

Open Problem: Bias, fairness, and ethics in deep learning

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How is deep learning going to change our world

General Intelligence

- The singularity happens
 - AI smarter than human
 - DOOM!



How far are we from AGI?

- Far, and we're not getting much closer



Dangers of dumb AI

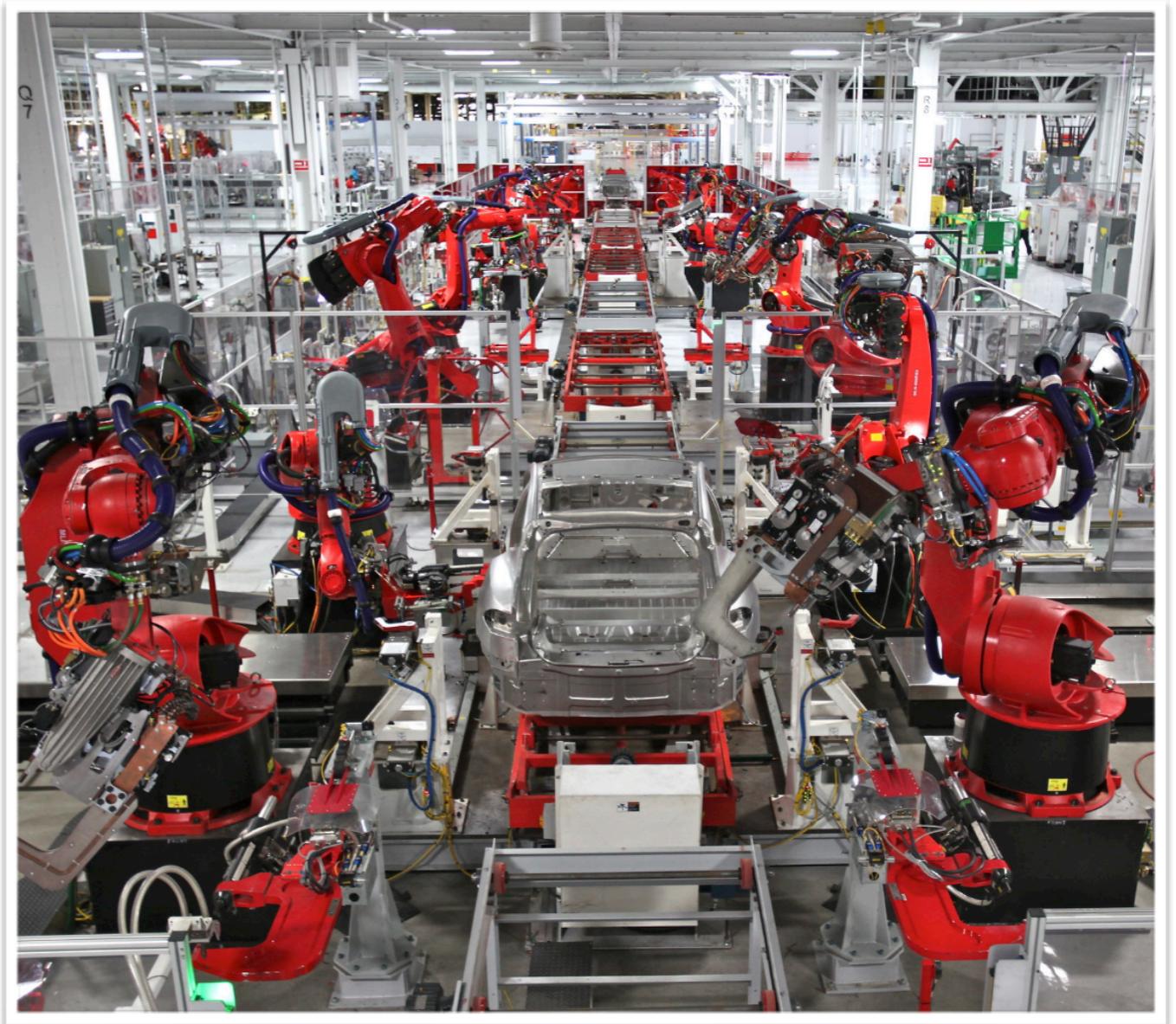
- Dumb / narrow AI works
- How will it change our world?



male
smile
black hair
...

Automation

- AI / ML replaces humans
 - Driving / trucking
 - Factories
 - Radiology
- Fewer humans needed



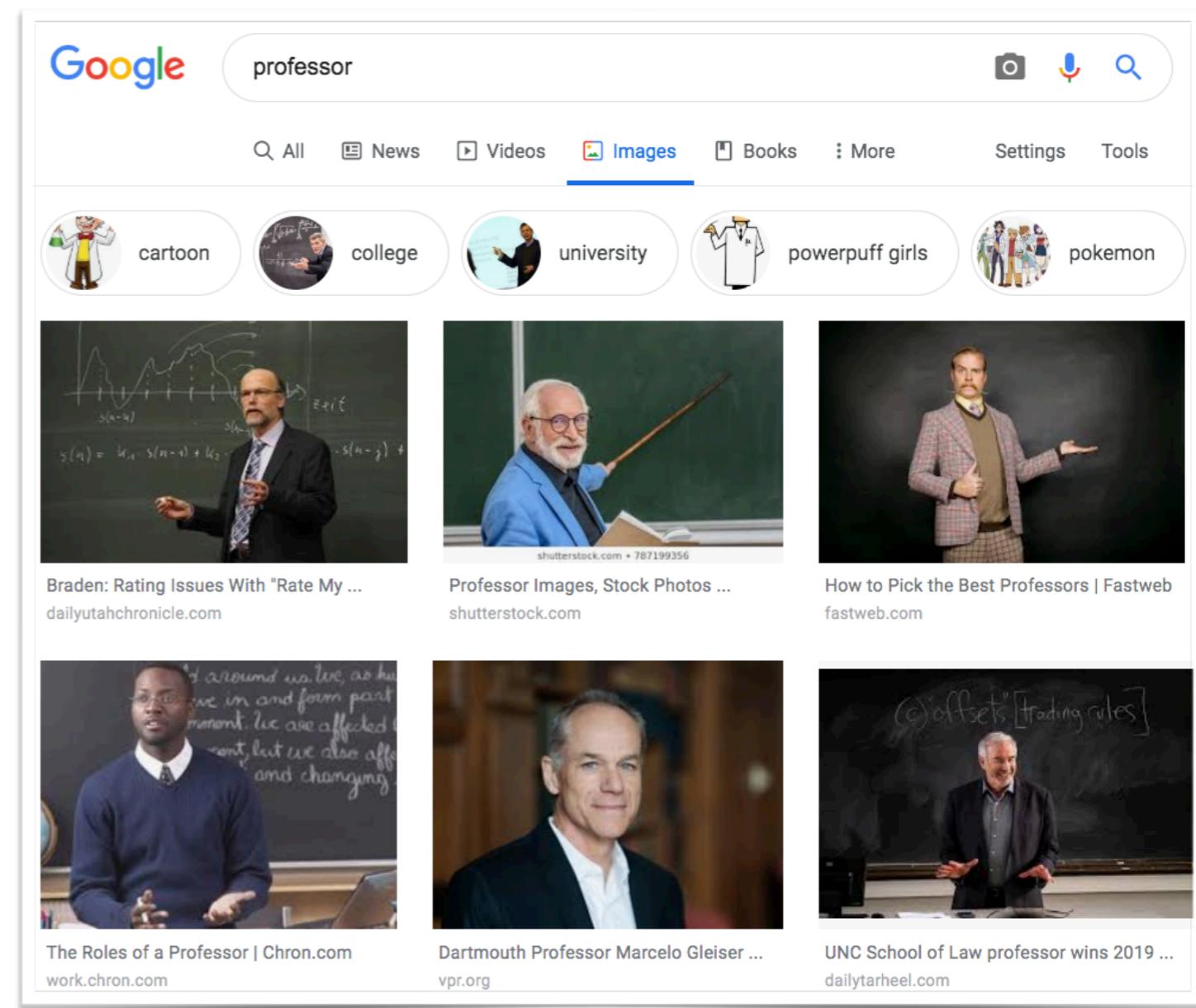
Misuse

- Fake images
 - Propaganda
- State sponsored surveillance



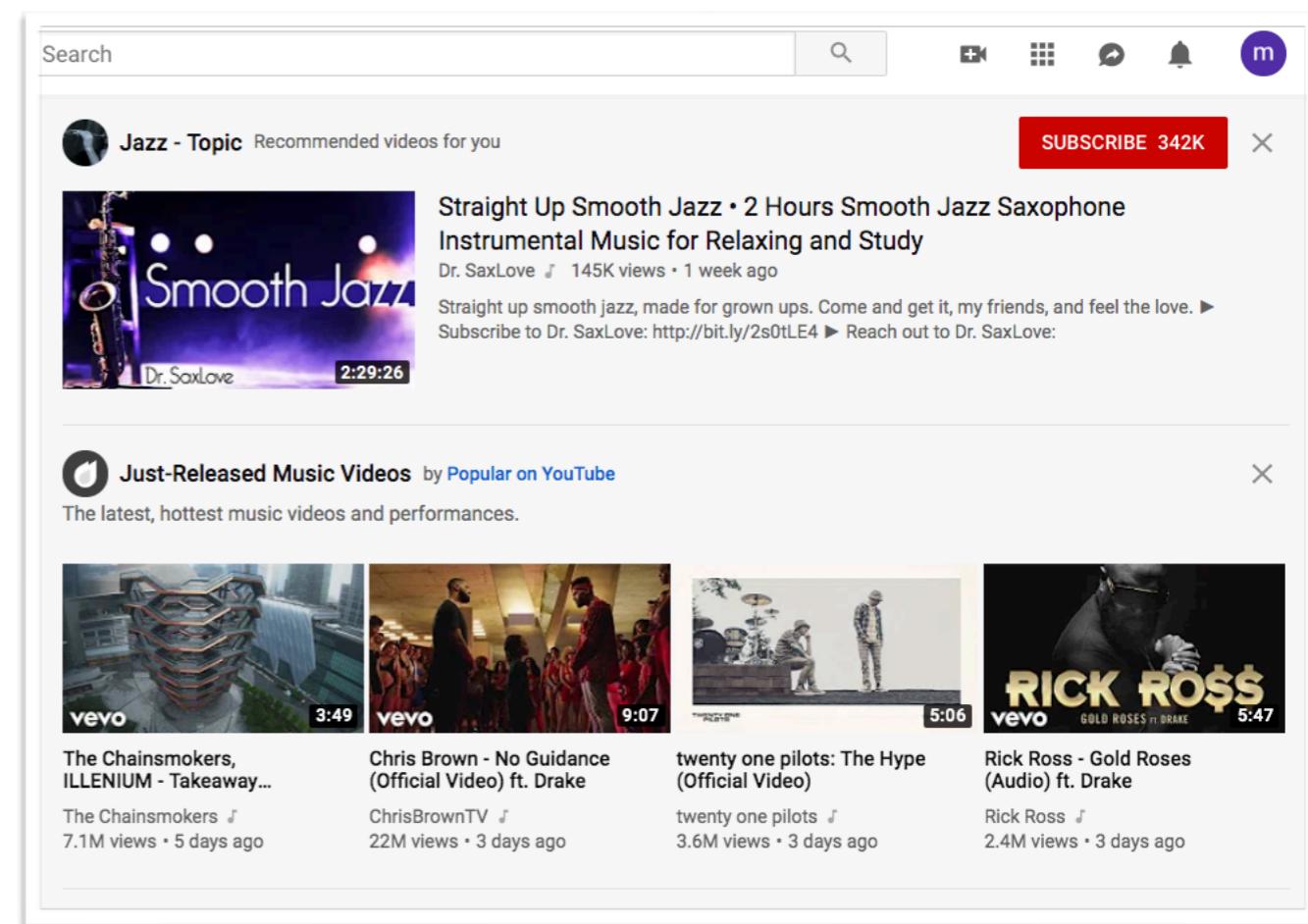
Bias

- DL systems inherit and amplify bias from data
 - e.g. google photos
 - credit applications
 - criminal justice



Recommender systems

- Find user specific content
 - predict users preferences
 - e.g. movies on netflix
 - e.g. products on Amazon
- Optimized to make company money (e.g. click rate, time on screen)



Video-sharing websites

- Recommender systems alter user behavior
 - How do you keep users engaged?
 - Fringe content
 - Conspiracies
 - Alt-left, alt-right
- YouTube Radical: <https://www.nytimes.com/interactive/2019/06/08/technology/youtube-radical.html>
- Towards neural mixture recommender for long range dependent user sequences, Tang et al., WWW, 2019

Social media

- Recommender systems shape view of world
 - What to show users?
Real or fake news?
 - A Genocide Incited on Facebook, With Posts From Myanmar's Military, <https://www.nytimes.com/2018/10/15/technology/myanmar-facebook-genocide.html>

74. The role of social media is significant. *** has been a useful instrument for those seeking to spread hate, in a context where, for most users, *** is the Internet. Although improved in recent months, the response of *** has been slow and ineffective. The extent to which *** posts and messages have led to real-world discrimination and violence must be independently and thoroughly examined...

Report of the independent
international fact-finding
mission on Myanmar*, Human
Rights Council

Dumb AI is dangerous too

- How can you help?
 - Understand the technology
 - Know that you see what an AI wants you to see
 - Ask for solutions
 - Help fix the problems



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Not all deep learning is bad

- AI assistant (Siri, Google, Alexa)
- Home security
- Healthcare
- Driving safety
- Disaster rescue

