Anthony Goldbloom: The jobs we'll lose to machines and the ones we won't

https://www.ted.com/talks/anthony_goldbloom_the_jobs_we_ll_lose_to_machines_and_the_ones_we_won_t?language=en

So this is my niece. Her name is Yahli. She is nine months old. Her mum is a doctor, and her dad is a lawyer. By the time Yahli goes to college, the jobs her parents do are going to look dramatically[1] different.

In 2013, researchers at Oxford University did a study on the future of work. They concluded that almost one in every two jobs have a high risk[2] of being automated[3] by machines. Machine learning is the technology that's responsible for most of this disruption[4]. It's the most powerful branch[5] of artificial intelligence[6]. It allows machines to learn from data[7] and mimic[8] some of the things that humans can do. My company, Kaggle, operates on[9] the cutting edge[10] of machine learning. We bring together hundreds of thousands of experts[11] to solve important problems for industry[12] and academia[13]. This gives us a unique perspective[14] on what machines can do, what they can't do and what jobs they might automate or threaten[15].

Machine learning started making its way into[16] industry in the early '90s. It started with relatively simple tasks. It started with things like assessing[17] credit risk[18] from

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[1] 極度地
[2] 風險
[3] 自動化
[4] 瓦解
[5] 分支
[6] 人工智慧
[7] 資料
[8] 模仿
[9] 對...施手術、影響
[10] 尖端、刃口、先進
[11] 專家
[12] 工業
[13] 學術界
[14] 觀點
[15] 威脅
[16] 慢慢走向
[17] 評估
[18] 信用風險

loan applications[19], sorting[20] the mail by reading handwritten characters from zip codes[21]. Over the past few years, we have made dramatic breakthroughs[22]. Machine learning is now capable of far, far more complex tasks[23]. In 2012, Kaggle challenged[24] its community to build an algorithm[25] that could grade[26] high-school essays[27]. The winning algorithms were able to match the grades given by human teachers. Last year, we issued an even more difficult challenge. Can you take images[28] of the eye and diagnose[29] an eye disease called diabetic retinopathy[30]? Again, the winning algorithms were able to match the diagnoses given by human ophthalmologists[31].

Now, given the right data, machines are going to outperform[32] humans at tasks like this. A teacher might read 10,000 essays over a 40-year career. An ophthalmologist might see 50,000 eyes. A machine can read millions of essays or see millions of eyes within minutes. We have no chance of competing against[33] machines on frequent, high-volume[34] tasks.

But there are things we can do that machines can't do. Where machines have made very little progress[35] is in tackling[36] novel[37] situations. They can't handle things they haven't seen many times before. The fundamental limitations[38] of machine learning is that it needs to learn from large volumes of past data. Now, humans don't. We

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[19] 貸款申請
[20] 排序、分類
[21] 郵區編號
[22] 戲劇性的突破
[23] 複雜的任務
[24] 挑戰
[25] 算法/演算法/算則法
[26] 評分
[27] 文章
[28] 影像
[29] 診斷
[30] 糖尿病性視網膜病變
[31] 眼科醫生
[32] 做得更好
[33] 競賽
[34] 大量的
[35] 進展
[36] 應付
[37] 新的、沒碰過的
[38] 基本限制

have the ability to connect seemingly[39] disparate[40] threads[41] to solve problems we've never seen before.

Percy Spencer was a physicist[42] working on radar[43] during World War II, when he noticed the magnetron[44] was melting[45] his chocolate bar[46]. He was able to connect his understanding of electromagnetic radiation[47] with his knowledge of cooking in order to invent — any guesses? — the microwave oven[48].

Now, this is a particularly remarkable[49] example of creativity[50]. But this sort of cross-pollination[51] happens for each of us in small ways thousands of times per day. Machines cannot compete with us when it comes to tackling novel situations, and this puts a fundamental limit on the human tasks that machines will automate.

So what does this mean for the future of work? The future state of any single job lies in the answer to a single question: To what extent is that job reducible[52] to frequent, high-volume tasks, and to what extent does it involve tackling novel situations? On frequent, high-volume tasks, machines are getting smarter and smarter. Today they grade essays. They diagnose certain diseases. Over coming years, they're going to conduct our audits[53], and they're going to read boilerplate[54] from legal contracts[55]. Accountants[56] and lawyers are still needed. They're going to be needed for complex tax structuring[57], for pathbreaking litigation[58]. But machines will shrink[59] their

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[39] 似乎是
[40] 不同
[41] 頭緒, 思路
[42] 物理學家
[43] 雷達
[44] 微波
[45] 融化
[46] 條狀的巧克力
[47] 電磁輻射
[48] 微波爐
[49] 讓人激賞的
[50] 創意
[51] 異花受粉、相互滲透
[52] 可減少到
[53] 處理、糾核我們的帳目
[54] 標準法律語言
[55] 法律合同
[56] 會計師
[57] 稅務結構

ranks[60] and make these jobs harder to come by[61].

Now, as mentioned, machines are not making progress on novel situations. The copy behind a marketing campaign[62] needs to grab[63] consumers' attention. It has to stand out from the crowd[64]. Business strategy[65] means finding gaps[66] in the market, things that nobody else is doing. It will be humans that are creating the copy behind our marketing campaigns, and it will be humans that are developing our business strategy.

So Yahli, whatever you decide to do, let every day bring you a new challenge. If it does, then you will stay ahead of the machines.
Thank you.

Comprehension questions
1. What did researchers at Oxford University find about the future of work?
2. Why will this happen?
3. What role does Anthony Goldbloom's company, Kaggle, play in machine learning?
4. What is machine learning capable of now?
5. According to the speaker, in what kind of tasks can machines outperform humans?
6. What things can humans do better than machines?
7. Why does the speaker say machines cannot compete with humans in novel situations? What example does he give?
8. So what does this mean for the future of work?

Discussion questions
1. What is the main idea of this talk?
2. What did you learn from this talk?
3. What do you plan to do when you graduate? Is it possible that your future job will be taken over by machines? Why?

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[58] 開創性的訴訟
[59] 縮水
[60] 排行
[61] 比較找不到
[62] 市場行銷
[63] 抓緊
[64] 豎立雞群
[65] 策略
[66] 溝距