BERKMAN KLEIN CENTER
FOR INTERNET & SOCIETY AT HARVARD UNIVERSITY

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MCMXVI

O IMPACTO DA INTELIGÊNCIA ARTIFICIAL E ROBÓTICA NO FUTURO DO EMPREGO E TRABALHO

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30 de Outubro de 2017

About the symposium at ABC

- Brazilian Academy of Sciences (ABC) --> provides a multidisciplinary environment to discuss multiple visions for the impact of AI+Robotics on emerging economies.

- Focus: impact of AI+Robotics on 1) economy; 2) society and 3) science

- Open questions:
  - What tasks, occupations and industries will be most affected by AI+Robotics?
  - What are the implications for the economy and society of developing countries?
  - What policies should we consider to minimize the downsides and maximize the benefits of AI+Robotics?
  - How can the Brazilian society use AI+Robotics to accelerate social and economic development?

The nature of AI

- Artificial Intelligence (AI) describes a set of advanced general purpose digital technologies that enable machines to do highly complex tasks effectively.

- "Artificial Intelligence" is used as an umbrella term to cover a set of complementary techniques that have developed from statistics, computer science and cognitive psychology.

- The term AI is often used as an umbrella term to refer to a **certain degree of autonomy** exhibited in advanced health diagnostic systems, next-generation digital tutors, self-driving cars, manufacturing and other AI- based applications.

- Various technologies and terms are used as a group that represents AI: machine learning, deep learning, neural networks, reinforcement learning, etc.

● AI isn't just transforming science; it is speaking to you in your smartphone, taking to the road in driverless cars, and unsettling futurists who worry it will lead to mass unemployment.

● For scientists, prospects are mostly bright: AI promises to supercharge the process of discovery.

● Already some pioneers are turning to AI to design and carry out experiments as well as interpret the results, opening up the prospect of fully automated science.



nature International

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The shape of work to come

Three ways that the digital revolution is reshaping workforces around the world.

Emily Anthes

18 October 2017

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- “It’s not that we’re running out of work or jobs per se,” David Autor, an M.I.T. economist who studies the impact of automation on employment, said. “But a subset of people with low skill levels may not be able to earn a reasonable standard of living based on their labor. We see that already.” As automation depresses wages, jobs in factories become both less abundant and less appealing. This process, Autor and other economists argue, can also exacerbate inequality.



TECHNOLOGY

These 11 Industries Are Most at Risk From Artificial Intelligence

As AI prevalence expands, a new report sheds light on its impact in the workforce.

11. Science (4%)

10. Healthcare/hospitals (4%)

9. Policing/security (5%)

8. Farming (6%)

7. Taxi drivers (7%)

6. Insurance companies (8%)

5. Financial analysis (9%)

4. Public transport (9%)

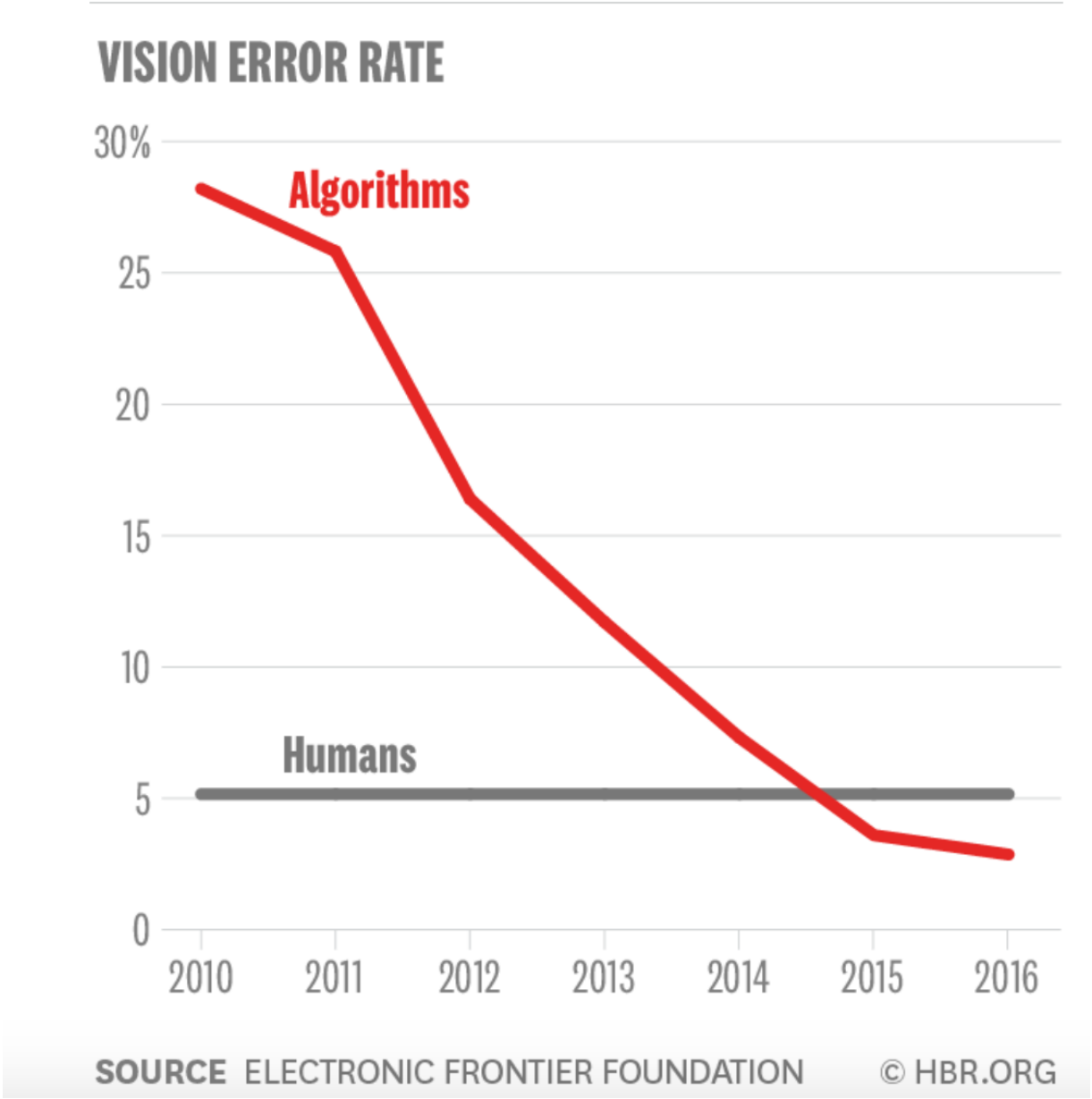
3. Construction (10%)

2. Banking (18%)

1. Manufacturing workers (19%)

AI -> general purpose technology

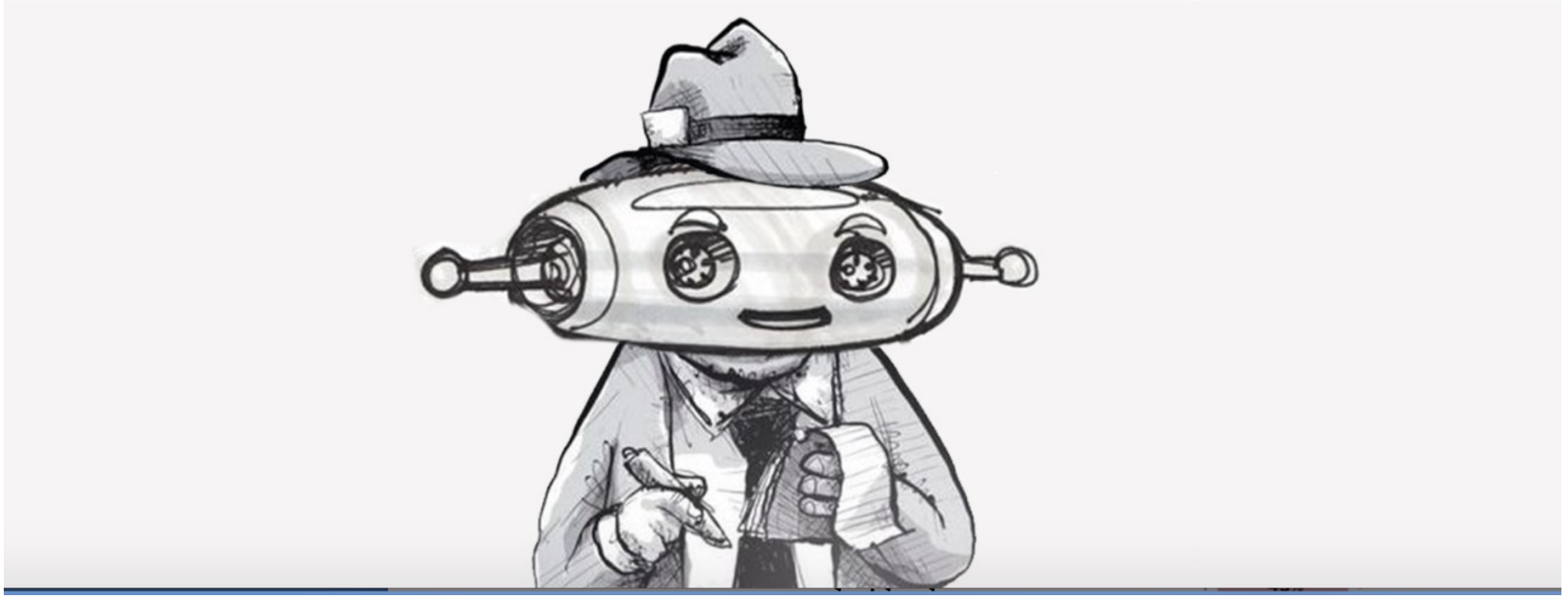
The error rate for recognizing images from a large database called ImageNet, with several million photographs of common, obscure, or downright weird images, fell from higher than 30% in 2010 to about 4% in 2016 for the best systems.



MODERN NEWSROOM

The Washington Post's robot reporter has published 850 articles in the past year

SEPTEMBER 14, 2017 by Lucia Moses



- Apart from fears of mass unemployment, accidents with machinery, restrictions on freedom, increased economic inequality and a devalued human experience, the public are broadly optimistic about the arrival of artificial intelligence, according to one of the first surveys of British opinions about the technology.

Artificial intelligence (AI)

Artificial intelligence survey finds UK public broadly optimistic

Support for 'machine learning' depended on what it would be used for, with mass unemployment among main fears

This article is 6 months old

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Ian Sample
Science editor

@iansample

Tuesday 25 April 2017
00.01 BST



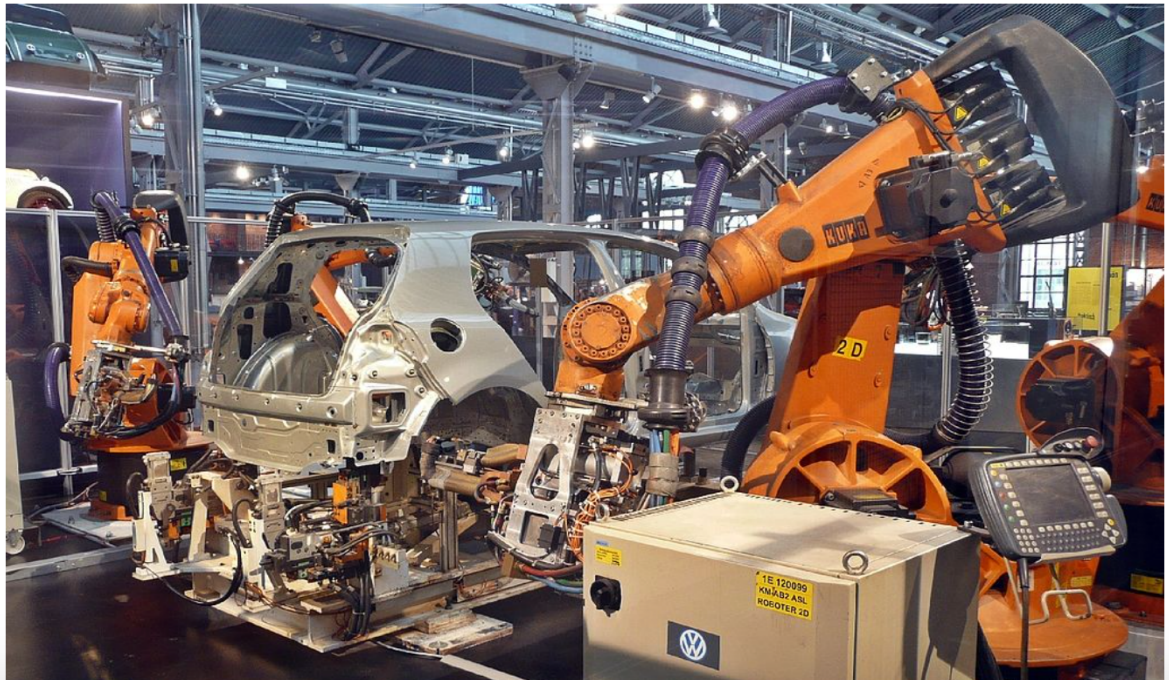
Ipsos Mori found a two-thirds of the UK public believe the benefits of machine learning outweighed the risks or were balanced. Photograph: Nic Delves-Broughton/PA

Chinese factory replaces 90% of human workers with robots. Productior rises by 250%, defects drop by 80%

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MIHAI ANDREI FEBRUARY 3, 2017

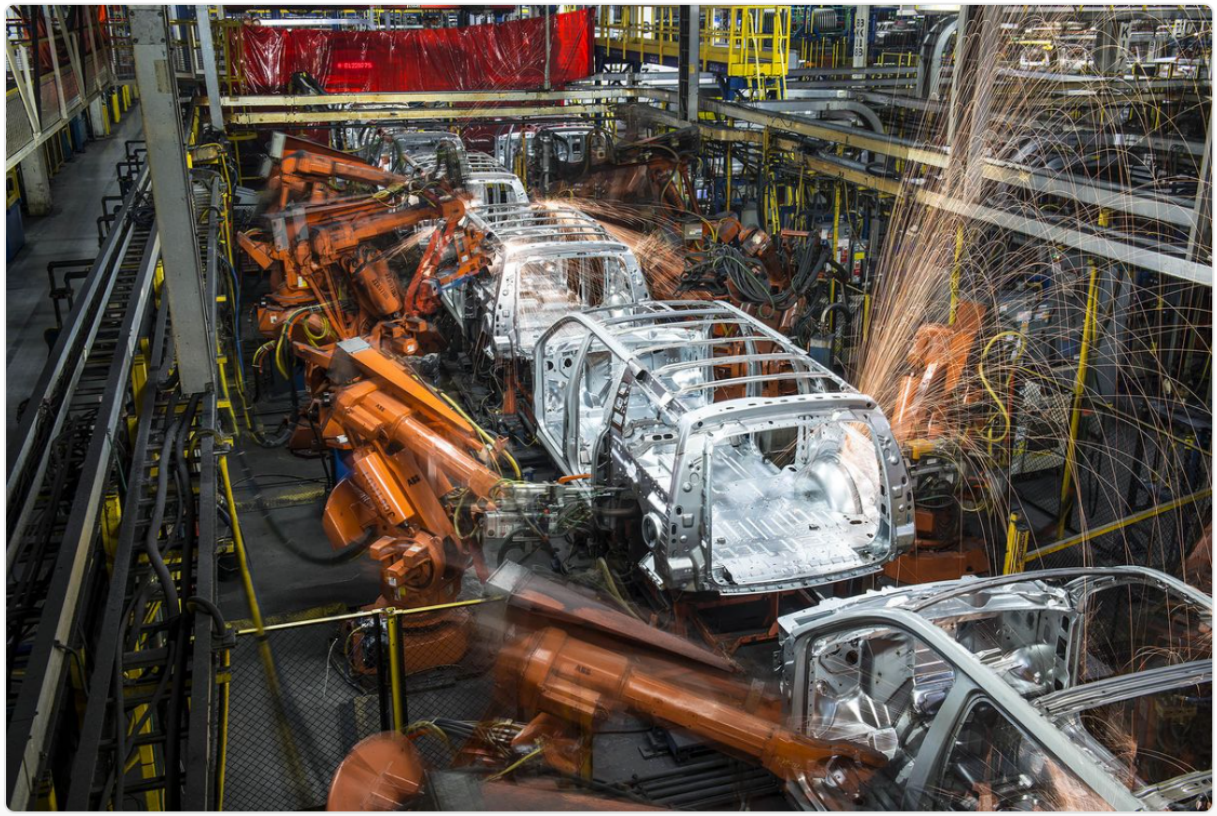
After a factory in Dongguan, China, replaced most of its workers with robots, it witnessed a spectacular rise in productivity.



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GM is connecting its 30,000 robots to the internet to help keep factories humming bloom.bg/2o60oAH



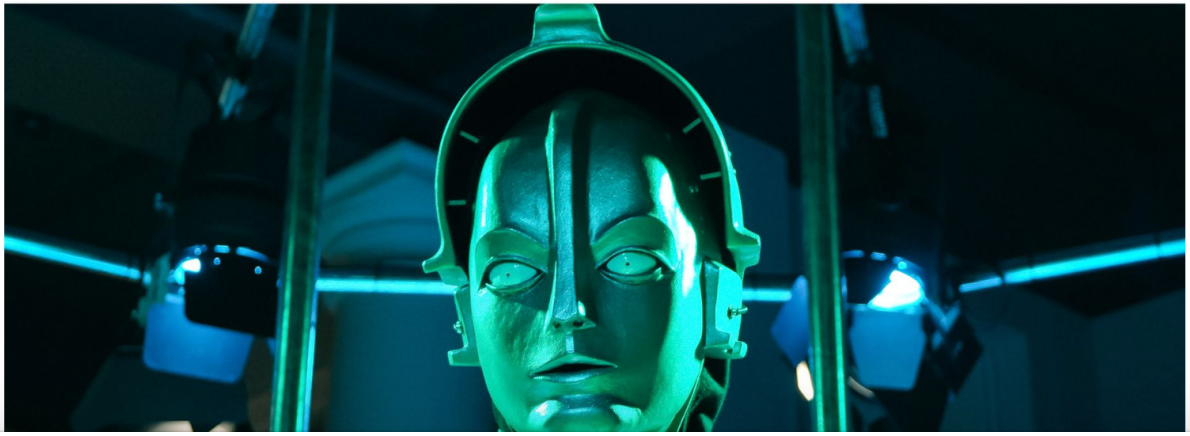
TECH | ARTIFICIAL INTELLIGENCE | ROBOT

Robots and AI are going to make social inequality even worse, says new report

Rich people are going to find it easier to adapt to automation

by James Vincent | @jjvincent | Jul 13, 2017, 8:25am EDT

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NOW TRENDING



BUSINESS DAY

Indian Technology Workers Worry About a Job Threat: Technology

By NIDA NAJAR JUNE 25, 2017



Sudhakar Choudhari, who was recently laid off from his job at Tech Mahindra, searching for job listings at his apartment in suburban Pune. Atul Loke for The New York Times

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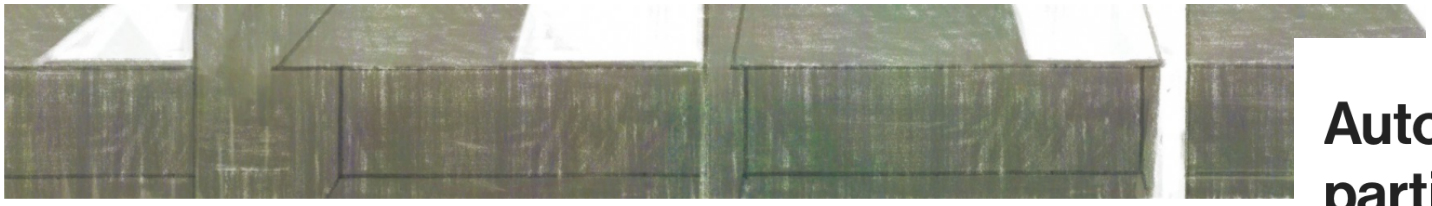
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MAY 2, 2017



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DADU SHIN

Intelligent Machines

India Warily Eyes AI

Technology outsourcing has been India's only reliable job creator in the past 30 years. Now artificial intelligence threatens to wipe out those gains.

by Samanth Subramanian October 24, 2017

Automation could hit India particularly hard because much of its high-tech - economy involves relatively routine work that is prime for computers to take over.

Bansal reckons that the IT sector hired 400,000 people annually until two or three years ago, and that the number has now shrunk to 140,000 to 160,000. Soon, he says, "net hiring will be barely above zero."

Two days after K.S. Sunil Kumar received a promotion, Human Resources phoned him up and asked him to resign.

This happened in April, just as Kumar was beginning his ninth year at Tech Mahindra, one of the giants in India's IT services industry. He worked in engineering services, where he designed components and tools for aerospace firms in North America and Europe. They'd send over specs

- Investment in technology could help bolster Britain's sputtering record on labour productivity, which is among the worst in the G7 and is failing to improve in line with expectations since the financial crisis.

- The CBI is urging Theresa May to launch the commission from early 2018. It said companies and trade unions should be involved and the commission should help to set out ways to increase productivity and economic growth as well looking into the impact of AI.

Artificial intelligence (AI)

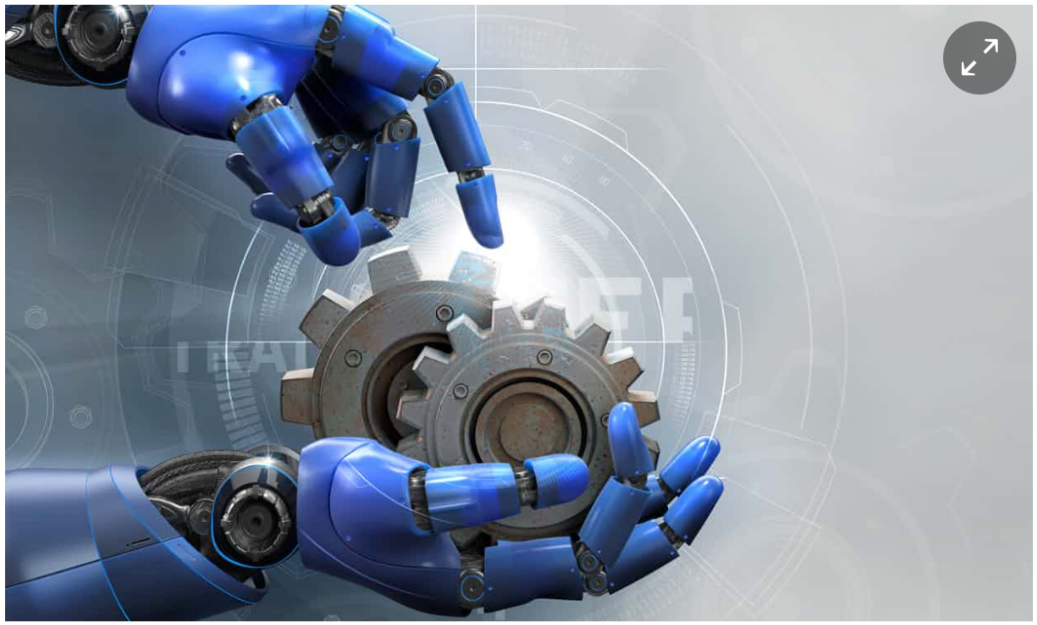
Artificial intelligence commission needed to predict impact, says CBI

Business group urges government to launch commission to assess consequences of AI on jobs and increasing productivity

174 203

Richard Partington

Friday 20 October 2017 06.01 BST



More than 10 million workers in the UK may be at risk of being replaced by automation, says PwC. Photograph: Ryan Etter/Getty Images/Ikon Images

Britain's biggest employers are calling for a commission to examine the impact of artificial intelligence on jobs.

Amid predictions of a workplace revolution threatening one in five jobs across the UK, the CBI is urging Theresa May to launch the commission from early 2018. It said companies and trade unions should be involved and the

AI social challenges

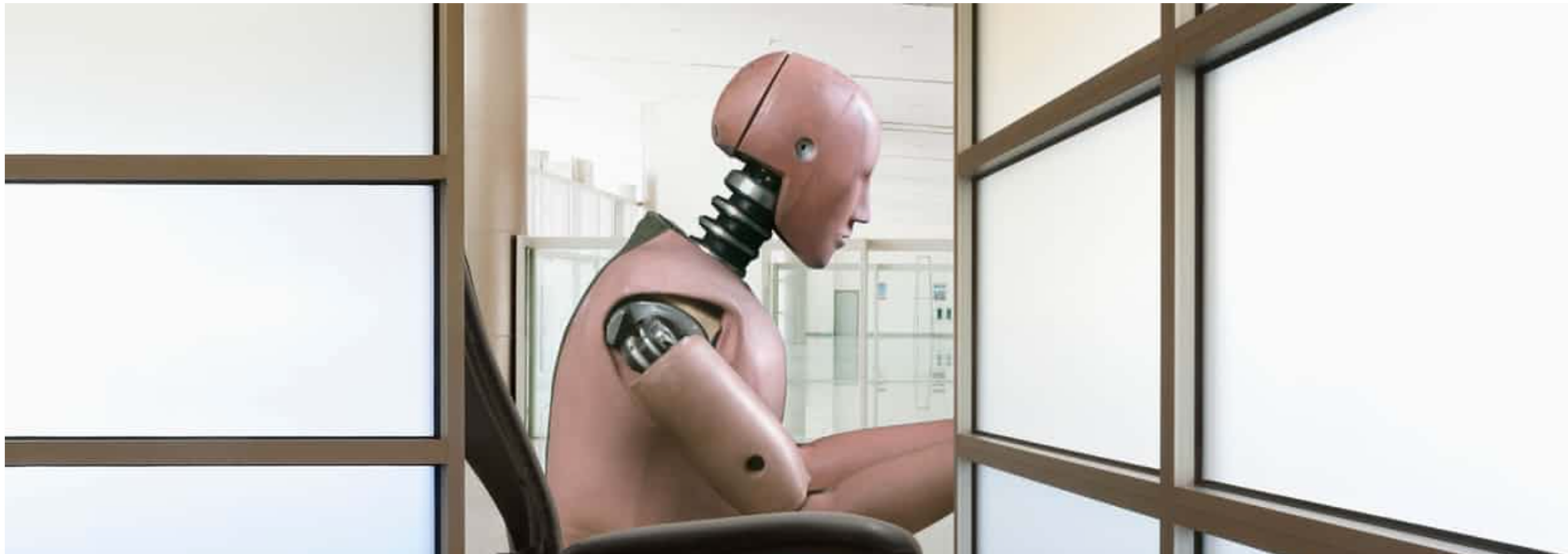
- AI applications may lead to new challenges or amplify pre-existing policy concerns and pressure points:
    - Justice and equality.
    - Use of force.
    - Safety and certification.
    - Privacy.
    - Displacement of labor and taxation.
- Question*: What will be the societal impacts of AI+Robotics on a **Belíndia-like** country?*

- From the risk of mass unemployment to the deployment of autonomous robotics by criminal organizations or rogue states, the new Centre for Artificial Intelligence and Robotics has been set the goal of second-guessing the possible threats.

theguardian

Robots could destabilise world through war and unemployment, says UN

United Nations opens new centre in Netherlands to monitor artificial intelligence and predict possible threats



Intelligent Machines

Are Face Recognition Systems Accurate? Depends on Your Race.

The available evidence suggests that face matching systems don't work equally well for different races.

by Mike Orcutt July 6, 2016





Machine Bias

There's software used across the country to predict future criminals. And it's biased against blacks.

by Julia Angwin, Jeff Larson, Surya Mattu and Lauren Kirchner, ProPublica

May 23, 2016

Some specific questions for the panelists:

1. What are the differences between the impact of AI+Robotics on developed countries and emerging economies?
2. What skills are required for the job market of the future?
3. What educational changes are needed?
4. How can we preserve and increase social mobility in an AI-driven economy?
5. What economic and social policies are required to integrate people who are left out of future labor markets
6. How can Brazilian scientists use AI to advance science?

- How should government and society prepare Brazil to take advantage of the benefits and mitigate the downside of AI+Robotics?
- What is the global role of emerging economies in the AI+Robotics age?

Obrigado!

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