The 4ᵗʰ Industrial Revolution.
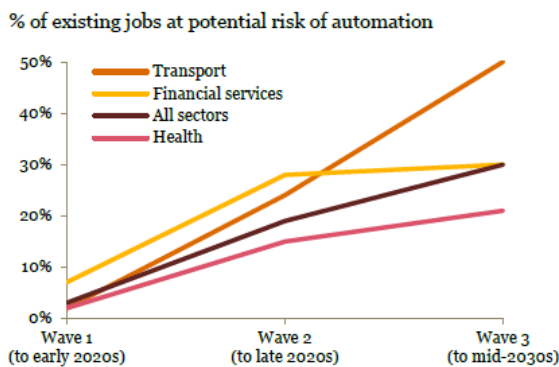
Movies and TV series:

2001, Space Odyssey, The Terminator, Blade Runner, The Matrix, I, Robot, The rise of the machines...

Person of Interest, Human

AI can increase global GDP by by $17 trillion.

Figure 1 – Potential job automation rates by industry across waves

% of existing jobs at potential risk of automation

Source: PwC estimates based on OECD PIAAC data (median values for 29 countries)

Figure 2 – Potential job automation rates by education level across waves

% of existing jobs at potential risk of automation
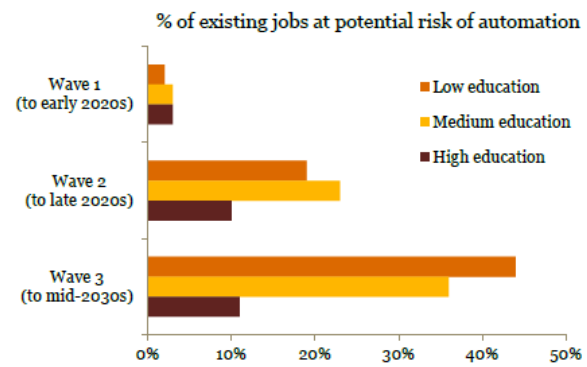
Source: PwC estimates based on OECD PIAAC data (median values for 29 countries)

Female workers could be more affected by automation over the next decade, but male jobs could be more at risk in the longer term

Figure 3 – Potential job automation rates by gender across waves

% of existing jobs at potential risk of automation
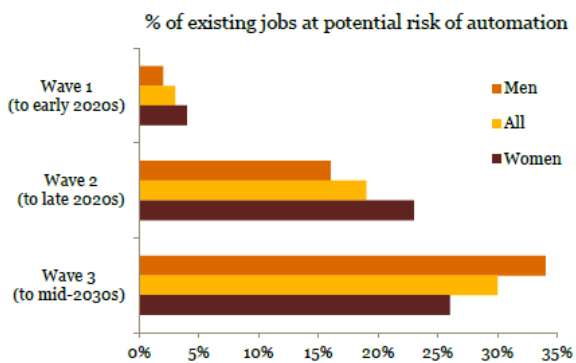
Source: PwC estimates based on OECD PIAAC data (median values for 29 countries)

| Waves	Description and impact
Wave 1: Algorithmic wave (to early 2020s)	Automation of simple computational tasks and analysis of structured data, affecting data-driven sectors such as financial services.
Wave 2: Augmentation wave (to late 2020s)	Dynamic interaction with technology for clerical support and decision making. Also includes robotic tasks in semi-controlled environments such as moving objects in warehouses.
Wave 3: Autonomous wave (to mid-2030s)	Automation of physical labour and manual dexterity, and problem solving in dynamic real-world situations that require responsive actions, such as in transport and construction.

The Real Reason to be Afraid of Artificial Intelligence

Peter Haas worked in robotics at Boston University and he is terrified of robots.

Video link: https://www.youtube.com/watch?v=TRzBk_KuIaM (12'38'')

Can you give the reason?

1st example.

This is a dog that has been misidentified as a wolf by an AI algorithm.
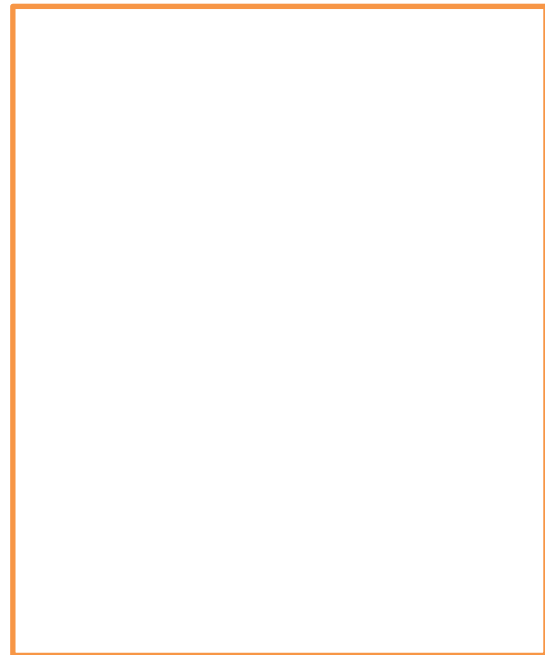
The researchers wanted to know: why did this husky get misidentified as a wolf?

So they rewrote the algorithm to explain to them that parts of the picture it was paying attention to when the AI algorithm made its decision.

Question: What do you think it paid attention to: make a drawing of the zones you think at in the empty frame.

What would you pay attention to?

What was the bias? Explain it.

<u>The Compass Criminal Sentencing (Correctional Offender Management Profiling for Alternative Sanctions)</u>

In July 2016, the Wisconsin Supreme Court ruled that COMPAS risk scores can be considered by judges during sentencing, but there must be warnings given to the scores to represent the tool's "limitations and cautions."

A general critique of the use of proprietary software such COMPAS is that since the algorithms it uses are trade secrets, they cannot be examined by the public and affected parties which may be a violation of due process. Additionally, simple, transparent and more interpretable algorithms (such as linear regression) have been shown to perform predictions approximately as well as the COMPAS algorithm.

Another general criticism of machine-learning based algorithms is since they are data-dependent if the data are biased, the software will likely yield biased results.

Source: https://en.wikipedia.org/wiki/COMPAS_(software)

In 2016, Julia Angwin was co-author of a ProPublica investigation of the algorithm.[13] The team found that "blacks are almost twice as likely as whites to be labeled a higher risk but not actually re-offend," whereas COMPAS "makes the opposite mistake among whites: They are much more likely than blacks to be labeled lower-risk but go on to commit other crimes." They also found that only 20 percent of people predicted to commit violent crimes actually went on to do so.

In a letter, Northpointe (the COMPASS owner) criticized ProPublica's methodology and stated that: "[The company] does not agree that the results of your analysis, or the claims being made based upon that analysis, are correct or that they accurately reflect the outcomes from the application of the model."

Another team at the Community Resources for Justice, a criminal justice think tank, published a rebuttal of the investigation's findings. Among several objections, the CRJ rebuttal concluded that the Propublica's results: "contradict several comprehensive existing studies concluding that actuarial risk can be predicted free of racial and/or gender bias."

A subsequent study has shown that COMPAS software is no more accurate than predictions made by people with little or no criminal justice expertise.They found that: "On average, they got the right answer 63 percent of their time, and the group's accuracy rose to 67 percent if their answers were pooled. COMPAS, by contrast, has an accuracy of 65 percent."

Source : https://en.wikipedia.org/wiki/COMPAS_(software)

3rd example:
Strava and military secrets

Figure 1 A military base in Helmand Province, Afghanistan with route taken by joggers highlighted by Strava. Photograph: Strava Heatmap

Figure 2 Area 51, with a lone cyclist marked on the map. Photograph: Strava heatmap

Sensitive information about the location and staffing of military bases and spy outposts around the world has been revealed by a fitness tracking company.

The details were released by Strava in a data visualisation map that shows all the activity tracked by users of its app, which allows people to record their exercise and share it with others.

Zooming in on one of the larger bases clearly reveals its internal layout, as mapped out by the tracked jogging routes of numerous soldiers. The base itself is not visible on the satellite views of commercial providers such as Google Maps or Apple's Maps, yet it can be clearly seen through Strava.

Outside direct conflict zones, potentially sensitive information can still be gleaned. For instance, a map of Homey Airport, Nevada – the US Air Force base commonly known as Area 51 – records a lone cyclist taking a ride from the base along the west edge of Groom Lake, marked on the heatmap by a thin red line.

Source: https://www.theguardian.com/world/2018/jan/28/fitness-tracking-app-gives-away-location-of-secret-us-army-bases