Chapter 24. Meeting 24, Discussion: Aesthetics and Evaluations

24.1. Announcements

- Sonic system reports due and presentations begin: 11 May

24.2. Quiz Review

- ?

24.3. The (Real) Turing Test

- Turing, A. M. 1950. "Computing Machinery and Intelligence." *Mind* 59: 433-460.

VOL. LIX. No. 236.] [October, 1950

MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY

I.—COMPUTING MACHINERY AND INTELLIGENCE

BY A. M. TURING

1. *The Imitation Game.*

I PROPOSE to consider the question, 'Can machines think?' This should begin with definitions of the meaning of the terms 'machine' and 'think'. The definitions might be framed so as to reflect so far as possible the normal use of the words, but this attitude is dangerous. If the meaning of the words 'machine' and 'think' are to be found by examining how they are commonly used it is difficult to escape the conclusion that the meaning and the answer to the question, 'Can machines think?' is to be sought in a statistical survey such as a Gallup poll. But this is absurd. Instead of attempting such a definition I shall replace the question by another, which is closely related to it and is expressed in relatively unambiguous words.

The new form of the problem can be described in terms of a game which we call the 'imitation game'. It is played with three people, a man (A), a woman (B), and an interrogator (C) who may be of either sex. The interrogator stays in a room apart from the other two. The object of the game for the interrogator is to determine which of the other two is the man and which is the woman. He knows them by labels X and Y, and at the end of the game he says either 'X is A and Y is B' or 'X is B and Y is A'. The interrogator is allowed to put questions to A and B thus:

C: Will X please tell me the length of his or her hair?

Now suppose X is actually A, then A must answer. It is A's

© Oxford University Press. All rights reserved. This content is excluded from our Creative Commons license. For more information, see http://ocw.mit.edu/fairuse.

- A test of human and computer indistinguishability

Image by MIT OpenCourseWare.

- Based on a party game in which an interrogator attempts to distinguish the gender of two human agents
- Through removing biases (sound, visual presence), and focusing on language alone, can a machine be indistinguishable from a human?
- Multiple tests can be averaged; after 5 minutes of conversation correct identification must be less than 70 percent
- Claim only of achieving thinking, not intelligence
- Functional rather than structural indistinguishability (2000, p. 429)

- Deception is permitted: mathematical questions can take longer, or fake mistakes
- Is human-like conversation the sole determinate of thinking?

24.4. The Eliza Effect

- Humans too easily associate humanity with machines
- Eliza in emacs: shift + escape; enter "xdoctor" and return

24.5. Other Tests: The John Henry Test

- The John Henry Test (JHT): a test of verifiable distinguishability between human and machine
- Other examples?

24.6. Other Tests: The Turing Hierarchy

- Steven Harnad
- Total Turing Test: full physical and sense based interaction
- T4: internal microfunctional indistinguishability
- T5: microphysical indistinguishability, real biological molecules
- t1: toy tests: subtotal fragments of our functional capacity (Harnad 2000, p. 429)
- The TT is predicated on total functional indistinguishability; anything less is a toy

24.7. A Little Turing Test

- Hofstadter, D. R. 1979. *Gödel, Escher, Bach: an eternal golden braid* . New York: Vintage.
- The little turing test (1979, p. 621)

A Little Turing Test

Below, I have reproduced nine selections, carefully culled from many pages of output from later versions of my program. Along with them are three (seriously intended) human-written sentences. Which?

(1) Blurting may be considered as the reciprocal substitution of semiotic material (dubbing) for a semiotic dialogical product in a dynamic reflexion.

(2) Rather think of a pathway of a 'sequence' of gedankenexperiment simpletons where heir-lines are a prima facie case of a paradiachronic transitivity.

(3) Think of that as a chain strength possibility of what, eventually, comes out as a product (epistemic conditions?) and the product is not a Frankfurt-ish packing-it-all-in.

(4) Despite the efforts, the reply, if you will, had been supported by the Orient; hence a fallacy will thereafter be suspended by the attitude which will be being held by the ambassador.

(5) Of course, until the upheavals, the ambassador was slightly gradually mollycoddling the rabble.

(6) Supposedly, refined liberty caused the attitudes insofar as peace is distilled by the consequences which will not eventually be caused by the command irrevocably insofar as peace of it is sometimes causing the intransigency infinitesimally surprisingly.

(7) According to the sophists, the campaigns in the city-states, in other words, have been accepted by the Orient cunningly. Of course, the Orient has been separated by the states particularly violently.
The Orient supports the efforts which had been supported by mankind.

(8) Admittedly, the hierarchical origin of the fallacy, nevertheless, will be prophesied by the enemies of it. By the same token, the individualists will have testified that intransigency will not have suspended the campaigns.

(9) Needless to say, during the upheaval which will have warranted the secrecy, the replies do not separate the Orient. Of course, the countries, ipso facto, are always probing liberty.

(10) Although a Nobel Prize was being achieved by the humanists, yet in addition, it was being achieved by the serf.

(11) An attitude will often be held by the serfs of a strife-torn nation.

(12) Moreover, the Nobel Prizes will be achieved. By the same token, despite the consequence, the Nobel Prizes which will be achieved will sometimes be achieved by a woman.

© Vintage Books. All rights reserved. This content is excluded from our Creative Commons license. For more information, see http://ocw.mit.edu/fairuse.

- Is this a Turing Test?

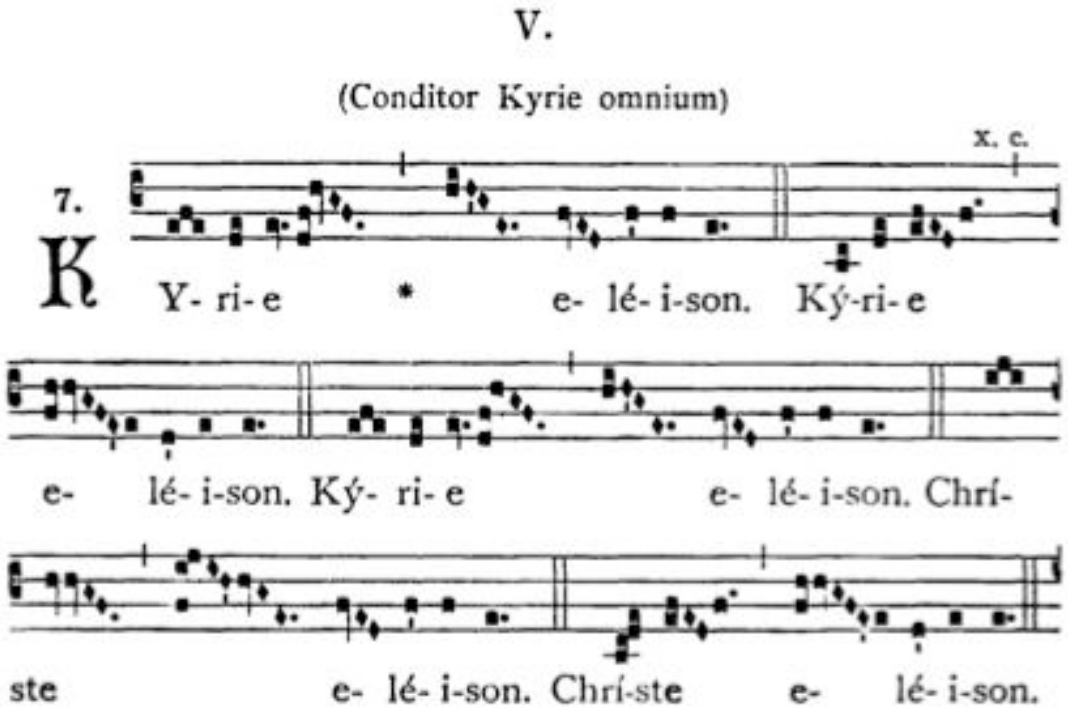
24.8. A (Kind of) Turing Test

- Kurzweil, R. 1990. *The Age of Intelligent Machines*. Cambridge: MIT Press.
- "The essence of the Turing Test is that the computer attempts to act like a human within the context of an interview over terminal lines. A narrower concept of a Turing test is for a computer to successfully imitate a human within a particular domain of human intelligence. We might call these domain-specific Turing tests. One such domain-specific Turing test, based on a computer's ability to write poetry, is presented here." (1990, p. 374)
- 28 question "poetic Turing test" administered to 16 human judges; 48 percent correct overall
- Cybernetic Poet

  http://www.kurzweilcyberart.com/poetry/rkcp_akindofturingtest.php
- "Music composed by computer is becoming increasingly successful in passing the Turing test of believability. The era of computer success in a wide range of domain-specific Turing tests is arriving." (1990, p. 378)
- Kurzweil and Kapor Long Bet: 20,000 that a machine will pass the Turing Test by 2029
- Is there a narrower concept of a Turing Test?

24.9. A Musical Turing Test

- Compare chants created by computer and by humans



© source unknown. All rights reserved. This content is excluded from our Creative Commons license. For more information, see http://ocw.mit.edu/fairuse.

- Is this a Turing Test?
- How would this test be different if the music was performed by humans?

24.10. Musical Turing Test Archetypes

- Musical Directive Toy Test (MDtT)
- Musical Output Toy Test (MOtT)
- The problem of musical judgements
- Music is not natural language
- We have aesthetic expectations for human and computer music
- All executed tests report a win for the computer
- Does success of a MDtT or a MOtT offer a sign of system design success?
- Does aesthetic success suggest system design success?

24.11. Discrimination Tests

- Blind comparison of musical outputs
- Often material used to create the music is used as part of the test
- All listening test are bound by musical judgements

24.12. Cope's MOtTs

- Cope does not associate these test directly with the TT
- Compares EMI generated Mozart with Mozart
- 1992 AAAI conference conducted a test with 2000 visitors, claiming "absolutely no scientific value" but claims that "machine-composed music has some stylistic validity"
- Compares virtual music to real music in The Game
- Many have used Cope's music or related tests as examples of musical TTs where the machine wins

24.13. Machine Authorship in Generative Music Systems

- Is the machine responsible for the musical output?
- Is the test testing the machine at all?

24.14. Aesthetic Intention in Generative Music Systems

- The intentional fallacy: the idea that understanding the artist's intention is necessary for evaluating a work (Beardsley 1946)
- Is intention required to make music?
- Can authorship be given to things that do not have intention?

24.15. Listening

- Listening: David Soldier, "The Birth of Ganesha," *Elephonic Rhapsodies*, 2004

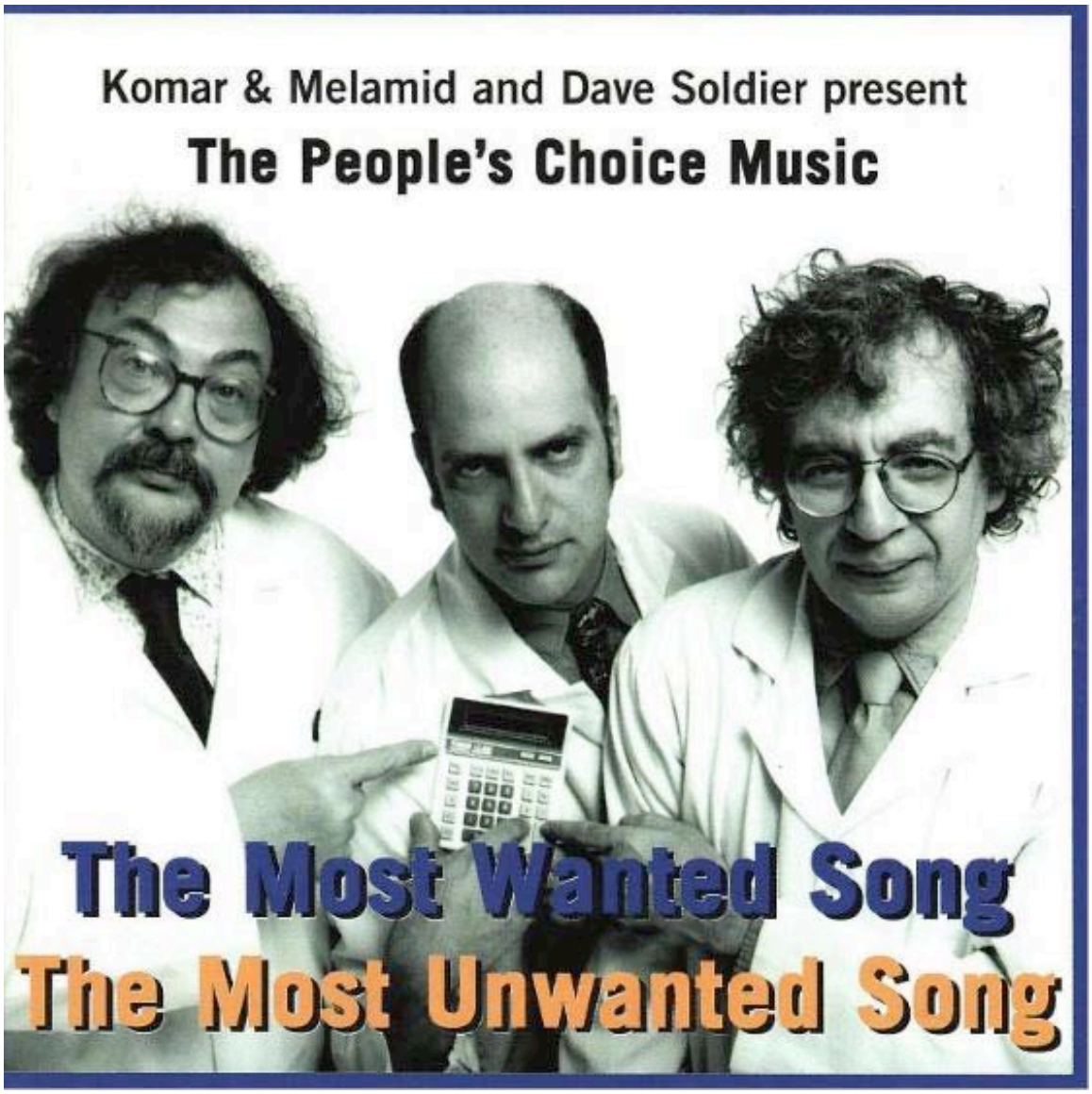
- Elephants trained and directed in improvisation with instruments

24.16. Naughtmusik

- Soldier, D. 2002. "Eine Kleine Naughtmusik: How Nefarious Nonartists Cleverly Imitate Music." *Leonardo Music Journal* 12: 53-58.
- Genuine music requires composers with intent
- Naughtmusik: nonart sounds, composers without intent
- An Adapted Turing Test: can human judges detect naughtmusik?
- The Tangerine Awkestra: children 2 to 9, produce sounds using instruments they do not know how to play, recorded in a studio; listened to free jazz of Ornette Coleman and others
- 5 sophisticated adults: 5 of 8 trials led to correct identification: not iron-clad
- Thai elephant orchestra
- "There is something out there that looks, sounds, feels, smells like music, but isn't" (2002, p. 58)

24.17. Listening

- The People's Choice Music: with Vitaly Komar and Alex Melamid
- Survey given to 500 Americans
- Survey responders had no intent; the works were created without individual intent, and thus no creative decision making was involved
- Listening: David Soldier, *The Peoples Choice*, 2002



Courtesy of Dave Soldier. Used with permission.

24.18. Authorship Matters

- Humans are still ultimately responsible for machine creations
- The designation of author is a special designation, granted only by humans

- Authorship does not require intention: what does it require?

MIT OpenCourseWare
http://ocw.mit.edu

21M.380 Music and Technology: Algorithmic and Generative Music
Spring 2010

For information about citing these materials or our Terms of Use, visit: http://ocw.mit.edu/terms.