

AI and Machine Learning: a Heretic View

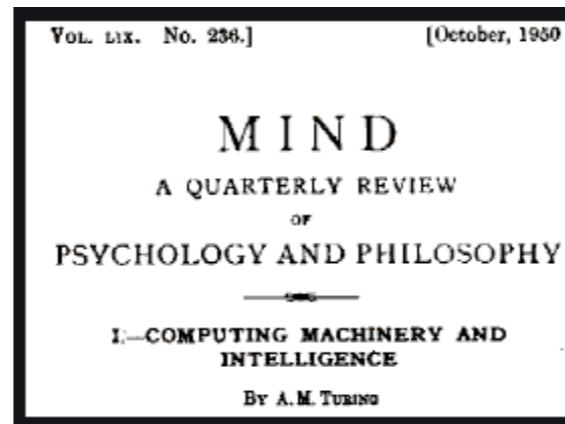
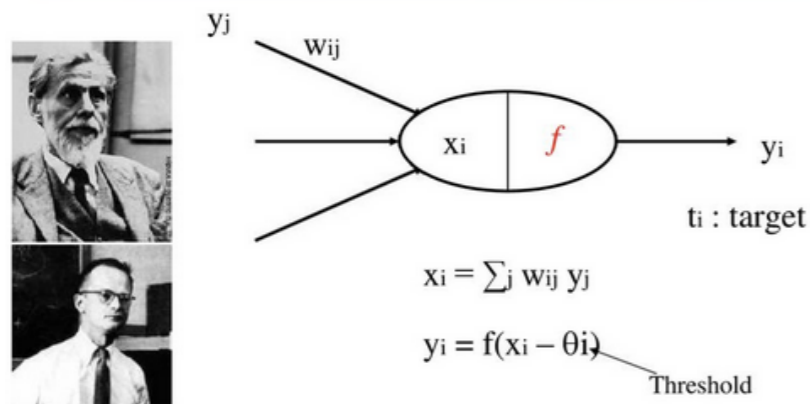
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summary

- 80 years in one slide
- what is behind the current success
- my favorite list of overlooked facts
- learning performance
- lesson learnt from the biomedical domain
- our focus

some history

Mc Cullough-Pitts neuron (1943)



Turing Test (1950)

Dartmouth Summer Research Project (1956)



Deep Blue vs Kasparov (1997)

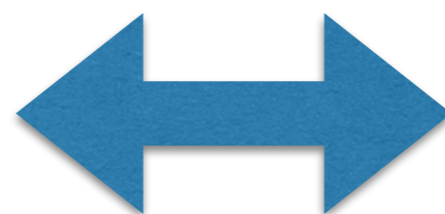


Deep networks (last 15 years)

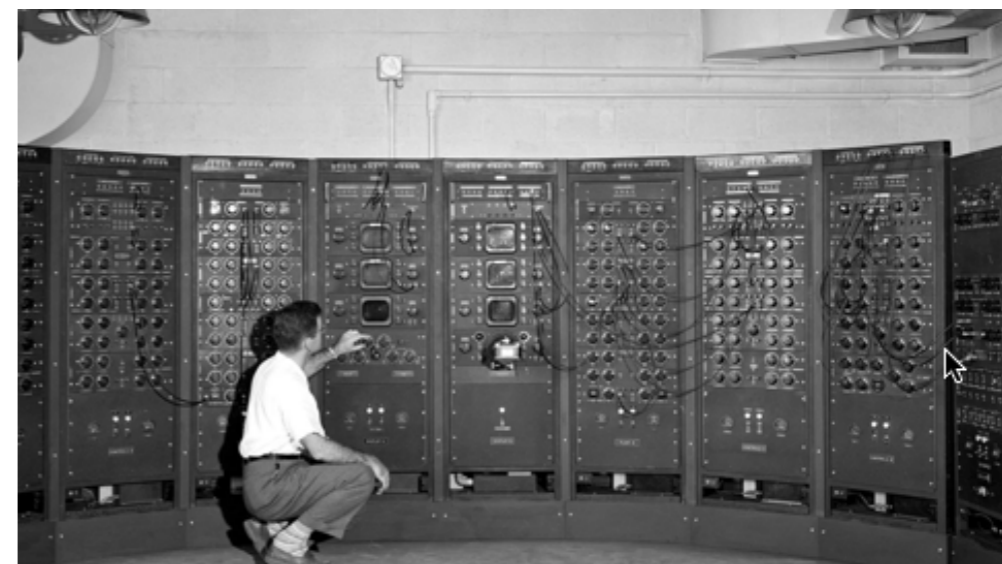
AlphaGo vs Lee Sedol (2017)







machine
learning



far from being done

- intelligence goes beyond perception
- millions of labeled samples
- only know how to learn the bias in the data
- where has all the knowledge gone?
- we should definitely go for the low hanging fruit but, at the same time, remain aware of the current limitations

failure or success?

when a learning algorithm does not reach perfect performance we blame it on

- noise in the data
- size of the data set
- but very rarely on the fact that data might be only part of the story

truth is: *keep watching out for overfitting*

our experience

- data may never be big: around 7,000 diseases are rare (affect less than 1 every 2,000 people)
- labeling is expensive
- often not even the domain expert knows the answer
- learning is a very powerful tool for exploring and advancing the expert knowledge
- keep searching for new technologies which combine learning with computational models and established knowledge

what we are currently doing

-  led by Lorenzo Rosasco

in which we blend basic research on harmonic analysis, optimization, regularisation theory, and machine learning with applications in various domains



- with Michele Piana we are launching the BMB initiative (BioMedical Big data center) funded by the Regione Liguria by the end of the year