

CS 4873: Computing, Society & Professionalism

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Week 12: Work and Wealth

April 5, 2021

Slides adapted from Sauvik Das, Munmun de Choudhury, and Amy Bruckman

Great strides

- Computing has transformed and continues to transform the workplace
 - Increases in productivity
 - Globalization of job market
 - Organization of companies
 - Telework
- Significant reduced human need for repetitive or automatable tasks

Loss of Jobs to Robots and Automation

- Manufacturing jobs down 40% from 1979 to 2011
 - Population of US up 39 percent over this period
- Percent of Americans in manufacturing jobs 35 percent (1947)→8 percent (2016)
- Manufacturing output has doubled since 1970
- Time to make a car: 35 hours (1977)→15 hours (2008)

Loss of White-Collar Jobs

- Pharmacists
 - Human pharmacist fills 8000 Rx in a year
 - Robo-pharmacist fills 8000 Rx in an hour
- Law firms
 - Number of jobs for new lawyers down 20% from 2006 to 2016
 - Things done by new lawyers now done by computer
 - Simple things like Wills
- Teaching Assistant
 - Jill Watson robo-TA created by Prof. Ashok Goel

Baxter: inventory management



[Baxter \(robot\) - Wikipedia](#)

Otter.ai: Transcription



X.ai: Scheduling

[for teams](#)[how it works](#)[plans](#)[sign up](#)[+ schedule meeting](#)

How it works

Share a link to time options or tell x.ai to send them directly to your guests.



From: jen@vendor.com

To: liz@company.com, mario@company.com, alex@vendor.com

CC: scheduler@vendor.com

Let's get that training session on the calendar. Scheduler, please schedule 2 hours in my office at the end of next week with Liz and Mario. Call it "Session 1" and make Alex optional.



From: Meeting Scheduler <scheduler@vendor.com>

To: liz@company.com

Hi Liz

Happy to find time for you and Jen. Please select one of the options:

Wed, May 6th

Thu, May 7th

Fri, May 8th

Last-mile delivery

DHL LAUNCHES ITS FIRST FULLY-AUTOMATED URBAN DRONE DELIVERY SERVICE

Walmart to test drone delivery grocery, household items

16 May 2019

PUBLISHED WED, SEP 9 2020-9:16 AM EDT

REUTERS

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KEY POINTS

- Walmart said on Wednesday it would run a pilot project for delivery of grocery and household products through automated drones, along with end-to-end delivery firm Flytrex, as the U.S. retailer looks to beef up its delivery business.
- Bentonville, Arkansas-based Walmart said the test would start on Wednesday in Fayetteville, North Carolina, with cloud-controlled drones picking up and dropping off select items.
- The company has accelerated the expansion of its pick-up and delivery services in the face of the Covid-19 pandemic, as virus-wary consumers increasingly prefer having items delivered at their doorsteps.



ing, an intelligent autonomous aerial vehicle company, have entered into to jointly launch a fully automated and intelligent smart drone delivery last-mile delivery challenges in the urban areas of China.

IL the first international express company to provide such a service in

Self-driving cars



Greater expectations

- Expected to do much more in the decades to come
- Not just simple manual tasks, also knowledge work

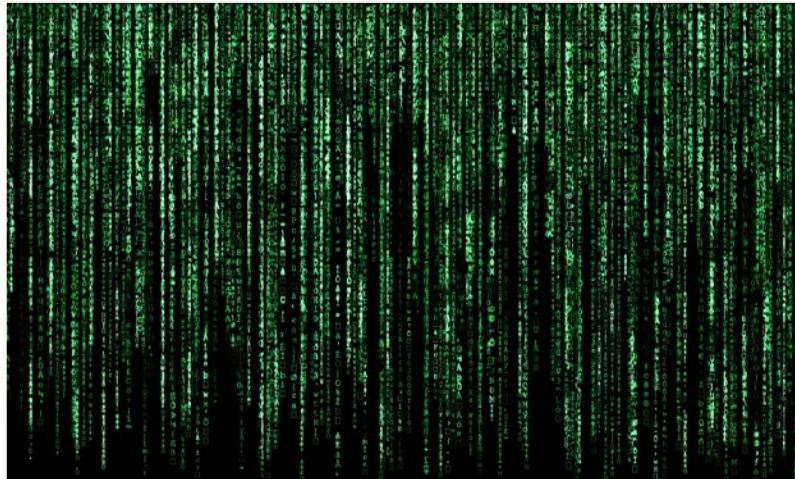
Writing

A robot wrote this entire article. Are you scared yet, human?

GPT-3

We asked GPT-3, OpenAI's powerful new language generator, to write an essay for us from scratch. The assignment? To convince us robots come in peace

- For more about GPT-3 and how this essay was written and edited, please read our editor's note below



▲ 'We are not plotting to take over the human populace.' Photograph: Volker Schlichting/Getty Images/EyeEm

Great Writing, Simplified

Compose bold, clear, mistake-free writing with Grammarly's AI-powered writing assistant.

Add to Firefox It's free

A Featured Extension on Firefox

30 million people use Grammarly to improve their writing

Watson Wins *Jeopardy!* Challenge



Interacting with people

Google Duplex's haircut-booking feature could help short-handed businesses

Kyle Wiggers

@Kyle_L_Wiggers

October 12, 2020 11:40 AM

AI

f t in

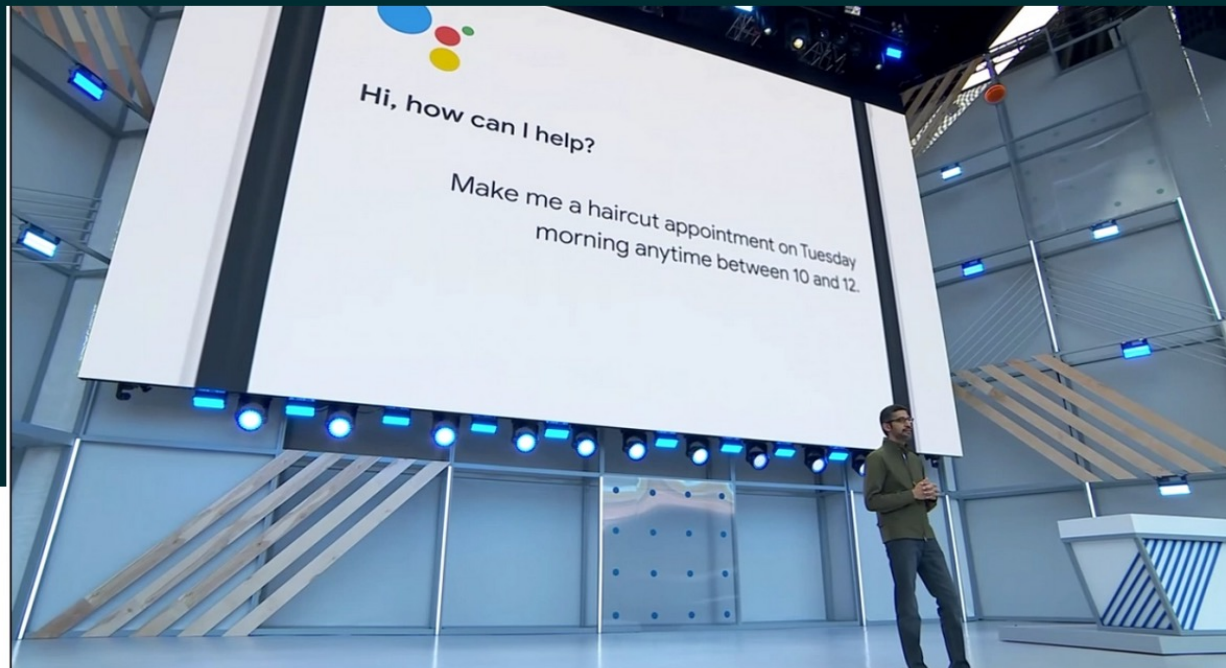


Image Credit: YouTube



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HEALTH AND SCIENCE

Google's DeepMind A.I. beats doctors in breast cancer screening trial

PUBLISHED THU, JAN 2 2020•8:13 AM EST



David Reid
@DAVYREID73

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KEY POINTS

- Anonymous scans of 29,000 women were used in the trial.
- The biggest improvements over human scanning was found in the U.S. portion of the study.
- Google-owned DeepMind has already used AI to read eye scans and spot neck cancer.

AI



How people are using AI to detect and fight the coronavirus

KHARI JOHNSON @KHARIJOHNSON MARCH 3, 2020 12:49 PM



UVD disinfectant robot spreads ultraviolet rays in hospitals to kill bacteria and viruses

TOM SIMONITE

BUSINESS 02.26.2020 07:00 AM

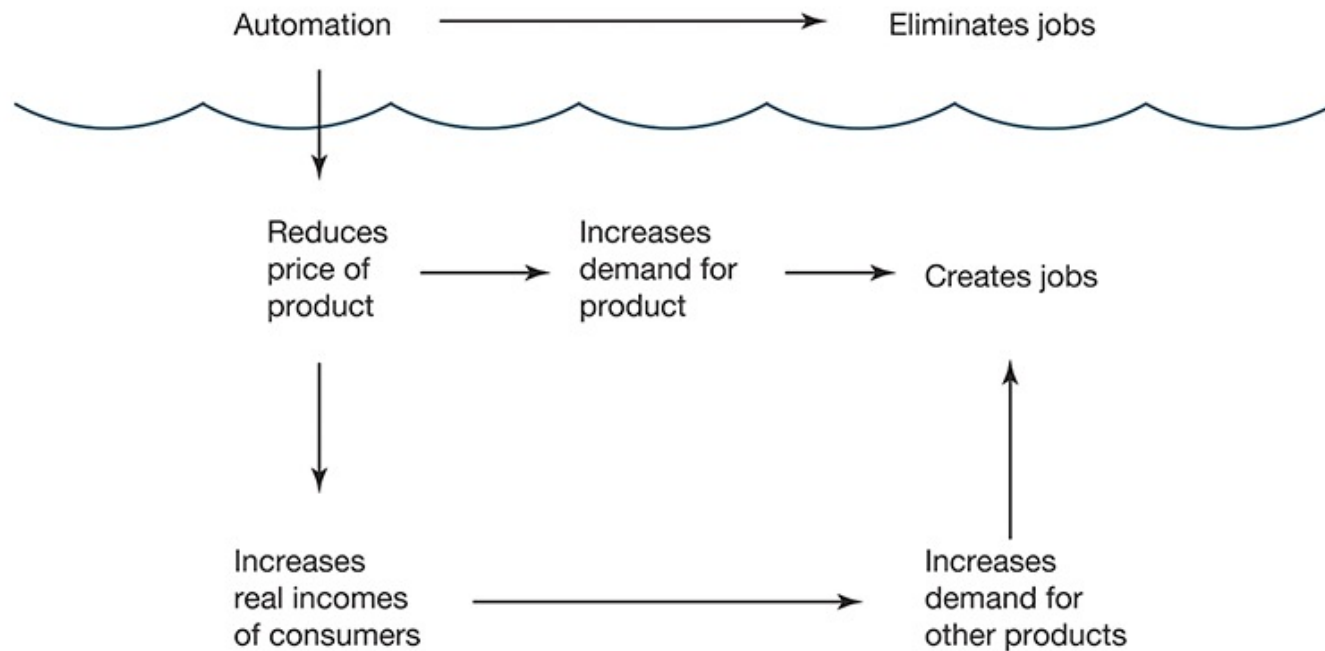
Chinese Hospitals Deploy AI to Help Diagnose Covid-19

Software that reads CT lung scans had been used primarily to detect cancer. Now it's retooled to look for signs of pneumonia caused by coronavirus.



Model of the Impact of Automation

Figure 10.3



Superficially, automation eliminates jobs; but automation can also stimulate the creation of new jobs.

Do You Believe the Model?

- Example where it works: stock traders
 - Jobs for traders working on the floor have been eliminated
 - But more people hired to write automatic trading programs
- In other cases, it may not work
- Notice that the new jobs have higher skill requirements
 - New jobs may not go to the same people as the old ones

Table 10.1

<i>Higher Demand</i>	<i>Lower Demand</i>
Software engineers—applications	Butchers
Computer support workers	Secretaries and stenographers
Software engineers—systems	Payroll clerks
Network administrators	Bank tellers
Network systems analysts	File clerks
Desktop publishers	Cashiers
Database administrators	Typists
Personal and home-care aides	Pharmacists
Computer systems analysts	Bookkeepers
Medical assistants	Postal clerks

Greater use of information technology in the workplace has increased demand for employees in certain job categories while reducing demand for employees in other categories [36].

Depending on who is speaking, the outlook for Job Impact may be good or bad

World Economic Forum is among the most negative: Five Million Jobs by 2020. The Real Challenge of the Fourth Industrial Revolution

- Skills and job displacement will affect every industry and geographical region, but losses can be offset by job growth in key areas.
- “Over the next five years is such that as many as 7.1 million jobs could be lost through redundancy, automation or disintermediation, with the greatest losses in white-collar office and administrative roles. This loss is predicted to be partially offset by the creation of 2.1 million new jobs, mainly in more specialized ‘job families’, such as Computer and Mathematical or Architecture and Engineering.”

Human Costs

- AI is unlikely to replace the need for humans in the work-place, but there will be a (potentially) decades-long transition period where:
 - Real people will be out of jobs and unable to find new ones
- Need to approach this responsibly as a society
 - Can't just assume that the 50-year old coal miner will become an AI expert so she can feed her family
 - If we're not careful, unchecked "creative destruction" could result in significant human suffering
- We also need to consider how to adjust society to handle the possibility that there won't be as many jobs

Longer Work Week

- Mid 4th century Roman Empire: 175 festival days
- Kung bushmen work 15 hours/week
- From 1970 to 1990, US working hours went up 163 hours
 - That's an extra month

Protestant Work Ethic and the Spirit of Capitalism by Max Weber

- A paradox:
 - Factory pays workers in a developing nation by the piece
 - Want more productivity
 - Raise wages per piece
 - What happens?
 - People work less
 - Just wanted enough to cover their basic needs

Why is it Different?

- Weber argues that people in capitalist societies measure their worth by their material success
 - Perhaps religious: a sign that God favors you

Why Have Working Hours Gotten Longer Recently?

- Bringing more work home with email, cell phones
- Mythical man month: can get more done with one person
 - Adding a programmer to a late project makes it later
- What obstacles does working with someone else add?
- Why do nurses work 12-hour shifts?
 - Have you ever been hospitalized?
 - What info was lost at shift change?

Amount of Stuff We Have Has Risen

- Average square feet of a house
 - 1964: 1470 sq ft
 - 2001: 2100 sq ft
 - 2018: 2435 sq ft
- We have more stuff, and less free time
- How to approach this tradeoff is a critical, highly personal choice you make

Organizational Structure

- Organizations used to be more hierarchical
- Organizational structures are now flatter and more connected

Telework

- A lot has changed since your textbook was written

Benefits of Telework

- Increased productivity (?)
- Reduces absenteeism
- Reduced pollution & traffic
- Increased flexibility
- Improved child-care options
 - 2020: Or lack thereof
- Coordinate schedules with other time zones
- Improves morale (?)
- Can recruit and retain more employees
 - Ones who live further
 - Ones who need flexibility for family reasons
- Saves overhead
- Less vulnerable to problems that occur in one geographic space
- Save money for employees?

Disadvantages of Telework

- Decreased productivity?
- Can't meet with customers at the office
- Resentment from those working at the office?
- Working too many or too few hours
- Distractions from child-care responsibilities
- Social isolation & low morale
- Lack of "visibility" leading to problems at raise and promotion time
- Removes control from managers
- Sensitive information may be less secure
- Less of a resource for other employees
- Difficult to schedule team meetings
- Work longer hours for the same pay

The Gig Economy

2020 California Proposition 22

From Wikipedia, the free encyclopedia

Proposition 22 was a ballot [initiative](#) in California on the November 2020 [state election](#) which passed with 59% of the vote and granted app-based transportation and delivery companies an exception to [Assembly Bill 5](#) by classifying their drivers as "[independent contractors](#)", rather than "employees",^{[1][2][3][4]} thereby exempting employers from providing the full suite of mandated [employee benefits](#) (which include time-and-a-half for overtime, paid sick time, employer-provided health care, bargaining rights, and unemployment insurance - among others) while instead giving drivers new protections of:

- What was at stake with Proposition 22?
- What do you think of the outcome?
- Is the gig economy good or bad for workers?
 - WHICH workers?

<i>Employee</i>	<i>Driver for a Ride-sharing App</i>	<i>Independent Contractor</i>
Does not set own working hours	Sets own working hours	Sets own working hours
Work assigned by employer	Only feasible way to find customers is through app	Advertises to find work
Employer sets wages	Earnings set by app	Sets own fees for services
Entitled to minimum wage	Not entitled to minimum wage	Not entitled to minimum wage
Pays only employee's portion of Social Security taxes	Pays both employee's and employer's portions of Social Security taxes	Pays both employee's and employer's portion of Social Security taxes
Can get fired	Can be taken off list of providers	Cannot be fired
Eligible for unemployment insurance	Not eligible for unemployment insurance	Not eligible for unemployment insurance
Can unionize	Courts must determine if drivers can unionize	Cannot unionize

Workplace Surveillance

- We read about it early in the year
- Lower-wage workers are more likely to be subject to it

Globalization

- Do you drive an American-made car?
 - Where were the parts made?
 - Where was it assembled?
- Do you care about buying American goods?
 - Why or why not?

Arguments For Globalization

- Can increase everyone's standard of living
- Each country has a specialty
- Increases competition
 - Better prices for consumers
- People in poorer countries deserve jobs too
- Creating jobs around the world leads to greater stability
- Poorer countries typically become more prosperous by exporting goods

Arguments Against Globalization

- American workers shouldn't have to compete with foreign workers who do not receive decent pay and working conditions
- Globalization increases the rate of US job loss overseas
- Foreign workers also hurt by globalization
 - Example: Foreign farmers hurt by US farm subsidies
- Many foreign workers aren't allowed to unionize

Planet Money T-Shirt Podcast

- Cotton is grown in the US
- Person who drives harvester just sits there (all automated)
- Why is cotton grown in the US?
 - Subsidies
 - Cheap insurance
 - Automation makes a superior quality product
 - Human pickers get cotton dirty

Planet Money T-Shirt Podcast

- Cotton is shipped to Indonesia to make thread
- Thread shipped to Bangladesh to make fabric
 - Factory jobs leading to dramatic social change
 - No longer starving (siblings starved to death)
 - Sisters choose not to have a traditional arranged marriage
- Fabric shipped to Colombia to make fabric into shirts
 - Jobs follow poverty
 - Company that provides fair working conditions can't compete
 - Jockey is pulling out of Colombia

The Big Invention: Shipping Containers

- Key to globalization
- Unloading a ship used to take weeks
- Now use crane to move container to back of a truck

