

Kognitive Architekturen

Kognitive Architekturen

- Begriffsklärung



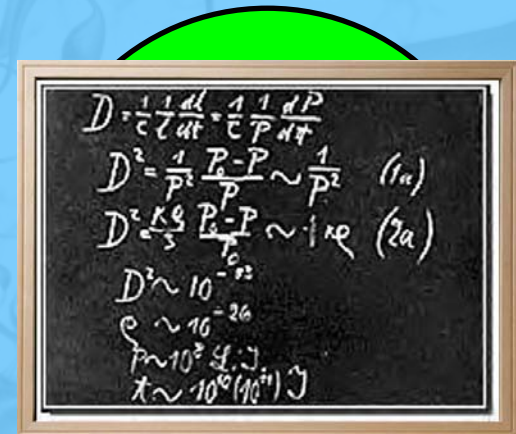
Kognitive Architekturen

- Begriffsklärung
- Ursprung



Kognitive Architekturen

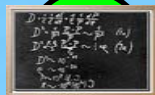
- Begriffsklärung
- Ursprung
- Theorie


$$D = \frac{1}{c} \frac{dL}{dt} = \frac{1}{c} \frac{dP}{dt}$$
$$D^2 = \frac{1}{P^2} \frac{P_0 - P}{P} \sim \frac{1}{P^2} \quad (1a)$$
$$D^2 = \frac{K_0}{c} \frac{P_0 - P}{P} \sim 1 \times e \quad (2a)$$
$$D^2 \sim 10^{-22}$$
$$c \sim 10^{-26}$$
$$P \sim 10^3 \text{ g. J.}$$
$$t \sim 10^8 (10^{11}) \text{ J}$$



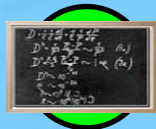
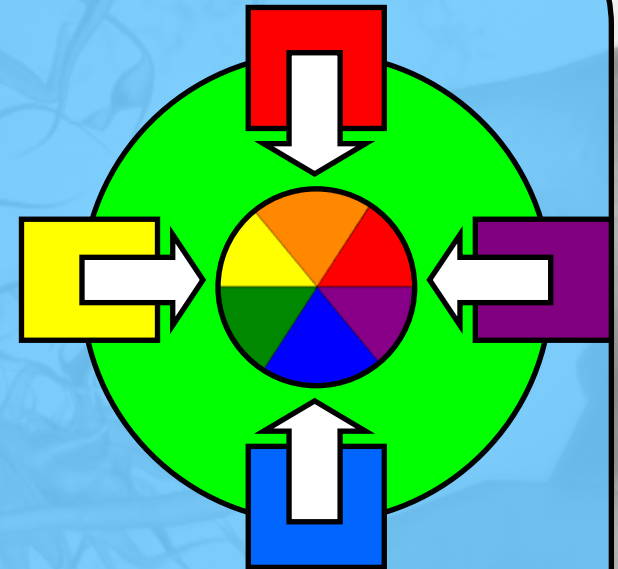
Kognitive Architekturen

- Begriffsklärung
- Ursprung
- Theorie
- Software



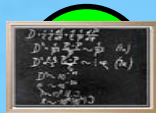
Kognitive Architekturen

- Begriffsklärung
- Ursprung
- Theorie
- Software
- Unified Theorie



Kognitive Architekturen

- Begriffsklärung
- Ursprung
- Theorie
- Software
- Unified Theorie



Kognitive Architekturen

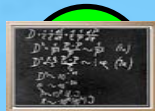
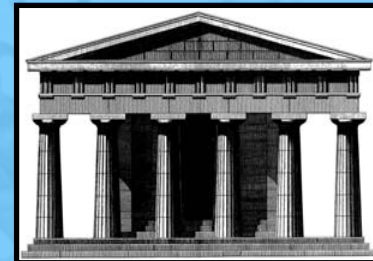
- Kognition

Cognoscere – erkennen



- Architektur

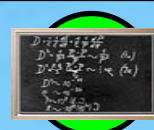
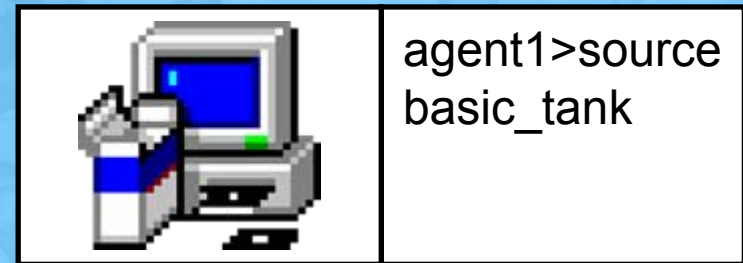
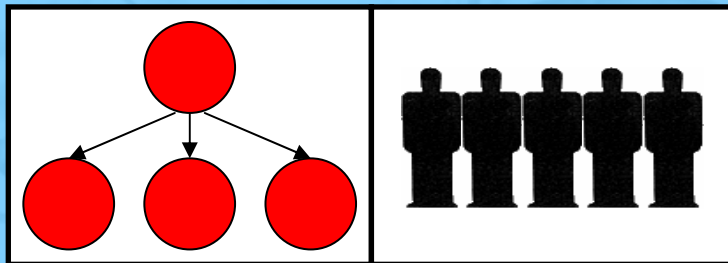
Αρχη – erstes, τεχνη - Handwerk



Etymologie

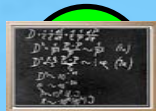
Kognitive Architekturen

Kognitive Architekturen



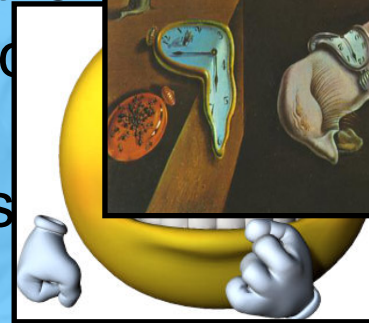
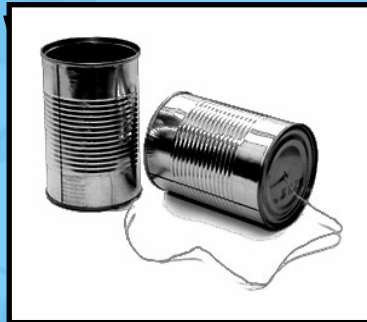
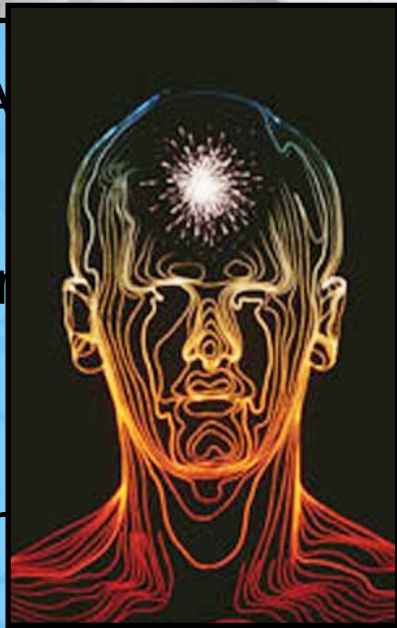
Etymologie

Kognitive Architekturen



Ursprung

Kognitive Architekturen



Erlernen / Reflektion

Sprachen / Kommunikation



Ursprung

Kognitive Architekturen

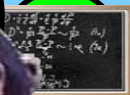


Wissensbasis

- Glaube an Fakten
- Wissen != Verhalten
- wichtiger Bestandteil

Ziele

- Zielorientiertheit
- Versteckte Repräsentation
- Versteckte Verarbeitung



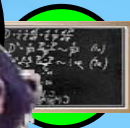
Ursprung

Kognitive Architekturen



„A system is intelligent to the degree that it approximates a knowledge-level system.“

„Intelligence is the ability to use the knowledge the system has in the service of the the system's goals.“



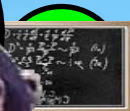
Ursprung

Kognitive Architekturen



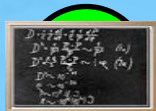
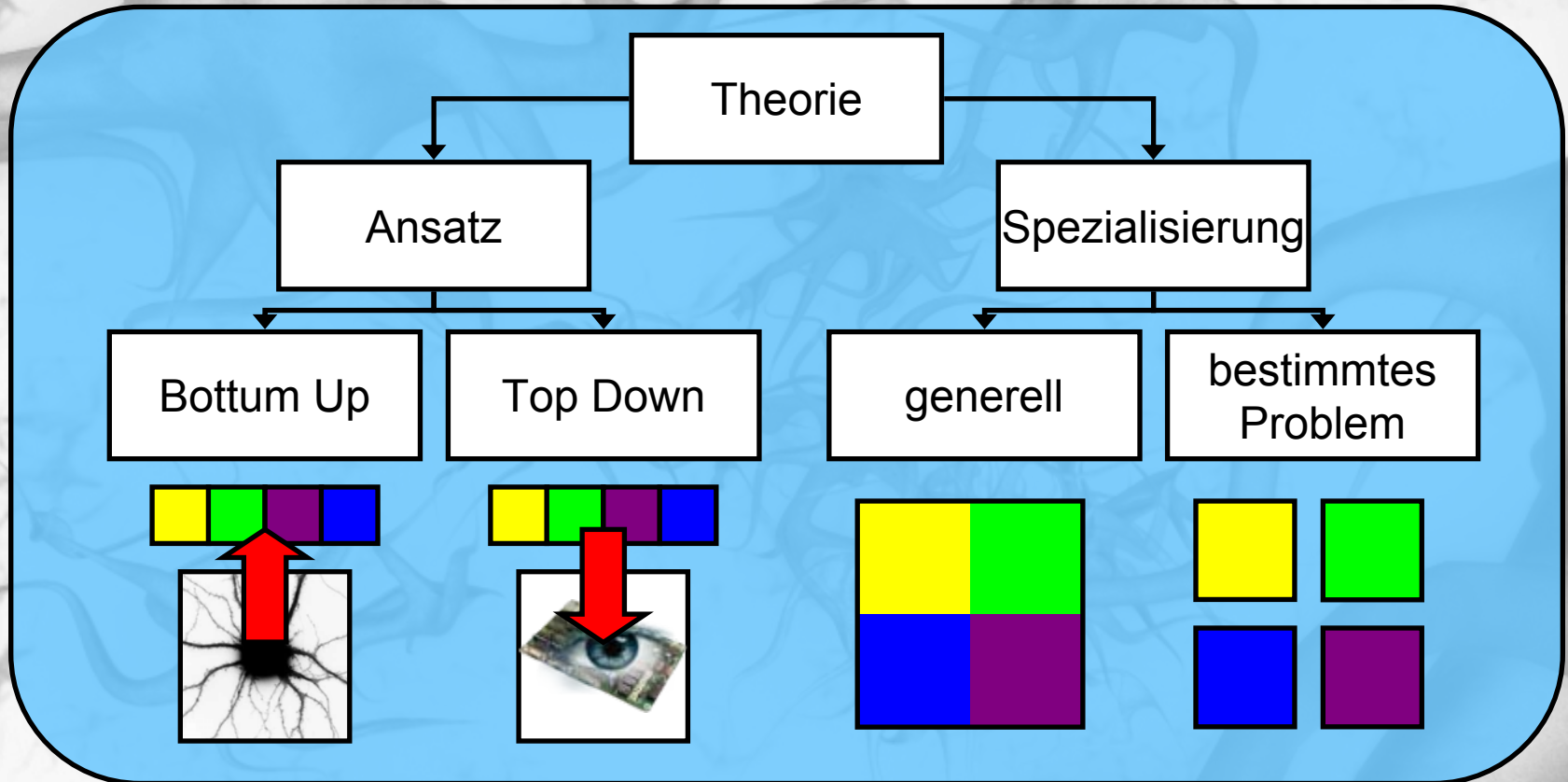
Intelligenz

- Berechenbar?
- Suche
- Problemraum
- eigene Kreation
- Auswahl: Operatoren



Ursprung

Kognitive Architekturen



Theorie

Kognitive Architekturen



Emil Post
* 11.02.1897
† 21.04.1954

Kanonisches System

$V = \{a, b, c\}$

$\$ \rightarrow a\a

$\$ \rightarrow b\b

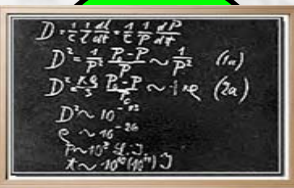
$\$ \rightarrow c\c

$\$ \rightarrow a\a

$\rightarrow ab\$ba$

$\rightarrow abba$

acaaca, abccba, cbbcaacbbc, cabbac, ...



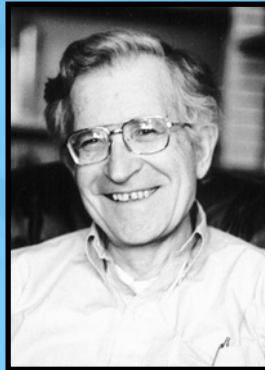
Theorie

Kognitive Architekturen



Andrey
Andreievich
Markov

* 14.06.1903
† 21.04.1979

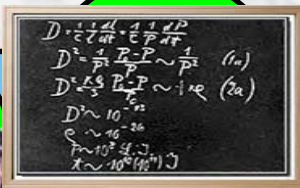


Noam
Chomsky

* 17.12.1928

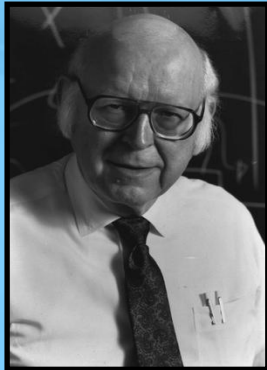
Basis

- Theorie Algorithmen
- Chomsky Hierarchie
- Methoden Psychologie



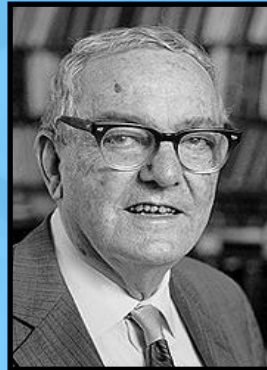
Theorie

Kognitive Architekturen



Allen
Newell

* 19.03.1927
† 19.07.1992

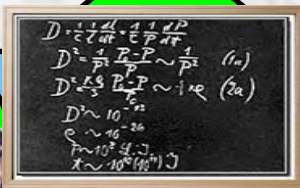


Herbert
Simon

* 15.06.1916
† 09.27.2001

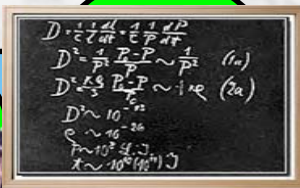
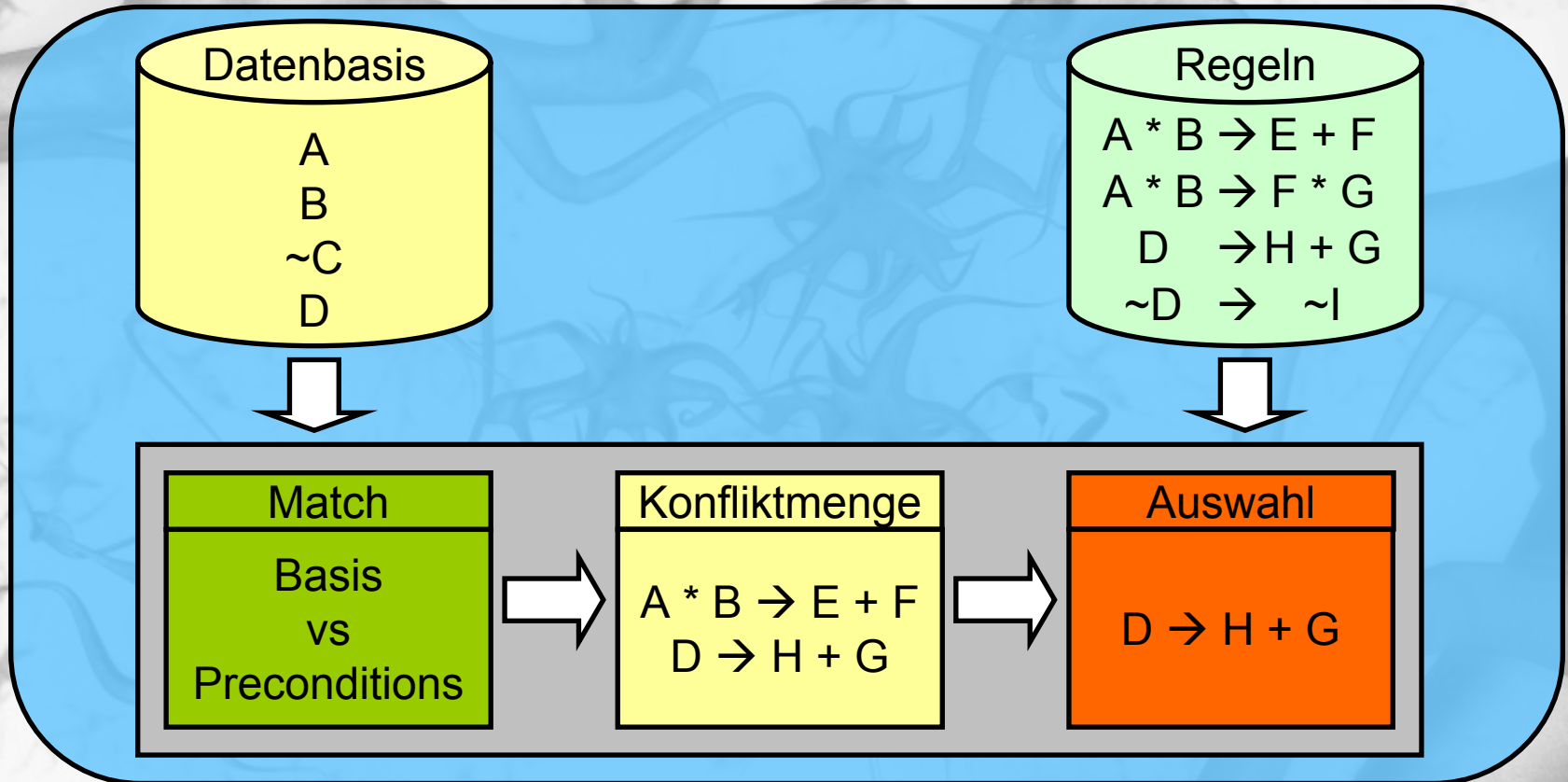
General Problem Solver

- Beginn Forschung KI (1957)
- Problemreduktion/-transformation
- Ausdrücke / Operatoren
- Zustandsraum
- Fehlschlag



Theorie

Kognitive Architekturen

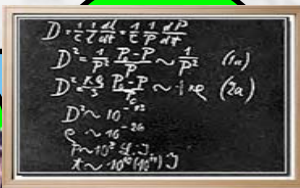
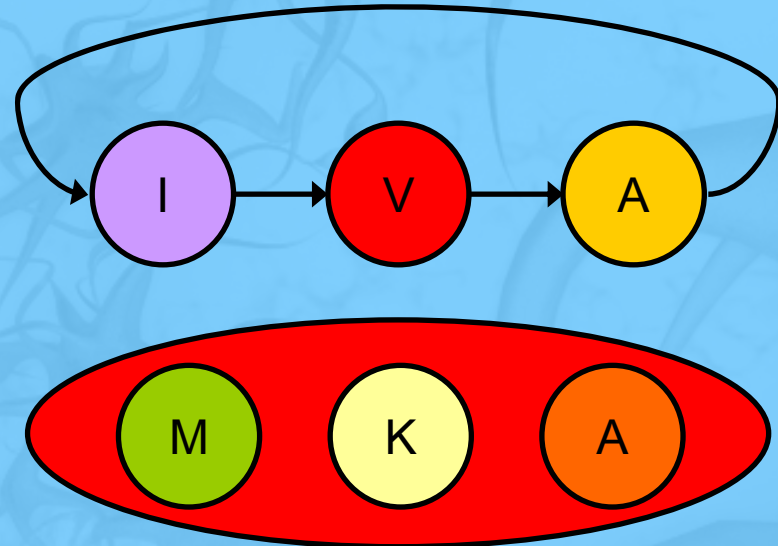


Theorie

Kognitive Architekturen

Eigenschaften

- episodisch

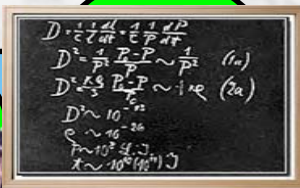
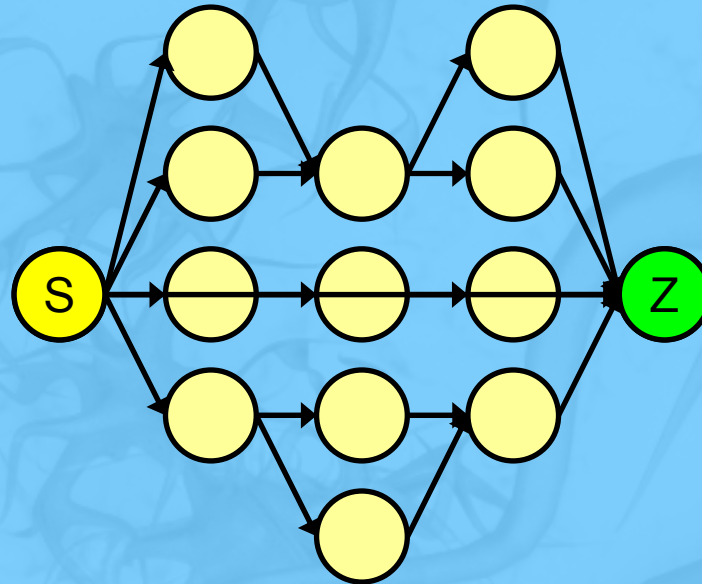


Theorie

Kognitive Architekturen

Eigenschaften

- episodisch
- lernen (chunking)

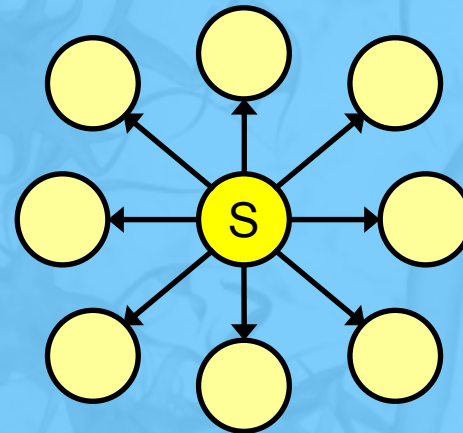


Theorie

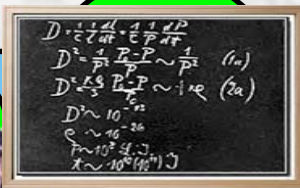
Kognitive Architekturen

Eigenschaften

- episodisch
- lernen (chunking)
- Konfliktauflösung



Z

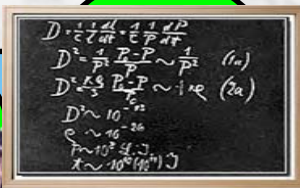
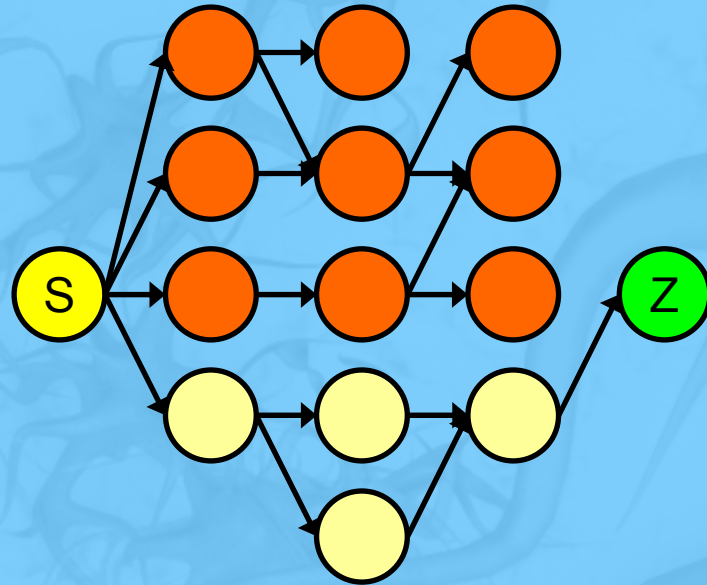


Theorie

Kognitive Architekturen

Eigenschaften

- episodisch
- lernen (chunking)
- Konfliktauflösung
- Sackgasse

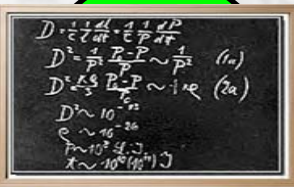
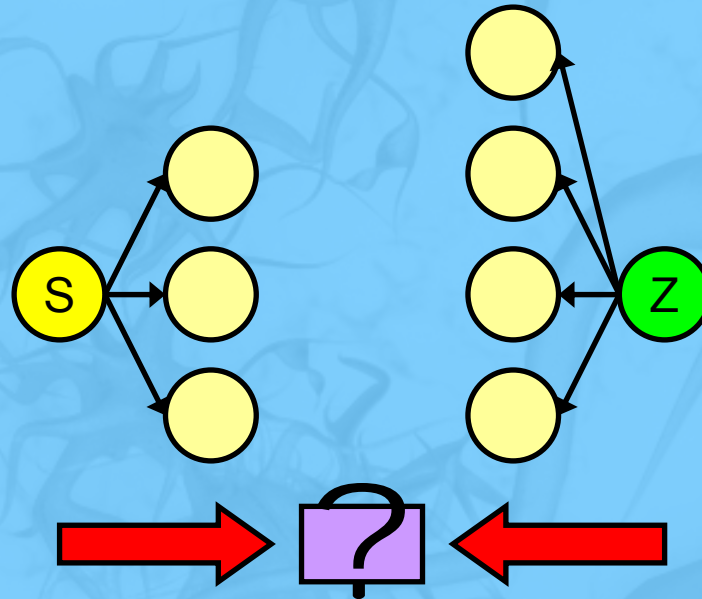


Theorie

Kognitive Architekturen

Eigenschaften

- episodisch
- lernen (chunking)
- Konfliktauflösung
- Sackgasse
- east / west coast

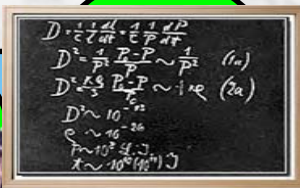
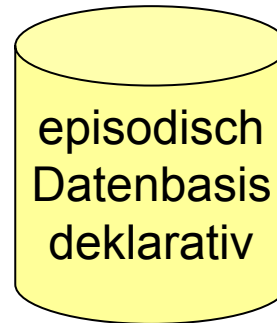


Theorie

Kognitive Architekturen

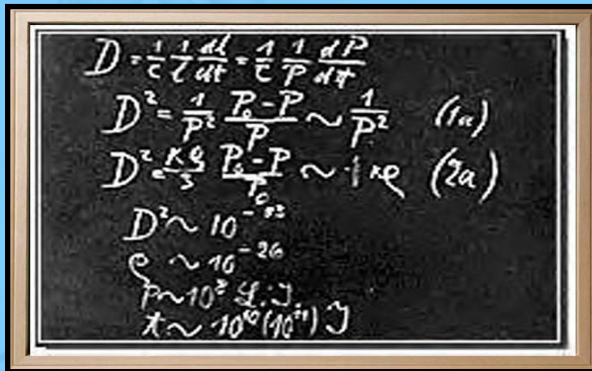
Eigenschaften

- episodisch
- lernen (chunking)
- Konfliktauflösung
- Sackgasse
- east / west coast
- Speicher



Theorie

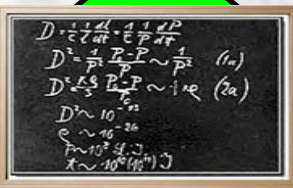
Kognitive Architekturen


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$$D^2 = \frac{1}{P^2} \frac{P-P}{P} \sim \frac{1}{P^2} \quad (2a)$$
$$D^2 \sim 10^{-22}$$
$$c \sim 10^{-26}$$
$$P \sim 10^3 \text{ g}$$
$$x \sim 10^6 (10^{11})$$

Theorien

- als Software
- Fokus auf Bereiche
- Wissenrepräsentation
- Interpreter




$$D = \frac{1}{c} \frac{dI}{dt} = \frac{1}{c} \frac{dP}{dt}$$
$$D^2 = \frac{1}{P^2} \frac{P-P}{P} \sim \frac{1}{P^2} \quad (1a)$$
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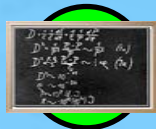
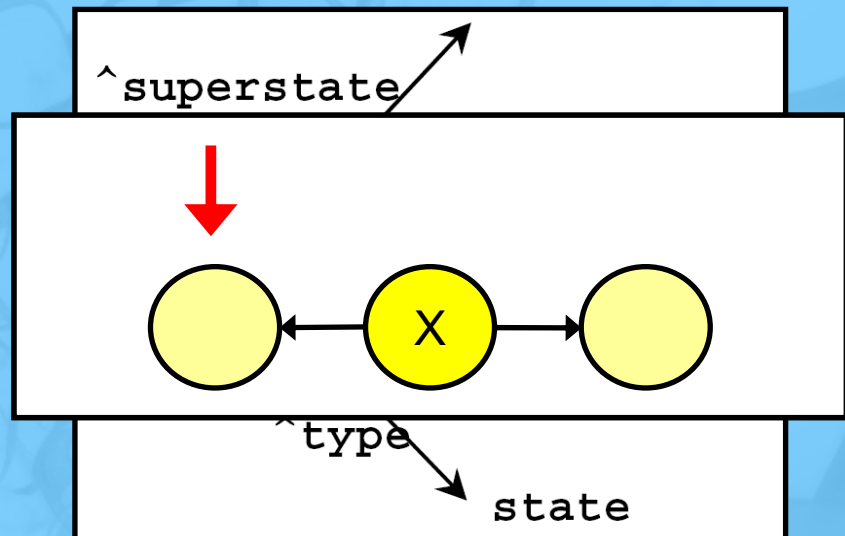


Theorie

Kognitive Architekturen

SOAR

- ein Speicher
- episodisch
- Metaregeln
- Subgoals
- chunking

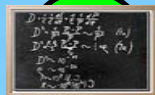
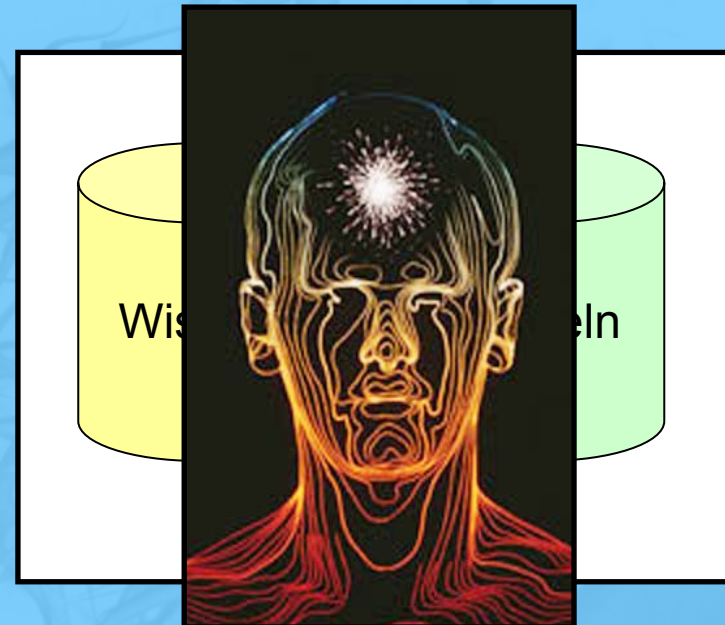


Software

Kognitive Architekturen

ACT-R

- zwei Speicher
- Aktivierung
- Nutzen / Kosten
- statistisches Lernen
- psychologischer Hintergrund

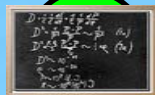
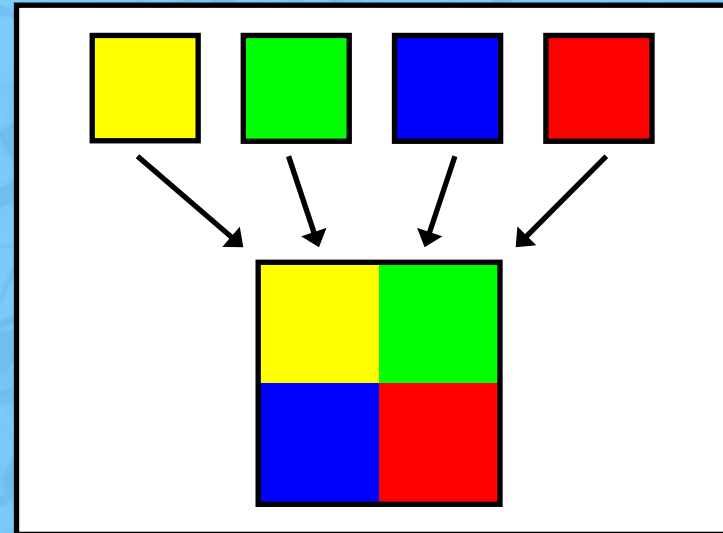


Software

Kognitive Architekturen

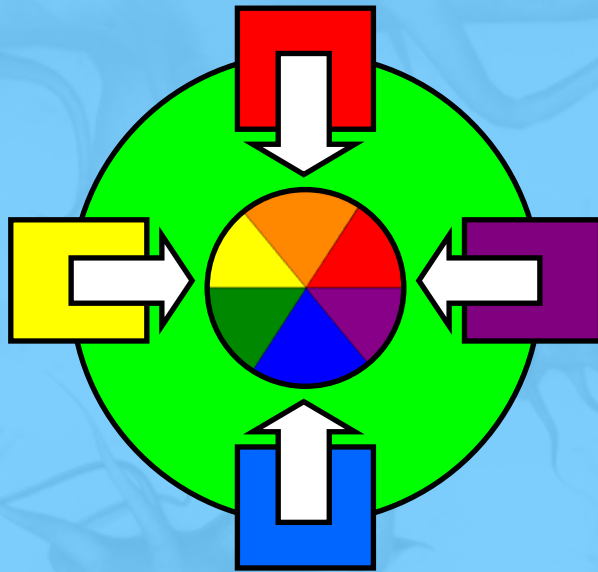
Prodigy

- Domain knowledge, Actions
- modular
- erweiterte Metaregeln
- statistisches Lernen
- Konfliktlösung: random



Software

Kognitive Architekturen



Unified Theories

- eine Theorie
- deckt 100% Kognition ab
- davon aber mehrere
- „ein Geist“ – eine Theorie
- Universell Einsetzbar

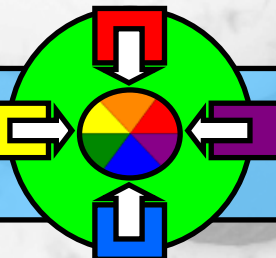
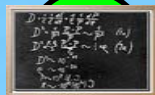
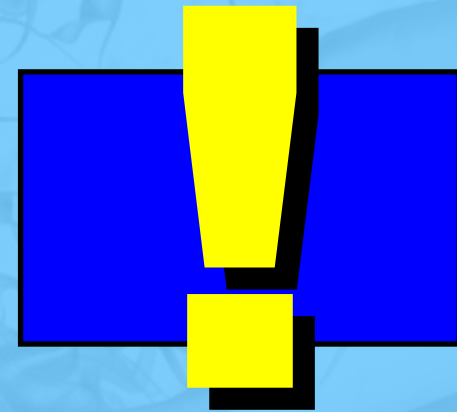


Unified Theorie

Kognitive Architekturen

Offene Probleme

- Klassifizierung/Verstehen
- Wissensrepräsentationen
- Kommunikation
- Gefühle
- andere Theorien
- Lernen



Unified Theorie

Kognitive Architekturen

Vielen Dank!

