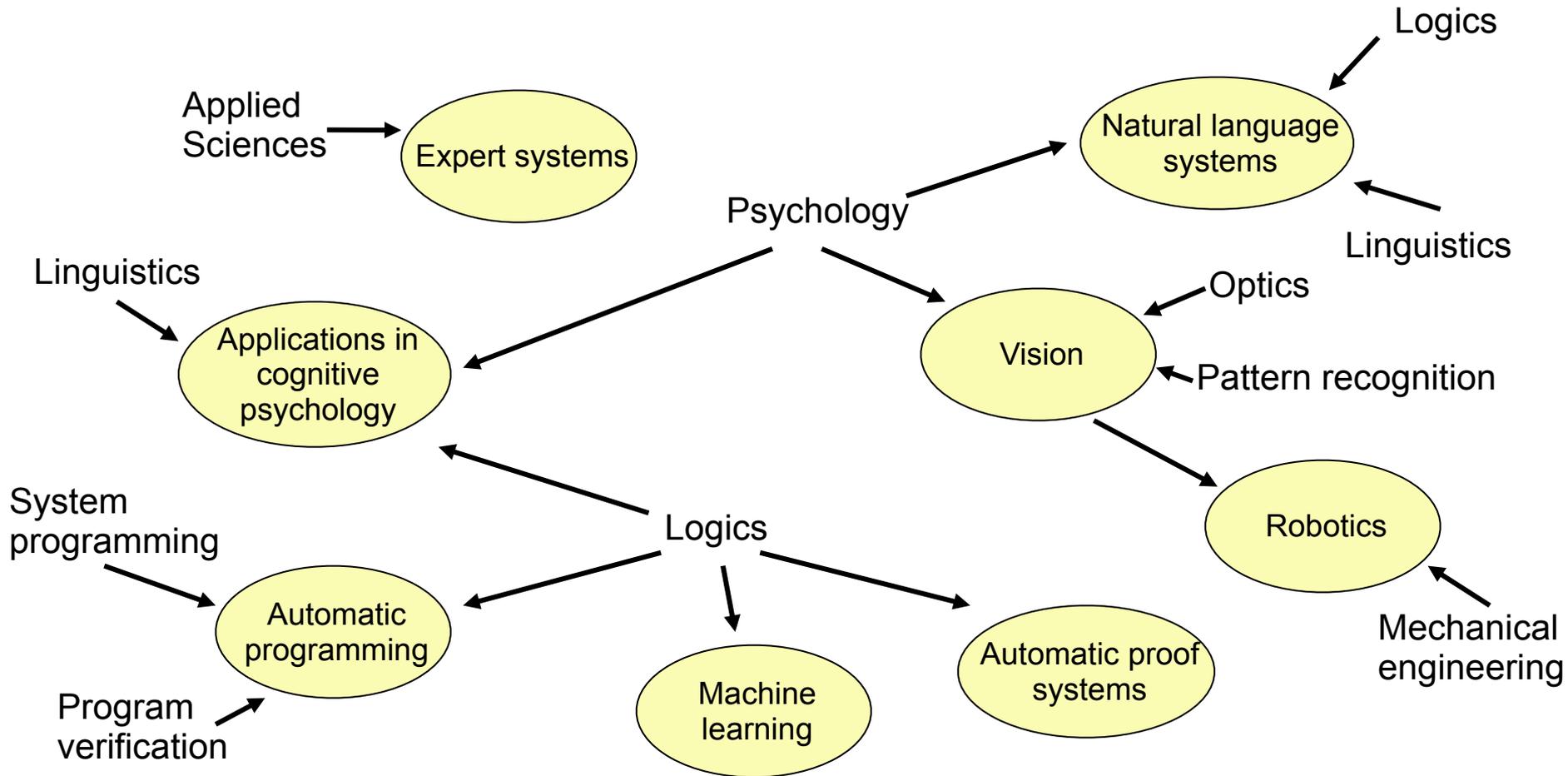
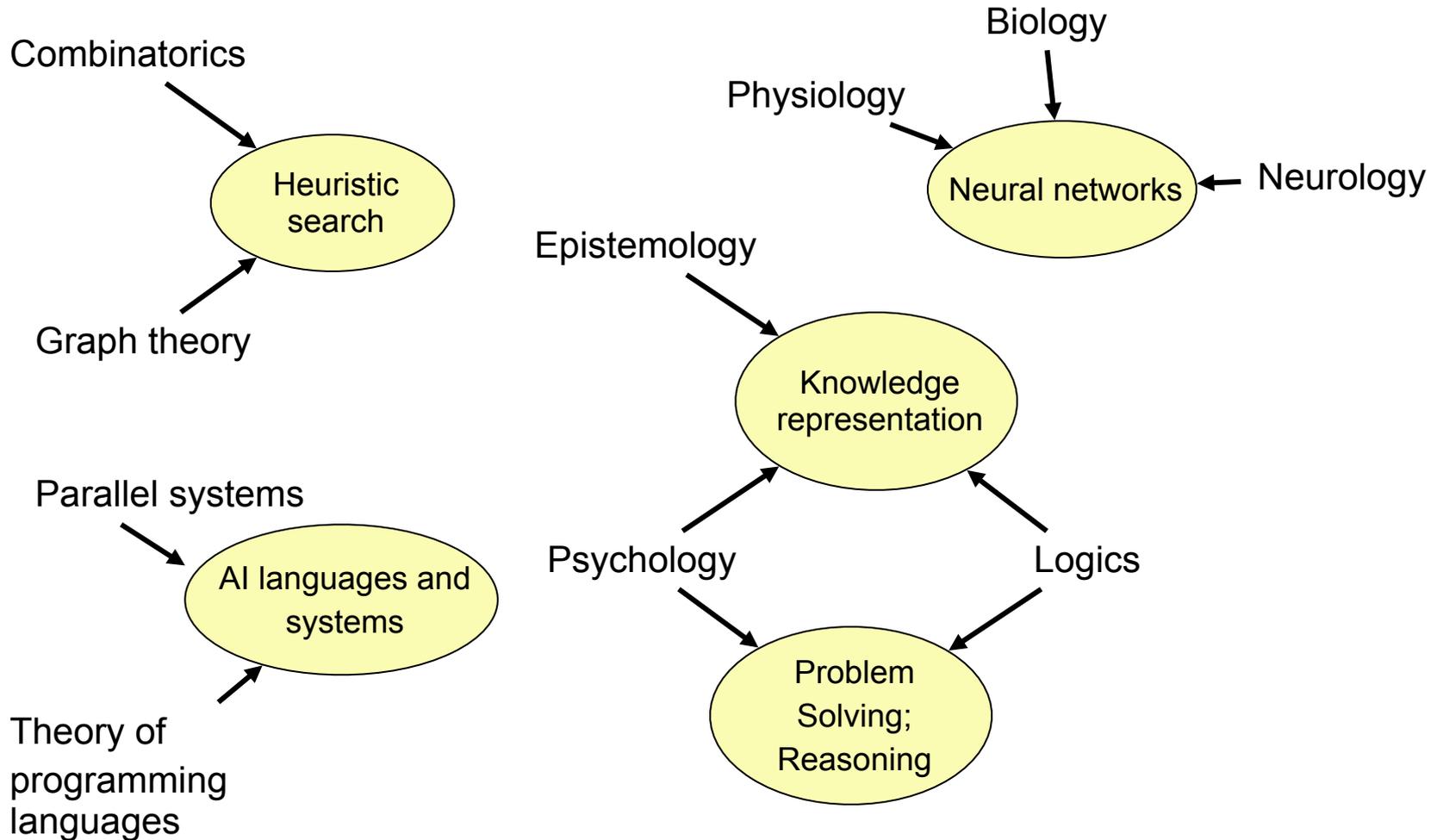


1. What is AI?

Some areas of AI



Some methods of AI



Some known definitions

"[The automation of] activities that we associate with human thinking, activities such as decision-making, problem solving, learning..." (Bellman, 1978)

"The study of mental faculties through the use of computational models."
(Charniak+McDermott, 1985)

"The study of how to make computers do things at which, at the moment, people are better."
(Rich+Knight, 1991)

"The branch of computer science that is concerned with the automation of intelligent behavior."
(Luger+Stubblefield, 1993)

Source: Russell/Norvig, 1995

- Systems that think like humans
- Systems that act like humans
- Systems that think rationally
- Systems that act rationally

„The study of the computations that make it possible to perceive, reason, and act.“
(Winston, 1992)

Thinking like humans

- Cognitive approach: how do we think?
 - Introspection
 - i.e. self observation while thinking
 - Psychological experiments
 - If theory of mind is correct, programs can be written
 - GPS, Newell & Simon 1961
 - Research area: Cognitive science
- Separation between AI and cognitive science
 - together in early stages
 - today: fruitful discussion
 - e.g. vision, natural language, learning



Acting like humans

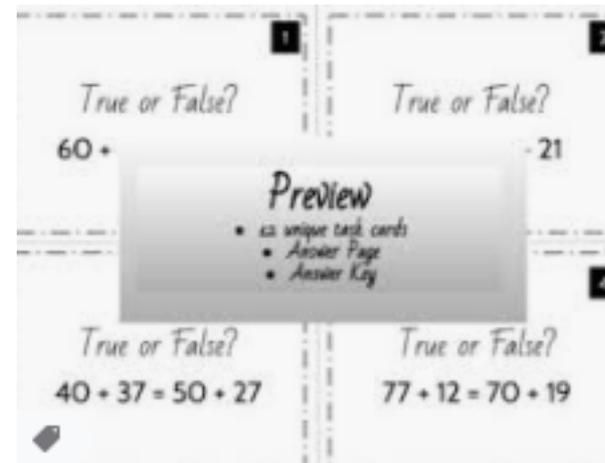
- Turing Test
 - Alan Turing 1950
 - Definition of intelligence
- Computer need for this:
 - Processing of natural language
 - Knowledge representation
 - Inference mechanisms
 - Learning methods



- Total Turing Test
 - so far: no physical interaction necessary
 - here: video signal to test perception ability
- Thus:
 - Understanding images
 - Robotics

Rational thinking

- “Law of thoughts”
 - Aristotle's Syllogism as first “Logic”
 - Given: correct preconditions
 - Result: correct conclusion
- Example
 - All men are mortal
 - Socrates is a man
 - ...?
- Two problems with this approach
 - Transformation of non-formal knowledge in formal knowledge is difficult (e.g. accuracy)
 - Big difference between problem solving in principal and in practice



Acting rational

- Rational agent
 - Agents act autonomous, perceive etc.
 - Rational agents act using the 'best outcome' principle
 - If uncertainty is given: best expected outcome
 - Law of thoughts – approach is based on correct inferences
- This is sometimes part of a rational agent but not vice versa
- Skills for Turing Test exists
- AI and rational agents have two advantages
 - More general as "LoT"
 - Better as e.g. behavioral approaches because rationality is defined

