
ASSN. FOR COMPUTING MACHINERY

Leslie Valiant

Margaret Neterval (mon2hu) and
Emily McClure (eem9dp)

Leslie Valiant

Born 1949 in Britain

Education:

- King's College, Cambridge
- Imperial College London
- University of Warwick (Ph.D)

Teaching Career:

- Carnegie Mellon University
- Leeds University
- University of Edinburgh
- Harvard University (1982-present)

Brilliant computer science work in computational learning

Nevanlinna Prize (1986)

Knuth Prize (1997)

EATCS Award (2008)

Turing Award 2010

The other awards

- Nevanlinna (1986): an award concerning the mathematical aspects of computer science awarded every 4 years...like leap year...
- Knuth Prize (1997): awarded for overall impact in the field of computer science
- EATCS (European Association for Theoretical Computer Science) (2008): a) no wonder they shortened the name, b) Valiant was the ninth EATCS award winner for his phenomenal theoretical computer science career, c) No, it was not a competition over who could EAT the most CS.

The Big Kahuna—The Turing Award

- Winner 2010
- Receiver of $250,000 (that's some serious cash—thanks, Google and Intel)
- The "Nobel Prize" of Computer Science
- He contributed quite a bit to computational learning theory and computer science in general
- Rumored to be helping robots, such as R2-D2, take over the world.
- Okay, that last part was pure speculation

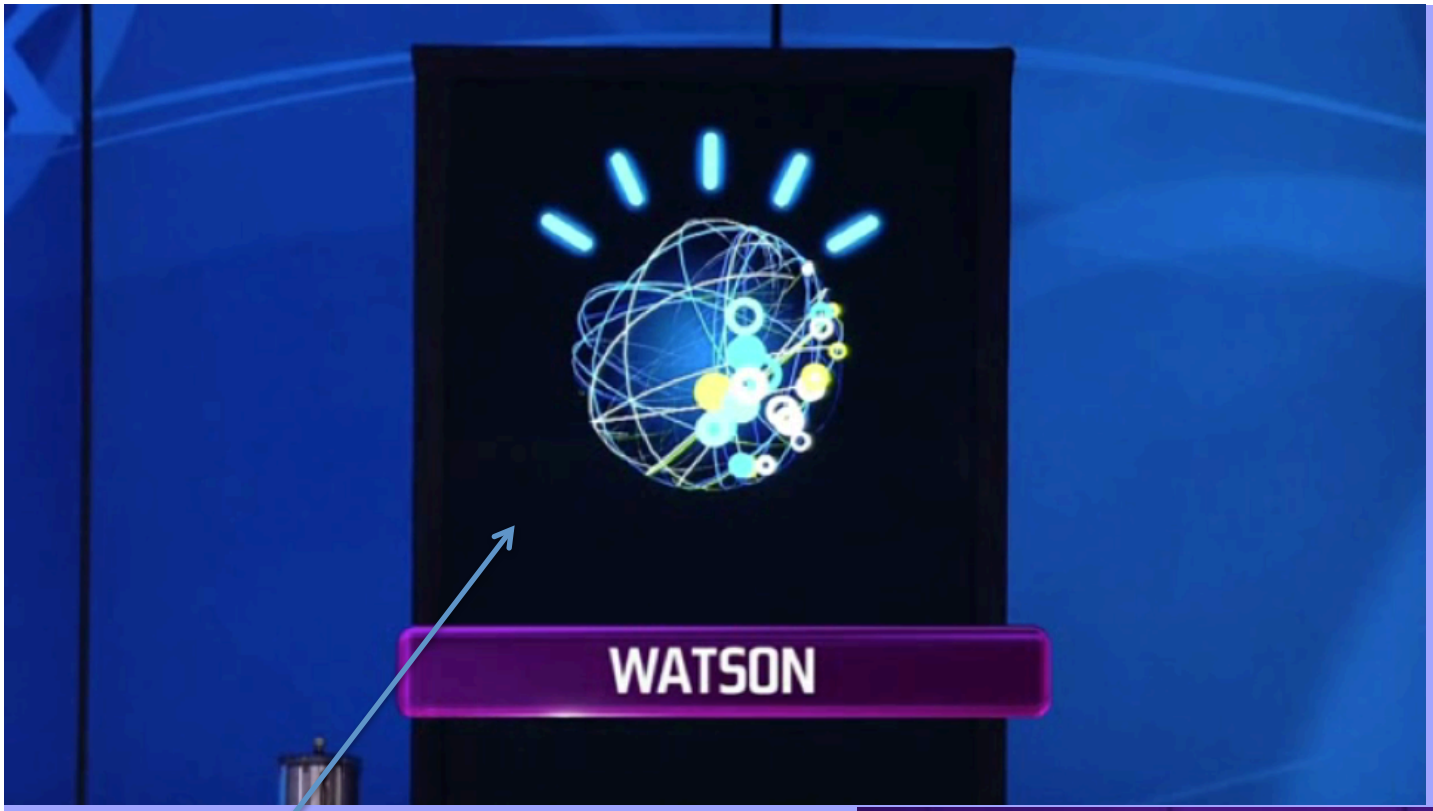
P vs. NP Problem

- He solved it! Just kidding.
- One of the Millennium Questions (each with a $1 million bounty on their heads)
- Contributed to the P vs. NP dilemma by identifying "#P," a class of complex counting problems, which are related to, but distinct from the P vs. NP problem—like those cousins in Kansas that people have... technically family, but, let's be honest...
- He also found a way to estimate the difficulty level in solving algebraic problems. Most 7th graders do this innately, but he found a way to quantify it.


PF'03
I WISH P≠NP WAS FINALLY PROVED!
BY ME, OF COURSE!
P.P.
POOR FELLOW! HE DOESN'T KNOW IT'S EQUAL INDEED, CONSIDER THE TRAVELLING DOG PROBLEM...*
* SORRY, THIS CARTOON IS TOO SMALL TO CONTAIN THE PROOF

and...Artificial Intelligence!

- Studied how computers learn in order to increase their efficiency, so that they "learn" faster
- Also contributed to cognitive science questions, like how the brain "computes" and offered modeling of that
- This has been implemented to improve Spam filters, for instance (they don't filter anything at first, but as time goes on, they "learn" what qualifies as spam, and block it)
- He does this using the aptly named Probably Approximately Correct model
- His work contributed to the development of machines like Watson, which won Jeopardy! three days in a row.
- Or think R2-D2 on Jeopardy!



Winner!

R2-D2

If Leslie Valiant had been around a long time ago in a galaxy far, far away, R2-D2 may have learned fast enough to save the day. Oh wait, he did. But maybe it wouldn't have taken 6 movies to defeat the Dark Side...

to be eaten

He's watching Watson win Jeopardy!

I learned my algorithms from Yoda...I could definitely beat that guy

Probably Approximately Correct model

- This is how he "teaches" the machines.
- Helps to determine whether or not the machine has enough information to make accurate predictions of the answers
- So it helps the computer (and the person) to know if the computer has enough information, the same way a cop would need enough information to solve a murder

Want to meet him? Here's how!

- *Thomas Jefferson Coolidge Professor of Computer Science and Applied Mathematics, School of Engineering and Applied Sciences, Harvard University* (quite the fancy title)
- To contact him: 617-495-5817
- Or fax him: 617-496-6404
- Or mail/visit him: 351, Maxwell Dworkin,
  33, Oxford Street,
  Cambridge, MA 02138
- And his office hours: Thursdays 1:30-2:30 pm

Bibliography

- Brown, Bob. "Harvard Computer Scientist Leslie Valiant Wins Turing Award." Network World. 9 Mar. 2011. <http://www.networkworld.com/news/2011/030911-valiant-turing-award.html>.
- Cooney, Michael. "What Makes IBM Watson So Smart?" Network World. 12 Feb. 2011. <http://www.networkworld.com/news/2011/021411-ibm-watson.html?ap1=rcb>.
- "Leslie Valiant." Harvard School of Engineering and Applied Sciences. <http://people.seas.harvard.edu/~valiant/>.
- Lohr, Steve. "Another Win for Artificial Intelligence: The Turing Award." 9 Mar. 2011. <http://bits.blogs.nytimes.com/2011/03/09/another-win-for-artificial-intelligence-the-turing-award/>.
- "P vs. NP Problem." The Clay Mathematics Institute. <http://www.claymath.org/millennium/P_vs_NP/>.
- Pudlak, Pavel. "P versus NP Cartoon." <http://www.win.tue.nl/~gwoegi/P-versus-NP/pudlak.png>.
- R2-D2 Photo. <http://en.wikipedia.org/wiki/File:Gen_Con_Indy_2008_030.JPG>.
- Timmer, John. "Turing Award Honors Learning Theory, Parallel Computing Work." Ars Technica. <http://arstechnica.com/science/news/2011/03/turing-award-honors-learning-theory-parallel-computing-work.ars>.