15-780: The Future of AI?

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The past of AI

1950s–1960s: creation of field, early successes (checkers, perceptron, Logical Theorist, Shakey, etc)

1970s: focus on logical methods

1980s: expert systems

1990s: splintering of AI fields into machine learning, computer vision, natural language processing, etc

2000s: growth of (continuous) optimization in AI and machine learning, rise of robotics, game theory advances

2010s: rise of deep learning
The future of AI?
The future of AI?

The next 10 years of AI?
General artificial intelligence?

TECH INNOVATION

Computer Posing as Teenager Achieves Artificial-Intelligence Milestone

Per Lijjas @perlijjas | June 9, 2014

The chatbot "Eugene Goostman" manages to fool more than 30% of people it was conversing to that it was human, becoming the first computer to pass the iconic 65-year-old Turing test.

A live-chatting computer has passed the artificial-intelligence milestone Turing Test at an event in London, as it fooled a third of people that they were actually speaking to a human.

Professor Kevin Warwick, a visiting professor at the University of Reading, in England, said in a statement that some would claim the test had already been passed, but “this event involved the most simultaneous comparison tests than ever before, was independently verified and, crucially, the conversations were unrestricted.”

The winning software, called Eugene Goostman, simulates a 13-year-old, saying that he likes hamburgers and candy and that his father is a gynecologist. Developer Vladimir Veselov said his team chose this personality because the program could then “claim that he knows anything, but his age also makes it perfectly reasonable that he doesn’t know everything.”

The father of modern computer science, Alan Turing, developed the Turing test 65 years ago to answer the question: Can machines think? In order to pass, a computer program must be mistaken for a human in more than 30% of its five-minute keyboard conversation.

According to Warwick, the test has implications today as a tool to fight cyberthreats.
Scott Aaronson’s conversation with Eugene

Scott: Which is bigger, a shoebox or Mount Everest?
Eugene: I can’t make a choice right now. I should think it out later. And I forgot to ask you where you are from…
Scott: How many legs does a camel have?
Eugene: Something between 2 and 4. Maybe, three? :-))) By the way, I still don’t know your specialty – or, possibly, I’ve missed it?
Scott: How many legs does a millipede have?
Eugene: Just two, but Chernobyl mutants may have them up to five. I know you are supposed to trick me.
Scott: No, I need to know that you’re not a chatbot. Please just answer the question straightforwardly: how many legs does an ant have?
Eugene: Something between 2 and 4. Maybe, three? :-))) Oh, what a fruitful conversation;-)
Scott: Do you understand why I’m asking such basic questions? Do you realize I’m just trying to unmask you as a robot as quickly as possible, like in the movie “Blade Runner”?
Eugene: …wait
Scott: Do you think your ability to fool unsophisticated judges indicates a flaw with the Turing Test itself, or merely with the way people have interpreted the test?
Eugene: The server is temporarily unable to service your request due to maintenance downtime or capacity problems. Please try again later.
The next 10 years of AI?

- Personal assistants
- Language translation
- Energy and sustainability
- Personalized medicine
- Intelligent tutors
- Autonomous cars
Not many people saw the deep learning craze coming

So it’s likely that the 2020s will be remembered for an advance in AI that is completely separate from any of the topics above
We are, by almost any measure, in the midst of another AI “boom,” and there are a seemingly endless variety of problems to work on.
This course: A post-“modern” approach to AI

Recent AI (in the above applications, and at AI conferences) differs considerably from presentation in Russell and Norvig text

This course has been aimed at giving you experience with the tools and techniques of these new approaches, which we believe you will find applicable in a huge number of areas

Remember, in this course you have: 1) implemented a (nearly) state-of-the-art SAT solver; 2) built a (revised and dual) simplex algorithm for solving LPs; 3) built an integer programming solver for combinatorial auctions (using your own LP solver); 4) Implemented probabilistic inference in graphical models; 5) Implemented Q-learning; 6) Built your own implementation of a deep neural network; 7) Implemented a state-of-the-art algorithm for solving partial information, extensive form games; (you should all be proud!)