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The Role of Models@Runtime in Self-aware Computing Systems

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Models (@Runtime) of what ?

■ Goals of the self-aware system

- => **Goals@Runtime**
- Targeted state & behaviour

■ Knowledge of the self-aware system

- => **Knowledge@Runtime**
- Current state/behaviour
- “How things work”
- About self, other systems, environment

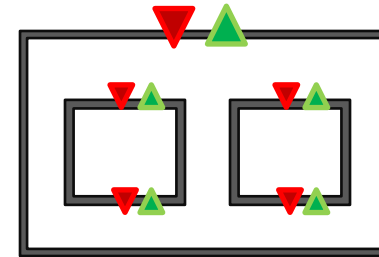
■ Learning, Reasoning and Action plans of the self-aware system (?)

- **ReDesign@R, Integration@Runtime**
- Models of learning, thinking and doing

■ Predictions

- **Imagination@Runtime?**
- Future states / behaviour / contexts

Goals@R Evaluation@R



Knowledge@R
Imagination@R

(Re)Design@R

■ Achieving Goals in self-aware systems:

- Translating and Splitting of User Goal Models into progressively “Lower-level” Goal Models and into Action Models;
- ReDesigning the self-aware system so that lower-level goals can be achieved and lead to user goals;
- Top-down & bottom-up process
Yoyo dynamics

Assumption is at the core of all mess-ups

- Self-aware Computer *has Model*
⇒ Self-aware Computer *thinks it Knows*

- “The greatest enemy of Knowledge is not ignorance, it is the *illusion of knowing*” – Stephen Hawking

- Models can be incomplete, biased and outdated
 - Machine learning => based on limited past experience
 - Externally acquired models => outdated, inapplicable, ...
- ⇒ How does that impact rational decision-making? and action?

Thank you!



Questions?