Please turn off and put away all electronics.
Please avoid the last 2 rows.
Machine intelligence

Functionalism

Machine Intelligence

Successes:
- Google driverless car, translation
- IBM Watson
- Robot scientist
- Mars rover
- Spaun

Approaches to MI
Symbolic reasoning: logic, rules, case-based reasoning
Neural networks (connectionism)
Statistical
  - Bayes networks
  - Machine learning
Synthesis: Eliasmith’s semantic pointer hypothesis

Turing Test
Turing Test (1950): use a text-based interface to see if people can tell the difference between communication with a computer and a human.
Not sufficient: people can be tricked, e.g., by Eliza.
Not necessary: a computer might be found out it even though it is many respects more intelligent than people.
For MI (AI)

Computers are getting faster with more powerful memories.
Successes: cars, Watson, etc.
Advances in neuromorphic computing
Silicon chip replacement thought experiment

Against MI

Progress has been slow and disappointing.
Computers will never be capable of consciousness, emotions, free will, etc.
Searle’s Chinese room argument.
Ethics: vs. machine domination.

Searle’s Chinese Room

<table>
<thead>
<tr>
<th></th>
<th>Person in room</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questions</td>
<td>Symbol table</td>
</tr>
</tbody>
</table>

Input  | Computer processor | Language data base
Output |

Brain representations and processes for language and learning

Sensory and motor connections to the world

Questions  | Robot processor including language and learning
Answers    | Sensory and motor connections to the world
Input      | Output
Responses to Searle
The person in the room would not produce natural language.
The analogy only applies to the simplest computers.
A robot with the capacity to interact with the world and learn from its experience would have meaning and intentionality.

Discussion Question
So you think computers will ever be as intelligent as humans?

Functionalism
Mental states are not defined by a special substance (dualism) or physical constituents (mind-brain identity).
Mental states are defined by functional causal relations to sensory inputs, behavioral outputs, and other mental states.
Main argument for functionalism: multiple realizability of mental states in non-human brains, computers, etc.

Against Functionalism
Option: restricted mind-brain identity theory: human mental states are brain states.
Dualist arguments: zombie, etc.
Materialist arguments:
The more we learn about the brain, the more we realize that physical structure matters: brain organization, neurotransmitters, glial cells, etc.
Computers might have consciousness, but it would be very different from human experience.