The AI Lectures from Tokyo

An experiment in global teaching

4 November 2003

身体性認知科学 ～　国際多点遠隔講義

Embodiment

Gary Larson

"The AI Lectures from Tokyo"

Lecture 1:
Intelligence --
an eternal conundrum?

Lecture 1

Intelligence: An Eternal Conundrum?
What it is and how it can be studied

Preliminary remarks

- two parts: theory and “the latest from …”
- somewhat shorter than normal: textbook with additional reading
- classwork exercises
- cooperation between students at different sites
- community formation
- web site http://tokyolectures.org/

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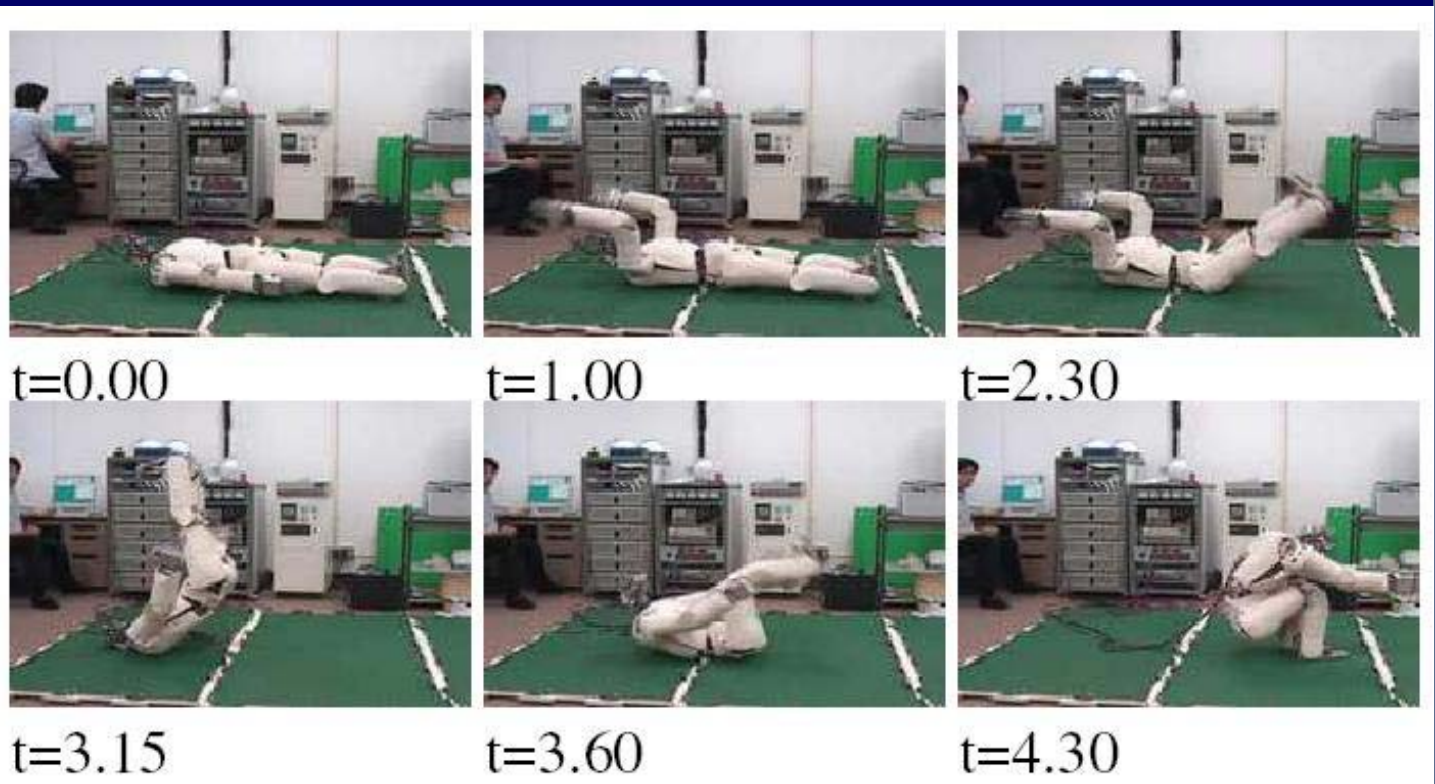
The latest from Japan: Today

robot that can stand up by itself (dynamically)



picture courtesy Prof. Yasuo Kuniyoshi University of Tokyo

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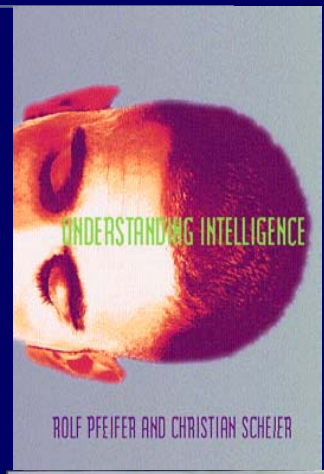
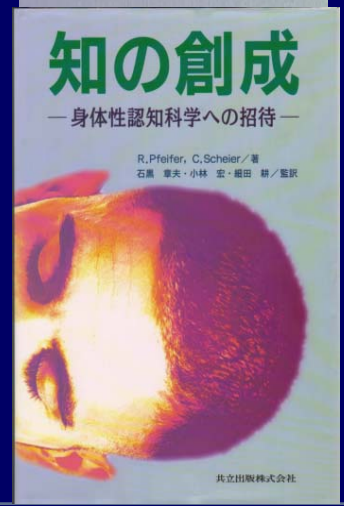
Textbook

Rolf Pfeifer and Christian Scheider



MIT Press, Paperback edition
Unterstanding Intelligence



知の創成、共立出版、2001

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Asking questions

During the lecture:

- participants: sit in one of the front rows
- hold up hand (and keep it up) until you get microphone
- speak loudly and clearly; avoid pauses between statements

After the lecture:

- website http://tokyolectures.org (please register)
- chatroom, forum, exercises, etc.
- contact project participants

Today's topics

- characterizing intelligence
- diversity/compliance
- "Turing Test"
- "Chinese Room"
- intelligence testing -- IQ
- studying intelligence:
  the synthetic methodology

Intelligence?

Intelligence?

Intelligence?

From the Penguin Dictionary of Psychology

"Few concepts in psychology have received more devoted attention and few have resisted clarification so thoroughly" (Reber, 1995, p. 379).

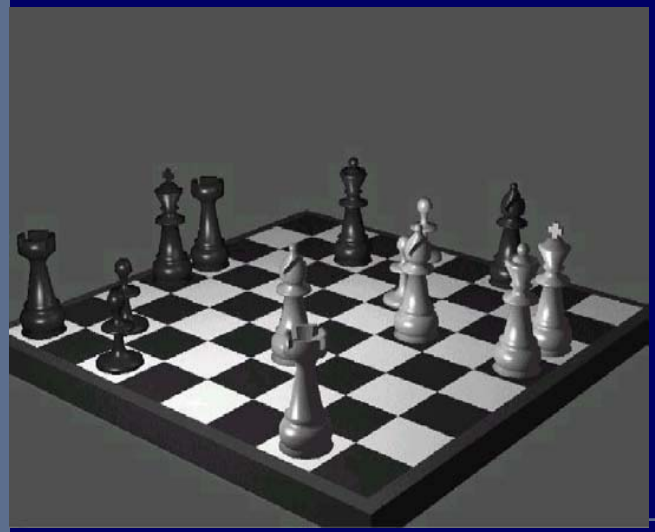
Some definitions of "intelligence"

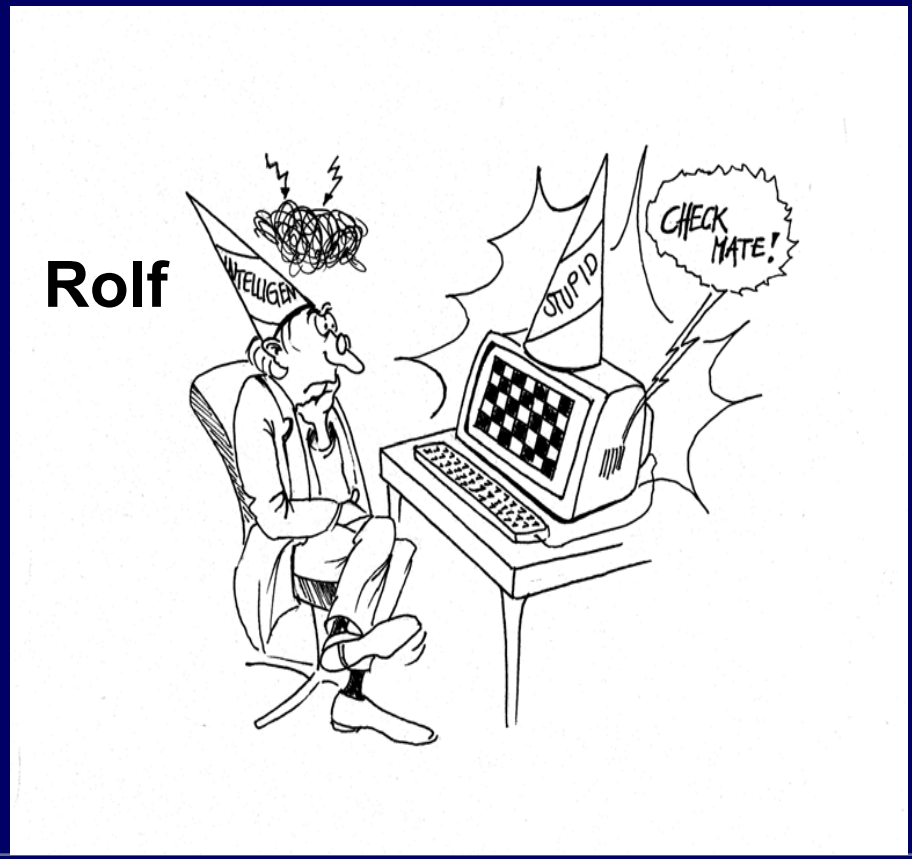
1921, Journal of Educational Psychology

- "The ability to carry on abstract thinking" (L. M. Terman)
- "Having learned or ability to learn to adjust oneself to the environment" (S. S. Colvin)
- "The ability to adapt oneself adequately to relatively new situations in life" (R. Pintner)
- "A biological mechanism by which the effects of a complexity of stimuli are brought together and given a somewhat unified effect in behavior" (J. Peterson)
- "The capacity to acquire capacity" (W. Woodrow)
- "The capacity to learn or to profit by experience" (W. F. Dearborn)

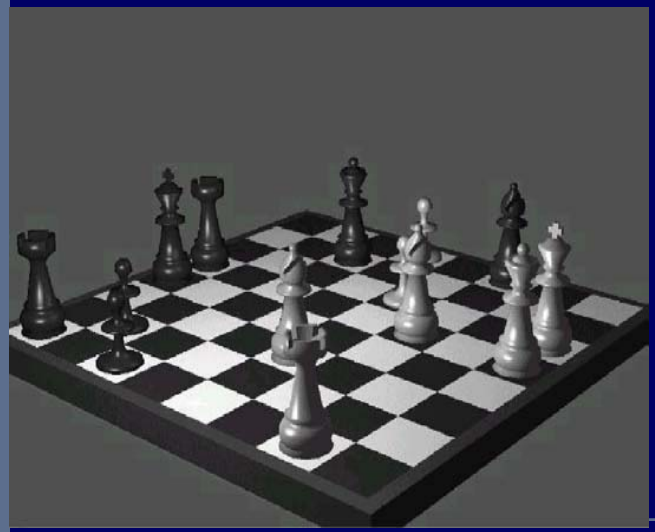
Intelligence

Playing chess

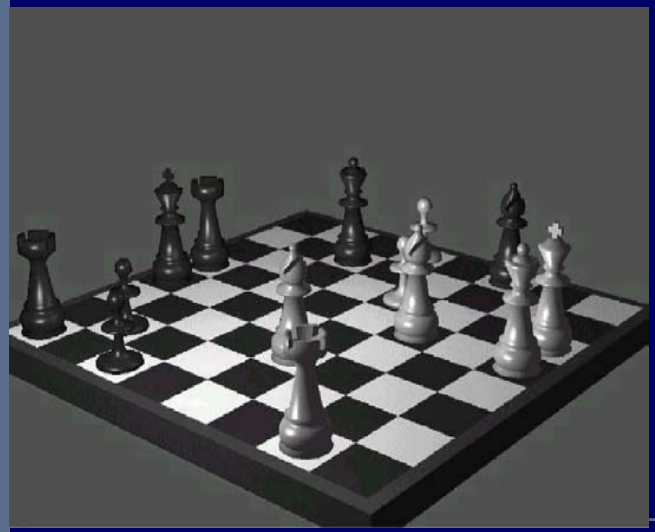




Playing chess



Playing chess



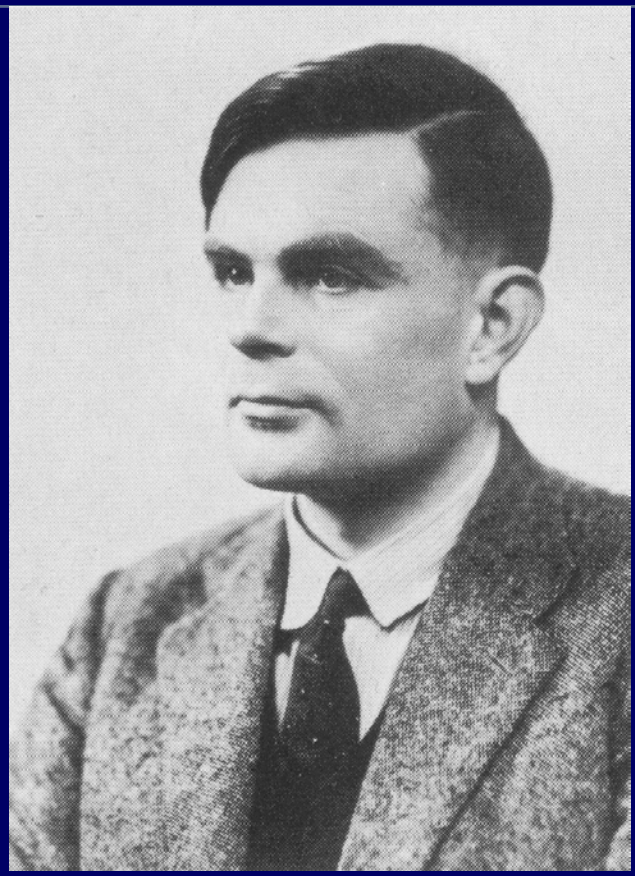
Common denominator?

Observing behavior

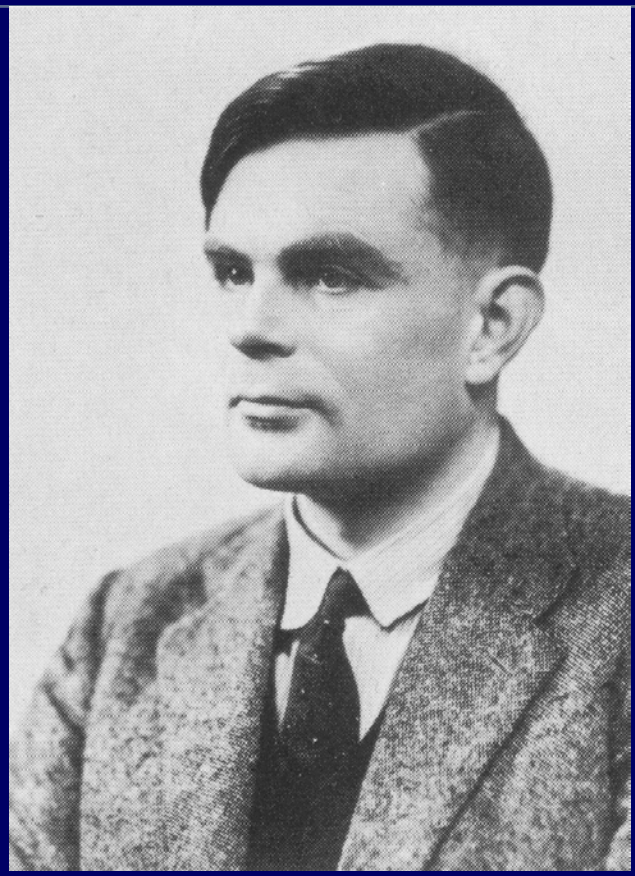
Videos

- Robovie

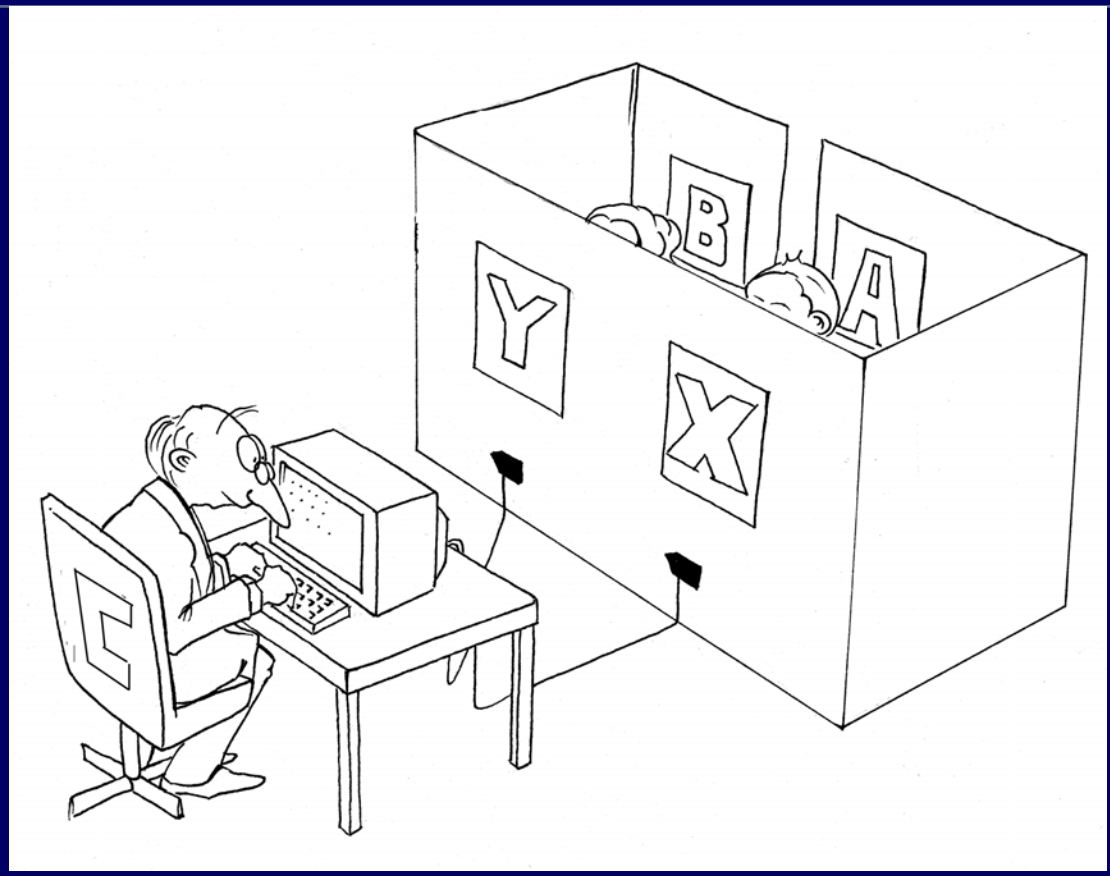
- real dog



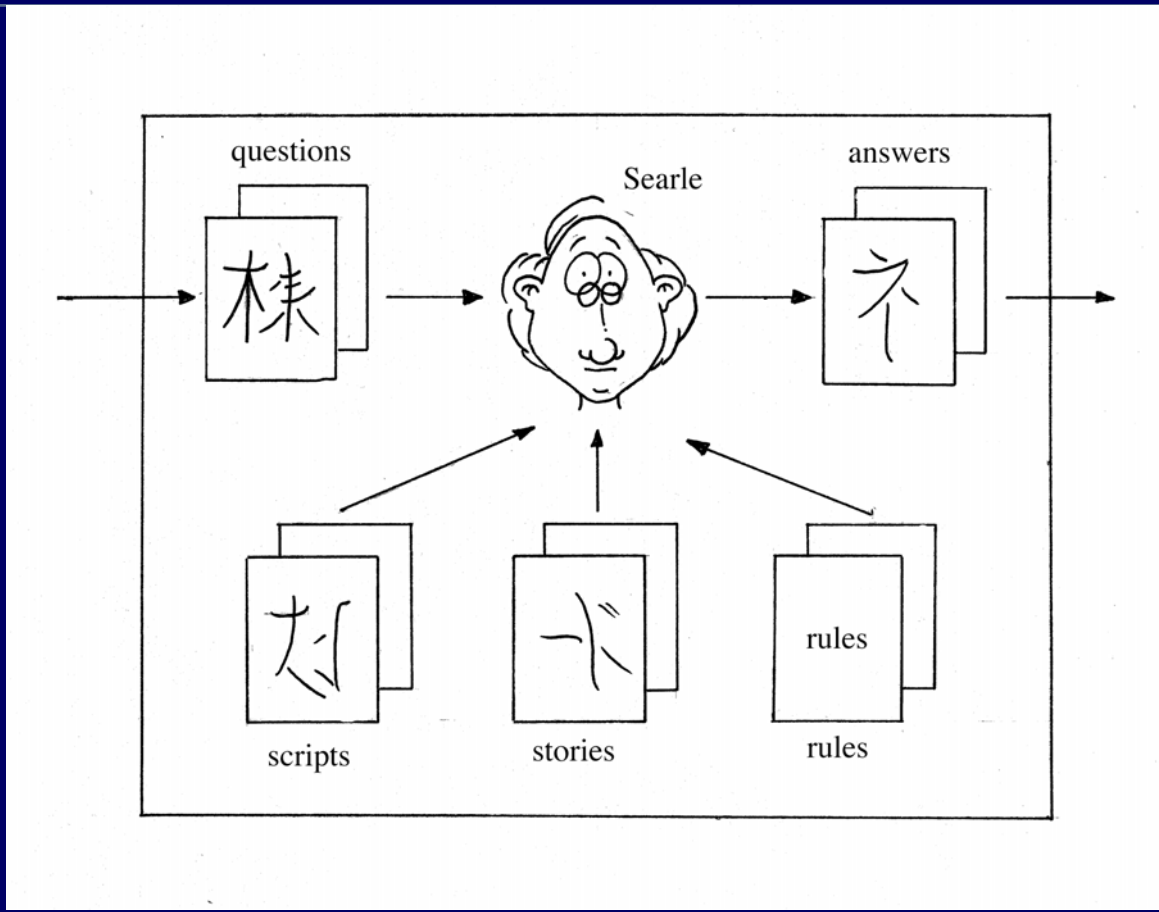
Alan Turing (1912–1954)



The Turing Test

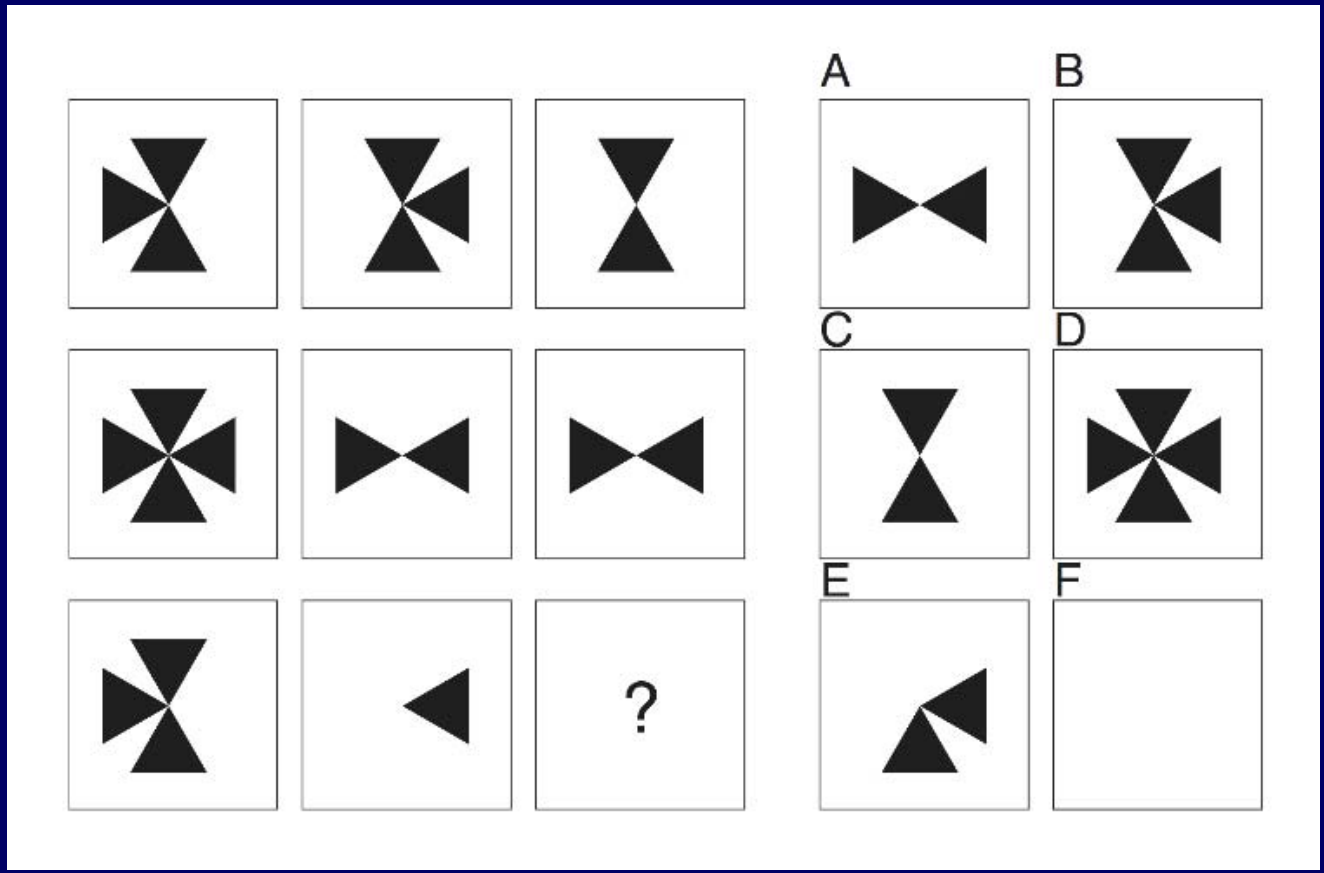


Searle's "Chinese Room"

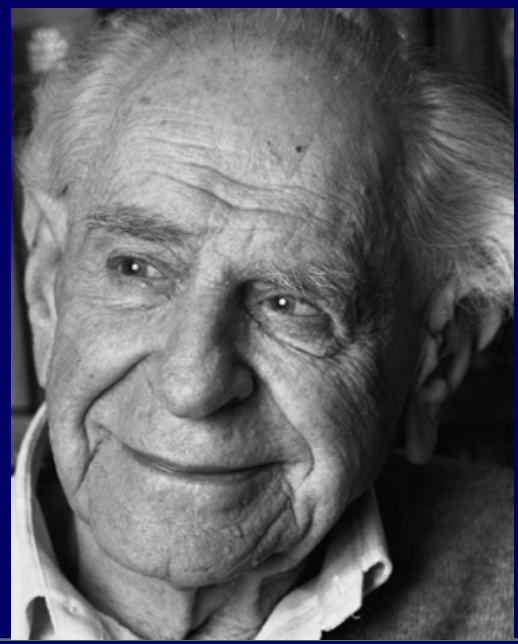


Measuring intelligence

IQ Test



Karl Popper on IQ Tests

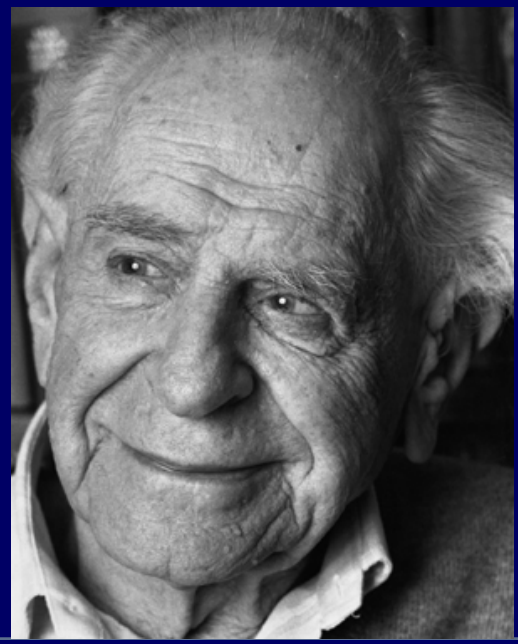


Karl Popper on IQ Tests

Video
- Karl Popper

Karl Popper (1902–1994)

"champion" of Philosophy of Science in the 20th century



Assignments

- Read chapter 1 of “Understanding Intelligence”
- Classwork exercise 1
- Take an IQ test
- Check out http://tokyolectures.org

- Special assignment for Beijing:
  Comment on Searle’s famous “Chinese Room” thought experiment and give a short (5-7 min) presentation on this at the beginning of next week’s lecture.

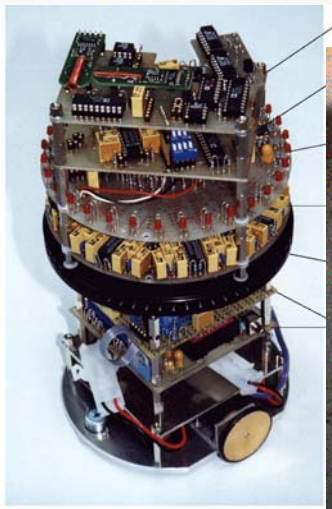
How to study intelligence?

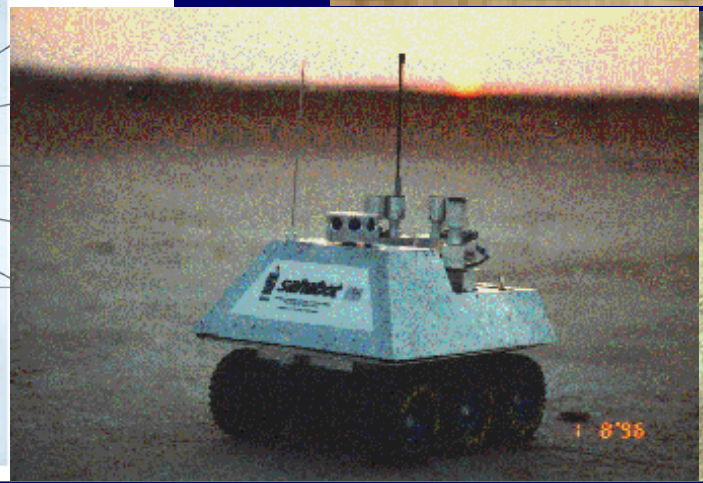
How to study intelligence?

- the “synthetic methodology”

Navigation behavior of desert ants

Sahabot I and II
The “analog robot”

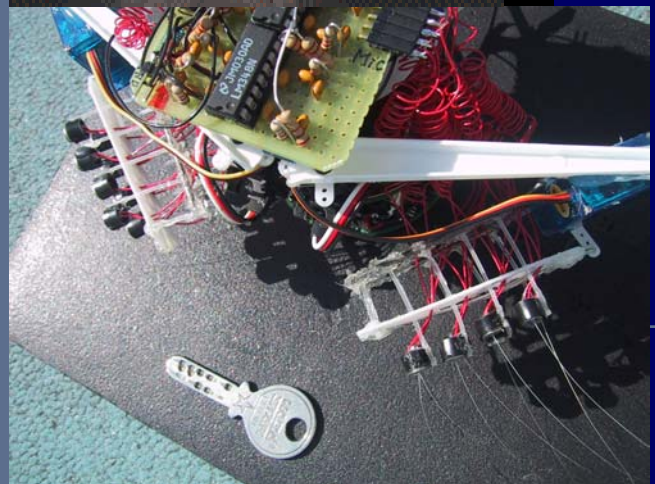




Design and construction:
Hiroshi Kobayashi, Dimitri Lambrinos, Ralf Möller, Marinus Maris

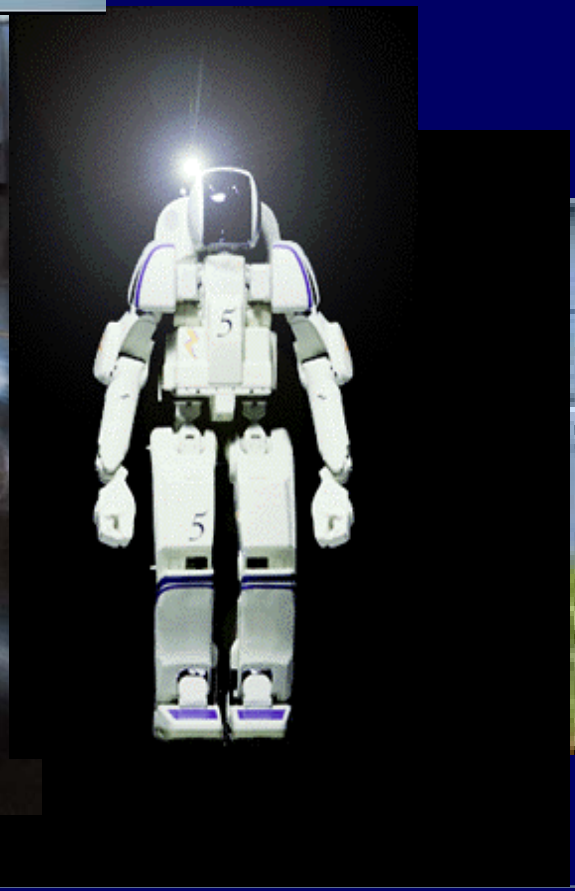
Function of whiskers in rodents

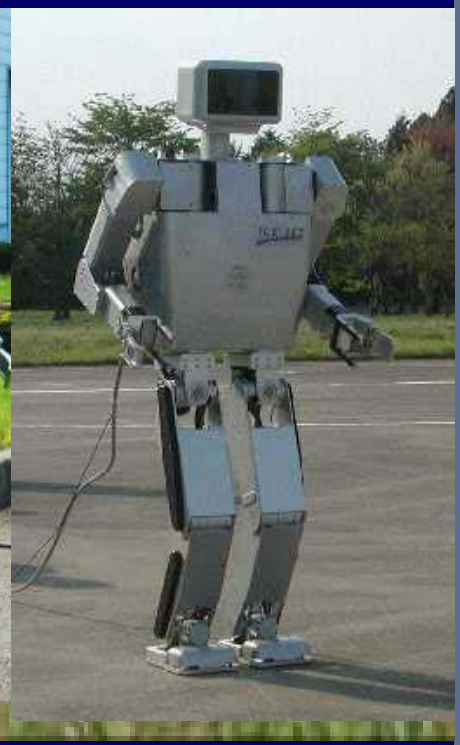
Design and construction:
Verena Hafner, Miriam Fend and Hiroshi Yokoi



A-Mouse, the Artificial Mouse

Human walking





H-7: design and construction
S. Kagami, Univ. of Tokyo

Asimo by Honda

Assignments

- Read chapter 1 of “Understanding Intelligence”
- Take an IQ test yourself
- Check out http://tokyolectures.org for additional materials
- ***Beijing:***
  prepare a short presentation on the famous thought experiment by John Searle, the “Chinese Room” (ca. 5-7 min)

“The latest from Japan”

“The latest from Japan”

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