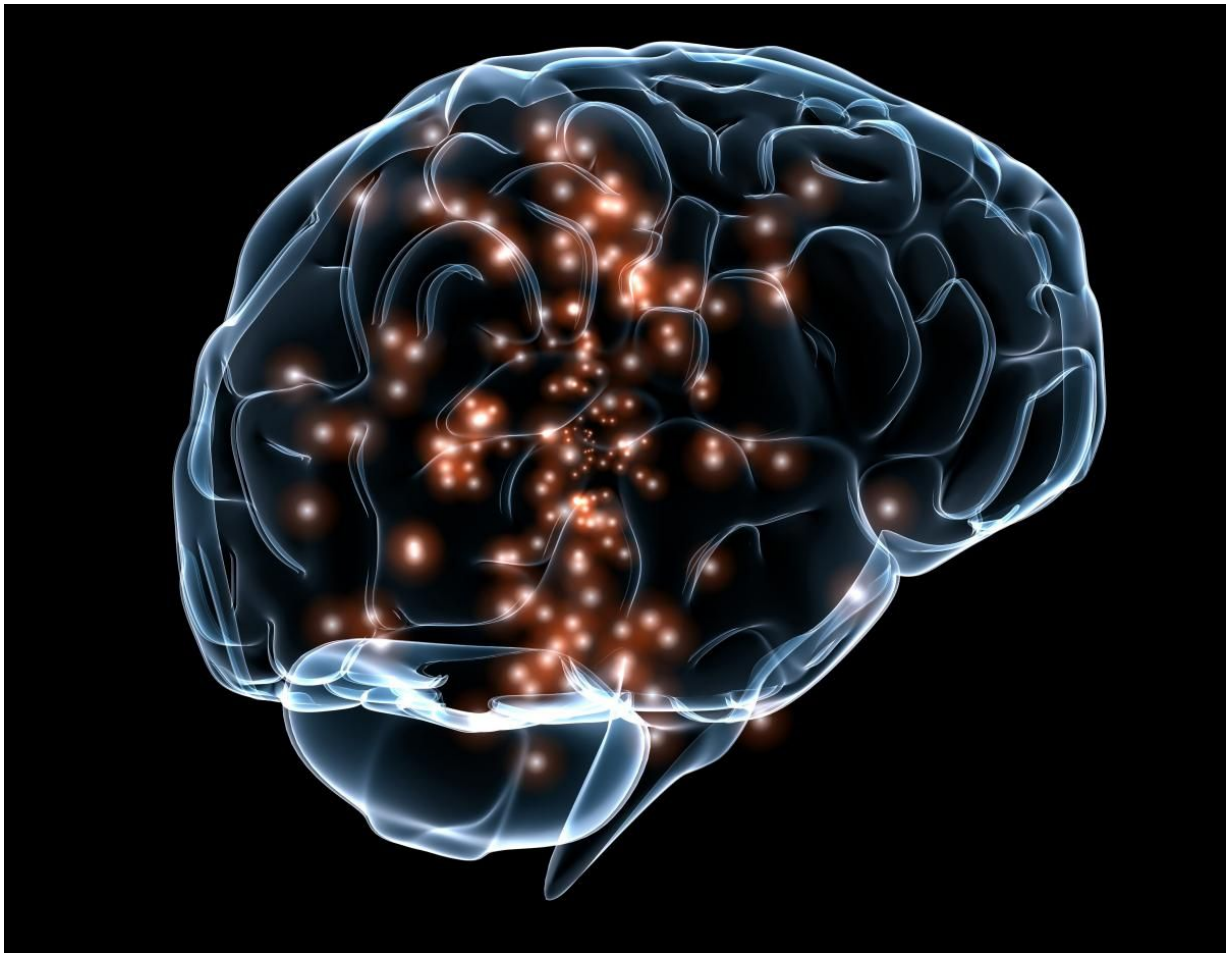
COMP551
Applied Machine Learning

1 Introduction

Instructor: Sarath Chandar



The human brain, a mystery to itself!!

Task 1: Identify the male face

Task 2: Compute mentally

546734555 * 12056385 = ???

What is going wrong?

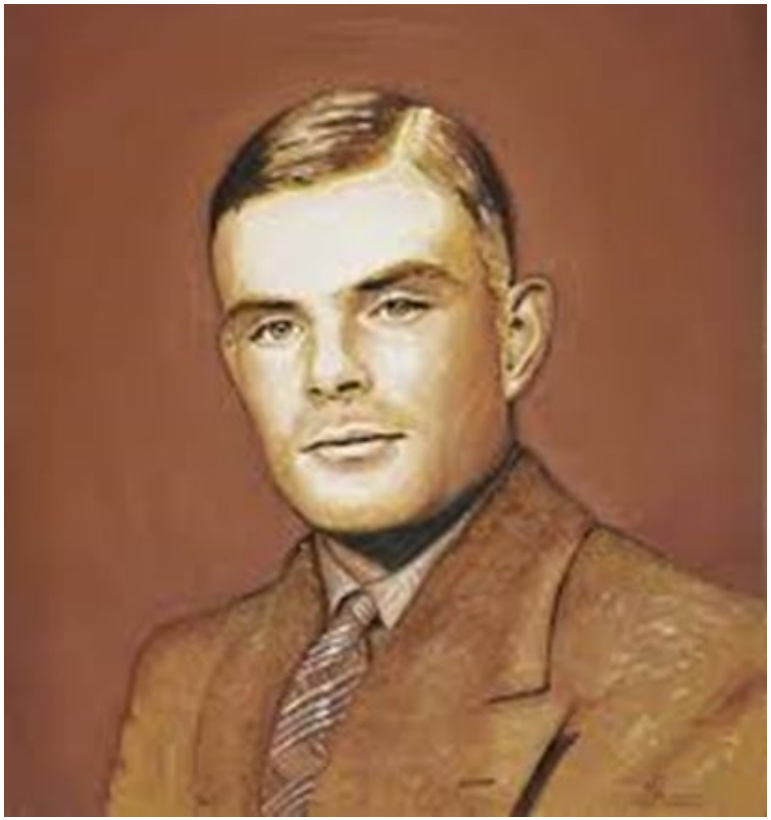
What is going wrong?

- Task 1 is easy for humans but not for machines.
- Task 2 is easy for machines but not for humans.

- We know the exact algorithm for task 2 which we can implement as a program.
- We still do not know the exact algorithm for task 1!

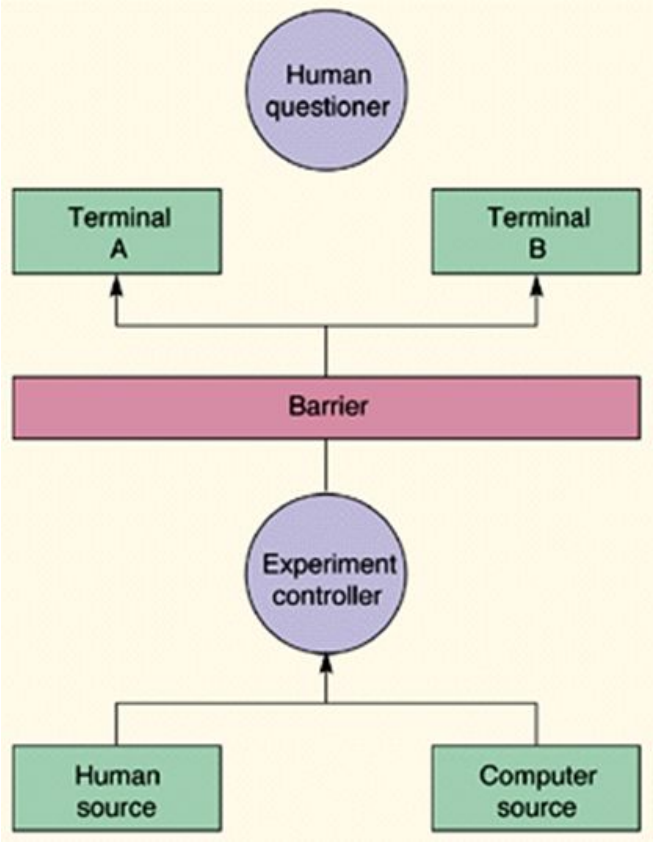
- Can a program learn task 1 by looking at examples?

Can Machines Think?



Alan M Turing (1950)

The Imitation Game aka Turing Test



Turing's prediction

I believe that in about fifty years' time it will be possible, to programme computers, with a storage capacity of about 109, to make them play the imitation game so well that an average interrogator will not have more than 70 per cent chance of making the right identification after five minutes of questioning. The original question, "Can machines think?" I believe to be too meaningless to deserve discussion.

Alan Turing, 1950.

HAL 9000 - “2001: A Space Odyssey” (1968)

2018: What can a Machine do?

Machine can play chess: IBM Deep Blue (1997)

Deep Blue, IBM's supercomputer, defeats chess champion Garry Kasparov in 1997

BY MICHELE MCPHEE,, K.C. BAKER, CORKY SIEMASZKO / NEW YORK DAILY NEWS / Sunday, May 10, 2015, 12:00 PM

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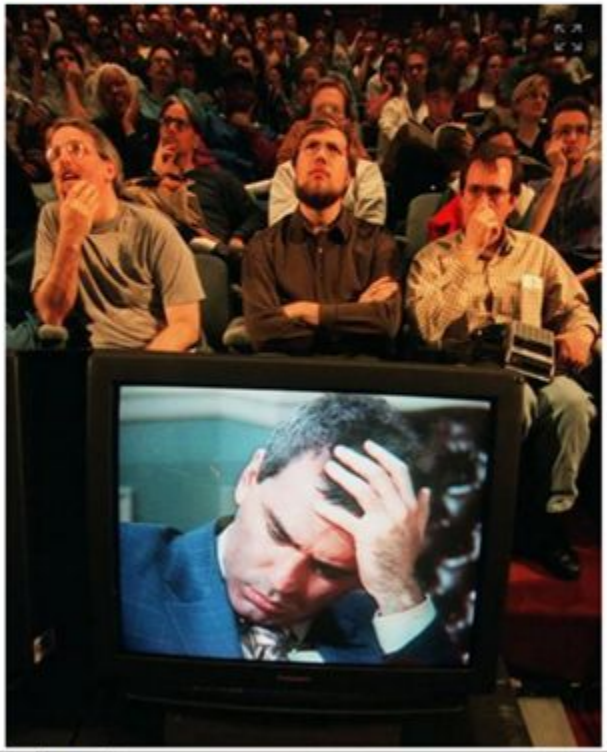


The world's greatest human chess player threw a tantrum and cried foul yesterday after being thrashed by a supercomputer.

It took IBM's Deep Blue just 19 moves to defeat world chess champion Garry Kasparov a stunning finale to an epic week-long battle of man versus machine.

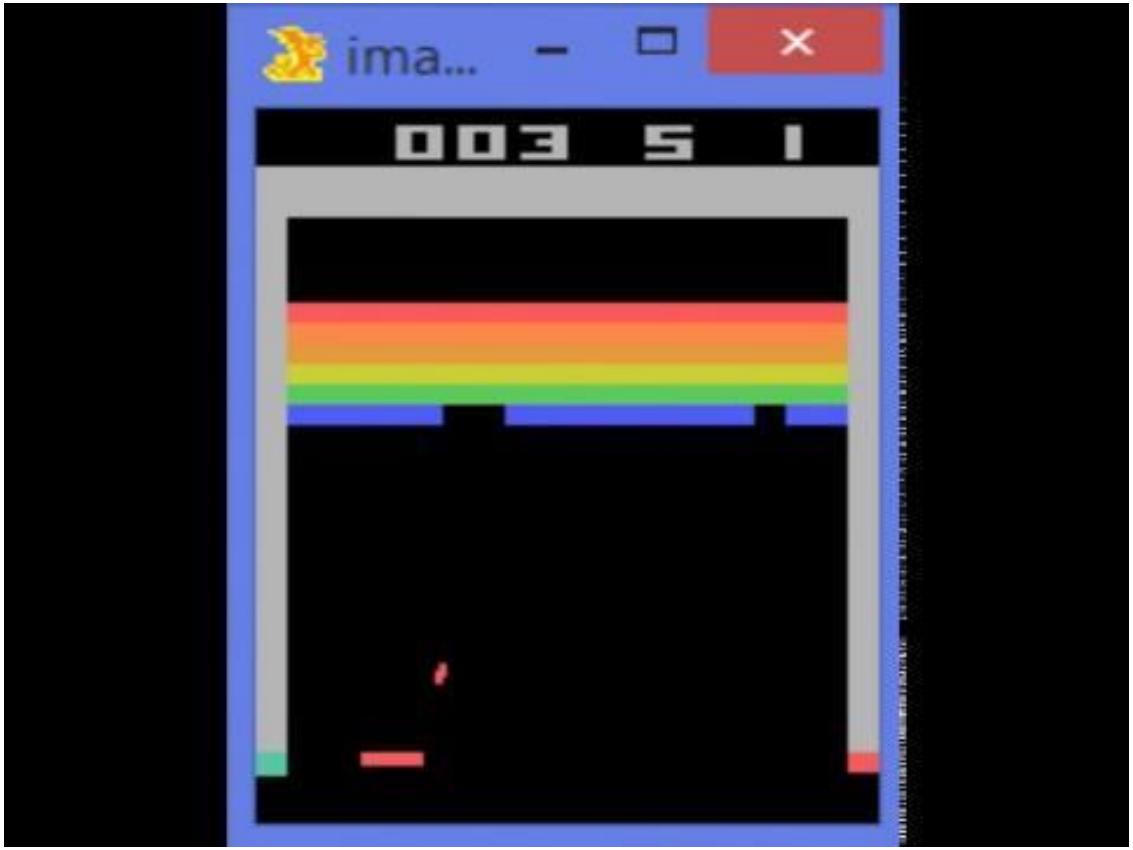
Not mollified by his $400,000 loser's share, Kasparov stormed off like a sore loser after resigning. He later accused IBM of unfairly programing the high-speed computer to beat him specifically.

He suggested that Deep Blue, which was supposed to play on its own, was coached during the match.

Machine can drive: Stanford Autonomous Helicopter (2004)

Machine can answer questions: IBM Watson playing Jeopardy (2011)

Machine can play video-games: Google DeepMind's Deep Q-learning playing Atari Breakout (2013)



Machine can win humans in Go (2016)

Google's AlphaGo AI beats Lee Se-dol again to win Go series 4-1

By Sam Byford on March 15, 2016 05:00 am Email @345triangle

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- Finding new planets !