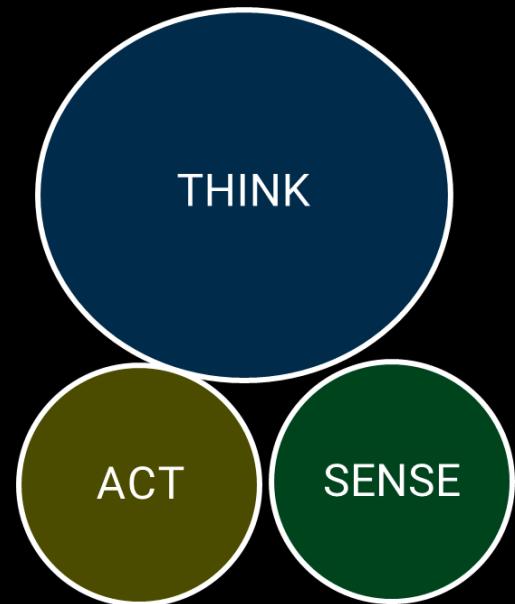


GOFAI vs Embodied AI

GOFAI vs Embodied AI

GOFAI

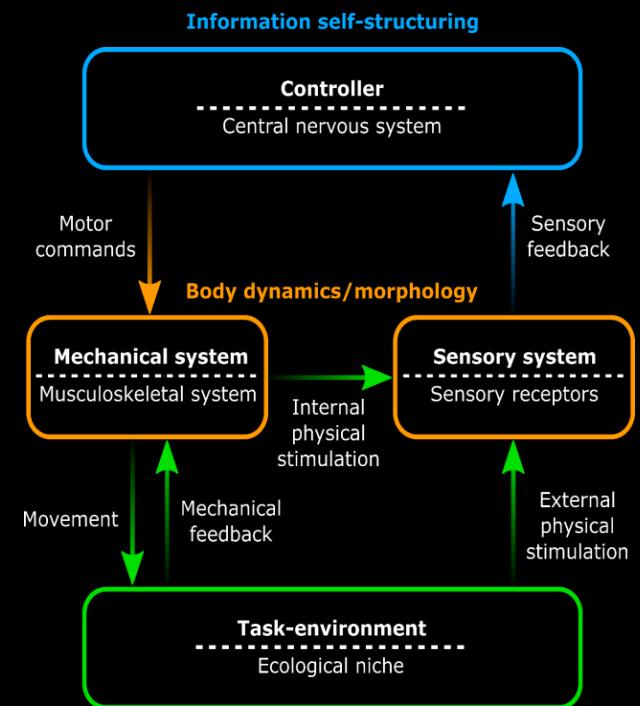
Robot's intelligence comes from **explicit symbolic representations and rule-based reasoning**



Intelligence requires a body

Morphology affects the control structure, sensing and actuation

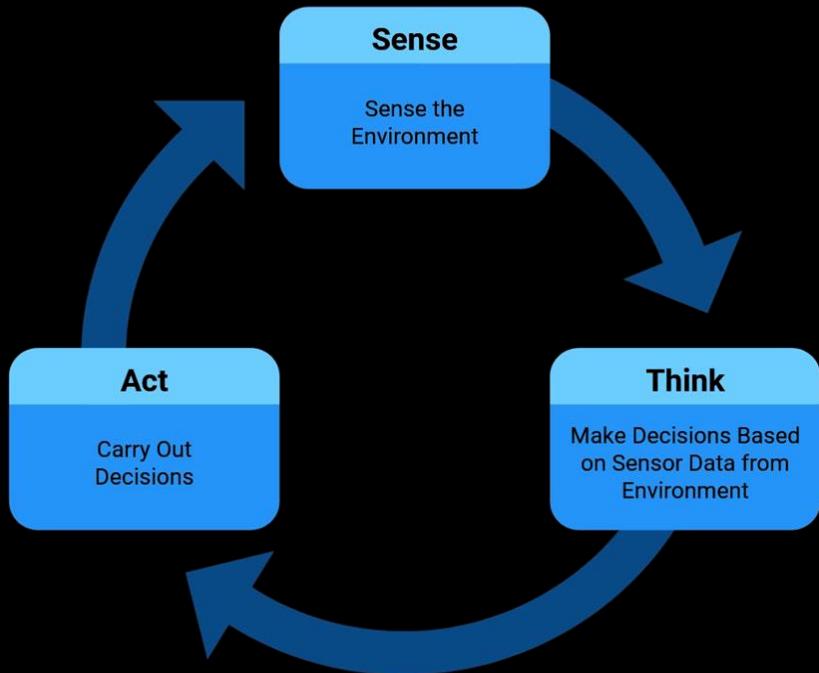
Embodied AI



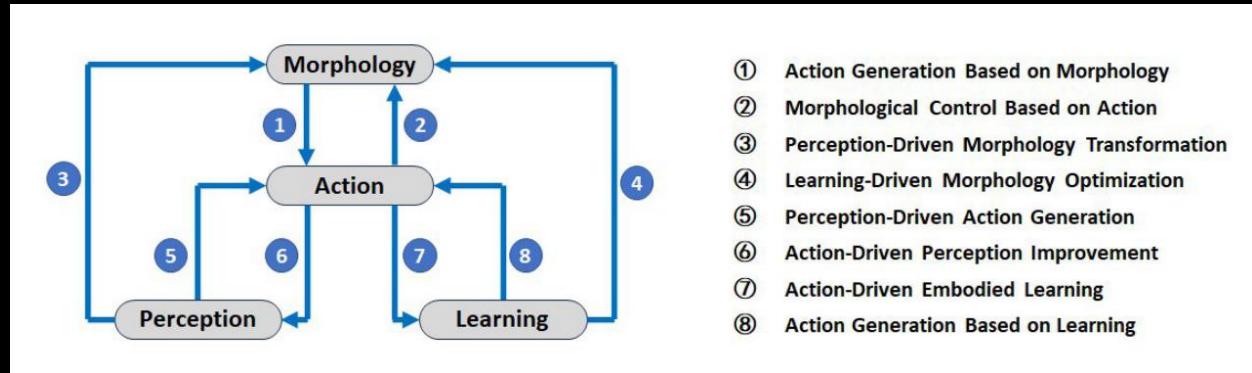
True embodiment will inevitably need to exploit physics.

GOFAI vs Embodied AI

GOFAI

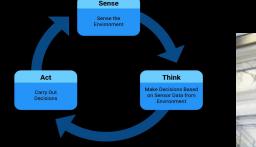


Embodied AI



True embodiment will inevitably need to exploit physics.

GOFAI



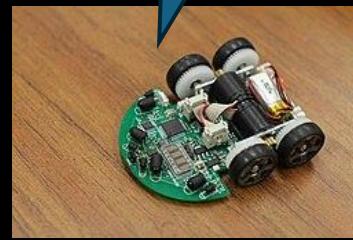
Set of instructions



Set of instructions



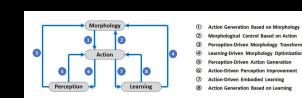
Need a symbolic world representation



Not symbolic representation of the world



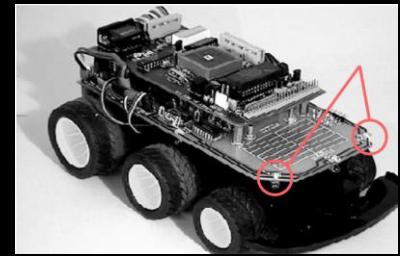
And me as well!



Embodied AI



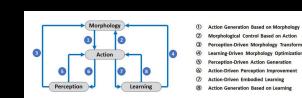
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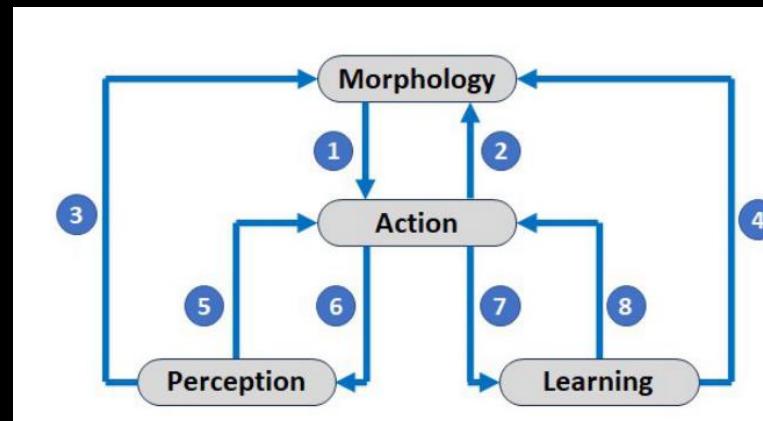
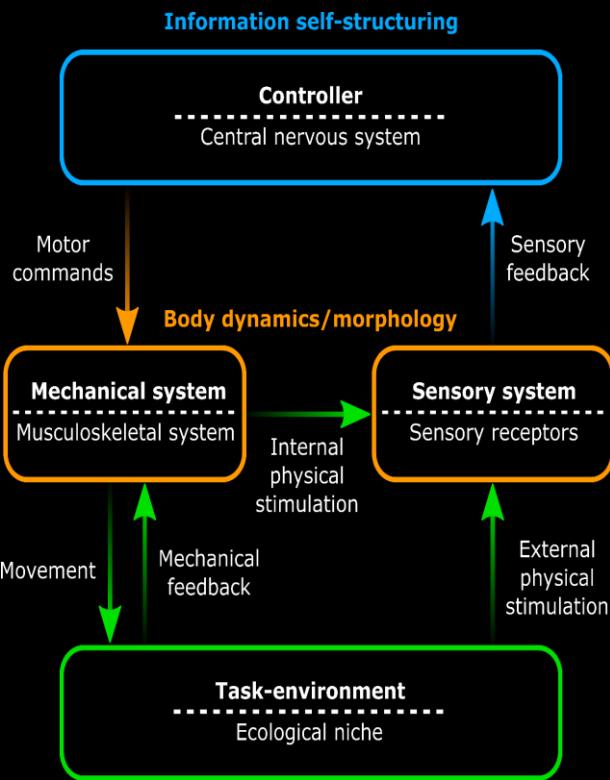
Not symbolic representation of the world



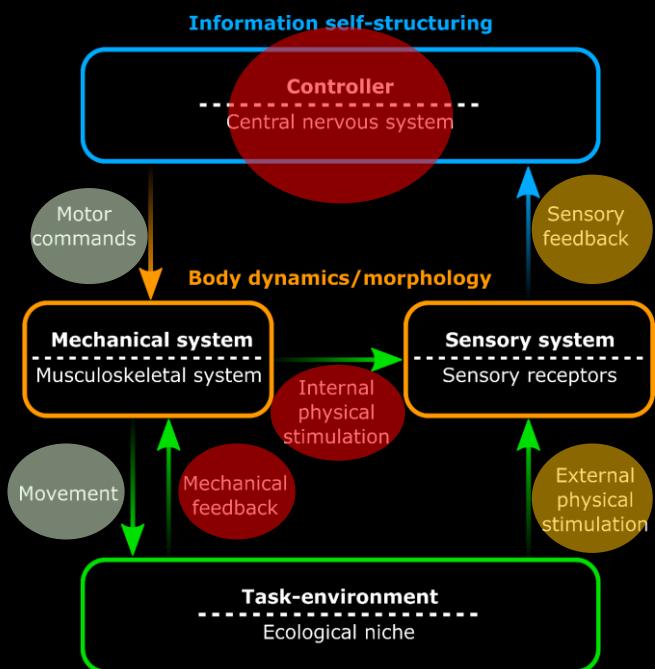
This robot can dance !!!



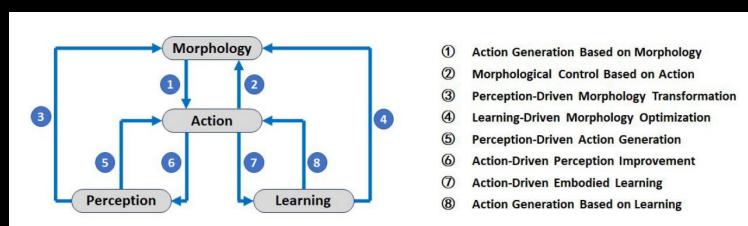




- ① Action Generation Based on Morphology
- ② Morphological Control Based on Action
- ③ Perception-Driven Morphology Transformation
- ④ Learning-Driven Morphology Optimization
- ⑤ Perception-Driven Action Generation
- ⑥ Action-Driven Perception Improvement
- ⑦ Action-Driven Embodied Learning
- ⑧ Action Generation Based on Learning

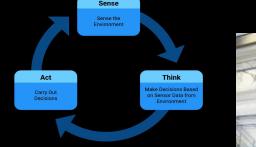


- **Morphology**– Their climbing capability is a clear morphological innovation. But the morphology is still fixed, not adaptive.
- **Sensing**– Good laser/environment scanning, but in a constrained, highly structured warehouse → high effectiveness, but low adaptability.
- **Action**– Can move and climb, but constrained by fixed routes and racks.
- **Cognition**– Warehouse software (“Deepsky”) manages logistics. Likely symbolic and centralized, with limited embodied grounding.



Interaction	Description	Score (0–3)
① Morphology → Action	The climbing lift design enables vertical movement on racks.	2
② Action → Morphology	Executing a “climb” task changes morphology (extends vertically).	2
③ Perception → Morphology	Sensors do not alter body structure.	0
④ Learning → Morphology	No learning-driven changes to morphology.	0
⑤ Perception → Action	LIDAR + markers directly guide navigation and climbing.	1
⑥ Action → Perception	The movement don't affect the perception	0
⑦ Action → Learning	Fleet logs and task performance inform optimization, weakly embodied.	1
⑧ Learning → Action	Central software updates routes, reassigns tasks. (I assume to be symbolic)	1

GOFAI



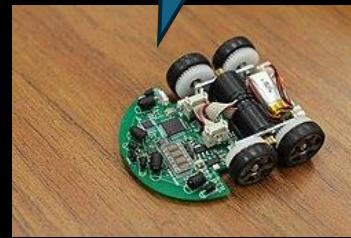
Set of instructions



Set of instructions



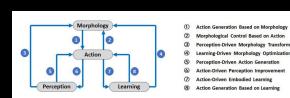
Need a symbolic world representation



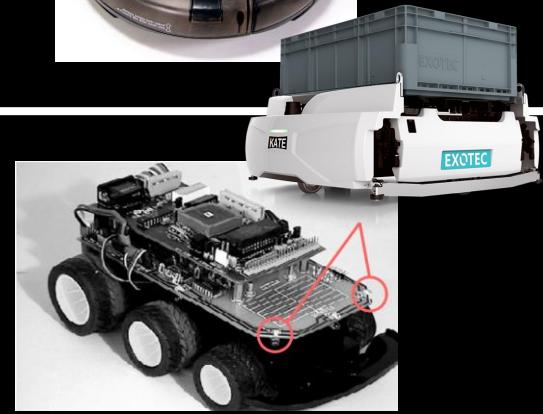
Not symbolic representation of the world



And me as well!



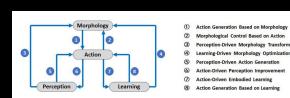
Embodied AI



Not symbolic representation of the world



This robot can dance !!!



Questions?

- Any robot you would like to evaluate?