HK1
Inleiding

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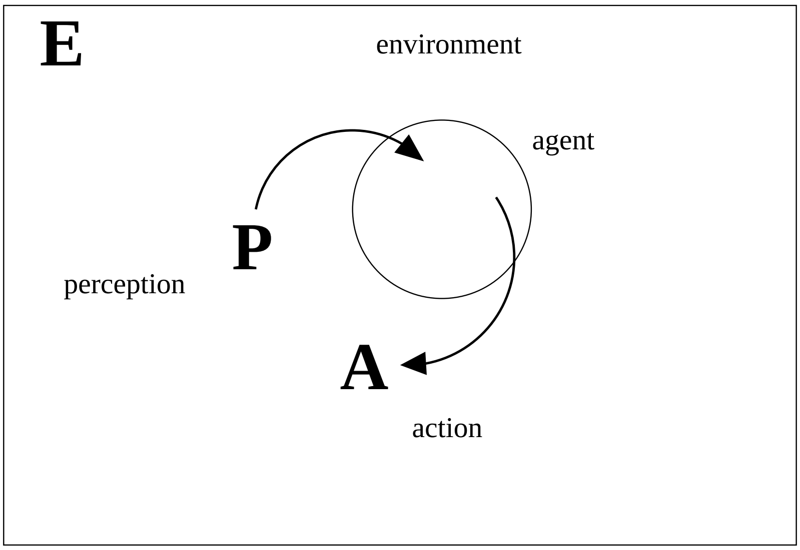
Cursus Kunstmatige Intelligentie / KI-RuG

- Hoorcolleges (Lambert Schomaker)
- Opdrachten maken (Wouter Teepe)
- Practica (studentassistent)

College	Datum	Boek	Onderwerp
1	3 apr	H1-2	Inleiding agents
2	5 apr	H3	Blind zoeken
3	10 apr	H4	Heuristisch zoeken
4	12 apr	H3/4	Constraint satisfaction
5	17 apr	H5	Game playing
6	19 apr	H6	Representatie 1
7	24 apr	H1-5	Toets H1-5
8	26 apr	H7	Representatie 2
9	1 mei	H10	Representatie 3
10	3 mei		Representatie 4
11	8 mei	H11	Planning 1
12	10 mei	H11	Planning 2
13	15 mei	H14	Onzekerheid 1
14	17 mei	H15/18	Onzekerheid 2, Leren
15	22 mei	H18	Leren

Uitslag toets mag voor 30% meetellen voor eindpunt.
(hoogste punt van a) 70% tent. + 30% toets
en b) 100% tent. telt).

Deelname practica is voorwaarde voor tentamen.



- **Environment**
- **Agent**
- **Perception**
- **Action**

0. Stateless action computation

$$A_t = \mathcal{F}(P_t)$$

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1. Action computed from perceptual history:

$$A_t = \mathcal{F}(P_{[t_0,t]})$$

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2. Action computed from action/perception history:

$$A_t = \mathcal{F}(A_{[t_0,t-\delta t]}, P_{[t_0,t]})$$

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3. Action computed from perception/action history and estimated future state of A and P:

$$A_t \;=\; \mathcal{F}(A_{[t_0,t-\delta t]}, P_{[t_0,t]}, \hat{A}_{[t,t+\delta t_a]}, \hat{P}_{[t,t+\delta t_p]})$$

Are Perception and Action the only necessary concepts?

- Memory is needed for state preservation
- Memory resources will be limited in a physical system: $\mathcal{F}$ presumes restructuring of incoming information during the agent's life
- Goals are needed (inbuilt or explicit) in order to constrain action tendencies
- For rationality: action plan evaluation is needed

or are there correspondences with biology?

It is not always necessary to find correspondences between computation and implementation, but the following observations from neurophysiology fit nicely with the proposed process (perception, action, memory, goals and planning/evaluation).

- **The brain is characterized by a clear-cut dual architecture:**
  - **Perceptual modules (back, everything behind the central sulcus)**
  - **Action (motor) modules (front, everything in front of the central sulcus)**
- **Within the motor system (from central sulcus to frontal lobe) there is a gradient, from concrete, muscle-based representations, through action pattern representations, towards, abstract action plans represented frontally.**
- **The phylogenetically new frontal lobe (planning) and the old limbic system in the center of the brain (biological drives) have a strong connection in normal humans such that the consequences (survival value) of plans generated by the (pre)frontal cortex can be evaluated.**