

Why ESC180 is the the most important course you'll ever take*

Some slides taken from

**The Future of Computer
Science**

And Why Every Other Major Sucks By Comparison

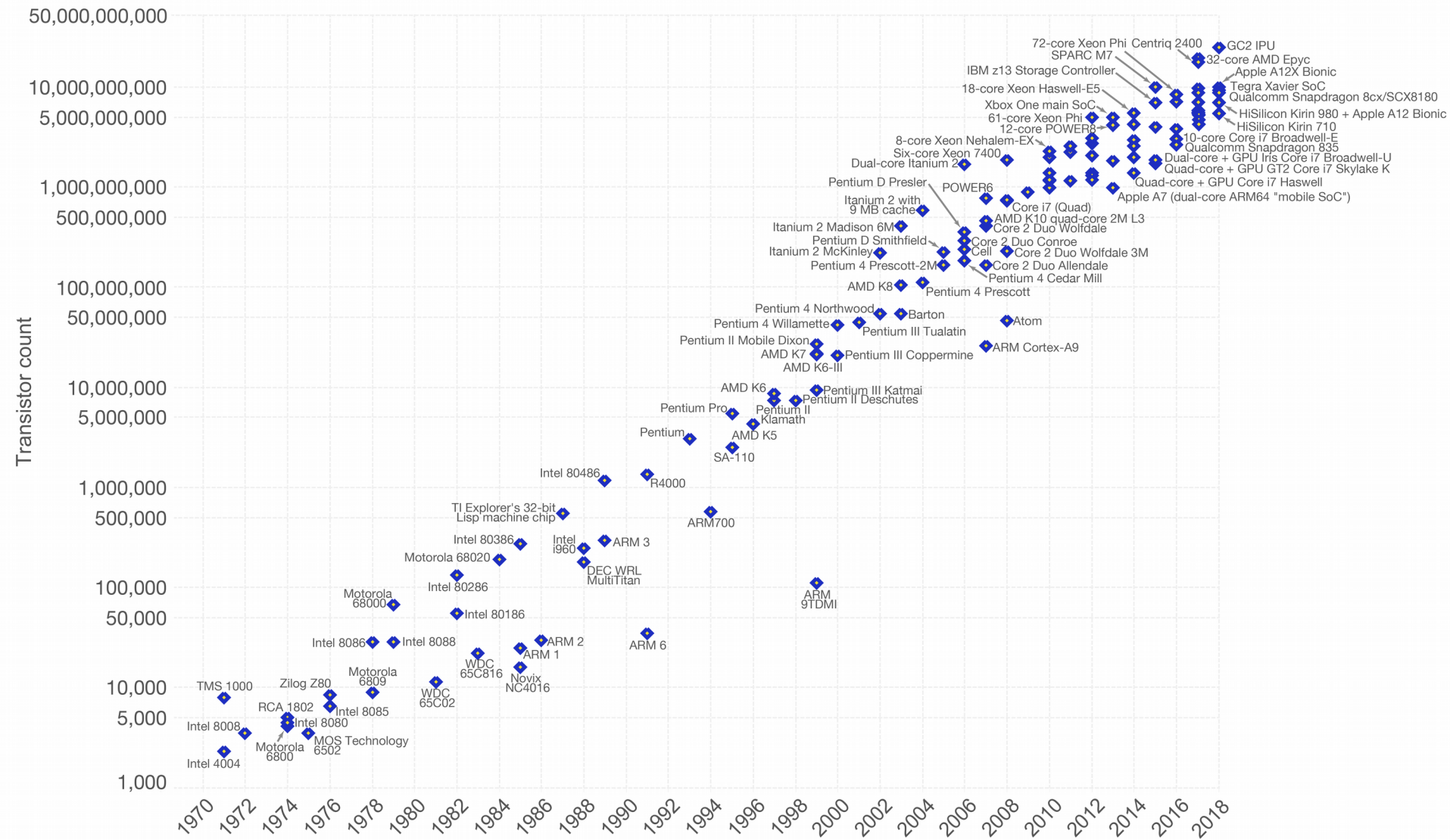
by Scott Aaronson, MIT EECS

Stereotypes of Computer Scientists



Moore's Law – The number of transistors on integrated circuit chips (1971-2018)

Moore's law describes the empirical regularity that the number of transistors on integrated circuits doubles approximately every two years. This advancement is important as other aspects of technological progress – such as processing speed or the price of electronic products – are linked to Moore's law.

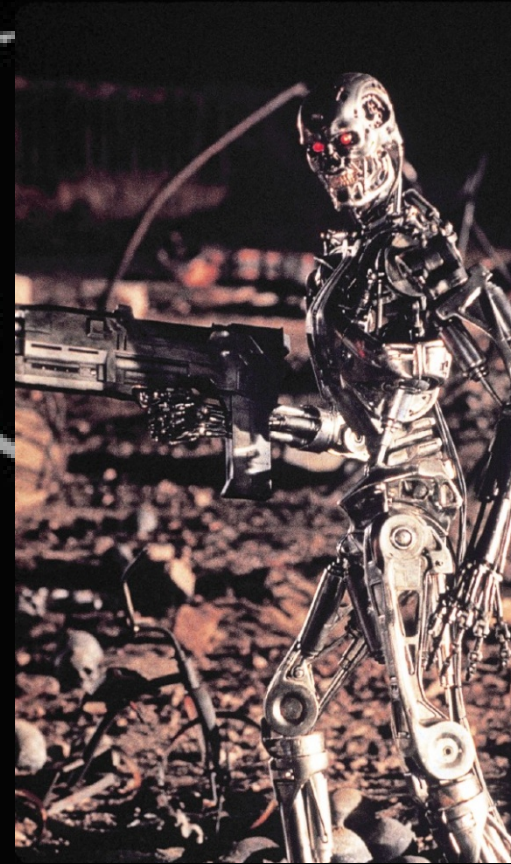


Insights From and to Other Disciplines

- Insights from *Distributional Semantics* lead to techniques like the one used in Project 3
 - “*Distributional hypothesis: linguistic items with similar distributions have similar meanings*” (Wikipedia)
- Programs inspired by how the brain works used to automatically learn how to detect cats in Youtube videos
- And to automatically learn to play videogames by trying different inputs and learning from mistakes

So what's next?

Robot Uprising



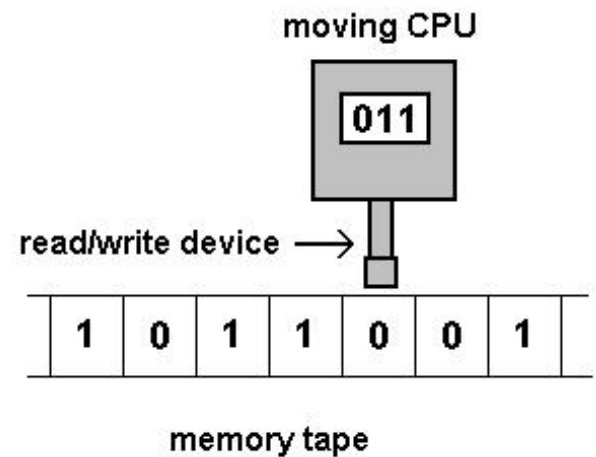
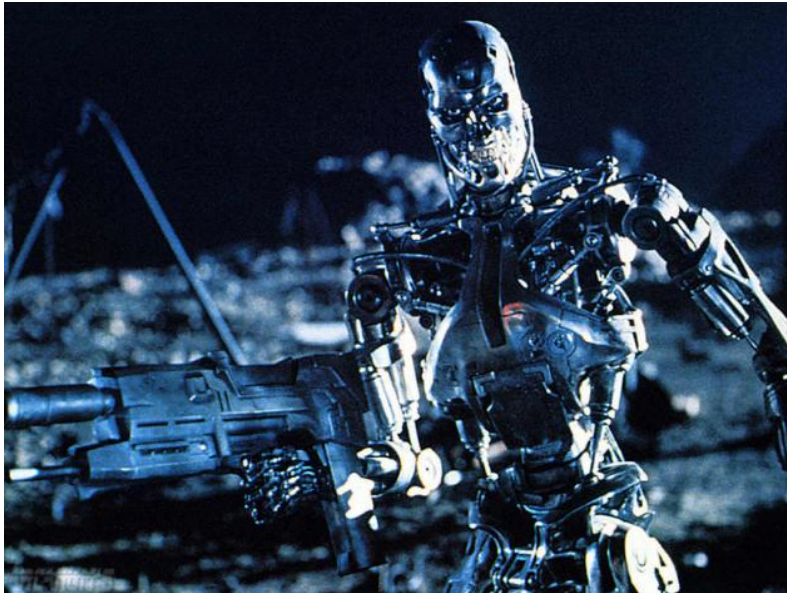
**Uploading our brains to computers;
replacement of “real life” by the Matrix**



Uploading our brains to computers; replacement of “real life” by the Matrix

facebook





So what else is there?

Quantum Computers

What we've learned from
quantum computers so far:

$$15 = 3 \times 5 \text{ (2001)}$$

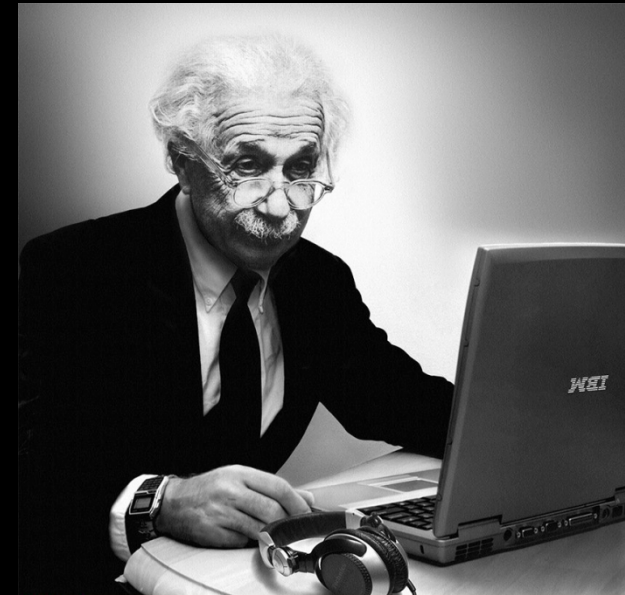
$$21 = 3 \times 7 \text{ (2012)}$$

$$56,153 = 233 \times 241 \text{ (2014)}$$

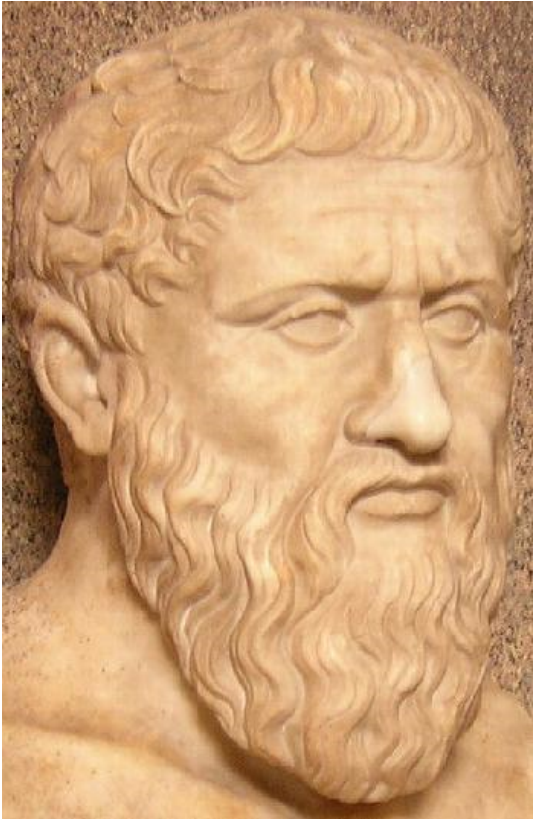
$$1,099,551,473,989 = 1,048,589 \times \\ 1,048,601 \text{ (2019)}$$

(with high probability)

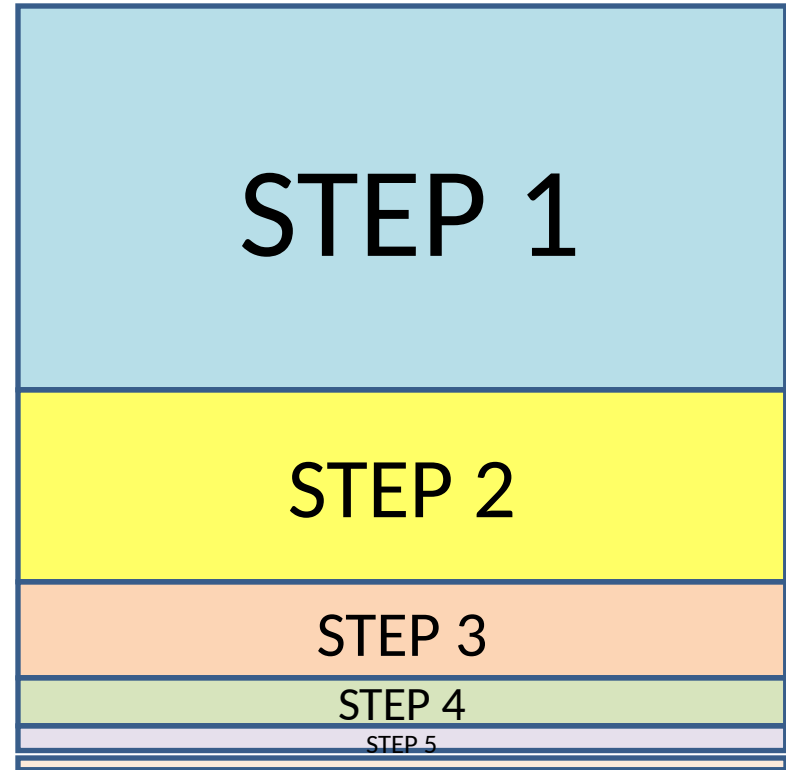
Relativity Computer



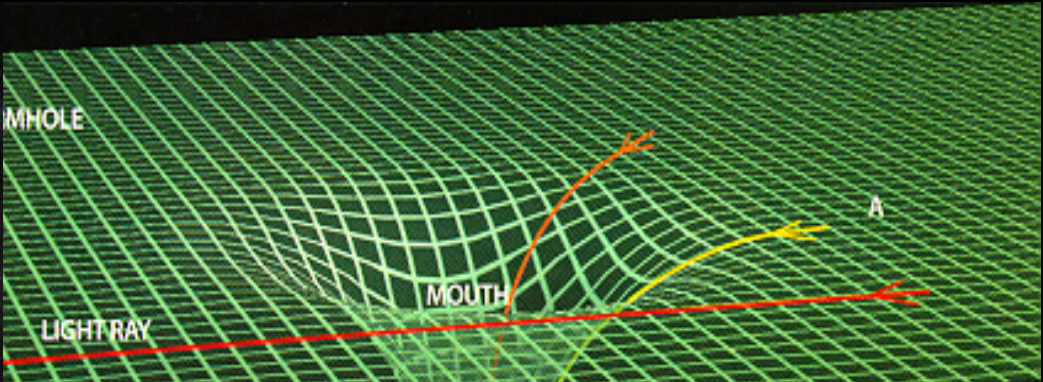
Zeno's Computer



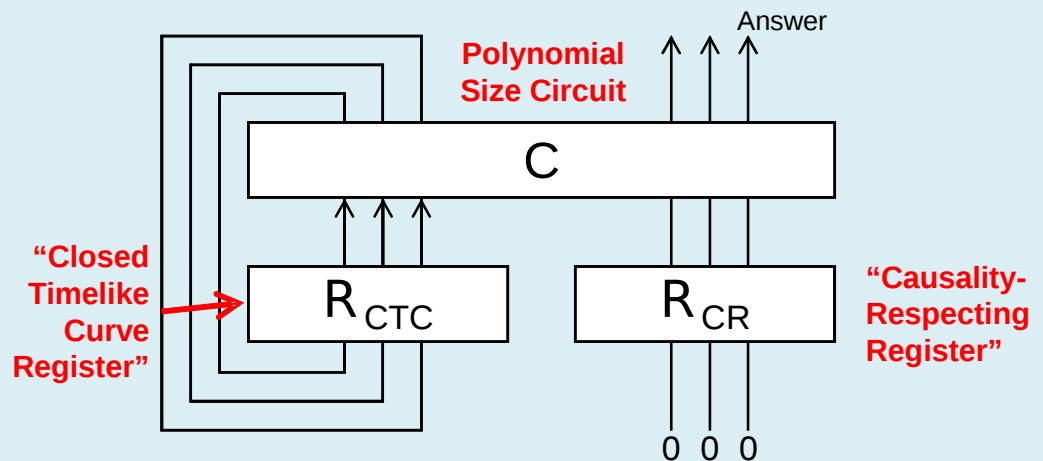
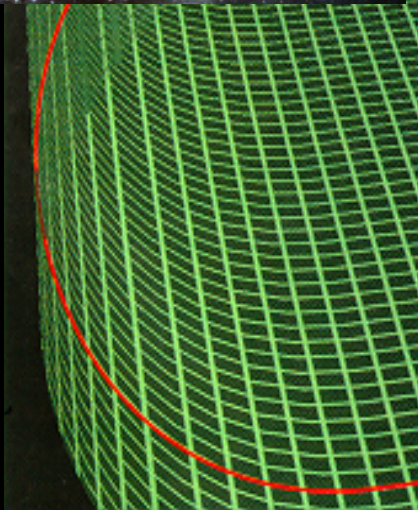
Time (seconds)



Time Travel Computer



S. Aaronson and J. Watrous. **Closed Timelike Curves Make Quantum and Classical Computing Equivalent**, *Proceedings of the Royal Society A* 465:631-647, 2009. arXiv:0808.2669.



Computer Science Is Interdisciplinary

