

Human Robot Interaction

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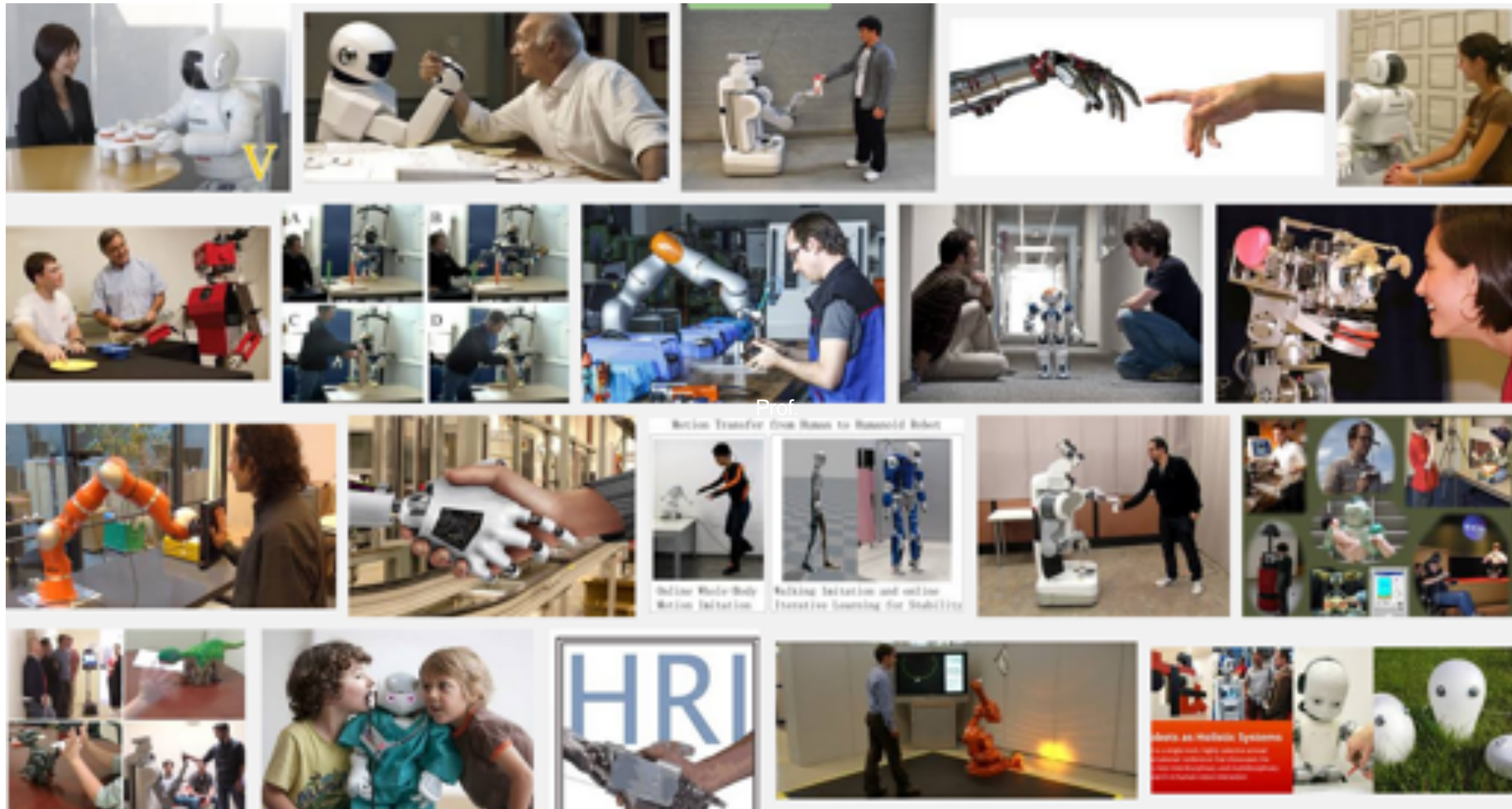
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Robots and Humans



HRI vs HCI

- Robots have (physical) **bodies**
- Robots act in **the real world**
- Robots are perceived as **living entities**
- Human-robot interaction is **asymmetric** (robots have not the same cognitive skills of humans)
- HRI is **bidirectional** (robots are not passive entities like computers!)

HRI is not a special case of HCI



Possible inputs

- Hand-held devices
- Speech
- Sound
- Touch

People

- Motion
- Gestures
- Race, Gender, Clothes...



Head

- Gaze
- Facial Expressions

- Temperature
- Olfaction

outputs

- Speech
- Sound
- Lighting
- Smell

Body

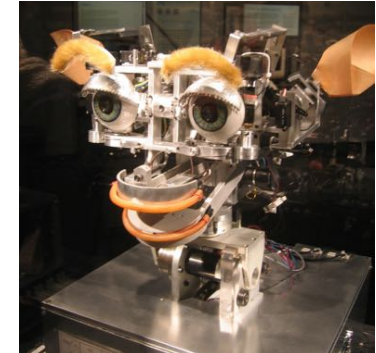
- Position
- Speed

Head

- Turning
- Eye motion
- Facial expressions

Arms

- Grab/Hand objects
- Gestures
- Shake hands

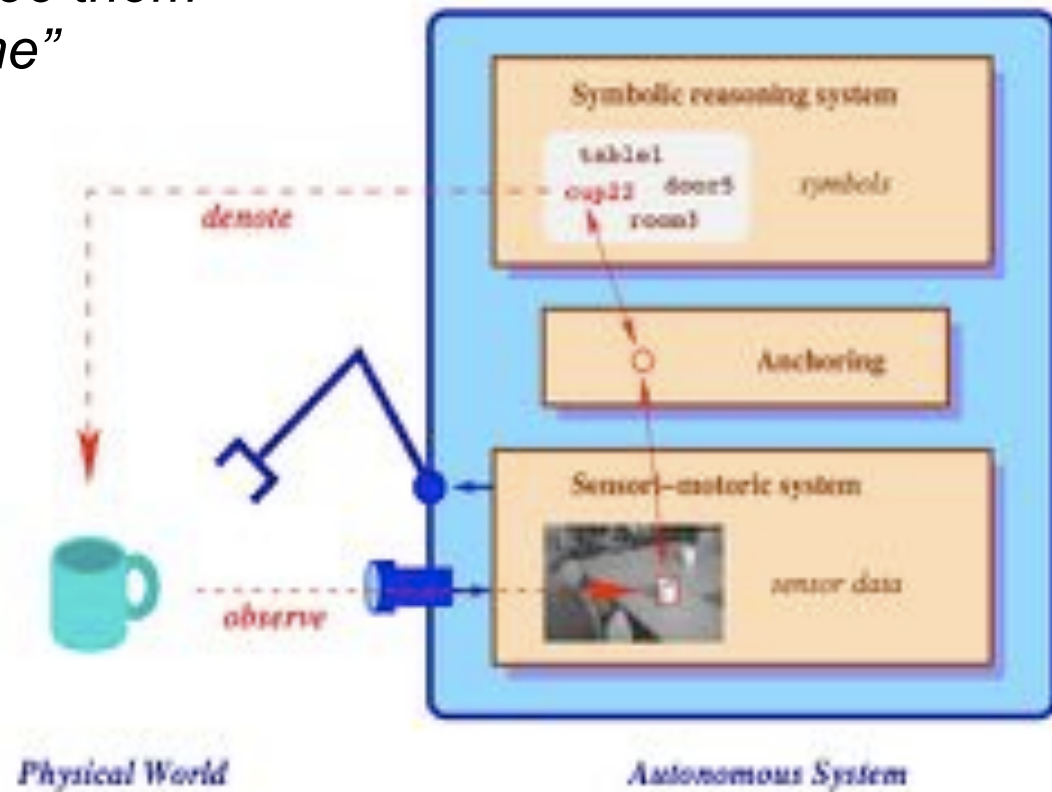


Symbol Grounding

“For things to exist there are two essential conditions, that a man should see them and be able to give them a name”

(Saramago, 1995)

- **Symbol grounding** (*Harnad, 1990*)
- **Anchoring** (*Saffiotti, 1994*)



Take the elevator

Description: The robot must take a crowded elevator with customers, asking for reaching another floor, and interacting with people during all the episode

Main challenge: Human Robot Interaction

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