespeede}(\text{halfspeed } a)) = \text{doublespeed}(\text{advance}(\text{advance}(\text{halfspeed } a))) =$

$\text{doublespeed}(\text{advance}(\text{delayed } a)) = \text{doublespeed}(\text{halfspeed}(\text{advance } a)) R (\text{advance } a)$

$\forall a \text{ doublespeede } a = \text{doublespeedo}(\text{delayed } a)$

$R = \{(\text{doublespeede } a, \text{doublespeedo}(\text{delayed } a)) \mid \forall a \in \text{Animation}\}$

i) $\text{sprite}(\text{doublespeede } a) = \text{sprite}(a) = \text{sprite}(\text{delayed } a) = \text{sprite}(\text{doublespeedo}(\text{delayed } a))$

ii) $\text{advance}(\text{doublespeede } a) = \text{doublespeede}(\text{advance}(\text{advance}(a)))$

$\text{advance}(\text{doublespeedo}(\text{delayed } a)) = \text{doublespeedo}(\text{advance}(\text{advance}(\text{delay } a))) = \text{doublespeedo}(\text{advance } a)$

$R' = R \cup \{(\text{doublespeede}(\text{advance}(\text{advance } a)), \text{doublespeedo}(\text{advance } a)) \mid a \in \text{Animation}\}$

die vorher bewiesenen gelten. Zusätzlich müssen wir zeigen, dass die sprites gleich sind (das advance ist ja genau das, was wir oben bewiesen haben)

i) $\text{sprite}(\text{doublespeede}(\text{advance}(\text{advance } a))) = \text{sprite}(\text{advance}(\text{advance } a))$

$\text{sprite}(\text{doublespeedo}(\text{advance } a)) = \text{sprite}(\text{advance}(\text{advance } a)) \quad \checkmark$