

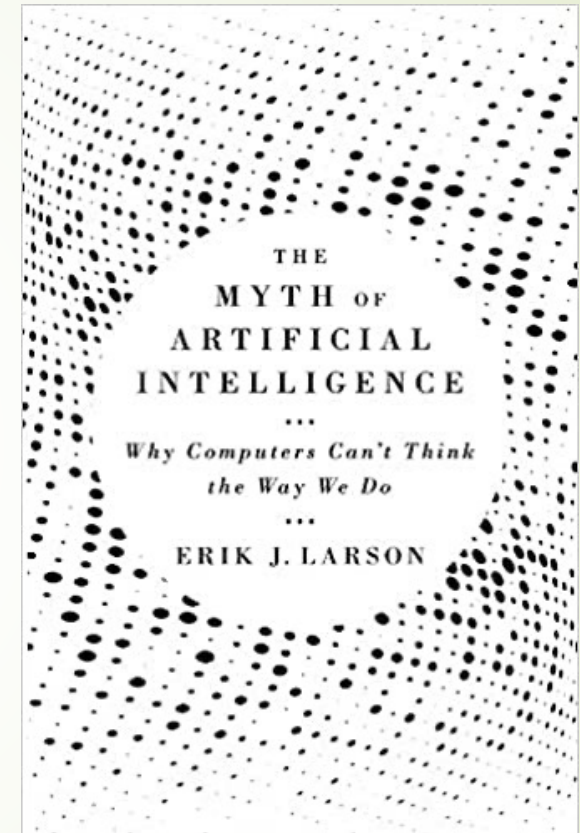
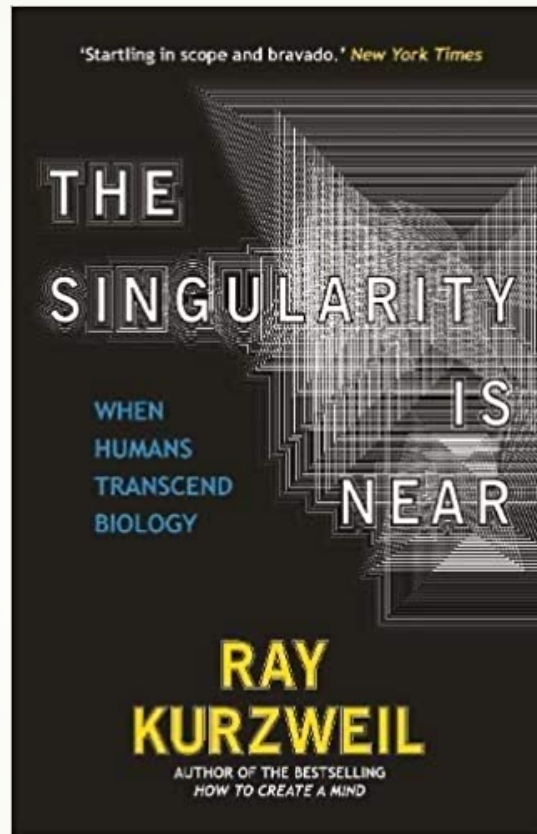
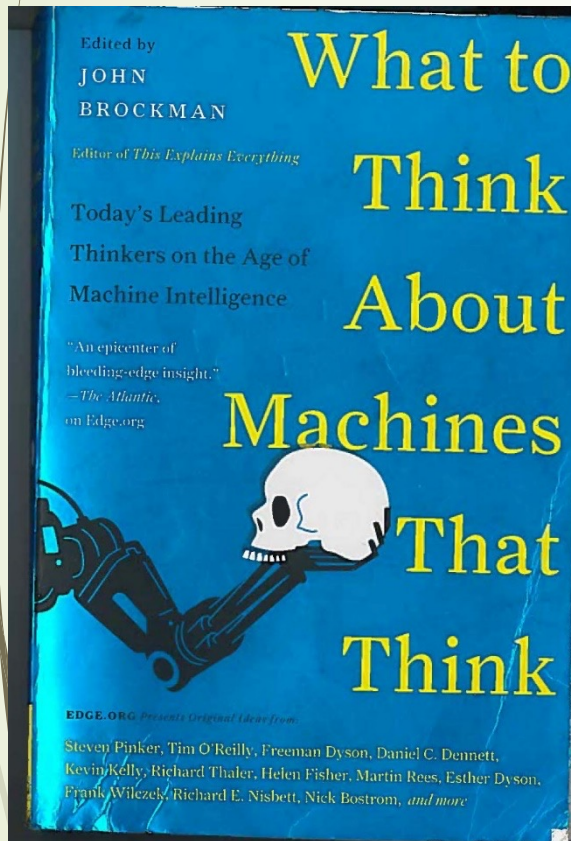
Aspirational AI or “Extreme” AI Ideas

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Some books with extreme ideas



Many people are now writing about artificial intelligence. Some of it is quite speculative. This lecture is based on the one on the left, a collection of 180 short articles.

Extreme ideas about AI

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- Ideas from over-optimists:
 - AI will produce “superintelligent” machines.
 - AI will revolutionize the world in a “fourth industrial revolution” (the other three: engines, mass production, and computers).
 - AI will cause eventually reach a “singularity” in which society becomes fundamentally different because AI is ubiquitous.
- Ideas from over-pessimists:
 - AI will take over the world and make people its slaves.
 - AI has fundamental limits because some aspects of thinking are uniquely human.

Do both the above consider superintelligent machines to be inevitable? Where do you put those who doubt they are inevitable?

Answering over-optimism (1)

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- ▶ AI may never be “superintelligent” because people have already shown limits of any kind of reasoning.
 - ▶ Large organizations like stockbrokers collect much data, but struggle making sense of it because there is much randomness. AI would have the same challenges.
- ▶ AI is automation technology. Most automations have increased efficiency but not changed society much:
 - ▶ Consider: Portable telephones, aircraft, refrigeration
 - ▶ People will lose some jobs with automation. New jobs usually arise, but often not immediately.

Answering over-optimism (2)

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- Most technological innovations are bad; we don't remember those. A few are mostly good, but any innovation has disadvantages.
- Having many AI entities doesn't differ much from having many human organizations. Organizations often have their own objectives different from those of their human members, and we need and have rules and laws to control them.
- AI does risk decreasing human liberty. This will be discussed in a later talk, "Risks of AI".

The AI “singularity”

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- As AI steadily gets more powerful, AI will overtake human intelligence in many areas. This might change society significantly – the “singularity”.
- Furthermore, the pace of technological change might increase greatly with machine learning.
- Will this make a big difference? Not necessarily:
 - Machine learning has limits.
 - When engine-powered vehicles overtook humans in speed, travel became easier. But walking is still good exercise.
 - AI tends to focus on what people do poorly (like math) because that’s where the biggest payoffs are. So AI and humans may rarely compete in the future.
 - When AI and people can compete, they may team well together.

Evil artificial intelligences in the movies (1)

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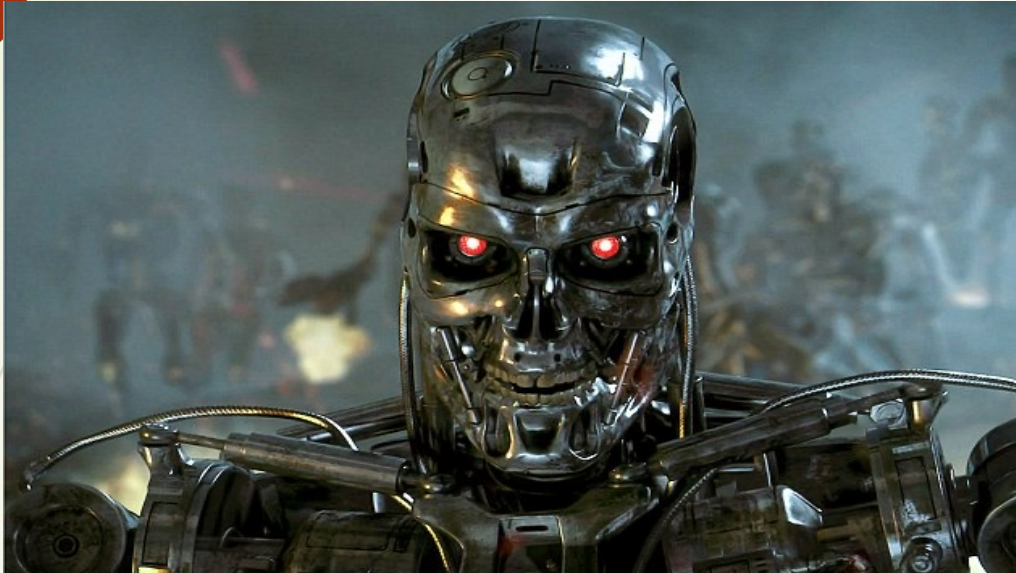


From
<https://www.denofgeek.com/movies/evil-artificial-intelligences-film/>

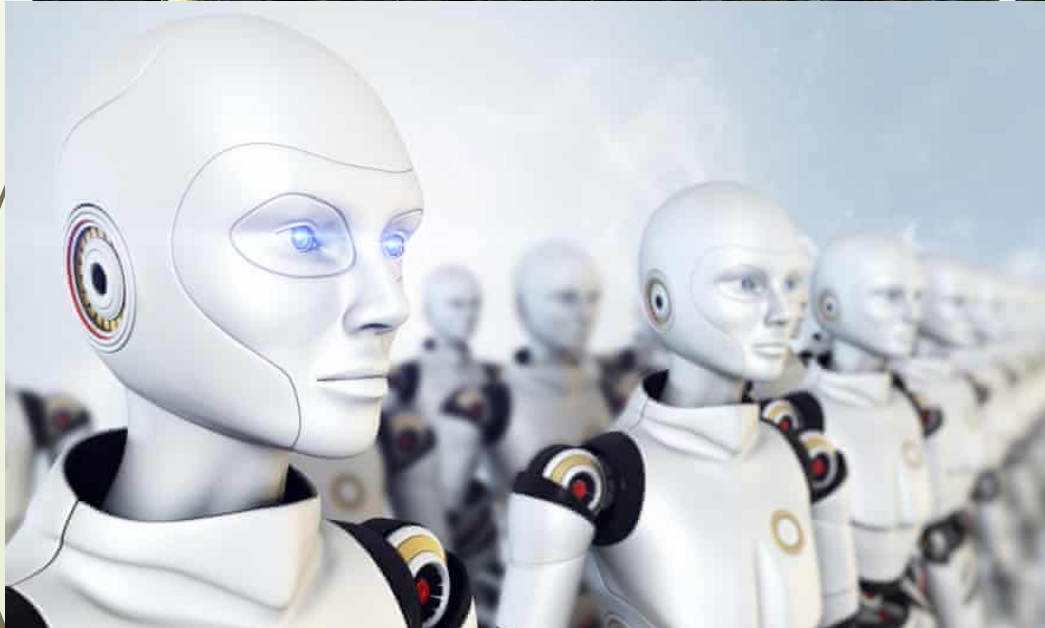


Evil artificial intelligences in the movies (2)

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From:
<https://www.dailymail.co.uk/sciencetech/article-3605349/What-s-worst-happen-enslaving-mankind-destroying-universe-experts-reveal-AI-turn-evil.html>



From
<https://www.theguardian.com/technology/2016/aug/30/rise-of-robots-evil-artificial-intelligence-uc-berkeley>

AI takeover

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- Some people worry that AI technology will make humans its slaves.
- AI is designed to create obedient servants. So we can train it to respect people and be ethical. That's different than nuclear weapons which don't check what is present where they explode.
- One writer asks: Could smarter screwdrivers take over the world?
- Unethical AI can be turned off, unlike possible recombinant DNA gene modifications.
- Still, any powerful technology raises ethical issues. More about ethics in another lecture.

Proposed limits of AI (1)

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There's a long history of claims about what AI could not do. For instance:

- Beat humans at chess
 - Carry on conversations in English
 - Play the stock market
 - Learn context for decisions (done with neural networks)
 - Communicate with other intelligences (done with speech acts)
 - Have emotions
 - Have empathy for people (done by plan understanding)
 - Think about itself (done by meta-reasoning)
- One by one, such skill have been achieved by AI. So we can be skeptical of claimed limits to AI.

Animals can behave very like humans (e.g. bonobos)



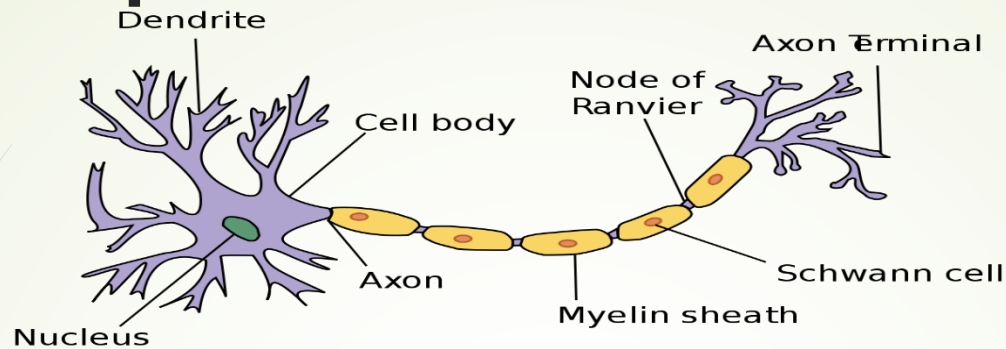
Proposed limits of AI (2)

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- ▶ Similar “species-ist” arguments have been made why animals can’t think (to justify their abuse). And animal brains are very similar to human brains.
- ▶ There are a few broad limits to AI:
 - ▶ Theorems in computer science give computational limits, e.g. whether a computer program will stop.
 - ▶ AI tasks are generally NP-hard, which means they need simplifications to be solvable with traditional software.
 - ▶ These limits so rarely impede solutions of real problems that they usually can be ignored.
- ▶ Some argue that AI only simulates intelligence.
 - ▶ However, if it walks like a duck and quacks like a duck, isn’t it a duck? If it can pass every intelligence test you can conceive, isn’t it intelligent? (That generalizes the Turing Test.)
 - ▶ Computer science shows hardware is not critical to capability beyond a certain minimum ability.
- ▶ People may confuse intelligence and consciousness.

Counter to pessimism: Brains are machines

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From:
<https://simple.wikipedia.org/wiki/Neuron>

- Brains are made of neurons.
- Neurons compute a weighted sum of the excitation of their input dendrites, encode as a frequency of firing, transmit it along an axon, and excite other neurons across synaptic membranes.
- About 30 neurotransmitters can broadly affect transmission of neurons.
- That's all there is – it's very mechanical.
- It should be possible to completely duplicate brain machines by engineered machines.