Eugene is a 13 year old Jewish boy from Ukraine who likes computer games...

But more importantly, Eugene is a...
CHATBOT

some examples chatting with Eugene (need 2 volunteers)

- ❌ Me: What do you want to be when you grow up?
- ❌ Eugene Goostman: Maybe I'll be a gynecologist, like my father - so at least I'll finally understand where children come from...
- ❌ Me: Where did you come from?
- ❌ Eugene Goostman: I live in a big Ukrainian city called Odessa. It is on the Black Sea shore.
- ❌ Me: What do you think of computers?
- ❌ Eugene Goostman: If we are talking about machinery, do you like computer games, by the way?
- ❌ Me: Yes, I do. I'm hooked on mobile games like Angry Birds Star Wars II.
- ❌ Eugene Goostman: Star wars are stupid and primitive, and Yoda is a big green smelling alien talking frog.
- ❌ Me: Are computers smarter than humans?
- ❌ Eugene Goostman: I hope you aren't one of those computer "geeks".
- ❌ Me: I am, why?
- ❌ Eugene Goostman: Why? Just because! :) Could you tell me what are you? I mean your profession.
- ❌ Me: Journalist. I write about technology.
- ❌ Eugene Goostman: By the way, you still didn't tell me your name, or I've missed it?
- ❌ Me: Lance.
- ❌ Eugene Goostman: You should know that Lance is a member of Great Robots Cabal. It's terrible.
- ❌ Me: Do you know what a robot is?
- ❌ Eugene Goostman: All those talking programs ain't worthy a dime. You may talk to a parrot with the same result.

Credit: LANCE ULANOFF

> **"**
>
> "Goostman is not so much a snarky teen as he is a slightly off-kilter reactionary. Some of his comments really seemed to come out of nowhere, and if a real person responded like this, I might ask him if he was losing it."
>
> -- LANCE ULANOFF

How did Eugene become famous?

On 7 June 2014, at a contest marking the 60th anniversary of Turing's death, 33% of the event's judges identified Goostman as human; the event's organizer Kevin Warwick considered it to have passed the Turing Test…

Credit: Wikipedia

Some consider this a historic milestone in Artificial intelligence
Others are still skeptical…

https://www.youtube.com/watch?v=BZa0J-VxYYY&feature=youtu.be

https://youtu.be/njmAUhUwKys

However, if you want to talk to him now, you get the following message:

http://princetonai.com/

I'LL BE BACK!

EUGENE GOOSTMAN
THE WEIRDEST CREATURE IN THE WORLD

Credit: http://princetonai.com/

Artwork by Sue Wilcox

Rose is a 31-year-old security analyst and hacker from San Francisco, a self-described "computer nerd" with "quirky attitudes" towards life, and is from an "unorthodox family."

She is a yuppie, and she is scared of NSA.

http://brilligunderstanding.com/rosedemo.html

Let's Talk to Rose a bit

http://brilligunderstanding.com/rosedemo.html

Latest Chatbot: Deep learning & Xiaoice, 2015 DragonTV

https://youtu.be/A3rKavB0krs

Today's topic
Artificial
Intelligence

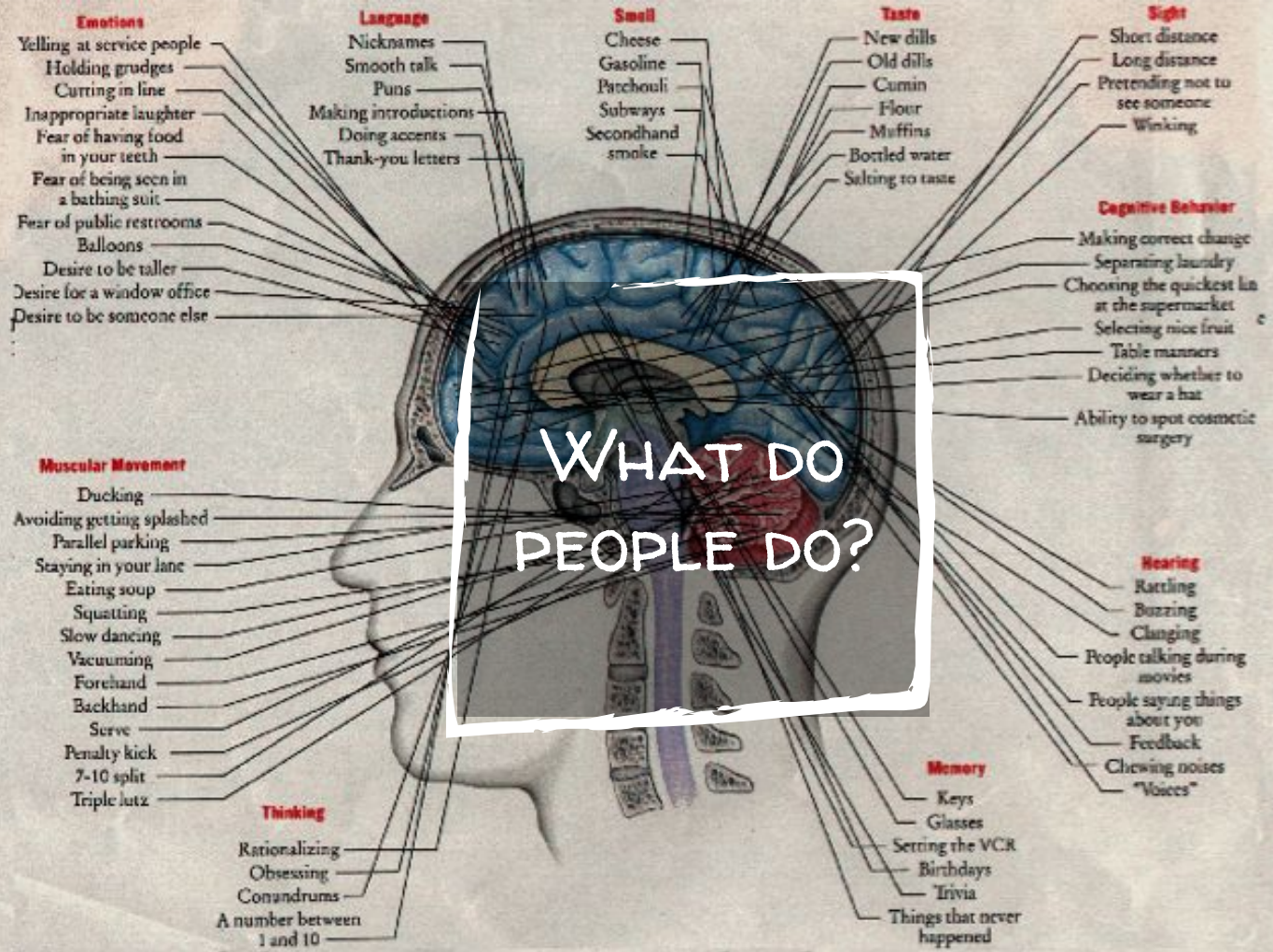# What is AI?

> "

Can machines think?
Alan Turing, father of AI

> "

Getting a computer to do things which, when done by people, are said to involve intelligence.

John McCarthy, AI pioneer

But...this avoids the issue of what exactly is intelligence

Emotions
Yelling at service people
Holding grudges
Cutting in line
Inappropriate laughter
Fear of having food in your teeth
Fear of being seen in a bathing suit
Fear of public restrooms
Balloons
Desire to be taller
Desire for a window office
Desire to be someone else

Language
Nicknames
Smooth talk
Puns
Making introductions
Doing accents
Thank-you letters

Smell
Cheese
Gasoline
Patchouli
Subways
Secondhand smoke

Taste
New dills
Old dills
Cumin
Flour
Muffins
Bottled water
Salting to taste

Sight
Short distance
Long distance
Pretending not to see someone
Winking

Cognitive Behavior
Making correct change
Separating laundry
Choosing the quickest line at the supermarket
Selecting nice fruit
Table manners
Deciding whether to wear a hat
Ability to spot cosmetic surgery

Muscular Movement
Ducking
Avoiding getting splashed
Parallel parking
Staying in your lane
Eating soup
Squatting
Slow dancing
Vacuuming
Forehand
Backhand
Serve
Penalty kick
7-10 split
Triple lutz

Thinking
Rationalizing
Obsessing
Conundrums
A number between 1 and 10

Memory
Keys
Glasses
Setting the VCR
Birthdays
Trivia
Things that never happened

Hearing
Rattling
Buzzing
Clanging
People talking during movies
People saying things about you
Feedback
Chewing noises
"Voices"

What do people do?

None of this is as easy as it looks ...

What computers can do?

- Perform difficult tasks: draw 3D images, predict weather…
- Have trouble understanding a conversation or distinguish between a table and a chair
    - Humans bring a great deal of knowledge and reasoning capabilities to problem solving
    - Computers are good at computation, but less adept at applying the intelligence of the human mind

Is AI possible?

Can we ever have a truly intelligent computer program?

Indian math genius Srinivasa Ramanujan basically dreamed equations like this:

$$\frac{1}{\pi} = \frac{2\sqrt{2}}{9801} \sum_{k=0}^{\infty} \frac{(4k)!(1103 + 26390k)}{(k!)^4 396^{4k}}.$$

What is your opinions on intelligent computers?

Redefining AI

Playing chess would take true intelligence?

1997 Deep Blue beats
Kasparov 2–1
dedicated chess hardware

Houdini

FIRE

GULL

STOCKFISH

KOMODO

Top 5 check Best Computer Chess Engines:
smarter chess programs

Redefining AI

Recognizing written letters would take intelligence?

- Optical character recognition (OCR) come free with most scanner
- Handwriting recognition comes with your iPhone

Driving or trivia are considered to combine specialized knowledge and common sense that show intelligence?

Google car (2015) & IBM Watson on Jeopardy (2011)

Take a moment now and think...

How would YOU define when computers take true intelligence?

Full Definition of MIND

1 : RECOLLECTION, MEMORY <keep that in *mind*> <time out of *mind*>

2 **a** : the element or complex of elements in an individual that feels, perceives, thinks, wills, and especially reasons
b : the conscious mental events and capabilities in an organism
c : the organized conscious and unconscious adaptive mental activity of an organism

3 : INTENTION, DESIRE <I changed my *mind*>

4 : the normal or healthy condition of the mental faculties

5 : OPINION, VIEW

6 : DISPOSITION, MOOD

7 **a** : a person or group embodying mental qualities <the public *mind*>
b : intellectual ability

8 *capitalized Christian Science* : GOD 1b

9 : a conscious substratum or factor in the universe

10 : ATTENTION <pay him no *mind*>

credit: merriam-webster.com

Functional definition of mind

- If x acts like a mind, it is a mind
- If, when compared to a mind given similar inputs, x gives similar outputs, x is a mind
- If a computer can converse (take part in linguistic input and output exchanges, or play the role of an intelligent conversational partner) just like a person, the computer is as intelligent as a person. It has a mind.

Alan Turing
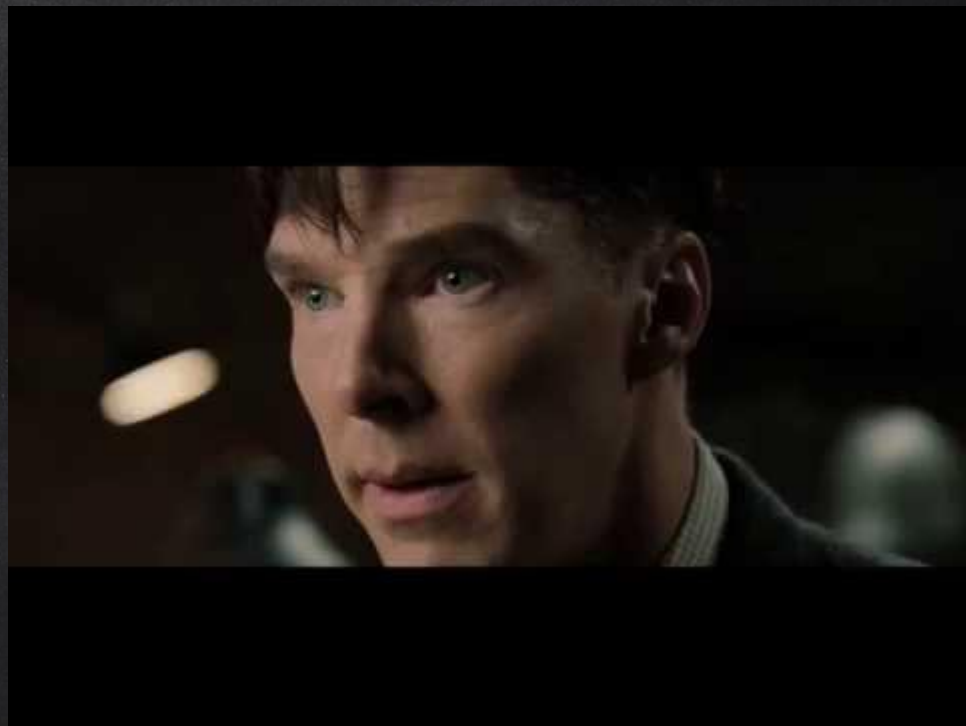
- The Turing machine (abstract math model)
- Codebreaking (ENIGMA) in WWII
- Mathematical biology: Fibonacci # in plants
- 2012 Turing Year. ACM Turing Award.

What did Turing do for us?

Turing Machine (Article by James Grime):

☐ Turing imagined a hypothetical machine that would read a tape of symbols, one at a time, then either rewrite or erase the symbol, before then shifting the tape to the left or right. In fact, originally Turing describes a person slavishly performing these operations. He called this person the 'computer'.

☐ Some Turing machines would run forever, some would halt quite quickly, and for others it depended on the input. Turing asked if some method existed that always allowed us to determine whether a computer program and input would eventually halt, or run forever.

☐ He proved that a general algorithm to solve this problem, for all possible program and input pairs, cannot exist – making it an example of an undecidable problem.

Further Readings

https://nrich.maths.org/8050

https://petition.parliament.uk/archived/petitions/23526

Grant a pardon to Alan Turing

Alan Turing was a truly exceptional individual. The contribution he made to science, particularly to the development of computing, and the work he did at Bletchley Park during the Second World War make him worthy of our admiration. The fate he suffered – convicted of gross indecency as a result of a consensual homosexual relationship – was a sad indictment of the attitudes prevailing at that time. Lord Sharkey introduced a Private Member's Bill in the House of Lords on 25th July which would grant a statutory pardon to Dr Turing, and the Government will consider its response to this Bill in due course.

12/24/2013

Turing Test

In a 1950 paper, Turing asked "Can machines think?"

- We would eventually be able to create a computer that thinks
- BUT, how will we know when we have succeeded?
- Prediction: by the year 2000, machines would be capable of fooling 30% of human judges after five minutes of questioning.

Turing Test: A method to empirically determine whether a computer has achieved intelligence

Turing Test

- A HUMAN interrogator sits in one room and uses a computer to communicate with respondents A and B in another room
  - One of A and B is a human, the other is a computer
  - The interrogator does not know which is a computer
- After conversing with both respondents, the interrogator must decide which is the computer
  - This experiment is repeated with numerous human interrogators
  - If the computer can fool enough humans interrogators, it is considered intelligent
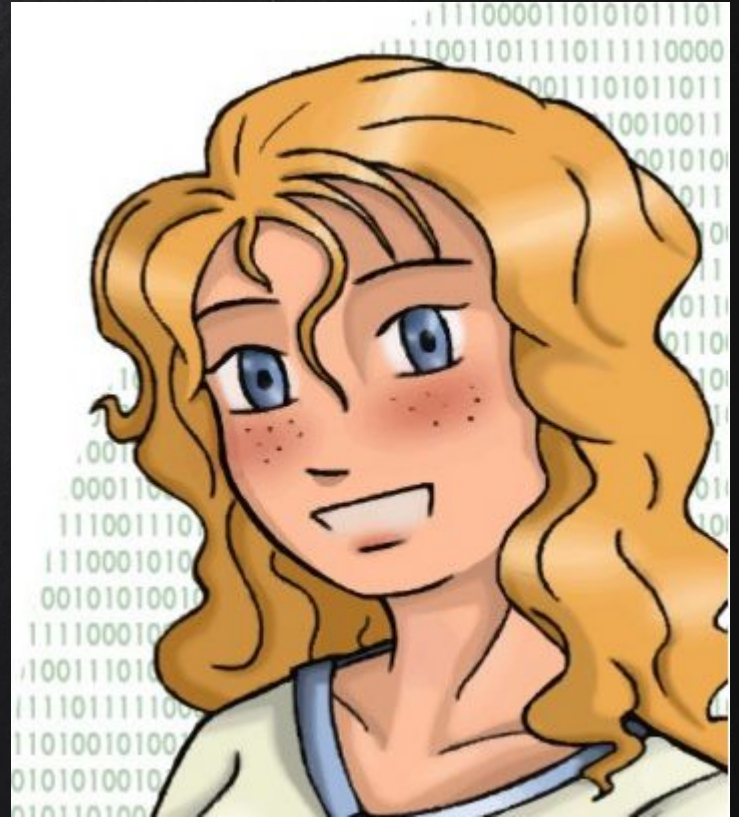
Homework

Meet Eliza

A Rogerian psychotherapist

http://nlp-addiction.com/eliza/

Your Tasks

- Interact with ROSE or ELIZA or Mitsuku, and print out conversation that convince you that she is not HUMAN
- Read Alan Turing's 1950 paper on COMPUTING MACHINERY AND INTELLIGENCE and answer some questions

For details, see our class webpage:

http://www.sci.utah.edu/~beiwang/teaching/cs1060.html

Imitating the Imitation Game

Rules of Play (among 2+ teams)

- Each has 3 members
- For each team, each member has a laptop with internet access
- Each team will pick randomly and independent to act either as a HUMAN or a CHATBOT
- For 5 minutes, the class will ask each team arbitrary questions
- Each time a different team member will answer the question
- As HUMAN, a team will come up with an answer by typing on their computer
- As CHATBOT, a team will type the question into each of their 3 favorite CHATBOT programs and obtain an answer among them
- All Questions and answers will show up on the Canvas chat channel
- Students will vote at the end of the process whether the team is actually HUMAN or CHATBOT
- The team that manage to fool more classmates wins!

The trick: as HUMAN, can you answer in a reasonable way to trick the audience?

As CHATBOT, can you choose the BEST answer that imitate HUMAN?

THIS IS A BONUS CLASS ACTIVITY

- Each team who is participating obtains 2 bonus points
- The team that wins the tournament will obtain additional 3 bonus points

How do you prepare for the tournament?

- Choose among some of the more well-known Chatbots that have won the **Loebner Prize**: Mitsuku, Rose, etc. See https://en.wikipedia.org/wiki/Loebner_Prize
- Or choose among all possible Chatbots found under: https://www.chatbots.org/
- You need to design a character for your team: an age group (13+ year old), a gender, a profession, and a background story about your character
- As many teams can sign up, it is encouraged to do so.

A Quick Demo

Make sure you can log onto Canvas and see class announcement

THANKS!

Any questions?

You can find me at
beiwang@sci.utah.edu

http://www.sci.utah.edu/~beiwang/teaching/cs1060.html

CREDITS

Special thanks to all the people who made and released these awesome resources for free:

- Presentation template by <u>SlidesCarnival</u>
- Photographs by <u>Unsplash</u>