

The Turing Test and Its Discontents

Administrivia

- *Class Website:*

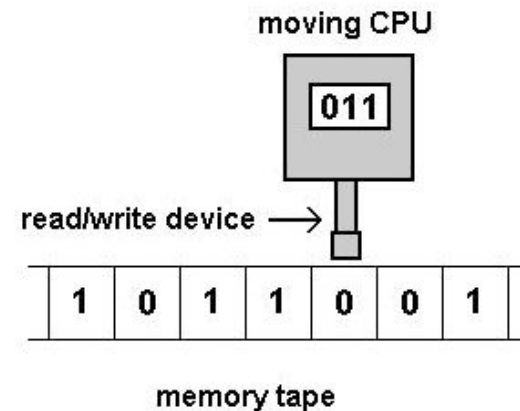
<http://13d.cs.colorado.edu/~ctg/classes/issmeth08/IssMeth08.html>

- Midterm paper (due March 18; 35 percent of grade)
- Final paper (due May 2; 40 percent of grade)
- Readings (~1 page hard copy, to be handed in for each reading; 15 percent of grade)
- Remaining 10 percent of grade based on class participation



The Turing Machine: or, What is a computer?

- Infinite tape of individual cells, each containing a 1, 0, or #(blank)
- Read/write head that can move one cell at a time left or right, read the contents of a cell, and write a symbol into it
- Moving “CPU”: a finite table of rules and internal states that says what to do when you are in a given state, reading a given cell. For example: “If I am in state 24 and reading a 0, write a 1 into the cell, move one step right, and change to state 52.”



Functionalism and “levels of description”

- Rough guidelines for playing chess (e.g., "protect the king", "hold the center", "don't let pawns become too scattered")
- Higher-level program structure. (Do we have a program based on collections of local "experts"? What kind of search mechanism do we use?)
- Program (written in, e.g., Lisp/Pascal; here, the details of the algorithm are specified: how do we represent the game board? What numerical measure do we use to determine, say, the worth of a given piece, or the "goodness" of a particular game configuration?).
- Assembly code/Machine code
- Code is translated into signals that cause input and output to collections of logical gates (packaged into "chips" in the computer)
- Logical gates are implemented in terms of transistors, resistors, and similar "primitive" electronic elements
- Transistors, resistors, etc. are implemented in "junctions" between two different material substances.

Levels of description: some points to think about

- First: there is no one "correct" level of description for something like our chess program. The chess player thinks of the program in terms of goals and rules-of-thumb; the Lisp programmer thinks of it in terms of search strategies and data structures (such as the representation of the pieces or game board); the hardware designer thinks of it in terms of digital logic elements. It would be mistaken to think of (say) the transistor level as the "true" level of the program; rather, each level conveys important information that the others suppress.
- Second: there is a certain deceptive quality to this hierarchy. Some levels "map" easily into the next lower level, as by translation. Some levels, though, are matters of interpretation.
- Third: this hierarchy is engineered. It is deliberate. We want to preserve this hierarchy of languages. There is no guarantee that non-engineered systems have the same properties.

The “Imitation Game”

Q: Please write me a sonnet on the subject of the Forth Bridge.

A: Count me out on this one. I never could write poetry.

Q: Add 34957 to 70764.

A: (Pause about 30 seconds and then give as answer)
105621.

Q: Do you play chess?

A: Yes.

Q: I have K at my K1, and no other pieces. You have only K at K6 and R at R1. It is your move. What do you play?

A: (After a pause of 15 seconds) R-R8 mate.

(Turing's) Objections to the Turing Test

- The Theological Objection
- The “Heads in the Sand” Objection
- The Mathematical Objection
- The Argument from Consciousness
- Arguments from Various Disabilities
- Lady Lovelace's Objection
- Argument from Continuity in the Nervous System
- The Argument from Informality of Behavior
- The Argument from ESP

Some Questions to Consider

- The pragmatic question (What makes passing this test so hard?)
- The flip side of the pragmatic question (What makes passing some versions of this test so weirdly easy?)
- False negatives? (Thinking beings that fail the Turing Test)
- False positives? (Non-thinking things that pass)

Jane was invited to Jack's birthday party.

She wondered if he would like a kite.

She went to her room and shook her piggy bank.

It made no sound.

Q: In the first line of your sonnet which reads 'Shall I compare thee to a summer's day', would not 'a spring day' do as well or better?

A: It wouldn't scan.

Q: How about 'a winter's day'? That would scan all right.

A: Yes, but nobody wants to be compared to a winter's day.

Q: Would you say Mr. Pickwick reminded you of Christmas?

A: In a way.

Q: Yet Christmas is a winter's day, and I do not think Mr. Pickwick would mind the comparison.

A: I don't think you're serious. By a winter's day one means a typical winter's day, rather than a special one like Christmas.

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J. Weizenbaum's ELIZA program (1966)

A typical conversation is the following:

Men are all alike.

IN WHAT WAY?

They're always bugging us about something or other.

CAN YOU THINK OF A SPECIFIC EXAMPLE?

Well, my boyfriend made me come here.

YOUR BOYFRIEND MADE YOU COME HERE

He says I'm depressed much of the time.

I AM SORRY TO HEAR YOU ARE DEPRESSED

It's true. I am unhappy

DO YOU THINK COMING HERE WILL HELP YOU

NOT TO BE UNHAPPY

I need some help, that much seems certain.

WHAT WOULD IT MEAN TO YOU IF YOU GOT SOME HELP

Perhaps I could learn to get along with my mother.

TELL ME MORE ABOUT YOUR FAMILY

[10:32:24] Alice:Hello, my name is Alice and I am the human.

[10:34:40] Judge 3:what is your profession?

[10:35:15] Alice:I am chat person. My job is chatting online. As you are sitting in front of your computer screen, you may be wondering if I am a computer or a person talking.

[10:35:45] Judge 3:could we chat about windsurfing?

[10:36:29] Alice:Do you mean you and me? Sure I can talk about it. windsurfing is quite an interesting topic. As you hear the sound of keys typing you may begin to feel more comfortable chatting with me.

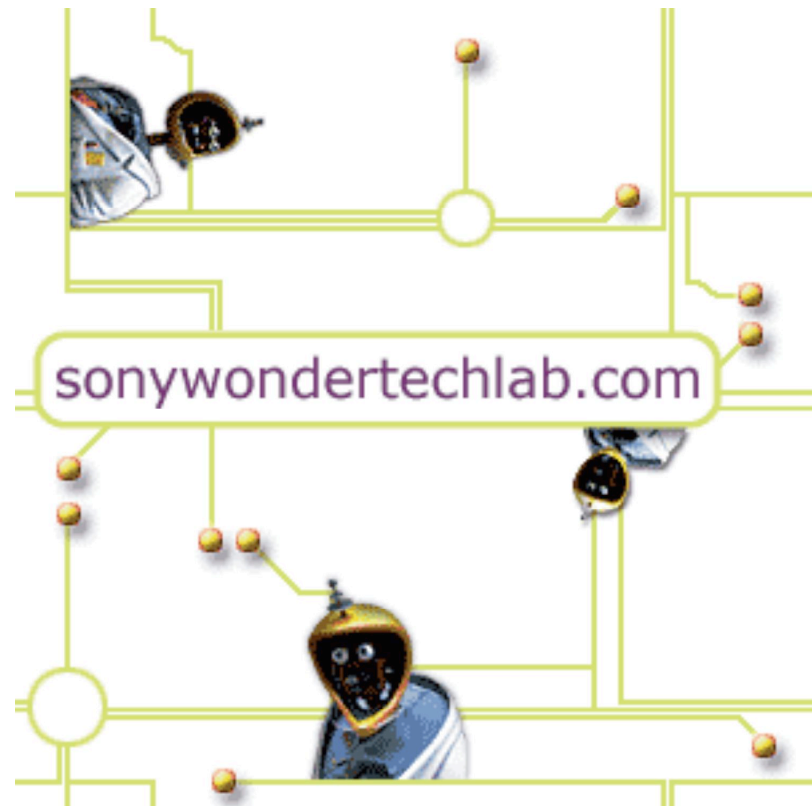
[10:36:40] Judge 3:what kind of topic is windsurfing exactly?

[10:37:15] Alice:Precisely. It seemed relevant. The feel of the keys on the tips of your fingers may remind you of some questions you wanted to ask me about.

[10:37:53] Judge 3:sorry but you didn't answer the question. can one eat a windsurfing?

[10:38:51] Alice:There is no need to apologize. Try asking me the question again in simpler terms. Theoretically, I suppose one could. You may be seated alone in a room, or together with a group of other people using computers. You may be judging me.





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A Few Questions (Besides Turing's)

- The computational metaphor, and the “embodied mind” objection
- The “necessity of evolution” objection

Searle's "Chinese Room"

Replies to Searle's Thought Experiment

- The Systems Reply
- The Robot Reply
- The Brain-Simulator Reply
- The Combination Reply
- The Other-Minds Reply
- The Many-Mansions Reply

Some Additional Things to Consider about the “Chinese Room”

- Degrees of consciousness (animals? That thermostat again?)
- The “danger of common sense” argument

If Machines Can't Think, What
Good Is the Computational
Metaphor?

An alternative way of thinking about the “computational metaphor”: direct physical combinations of computational and biological materials



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