



Lecture 10-2

Work and Wealth

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Participation Quiz

10. You get on a ski lift at the bottom of the mountain and take it all the way up to the top. What fraction of the lift's chairs do you pass?

How many chairs do you pass?



By Ratko Bozovic

A

Half of them

B

Two-thirds of them

C

All of them

D

Three-quarters of them

Increase in Productivity

- Working long hours
 - North Americans (particularly Americans) work longer hours than other cultures and other times in history
- Protestant Ethic and the Spirit of Capitalism
 - A famous explanation of this restless work ethic
 - Linked it to Calvinist theology of predestination
- We have exchanged leisure time for possessions
 - *Do you think this exchange is worth it? Would you exchange a much lower standard of living for much more free time?*

What is Artificial Intelligence?

AI is the study, design, and development of computational processes that solve problems that **previously required human intelligence**

Not all of computer science is focused on AI.

But, it's hard to think of a field in CS that isn't **contributing fundamentally** to it

The “**AI Paradox**”: once we become familiar with a technology, we stop considering it AI

OpenAI's Dota 2 AI steamrolls world champion e-sports team with back-to-back victories

The Int

By Nick Sta

HEALTH + BEHAVIOR



Artificial intelligence performs as well as experienced



New AI Model Exceeds Human Performance at Question Answering

UCLA RES

Microsoft's new AI translates Chinese-to-English as well as a human translator

By Michael Hicks March 14, 2018 World Of Tech

It's all in how you teach the AI



Denise Hea

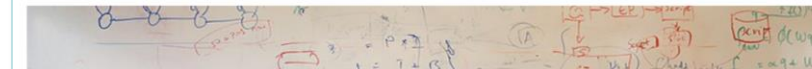
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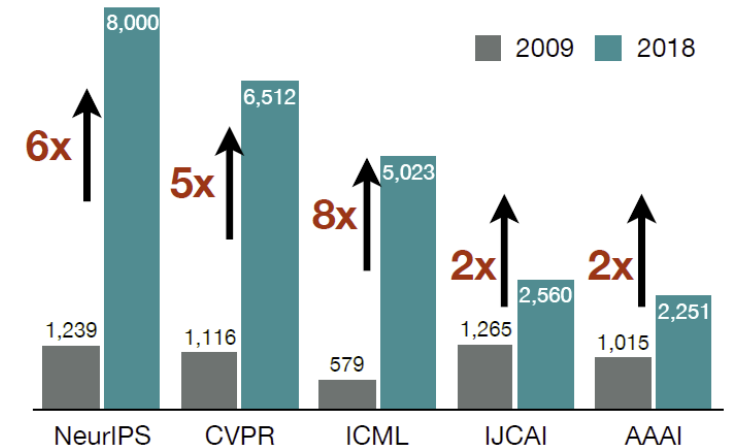
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3 Rising attendance at AI conferences



Source: The AI Index 2018 Annual Report

IBM computer Watson wins clash

DeepFace: Choosing the Crown

Microsoft, Google Image Recognition

Deep learning algorithms compete

By R. Colin Johnson, 02/18/15

PORTLAND, Ore. -- First computers hurdle is image recognition -- surely too. Now Microsoft has programmed

The competition is fierce, with the In the 2015 championship on December they have one-upped humans too. For benchmark of 5.1% errors with a 4.94 Microsoft by 0.04%.

In modern face recognition consists of four stages. We revisit both the classification step by employing apply a piecewise affine representation from a deep network involving several locally defining, rather than the we trained it on the large facial database in unconstrained environment. Our method reaches a Faces in the Wild (LFW) current state of the art human-level performance.

1. Introduction

Face recognition in front of the algorithm and cultural implications are far reaching, yet it main between machines as a buffer from having

ImageNet, with hundreds of object competition since 2010 with about 50 take the crown from the best human score. All the contestants algorithms, which are all derived from various versions of a human brain works to varying degrees. Most of the contestants algorithms in great detail. In the spirit of open source without

the most experts out

Deep convolutional neural network potential for general and high

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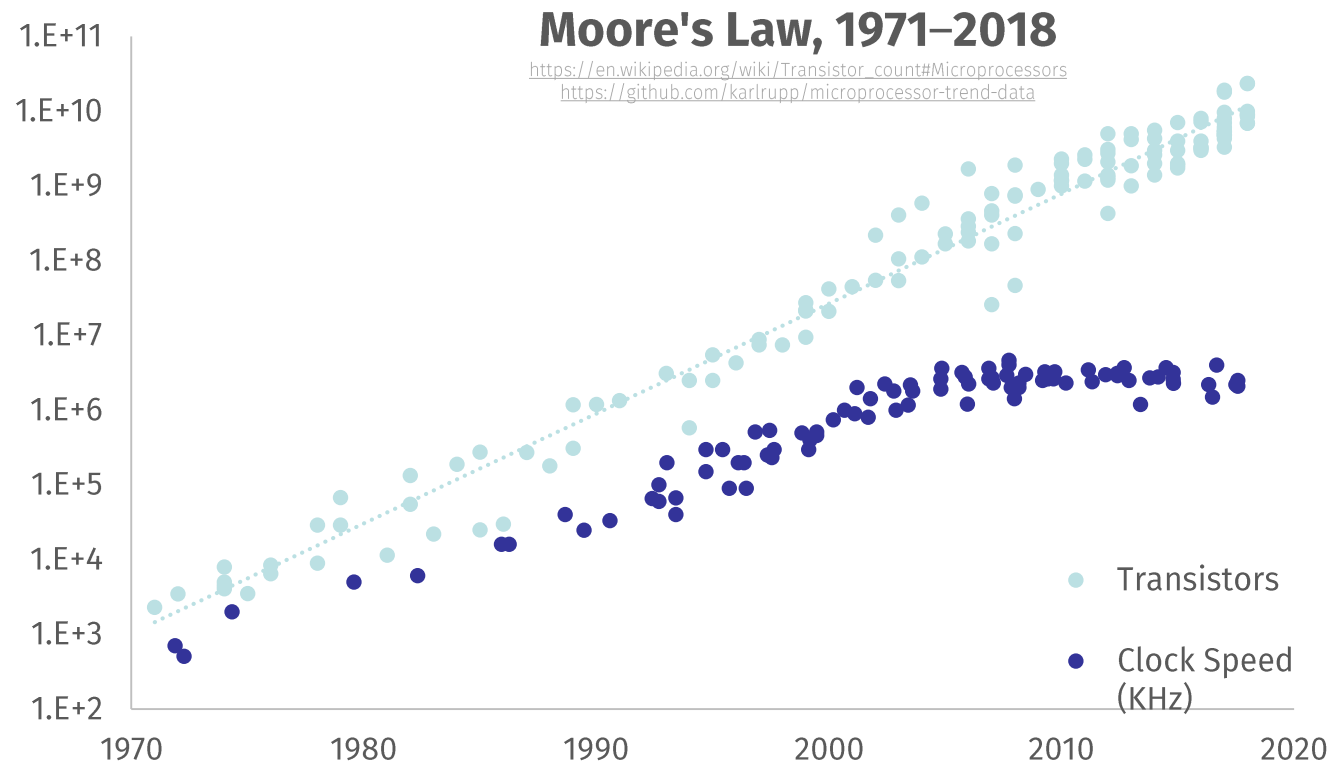
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Why is it happening?

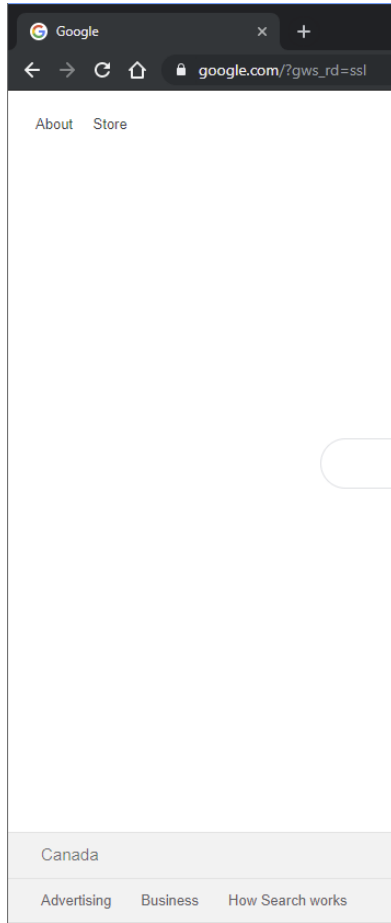
1. Scientific/mathematical **breakthroughs**, esp in machine learning
2. Growth in raw **computing power**



For comparison:

Species	# Neurons in Brain
Fruit Fly	10^5
Cat	10^9
Chimpanzee	10^{10}
Human	10^{11}

Today, most modern AI systems look like...



Growing Military Use

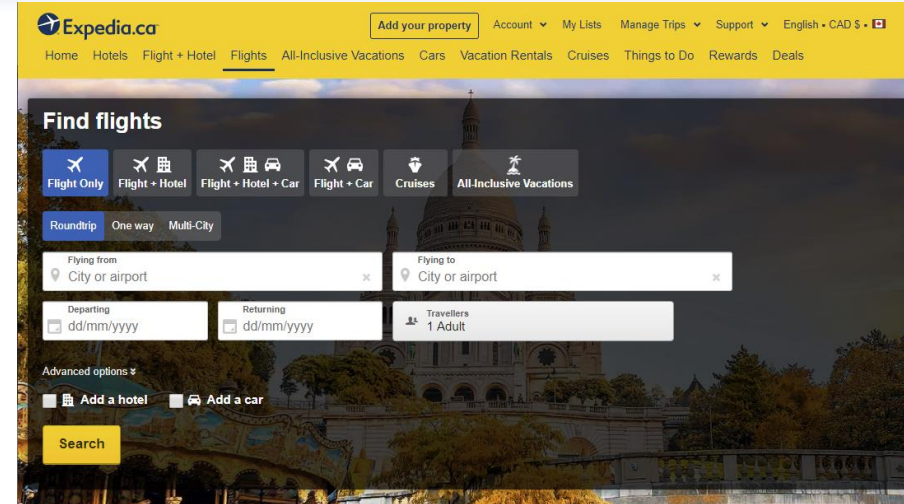


source: <https://www.youtube.com/watch?v=qsjPTtafilc>

CURIOUS
DROID

Economic Impact

- Likely impacts:
 - Increased mechanization of **routine labor**
 - Automation of lower-end **knowledge work**
- Automation is nothing new
 - like other waves of innovation, AI will almost certainly make society as a whole **much richer**
 - but, it may also exacerbate **income inequality**
- What will this mean for the economy of the future?
 - **Post-scarcity** economy?
 - Human labor as a **luxury good**?



Social Impact

- How will AI technologies **transform society**?
- Will there be a **social backlash** against AI?
 - If so, what will be considered AI?
- This **generation of children** will grow up taking for granted many technologies that strike us as magical
- How will **human relationships** change in the presence of always-available social agents?
- As we are increasingly **augmented by AI**, what are our inherent cognitive/emotional/motivational limitations, beyond which augmentation won't help?



Technology that will be in widespread use

- Tailored solutions for **specific tasks**, not general intelligence
- Prototypes **that work today** in labs & narrow deployments
- Some examples:
 - **Non-text input modalities** (vision; speech)
 - **Consumer modeling** (recommendation; marketing)
 - **Cloud services** (translation; question answering; AI-mediated outsourcing)
 - **Transportation** (automated trucking; some self-driving cars)
 - **Industrial robotics** (factories; some drone applications)
 - **AI knowledge work** (logistics planning; radiology; legal research; call centers)
 - **Policing & security** (electronic fraud; cameras; predictive policing)



Technologies that won't take off as quickly

- Overall, areas in which
 - major entrenched **regulatory regimes** need to be navigated
 - there exist **social/cultural barriers** to adoption
 - the **human touch** is crucial
 - substantial **new hardware** would need to be developed
- Some **examples**:
 - childcare, healthcare, eldercare
 - education
 - coaching, counselling
 - consumer robots beyond niche applications
 - semantically rich language understanding



Ethical consideration of advances in AI

- *Is it wrong to create machines capable of making human labor obsolete? Will humans become demoralized by the presence of vastly more intelligent robots?*
- *How can we ensure that intelligent robots will not be put to an evil purpose by a malevolent human? How can we ensure they do not adopt malevolent purposes themselves?*
- *Is it morally acceptable to create “personal” (self-conscious) AI?*



Work and Wealth

“The government should attempt to slow or stop the spread of automation technologies that are likely to eliminate large numbers of jobs.”

