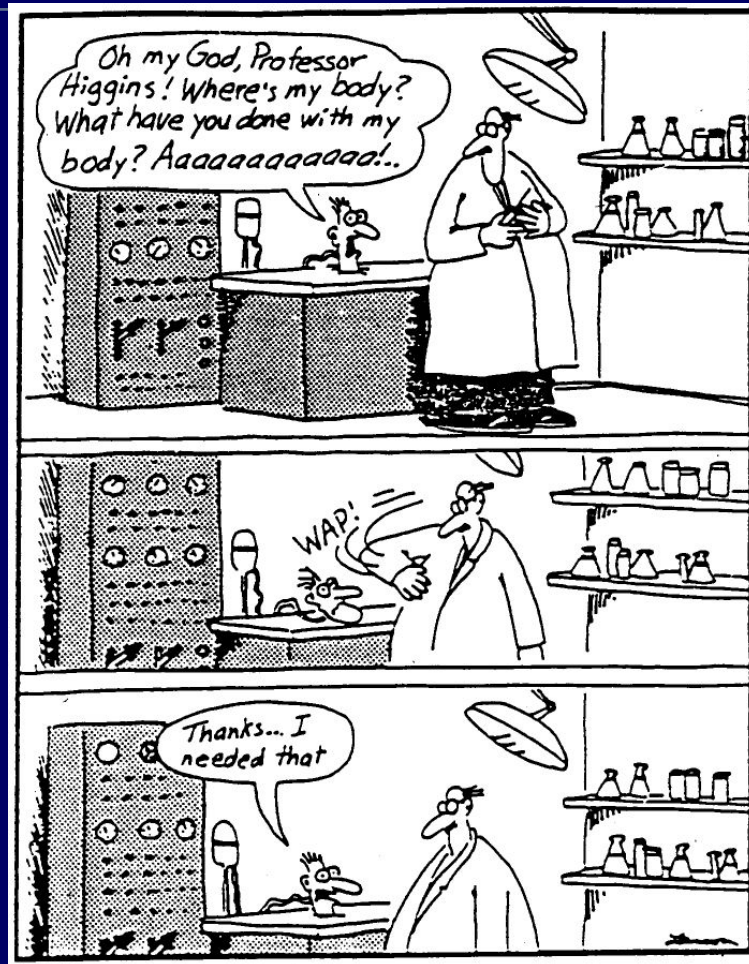

The AI Lectures from Tokyo

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/>

Preliminary remarks

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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



t=0.00



t=1.00



t=2.30



t=3.15



t=3.60



t=4.30

Preliminary remarks

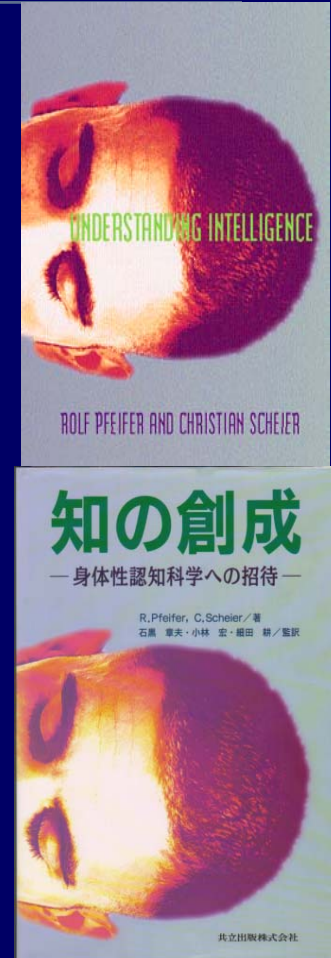
- two parts: theory and “the latest from ...”
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Textbook

Rolf Pfeifer and Christian Scheider

*MIT Press, Paperback edition
Understanding Intelligence*

知の創成、共立出版、2001



Preliminary remarks

- two parts: theory and “the latest from ...”
- somewhat shorter than normal: textbook with additional reading
- classwork exercises
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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).

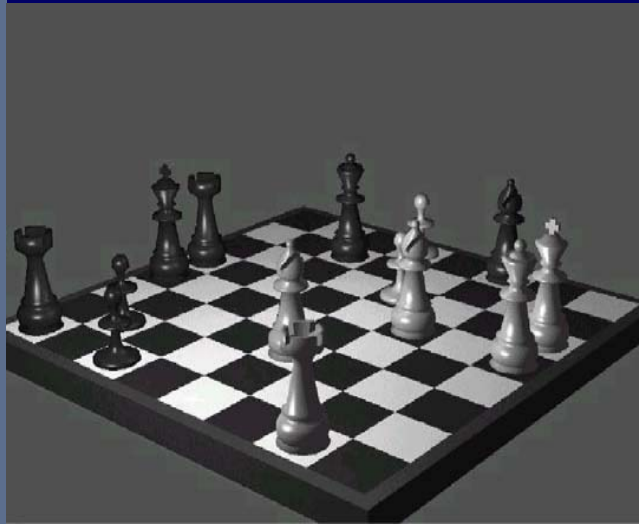
Some definitions of “intelligence”

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

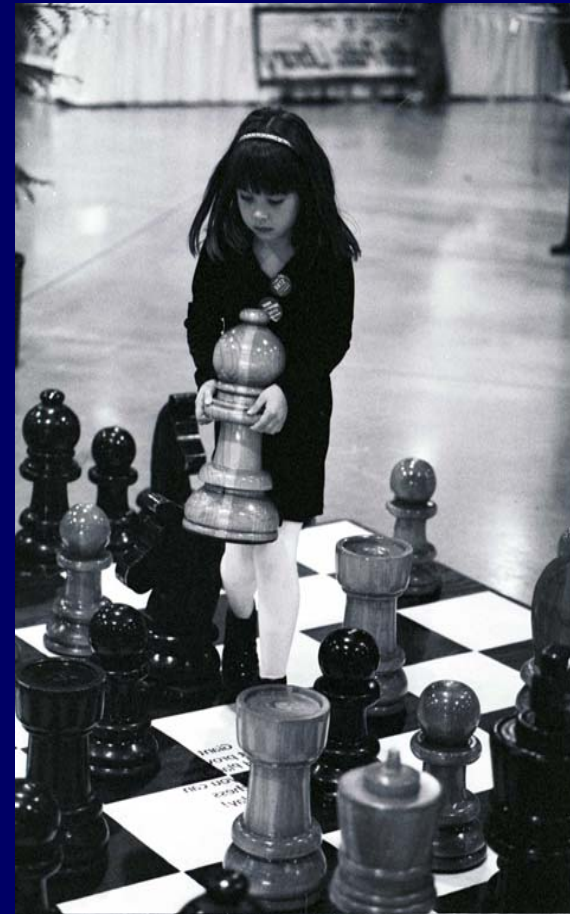
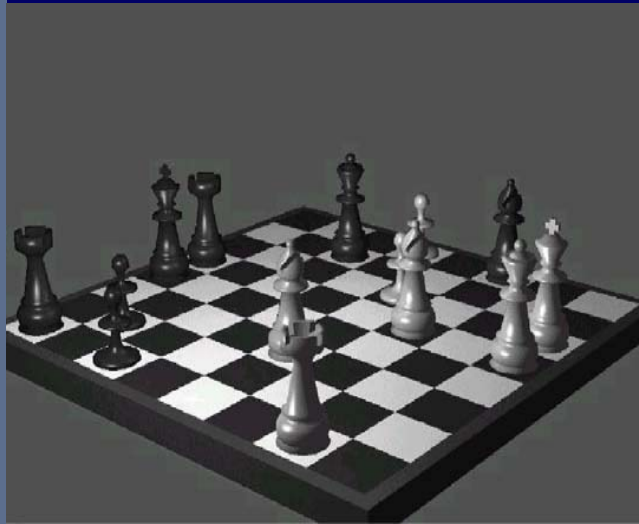
Playing chess



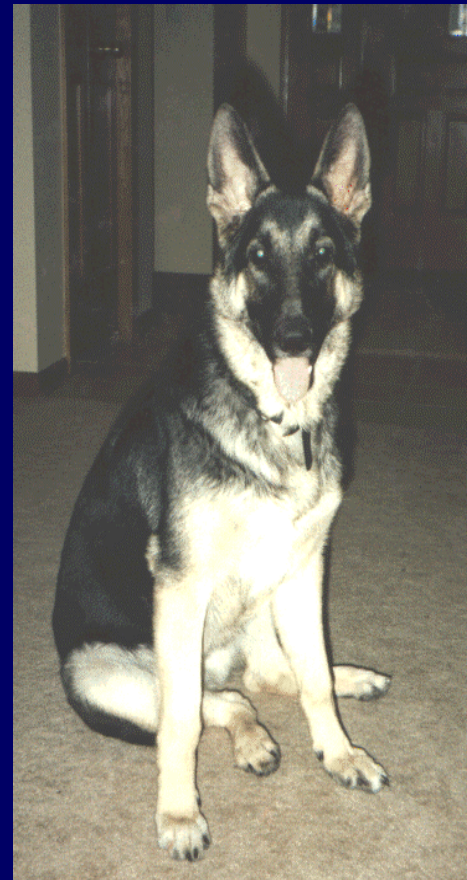
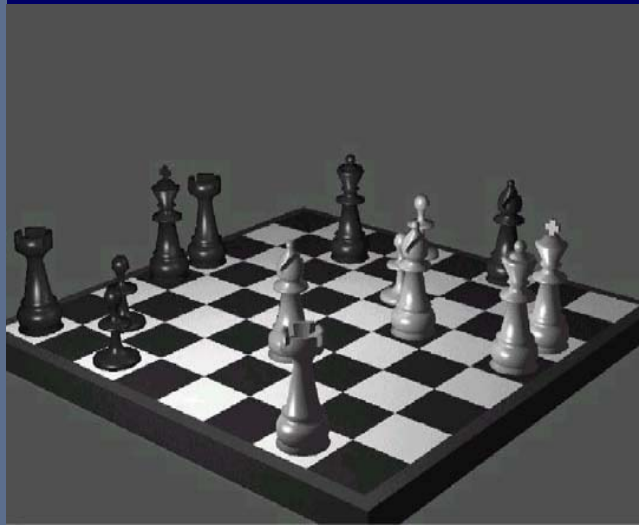
Rolf



Playing chess



Playing chess



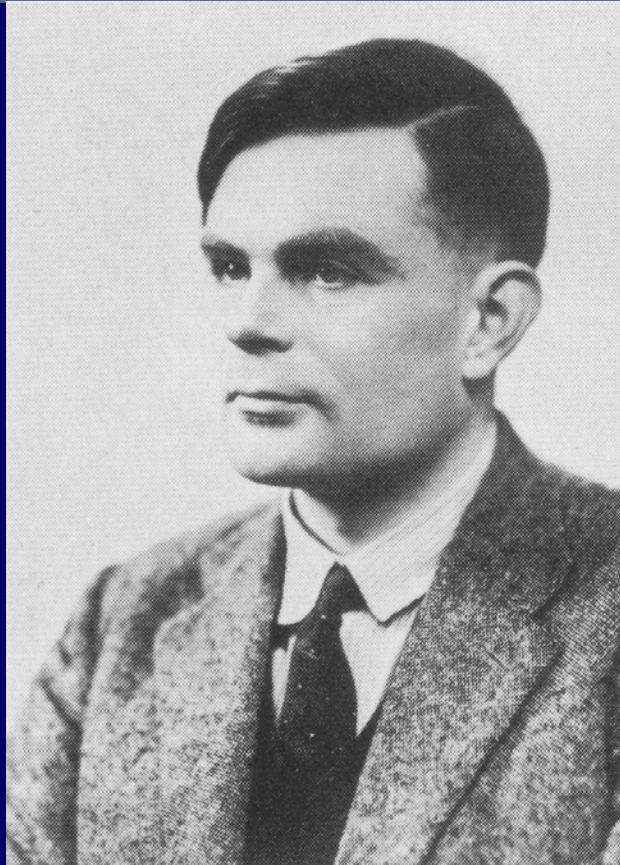
Common denominator?

Observing behavior

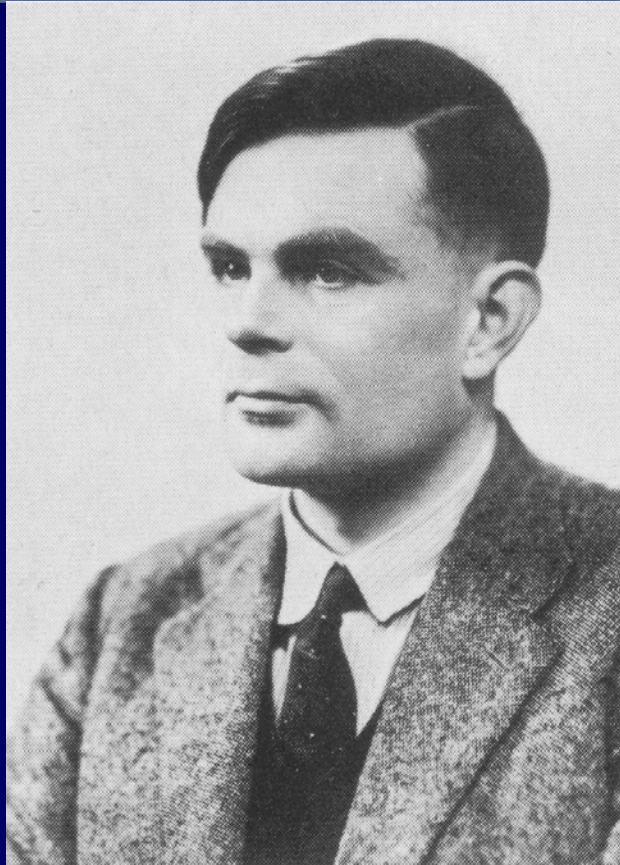
Videos

- *Robovie*

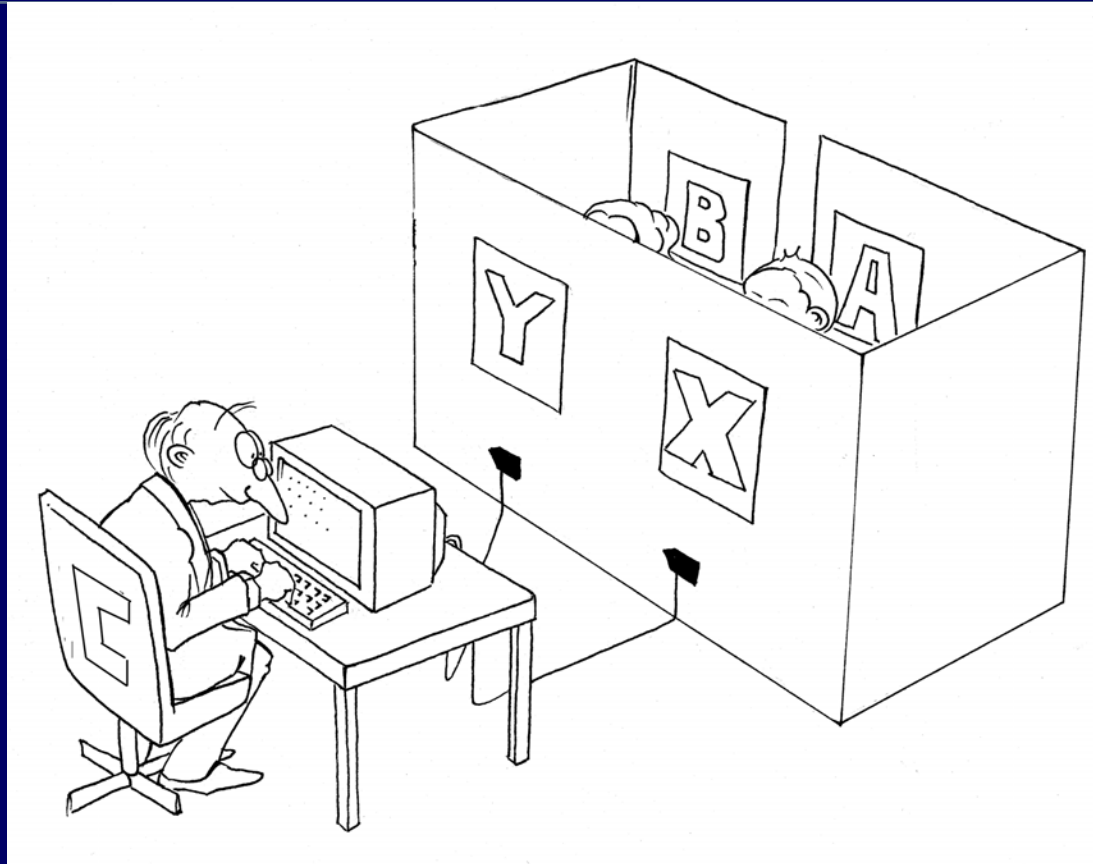
- *real dog*



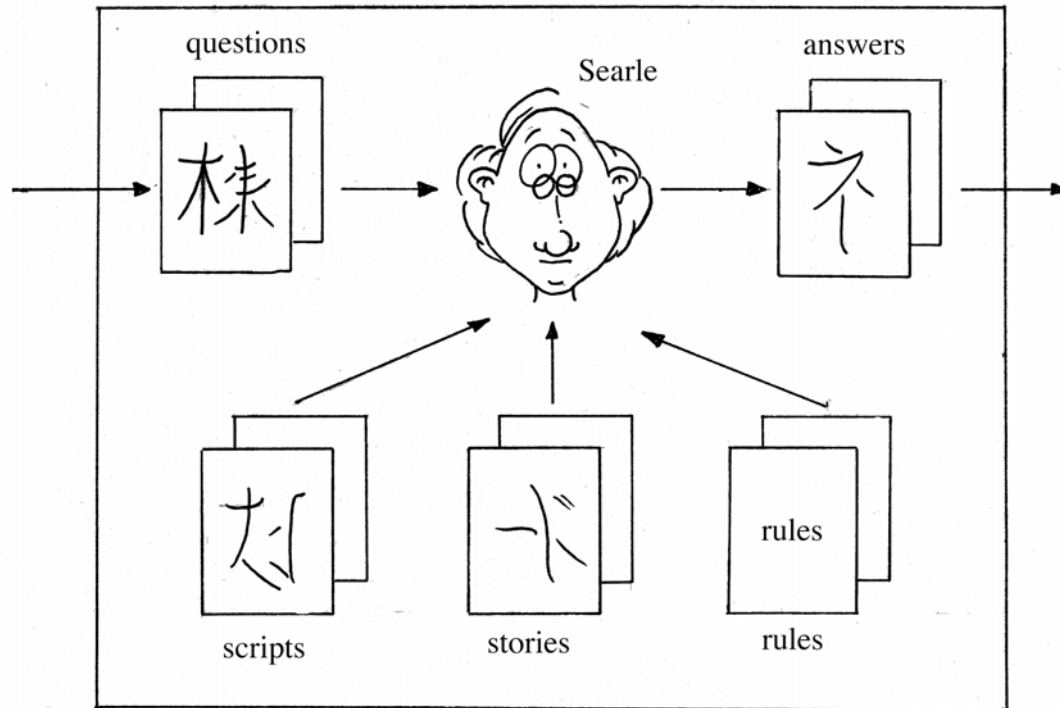
Alan Turing (1912–1954)



The Turing Test

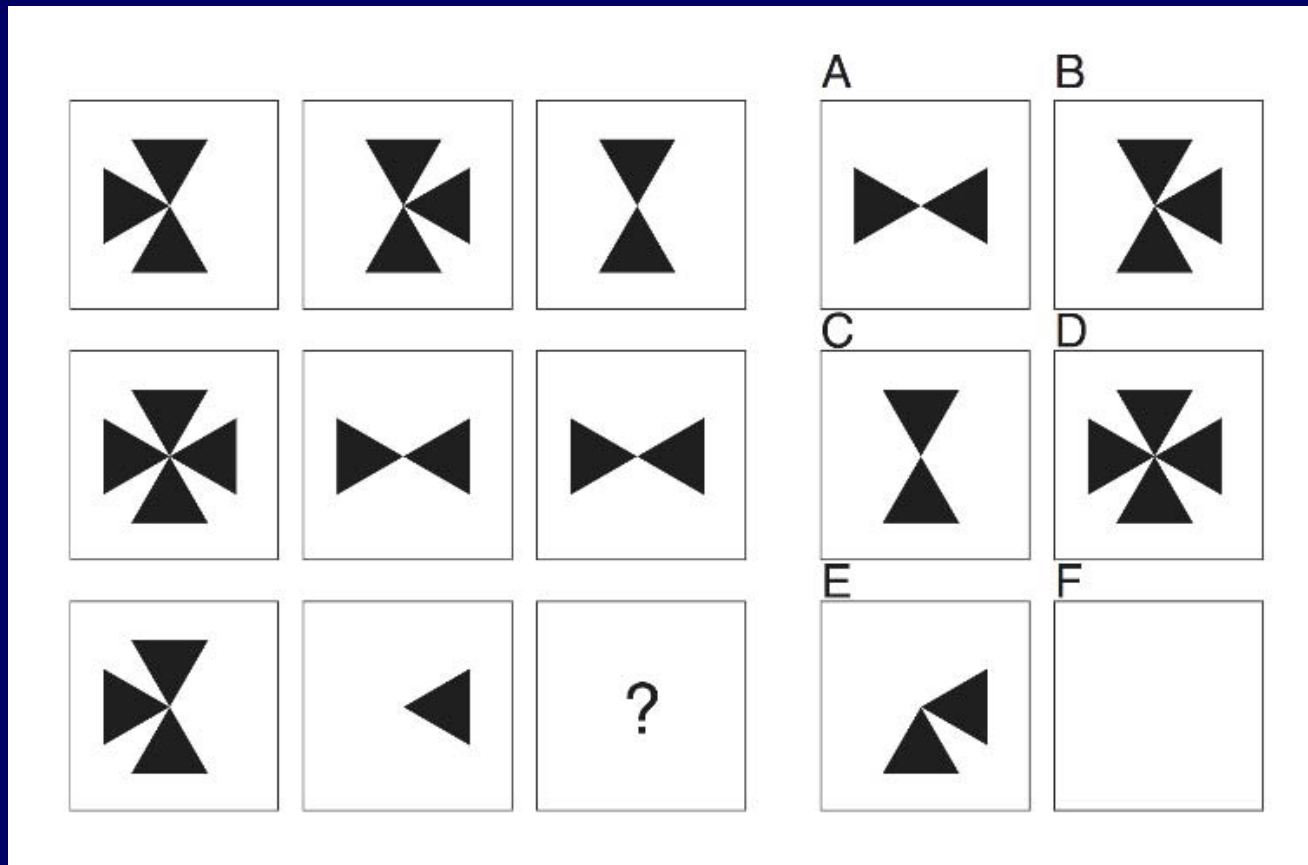


Searle's "Chinese Room"

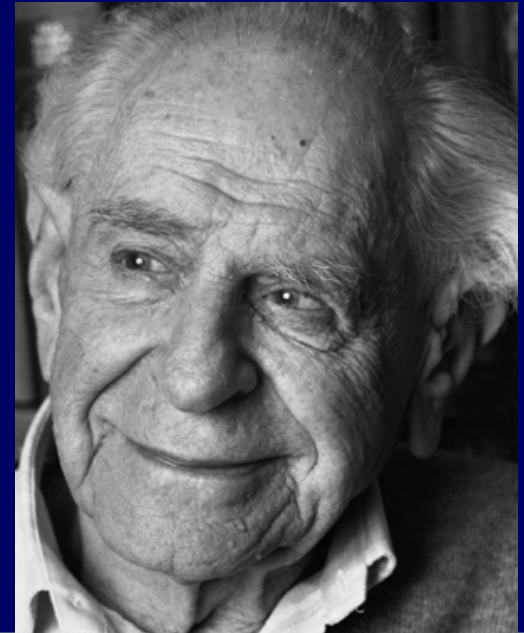


Measuring intelligence

IQ Test



Karl Popper on IQ Tests

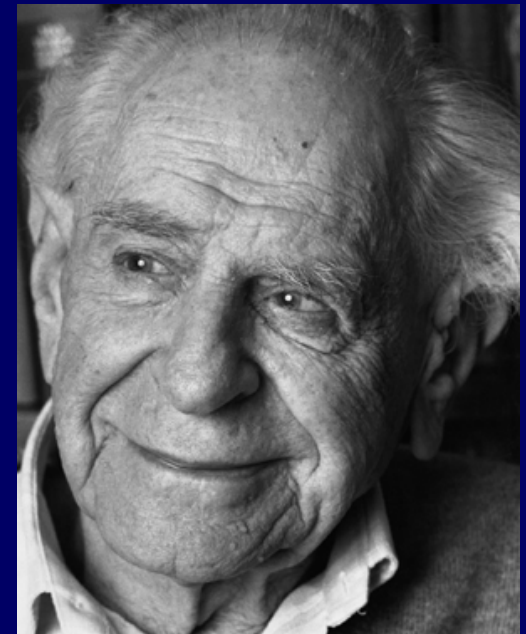


Karl Popper on IQ Tests

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?

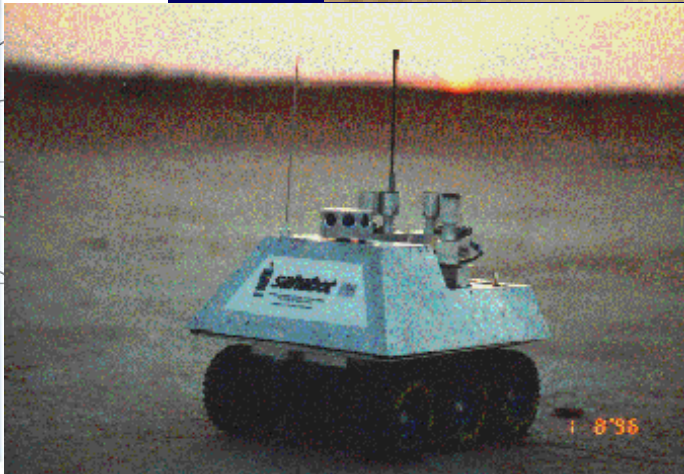
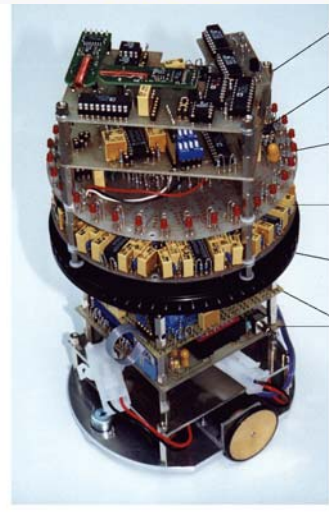
How to study intelligence?

- 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



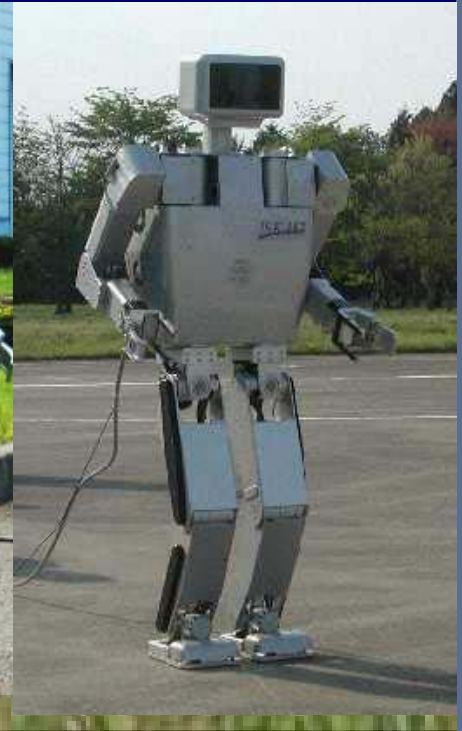
Design and construction:
Verena Hafner, Miriam Fend and
Hiroshi Yokoi



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”



Professor Yasuo Kuniyoshi
Intelligent Systems and Informatics Laboratory
The University of Tokyo



