

ARTIFICIAL GENERAL INTELLIGENCE

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KCE074BCT036

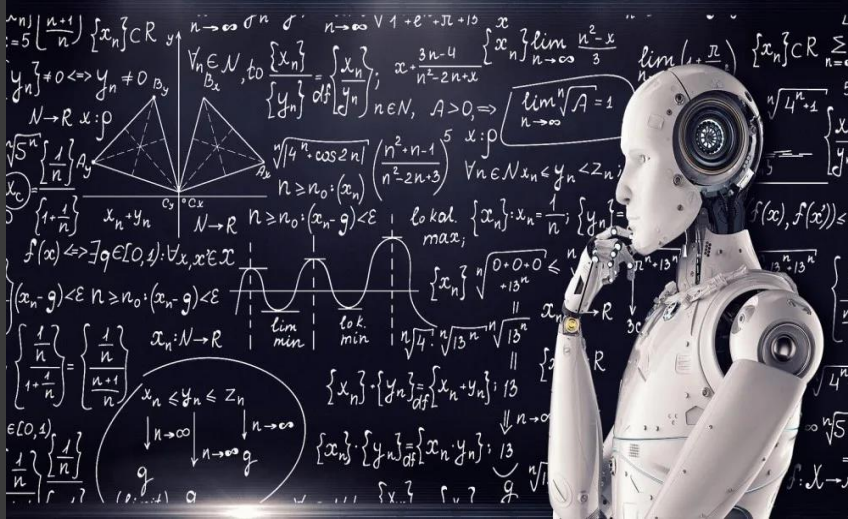


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Introduction

- ⦿ It is the hypothetical intelligence of a machine that has the capacity to understand or learn any intellectual task that a human being can do.
- ⦿ Systems with general human intelligence capable of sustaining long terms goals and intent.
- ⦿ Systems explicitly designed to autonomously learn novel tasks and adapt to changing environments.
- ⦿ Ultimately targets human level intelligence(and beyond) in real world environments.

Some glimpses of AGI



Scopes of AGI

- AI is also being applied in related areas such as synthetic biology for the manufacture and rapid design of micro organisms for industrial uses.
- The fraud detection system will be able to scan thousands of transactions instantly and predict/ classify them into buckets.
- Machine Learning will be crucial in ensuring that the Automated Vehicles operate smoothly and efficiently.
- Personalised advertising, knowledge of customers and their behavior gleamed through facial recognition can generate more revenue.

Competency characteristics of AGI

The following list of competencies was assembled at the 2009 AGI Roadmap Workshop (Adams et al., 2012) via a group of 12 experts, including AGI researchers and psychologists, based on a review of the AI and psychology.

1. Perception

- Vision: Image and scene analysis and understanding
- Hearing: Identifying the sounds associated with common objects; understanding which sounds come from which sources in a noisy environment
- Touch: Identifying common objects and carrying out common actions using touch alone
- Cross modal: integrating information from various senses

Competency characteristics contd...

2. Actuation

- Physical skills: manipulating familiar and unfamiliar objects
- Tool use, including the flexible use of ordinary objects as tools
- Navigation, including in complex and dynamic environments

3. Learning

- Imitation: Spontaneously adopt new behaviors that the agent sees others carrying out
- Reinforcement: Learn new behaviors from positive and/or negative reinforcement signals, delivered by teachers and/or the environment
- Interactive verbal instruction
- Learning from written media

Competency characteristics contd...

4. Attention

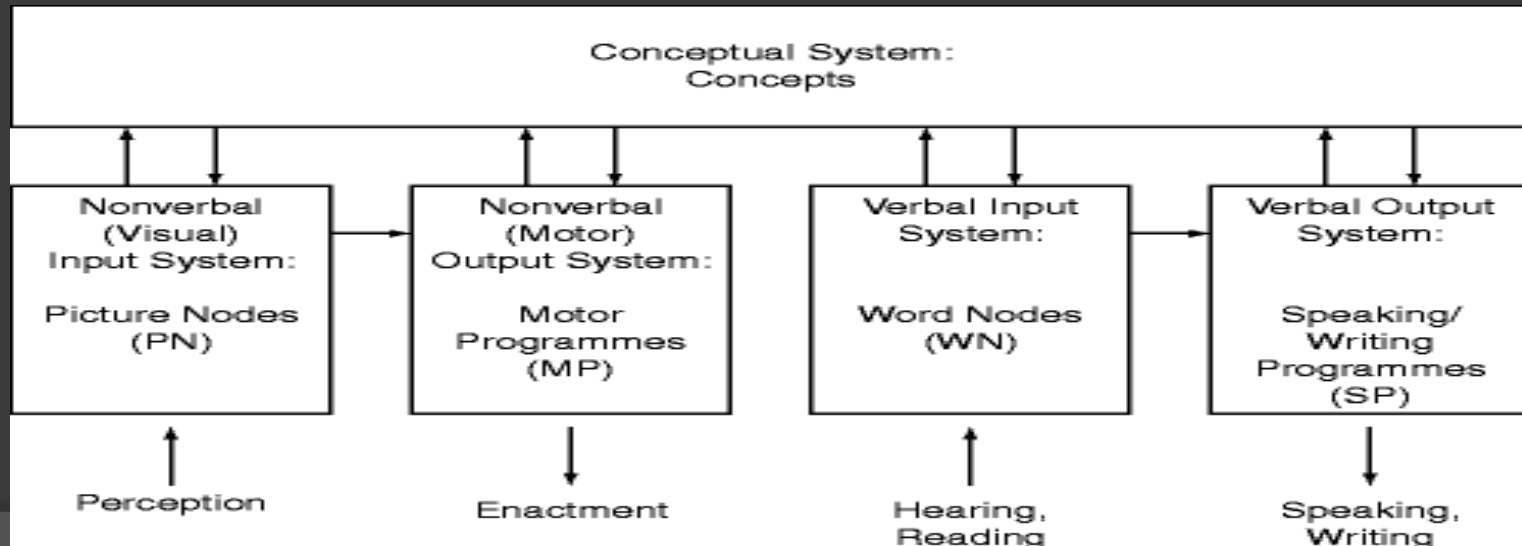
- Visual Attention within the agent's observations of its environment
- Social Attention
- Behavioral Attention

5. Emotion

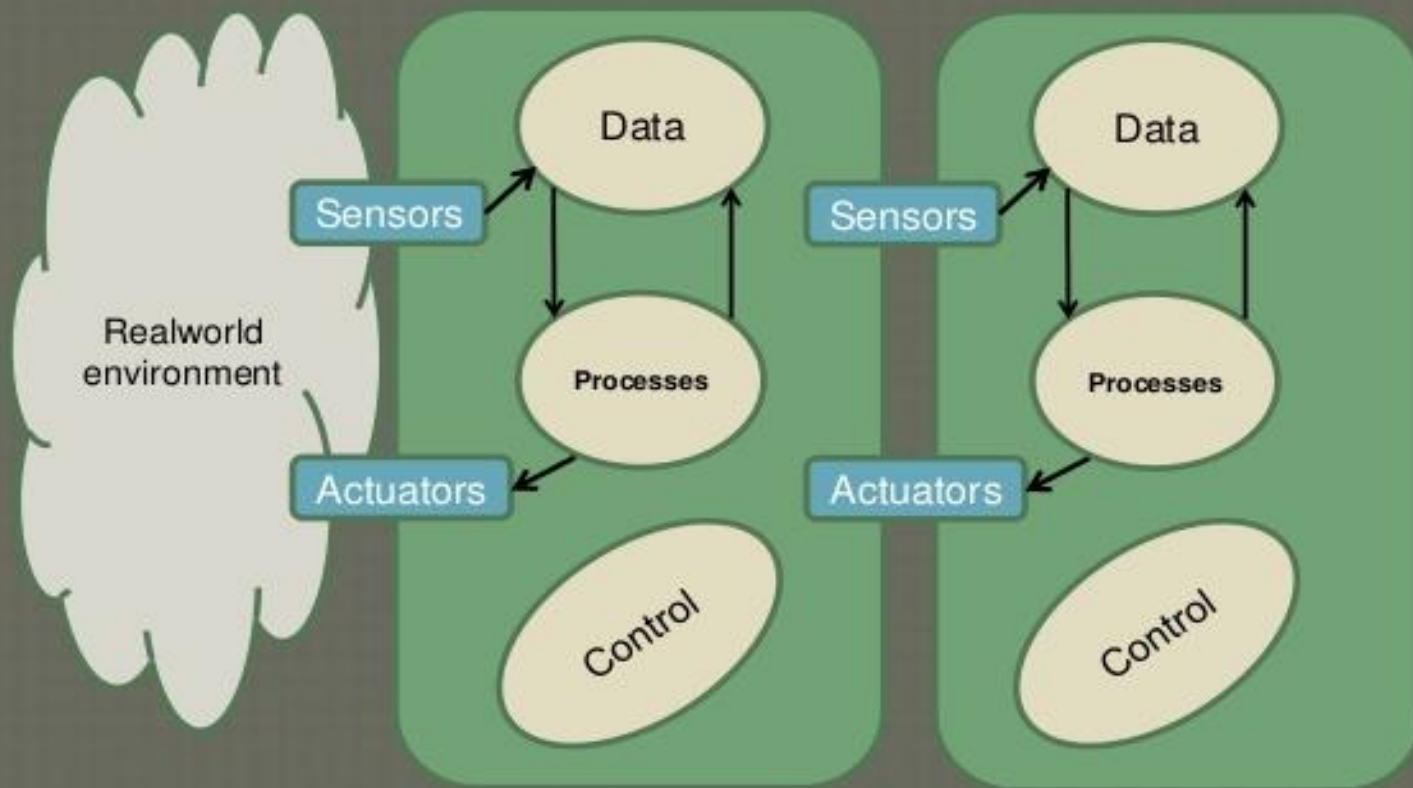
- Expressing Emotion
- Perceiving / Interpreting Emotion

Cognitive Architecture

- Originated in 1950s but active research program in 1980s
- Cognitive Science-differs from mainstream “narrow” AI and traditional “divide and conquer” approach of experimental cognitive psychology
- Theories of the core, immutable structures and processes of the human cognitive system
- Integration of multiple components of cognition

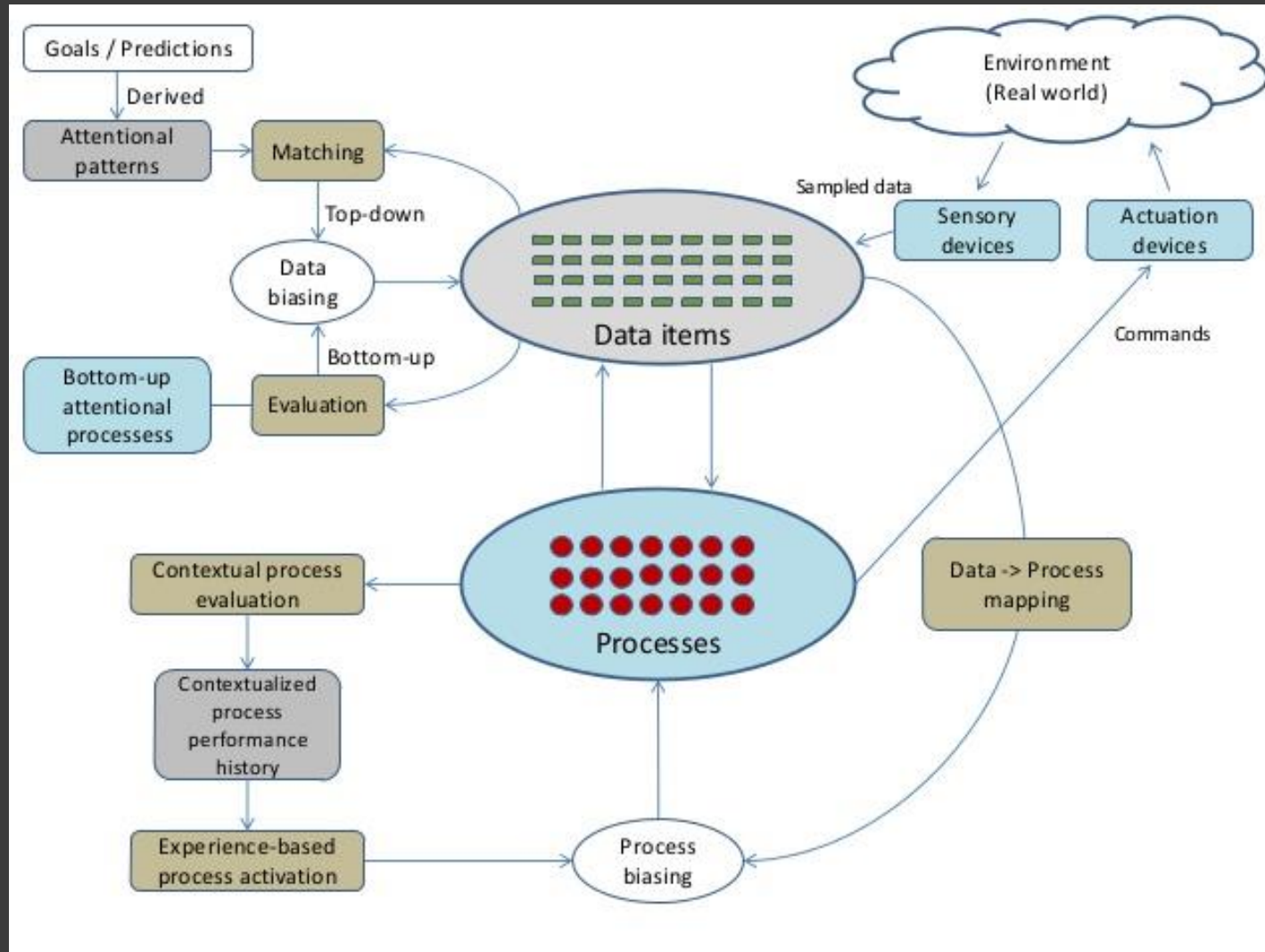


AGI Systems



Intellifest 2012

Detailed System of AGI



Metrics of AGI

A variety of metrics, relative to various different environments, may be used to measure achievement of the goal of “human-level AGI.” Examples include:

- The classic Turing Test, conceived as (roughly) “fooling a panel of college-educated human judges, during a one hour long interrogation, that one is a human being” (Turing, 1950) (and see (Hayes and Ford., 1995; French, 1996; Alvarado et al., 2002) for discussions of some of the test’s weaknesses).
- The Virtual World Turing Test occurring in an online virtual world, where the AGI and the human controls are controlling avatars (this is inclusive of the standard Turing Test if one assumes the avatars can use language) (Adams et al., 2012).

Metrics contd...

- The Online University Student Test, where an AGI has to obtain a college degree at an online university, carrying out the same communications with the professors and the other students as a human student would (including choosing its curriculum, etc.)(Adams et al., 2012).
- The Artificial Scientist Test, where an AGI that can do high-quality, original scientific research, including choosing the research problem, reading the relevant literature, writing and publishing the paper, etc. (this may be refined to a Nobel Prize Test, where the AGI has to do original scientific research that wins a Nobel Prize)(Adams et al., 2012).

Attentions for AGI

- ⦿ Control mechanism for prioritizing data and processes
- ⦿ Targets equally
 - External information (from environment)
 - Internal information (from within the system)
- ⦿ General , no assumptions about
 - Tasks
 - Environments
 - Modalities/embodiment
- ⦿ Adaptive
 - Learns to improve itself based on experience

Advantages of AGI

- ⦿ AI would have a low error rate compared to humans, if coded properly. They would have incredible precision, accuracy, and speed.
- ⦿ They won't be affected by hostile environments, thus able to complete dangerous tasks, explore in space, and endure problems that would injure or kill us.
- ⦿ Can detect fraud in card-based systems, and possibly other systems in the future.
- ⦿ Organized and manages records.
- ⦿ Interact with humans for entertainment or a task as avatars or robots
- ⦿ They don't need to sleep, rest, take breaks, or get entertained, as they don't get bored or tired.

Disadvantages of AGI

- ⦿ Can cost a lot of money and time to build, rebuild, and repair. Robotic repair can occur to reduce time and humans needing to fix it, but that'll cost more money and resources.
- ⦿ It's questionable: Is it ethically and morally correct to have androids, human-like robots, or recreate intelligence, a gift of nature that shouldn't be recreated? This is a discussion about AI that's popular in the days.
- ⦿ Storage is expansive, but access and retrieval may not lead to connections in memory as well as humans could
- ⦿ As seen partially with smartphones and other technology already, humans can become too dependent on AI and lose their mental capacities.

**Thank You For
Your Attention!**