

24.09 Minds and Machines

Fall 11 HASS-D CI

from the identity
theory to
functionalism

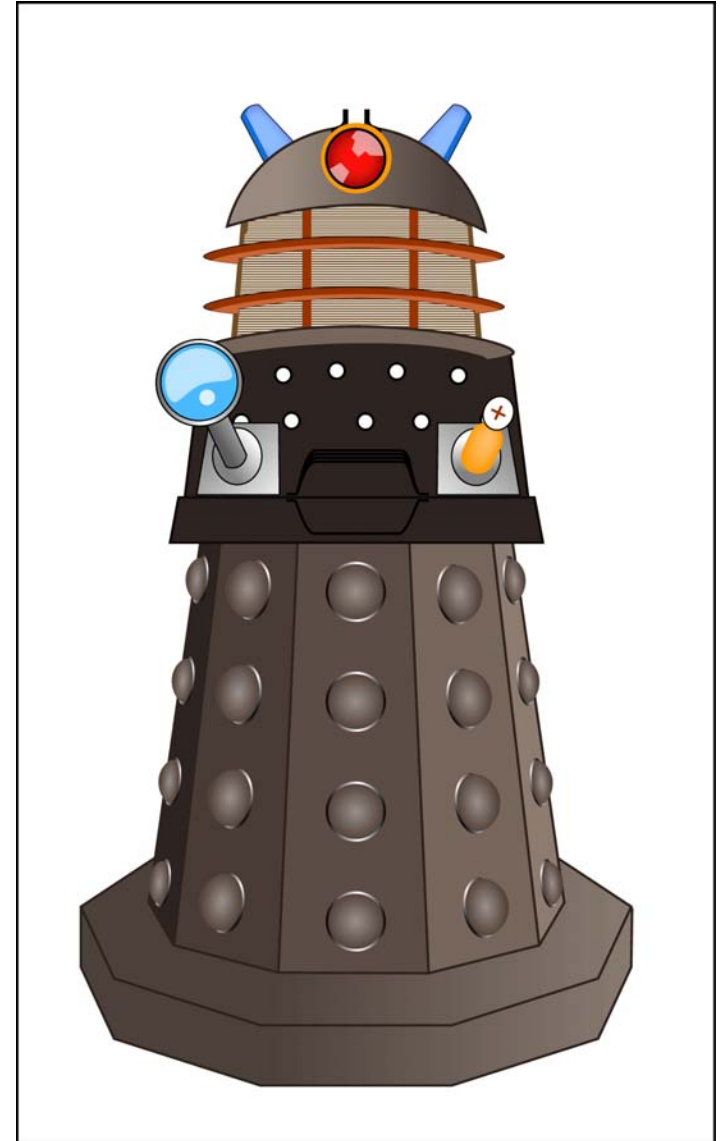


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roadmap

functionalism (a more general version of the computer model of the mind)

argument D (D+)

Kripke's objection

behaviorism

the identity theory

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Block, 'Functionalism'

Cartesian Dualism said the ultimate nature of the mental was to be found in a special mental substance. Behaviorism identified mental states with behavioral dispositions; physicalism in its most influential version identifies mental states with brain states. Functionalism says that mental states are constituted by their causal relations to one another and to sensory inputs and behavioral outputs. Functionalism is one of the major theoretical developments of Twentieth Century analytic philosophy, and provides the conceptual underpinnings of much work in cognitive science.

Putnam on the identity theory

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The [type-type] identity theorist] has to specify a physical-chemical state such that any organism (not just a mammal) is in pain if and only if (a) it possesses a brain of a suitable physical-chemical structure; and (b) its brain is in that physical-chemical state...it must be a state of the brain of any extra-terrestrial life that may be found that will be capable of feeling pain...

Putnam, 'The nature of mental states'

'replacement' thought-experiments

Image removed due to copyright restrictions.
A RoboCop movie poster.

a gradual replacement,
one neuron at a time,
with a chip that has the
same input-output
profile

is this any worse than a
cochlear implant?

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A Six Million Dollar Man poster.

an (apparent) lesson

minded creatures can in principle be made out of anything, provided certain structural constraints are met

you couldn't make a mind out of Jello, but you could make one out of silicon chips

Image removed due to copyright restrictions. Bowls of Jell-O.

mental states are the inner causes of behavior

the correspondence between mental states and behavior is many-many

(a) mental state M may produce different sorts of behavior, depending on the creature's other mental states

(b) the same behavior may be produced by different mental states

example 1: the mousetrap

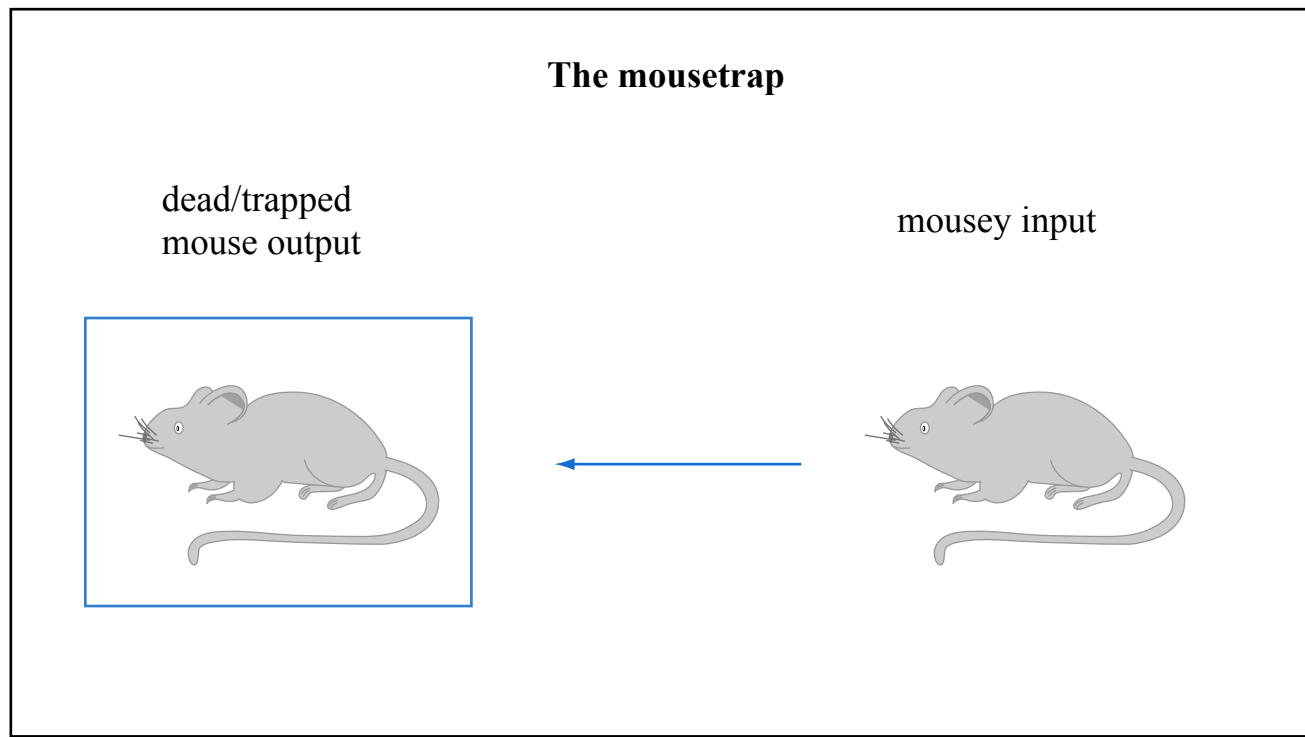


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multiple realizability

Images removed due to copyright restrictions. Three different mouse traps.

the mousetrap is...

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Mickey Mouse.

...the simplest sort of functional kind

since no constraints are placed on its inner organization, it is also a behavioral kind

example 2: the three-coke vending machine

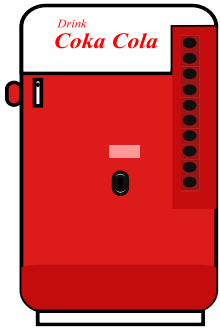





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initial
states

$M_3 I_0$	$M_2 I_0$	$M_1 I_0$	$M_3 I_1$	$M_2 I_1$	$M_1 I_1$
"25¢"	"25¢"	"25¢"			
$M_3 I_1$	$M_2 I_1$	$M_1 I_1$	$M_2 I_0$	$M_1 I_0$	shut down

Images by MIT OpenCourseWare.

output
for
25¢ input

next
states

the vending machine...

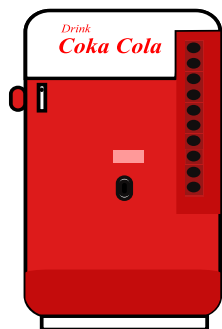


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...can be multiply realized

it is a functional but not behavioral kind

what are the functional states M_3 , I_2 , etc?

the table tells the whole story

functionalism

the view that mental states are functional states—states specified in terms of their causal relations to inputs, outputs, and other states

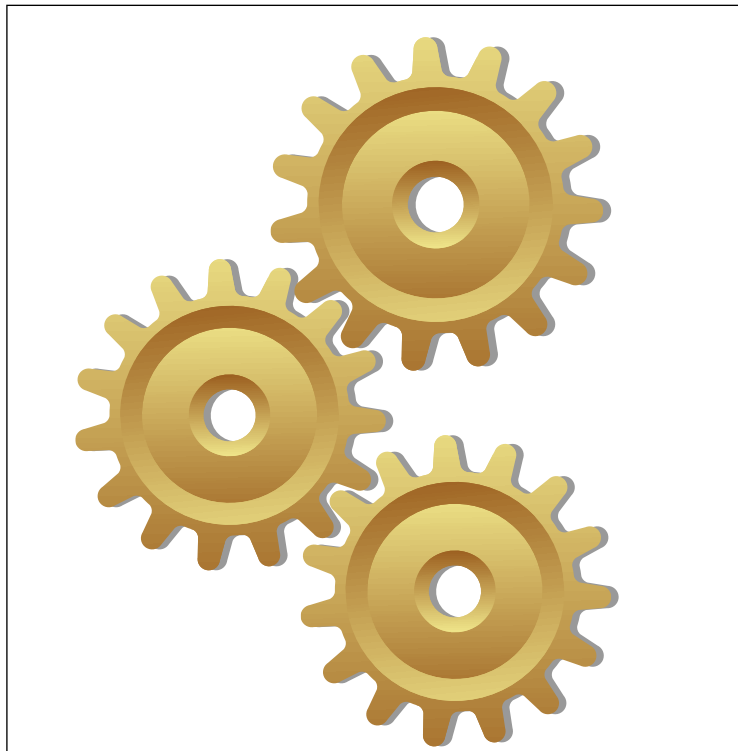


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functionalism and the lessons

1. mental states can be multiply realized
2. input-output isn't enough: it's what's in between that matters (recall the Aunt Bubbles machine)
3. mental states are the inner causes of behavior
4. the correspondence between mental states and behavior is many-many

functionalism accommodates all the above

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the three-coke vending machine again

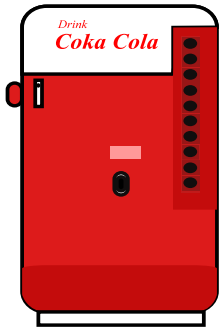


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the functionalist says that mental states can be specified like M_i, I_j - in terms of their causal relations to each other and to inputs and outputs

initial states

output for
25¢ input

next states




$M_3 I_0$	$M_2 I_0$	$M_1 I_0$	$M_3 I_1$	$M_2 I_1$	$M_1 I_1$
"25¢"	"25¢"	"25¢"			
$M_3 I_1$	$M_2 I_1$	$M_1 I_1$	$M_2 I_0$	$M_1 I_0$	shut down

Image by MIT OpenCourseWare.

the simple Turing machine table again

similarly, the functionalist says that mental states can be specified like S1 and S2—in terms of their causal relations to each other and to inputs and outputs

state scanned cell	S1	S2
I	R, S1	H
0	I, S2	H

philosophical toolkit: a priori and a posteriori

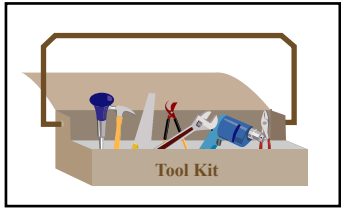


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(knowable) proposition p is knowable a priori iff p can be known independently of experience

otherwise, proposition p is knowable (only) a posteriori

a posteriori and necessary: water= H_2O	a posteriori and contingent: it's cloudy
a priori and necessary: $2+3=5$	a priori and contingent: ??

reading for next session

Putnam

this paper is difficult and we won't be discussing everything in it: just give it a skim on the first reading, concentrating on the 'twin-earth' example

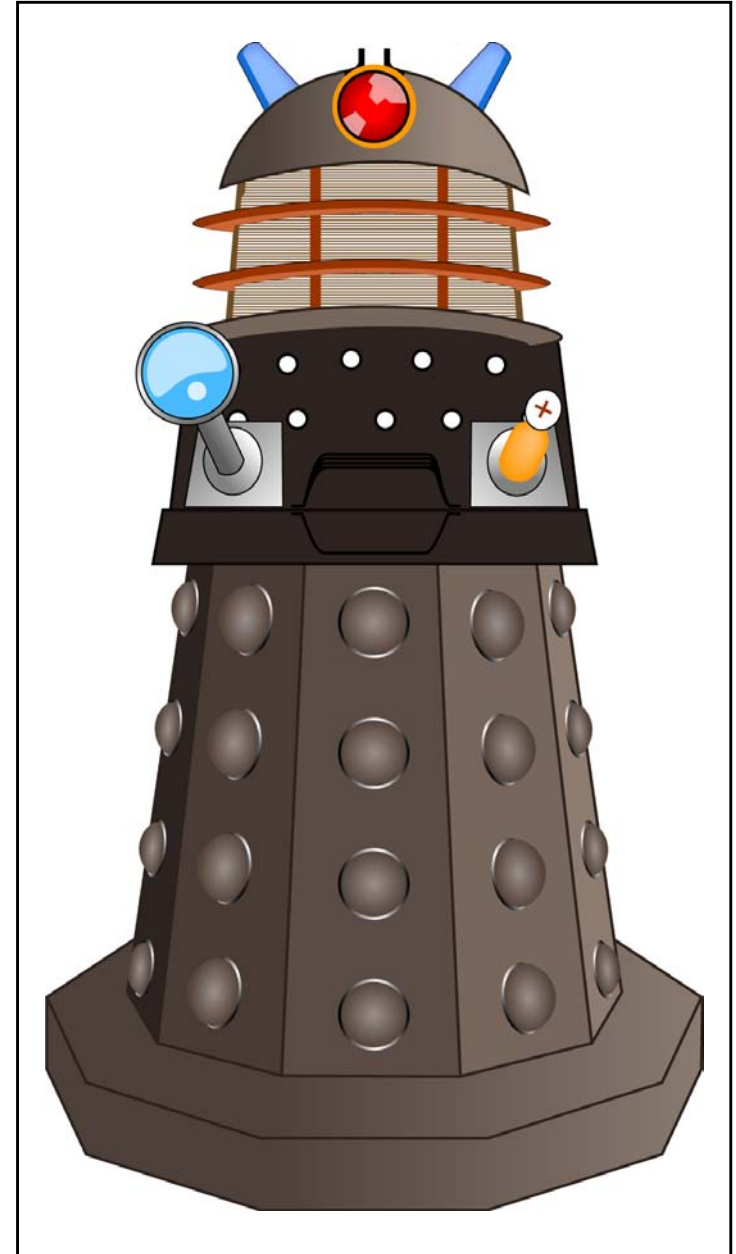


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Fall 2011

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