

Social Implications of Computing

CSE 120 Winter 2018

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AI is coming after highly skilled jobs, and it's meeting resistance

“When automated technologies first emerged, there was a gap between the laborers they replaced and the decision-makers who implemented them. But as AI has matured, it has begun to climb the corporate ranks. Now... startups are offering AI services that can replace entire professions with lower prices and more precise results.

“Those with the most power to adopt automation are also those with the most to lose by adopting it... This is indicative of a larger problem with automation. Processes that save time on menial tasks will be successful; those that position themselves as robo versions of professionals with the power to make decisions will likely not.”

- <https://venturebeat.com/2018/03/04/ai-is-coming-after-highly-skilled-jobs-and-its-meeting-resistance/>



Administrivia

- ❖ Assignments:
 - CS in Your Future done in section tomorrow (3/8)
 - Project Code, README, and Video due Friday (3/9)

- ❖ Final Exam – Tuesday 3/13, 3 pm in MGH 241
 - Scheduled slot is 2:30-4:20, but exam will be 60 minutes
 - Nearly identical to midterm – big ideas & programming
 - 10% of course grade
 - TWO sheets of notes (letter, double-sided, hand-written)

- ❖ Course Evaluation: <https://uw.iasystem.org/survey/188768>

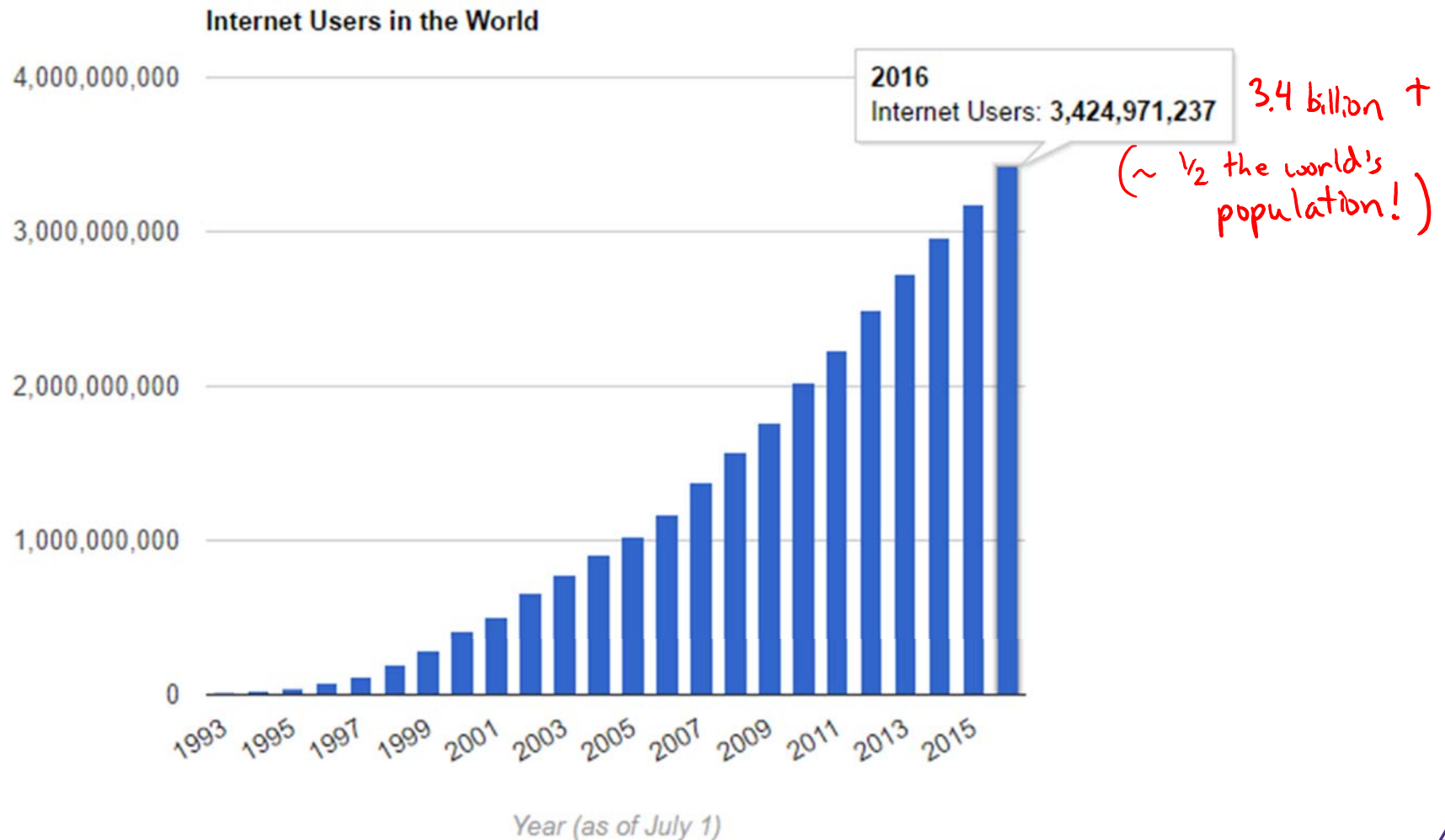
Societal Impact of Computers

- ❖ Computers have completely resurfaced society as we know it
 - *How does this affect the way we think, act, and work?*
- ❖ Ellen introduces kids to the technology of yesterday
 - <https://www.youtube.com/watch?v=3CMS9xnBRkc>

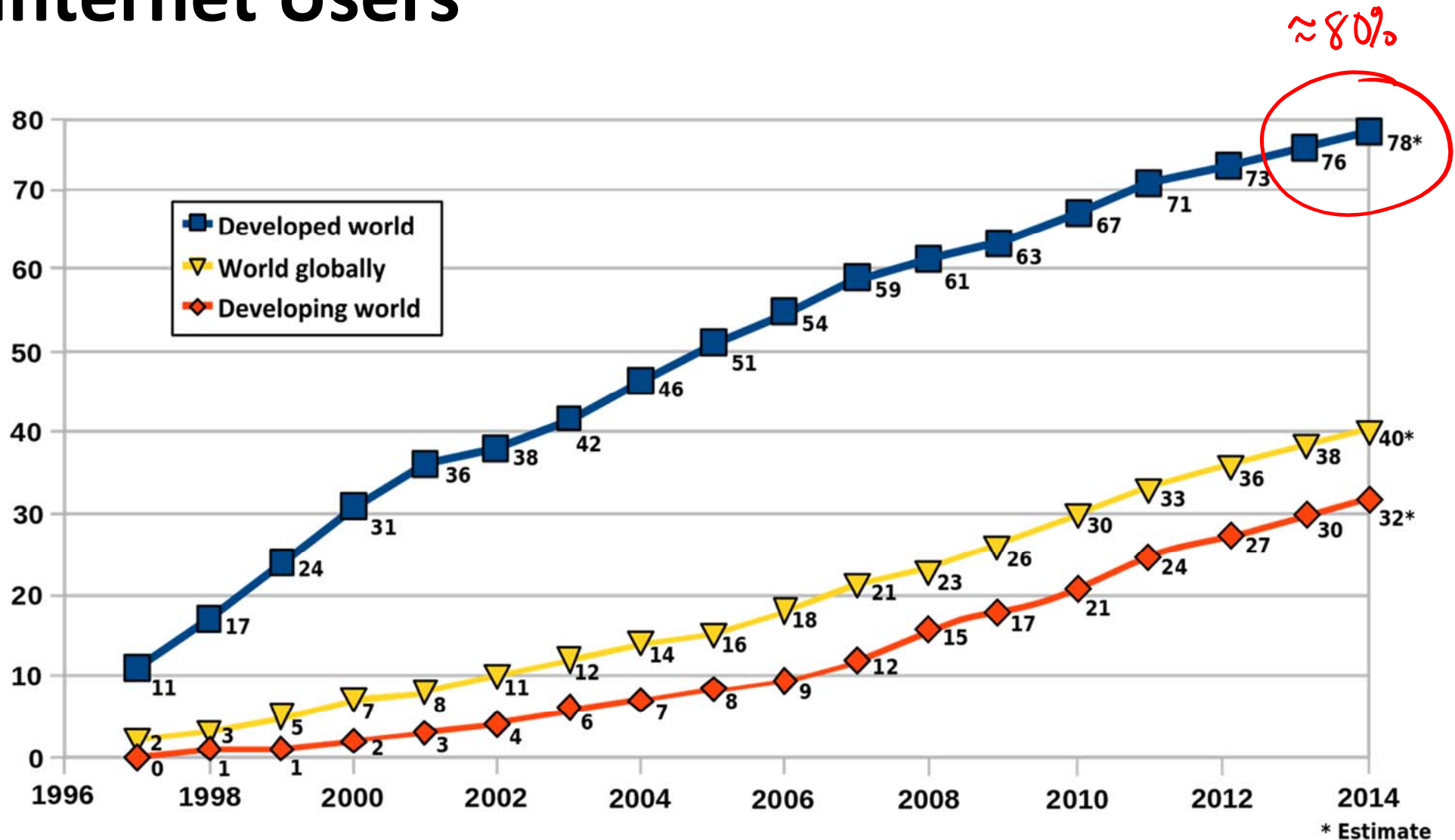


Internet Users

- ❖ Image from <http://www.internetlivestats.com/>
 - Accessed May 30, 2017



Internet Users

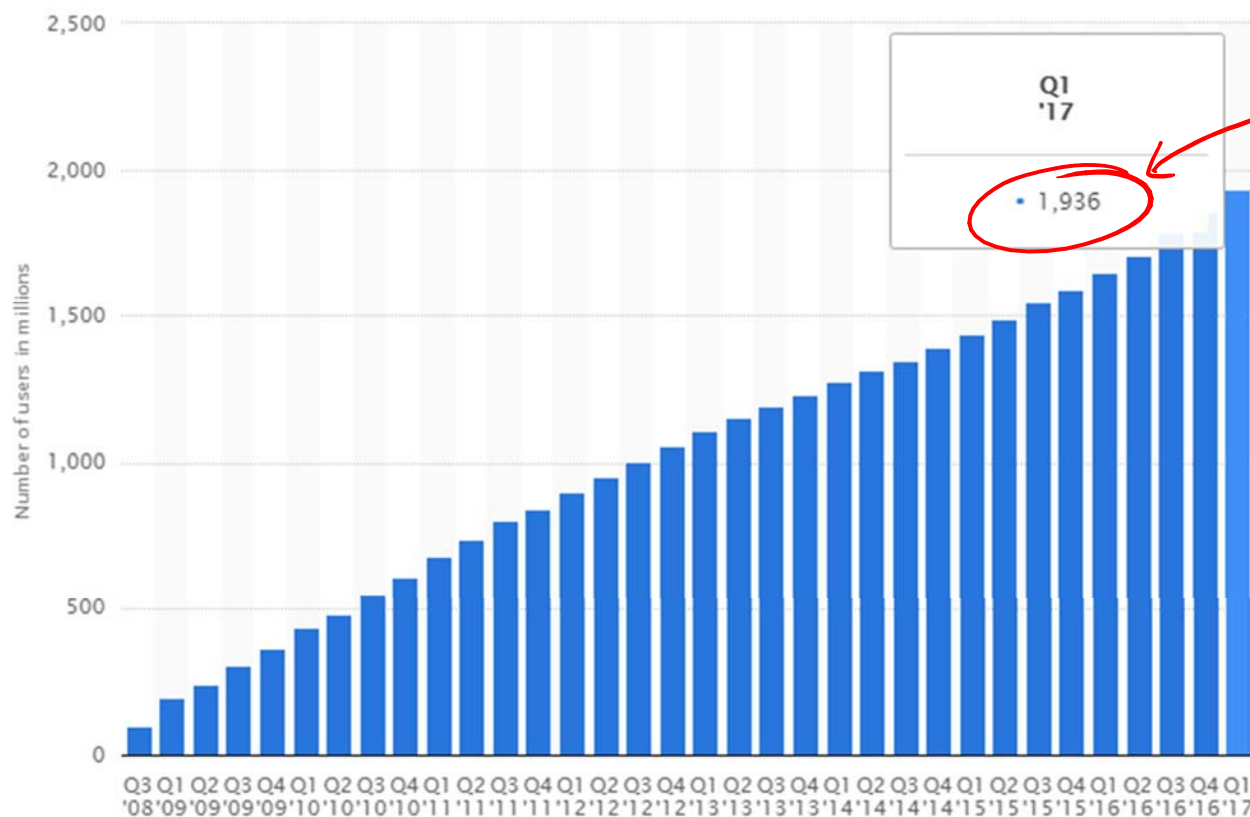


Graph of "Internet users per 100 inhabitants 1997 to 2014" based on data from "[Individuals using the Internet 2005 to 2014](#)" (XLS)

- https://commons.wikimedia.org/wiki/File:Internet_users_per_100_inhabitants_ITU.svg

Facebook Users

- ❖ Monthly active Facebook users worldwide (in millions)
 - <https://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/>
 - Accessed May 30, 2017



1.9 billion +
(~ 1/4 of world's population!)

Outline

- ❖ **How We Think: Politics and Media**
- ❖ How We Act: Social Movements
- ❖ How We Work: Job Implications

Audience News Consumption

- ❖ Where do you get your news (and opinions on the news) from?
 - Twitter
 - Facebook
 - USA Today (media website)
 - Snapchat
 - Youtube
 - Reddit

The Internet Forms Our Opinions

- ❖ Having an enormous amount of information available to us creates a *poverty of attention*
 - Compounded by the massive new problem of *fake news*
- ❖ How should we allocate our attention now that we have so many options to choose from?
 - Not only do we have the ability to choose what to read and pay attention to, but we also have the ability to choose what we believe in

Abundance of Info: Climate Change



Hellenic Shipping...

Antarctic sea ice hit 35-year record high Saturday

Washington Post - 19 hours ago

Antarctic sea ice has grown to a record large extent for a second straight year, baffling scientists seeking to understand why this ice is ...

Polar Code: a new regulation for polar shipping

Hellenic Shipping News Worldwide - Oct 20, 2015

Explore in depth (2 more articles)

2015 is fourth lowest year on record for minimum Arctic sea ice levels



Tracy Sinclair, Weekend Meteorologist, tsinclare@ktuu.com

POSTED: 02:06 PM AKDT Oct 12, 2015 | UPDATED: 05:32 PM AKDT Oct 12, 2015

Filter Bubbles (Eli Pariser)

- ❖ Eli Pariser warns that technology tends towards exposure to information that confirms preexisting beliefs
 - https://www.ted.com/talks/eli_pariser_beware_online_filter_bubbles
- ❖ People (myself included) tend to look to people who they think have the right answers
 - Often people who *act* and *look* like me or *share similar opinions*
 - This is a **bias** (natural filter bubble)

Polarization and Technology

- ❖ Pablo Barberá argues that technology has the opposite effect
 - *“How Social Media Reduces Mass Political Polarization. Evidence from Germany, Spain, and the U.S.”*
 - <http://smapp.nyu.edu/papers/SocialMediaReduces.pdf>
 - “Citizens are now exposed not only to their close friends’ opinions, but also to political content shared by their co-workers, childhood friends, distant relatives, and other people with whom they form weak ties.”
 - “Weak social ties tend to be more ideologically heterogeneous than strong social ties.”

Polarization and Technology

- ❖ Diana Mutz: *“Cross-cutting Social Networks: Testing Democratic Theory in Practice”*
 - http://repository.upenn.edu/cgi/viewcontent.cgi?article=1124&context=asc_papers
 - “Exposure to conflicting political viewpoints is widely assumed to benefit the citizens of a democratic polity.”
 - “...Utilizing a laboratory experiment manipulating exposure to dissonant and consonant political views, I further substantiate the causal role of cross-cutting exposure in fostering political tolerance.”

The Politics of Facebook Friends

- ❖ There's an interesting fad of unfriending people on social media sites like Facebook
- ❖ This past presidential election, in particular, has made many people post their personal political beliefs on Facebook
 - Friendships have been ruined as a result!
 - This results in a *tighter filter bubble*

The Politics of Facebook Friends

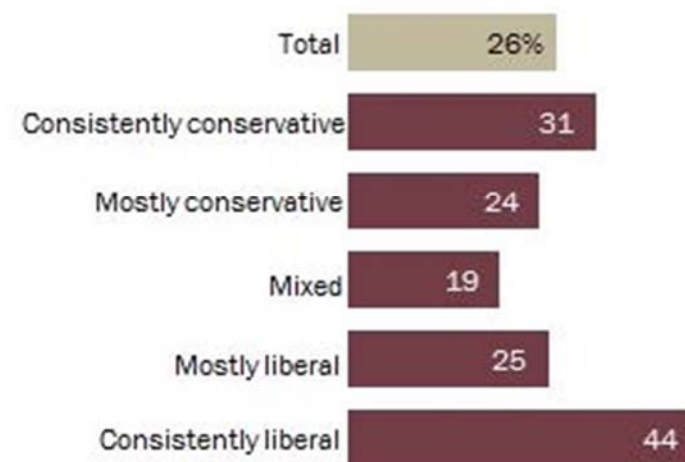
❖ Entire academic studies have been made on this topic

❖ Andrea Peterson explains:

- “ ... our online interactions about politics don't necessarily represent an entirely new pattern of interactions – but rather an extension of existing dynamics into the digital realm.”

Consistent Liberals More Likely to Block Others Because of Politics

% of Facebook users who have hidden, blocked, defriended or stopped following someone because they disagreed with something that person posted about politics ...



American Trends Panel (wave 1). Survey conducted March 19-April 29, 2014. Q35. Based on web respondents who are Facebook users (N=2,153). Ideological consistency based on a scale of 10 political values questions (see About the Survey for more details).

PEW RESEARCH CENTER

Peer Instruction Question

- ❖ Do you find that social media relationships have made you more politically aware and/or changed your own beliefs?
 - Vote at <http://PollEv.com/justinh>
 - A. Yes, social media has opened my mind to a variety of different opinions 24
 - B. No, I ignore or don't see dissenting opinions on social media 5
 - C. No, I tend to dismiss dissenting opinions on social media as bogus 3
 - D. I don't use social media enough for it to affect my opinions 2

Outline

- ❖ How We Think: Politics and Media
- ❖ **How We Act: Social Movements**
- ❖ How We Work: Job Implications

Individual Empowerment

- ❖ *Individuals* are empowered by their ability to access information and communicate
 - The Internet provides unprecedented access to both data and opinions
 - In China, Virtual Private Networks (VPNs) are a popular way for citizens to access news that is otherwise censored

individuals can circumvent censorship or misinformation!
- ❖ Governments often try to control information to help control public opinion
 - e.g. multiple Taiwanese textbook rewrites:
<https://newbloommag.net/2015/07/06/taiwans-textbook-controversy/>

Group Empowerment

- ❖ *Groups* are empowered by the ability to coordinate and attract assistance
 - Can attempt to bring people to a cause (*e.g.* create a Facebook protest event)
 - Information transmission creates collective identity (*i.e.* it's not just me that's mad; my friends are mad, too)

Small Change (Malcolm Gladwell)

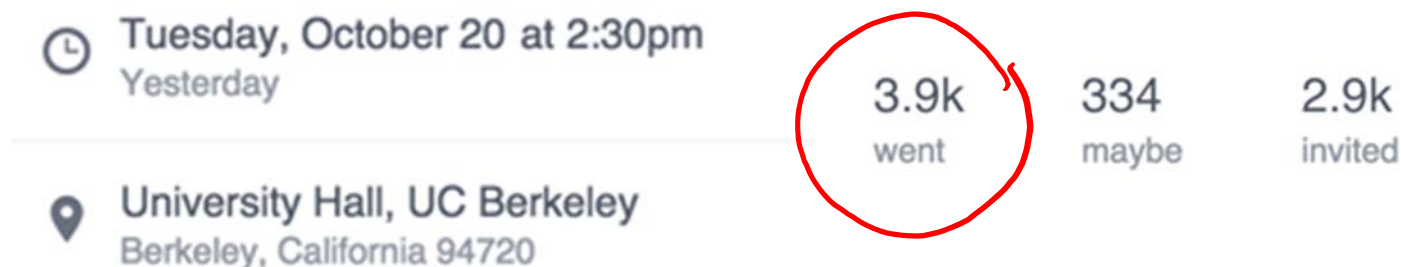
- ❖ <http://www.newyorker.com/magazine/2010/10/04/small-change-malcolm-gladwell>
 - “The world, we are told, is in the midst of a revolution. The new tools of social media have reinvented social activism.”
 - “Activism that challenges the status quo, that attacks deeply rooted problems” is physically dangerous
 - Research from the 60’s suggests that people who engage in such activism usually have very strong social ties with the movement

Small Change (Malcolm Gladwell)

- ❖ <http://www.newyorker.com/magazine/2010/10/04/small-change-malcolm-gladwell>
 - “The platforms of social media are built around weak ties. Twitter is a way of following (or being followed by) people you may never have met. Facebook is a tool for efficiently managing your acquaintances, for keeping up with the people you would not otherwise be able to stay in touch with.”
 - “Social networks are effective at increasing participation – by lessening the level of motivation that participation requires.”

Example: Alexander Coward Protest

- ❖ In Fall 2015, UC Berkeley Mathematics Lecturer Alexander Coward publicly announced his contract was not being renewed after the 2015-2016 academic year
 - Announcement came with harsh critique of math dept.
 - Feverish discussion of story on Facebook, Reddit, school newspaper, etc.
 - A protest event was created on Facebook, timed to coincide with an administrative review of Coward's case



Example: Alexander Coward Protest



October 18 at 1:59pm · 🌐

IMPORTANT UPDATE!

The time and place of the protest has changed! We're going to be gathering at 2:30 PM (when Dr. Coward's meeting starts) on the grassy area across the street from University Hall.

If you're interested in speaking at the protest or making signs, please message me or

23 people like this.

Example: Alexander Coward Protest



Photo from [Reddit](#): “What 3.9K facebook attendees looks like”

- ❖ **Slacktivism**: Actions performed via the Internet in support of a political or social cause but regarded as requiring little time or involvement
 - *e.g.* signing an online petition, joining a campaign group on a social media website

Facebook “Support” Photos

- ❖ Facebook has had a variety of “support” photos in recent years
 - Lots of controversy about why certain events receive more attention than others
 - *e.g.* Paris bombings (Nov. 13, 2015) vs. Lebanese bombing day earlier
- ❖ “Our research shows that if people are able to declare support for a charity publicly in social media, it can actually make them less likely to donate to the cause later on.”
 - <http://web.missouri.edu/~segerti/capstone/Slacktivism.pdf>

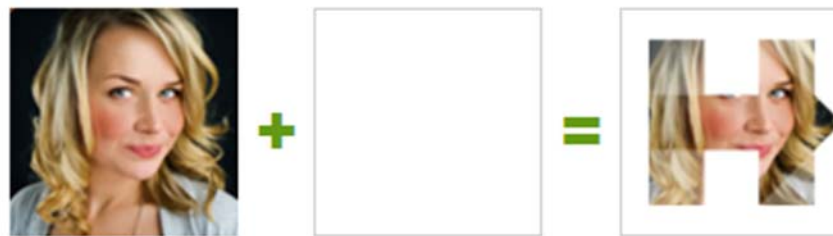


Hillary Clinton Presidential Campaign

- ❖ Could create “Personal Hillary Logo” for profile

- <https://twibbon.com/support/h-92>

Support this campaign by adding to your profile picture



- Does this mean you are more likely to go out and vote?
 - <https://www.forbes.com/sites/omribenshahar/2016/11/17/the-non-voters-who-decided-the-election-trump-won-because-of-lower-democratic-turnout/>
- ❖ Filter bubble: bias in media and social media realms led many to predict/assume a victory for Hillary

The Good and the Bad of Social Media

- ❖ Despite usefulness as an organizing tool, social media might not necessarily lead to successful high-risk political actions
 - Gladwell: “Weak ties seldom lead to high-risk activism.”
 - Tufekci: “Digital tools make it much easier to build up movements quickly... before the Internet, the tedious work of organizing that was required to circumvent censorship or to organize a protest also helped build infrastructure for decision making and strategies for sustaining momentum.”
 - <https://www.nytimes.com/2014/03/20/opinion/after-the-protests.html>

The Good and the Bad of Social Media

- ❖ However, social media can change society more subtly through establishing new social norms
 - Tufekci: “Those ‘likes’ on Facebook, derided as slacktivism or clicktivism, can have long-term consequences by defining which sentiments are ‘normal’ or ‘obvious’ — perhaps among the most important levers of change.”
 - <https://www.nytimes.com/2014/03/20/opinion/after-the-protests.html>

Outline

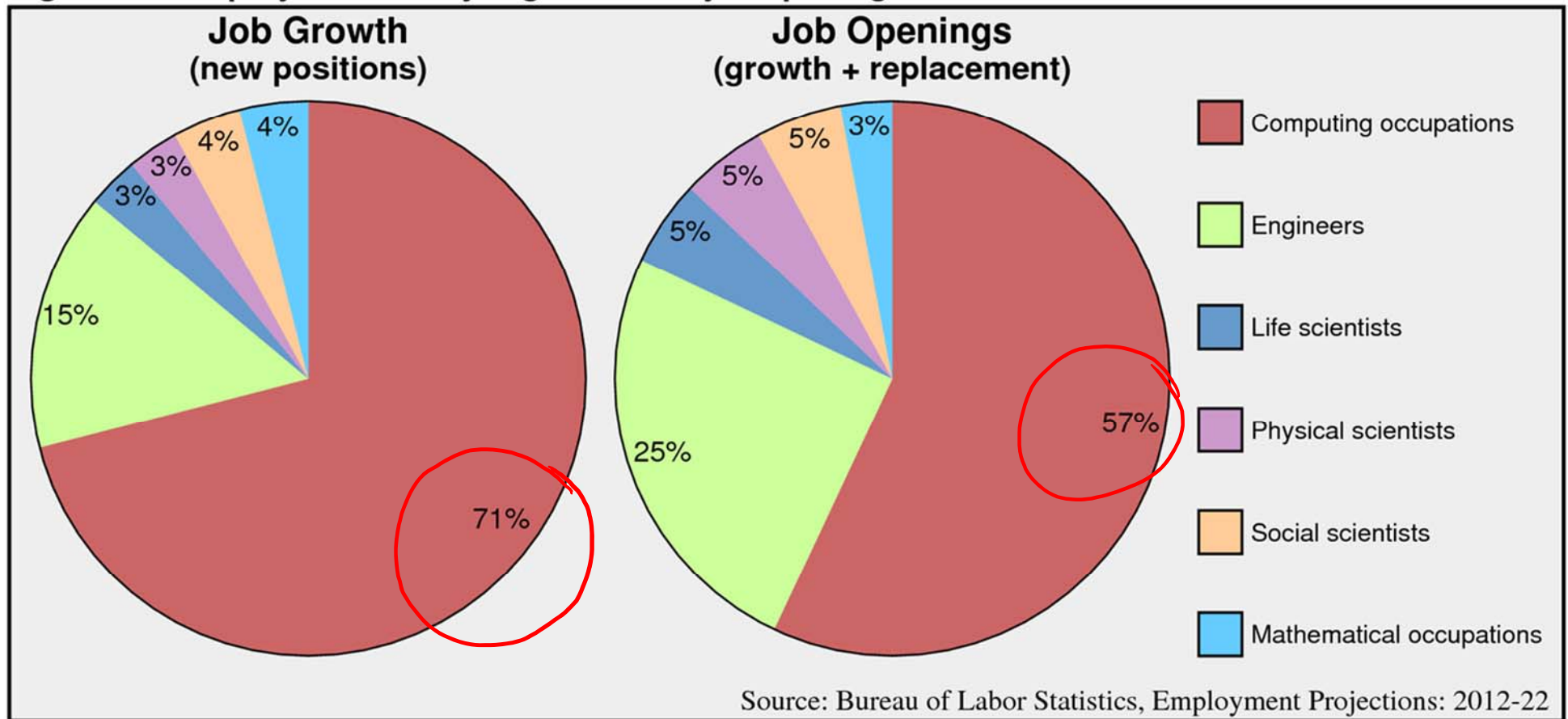
- ❖ How We Think: Politics and Media
- ❖ How We Act: Social Movements
- ❖ **How We Work: Job Implications**

Peer Instruction Question

- ❖ What was your primary motivation to take CSE120?
 - Vote at <http://PollEv.com/justinh>
 - A. **People told me it was cool** 0
 - B. **I thought it seemed interesting** 7
 - C. **Potentially interested in a CS career** 9
 - D. **Potentially interested in a career for which programming might be useful, but not necessarily CS** 18
 - E. **Other** 1

Rapid CS Job Growth

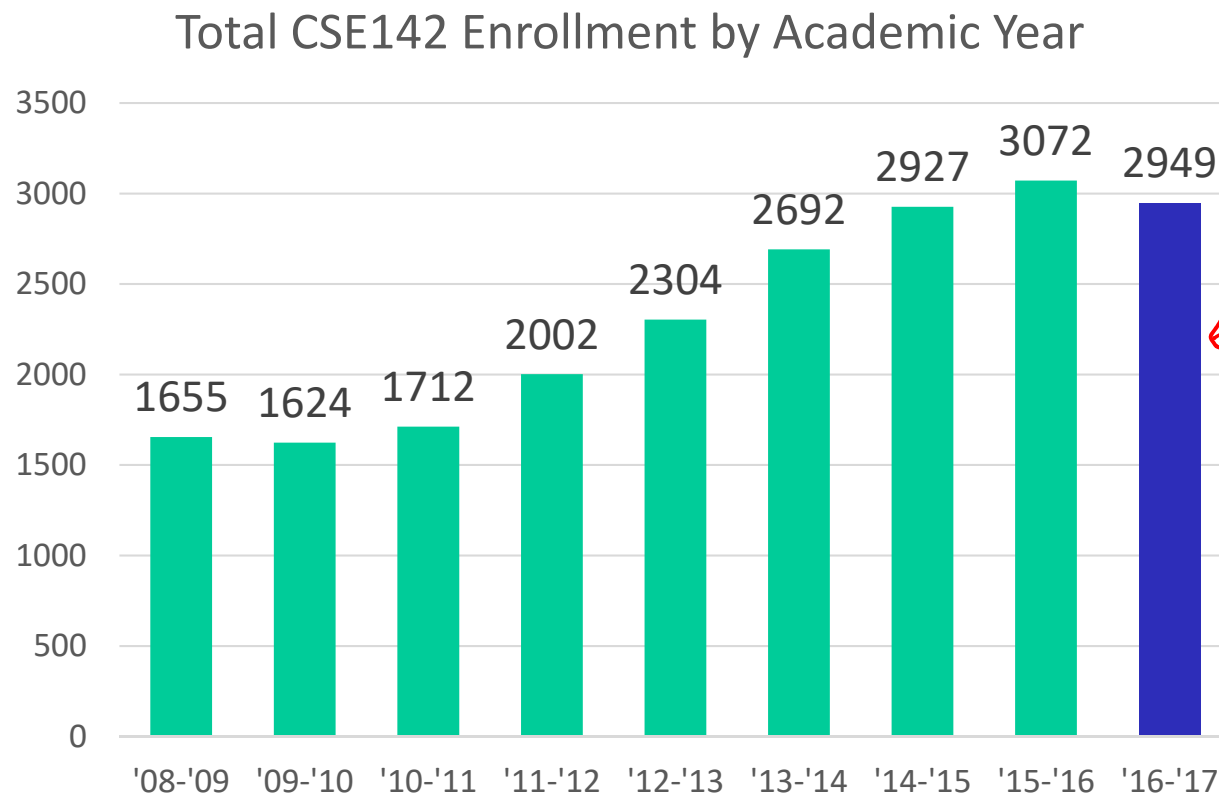
Figure 6. BLS projections for job growth and job openings for 2012-22



Source: <http://cs.stanford.edu/people/eroberts/CSCapacity/CSCapacity-HistoryToday.html>

Rapid CS Student Population Growth

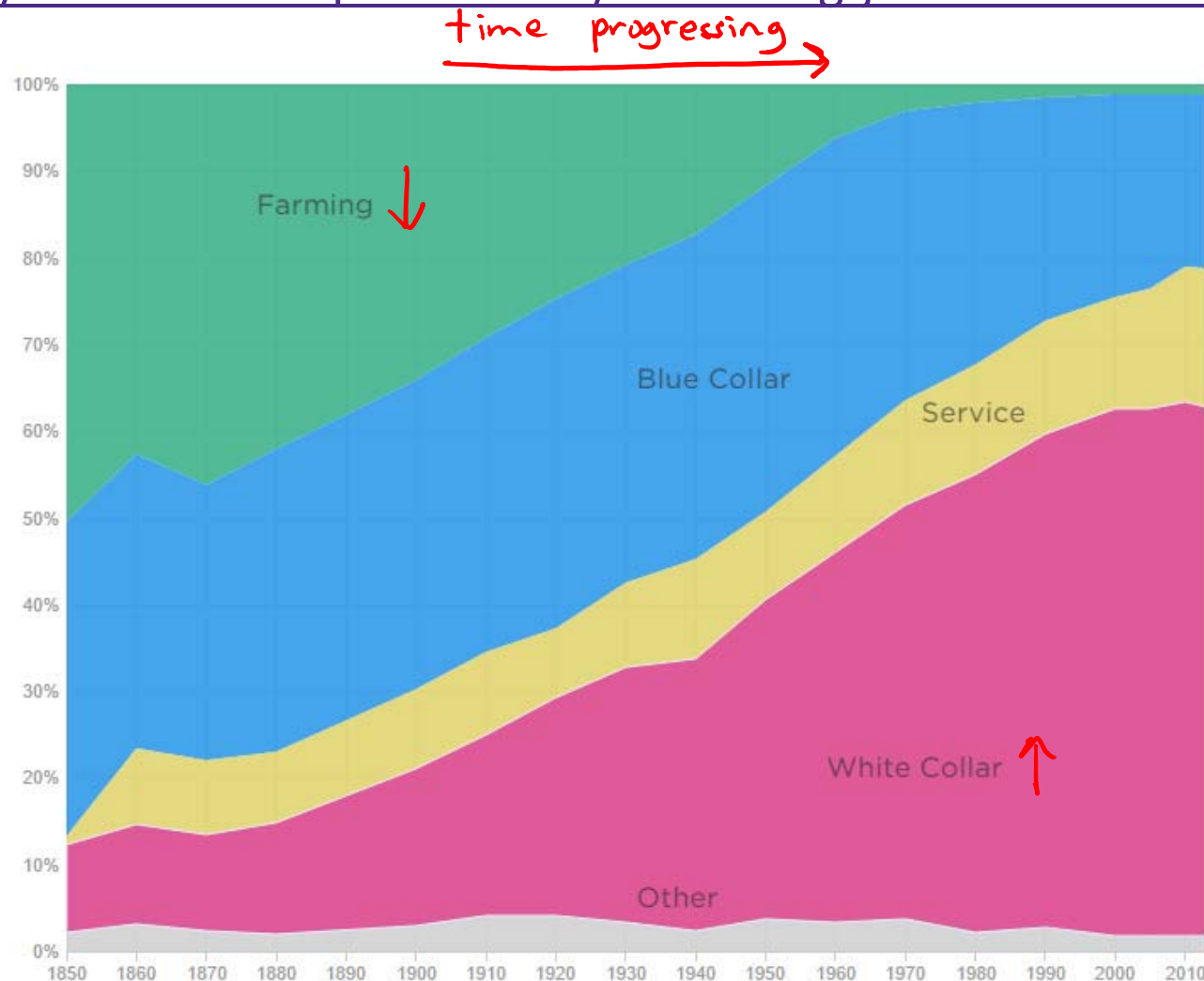
- ❖ CSE142 (here at UW) has seen a 2-fold enrollment increase since 2008
 - This is actually significantly slower than most other major American universities (closer to $\sim 4x$)



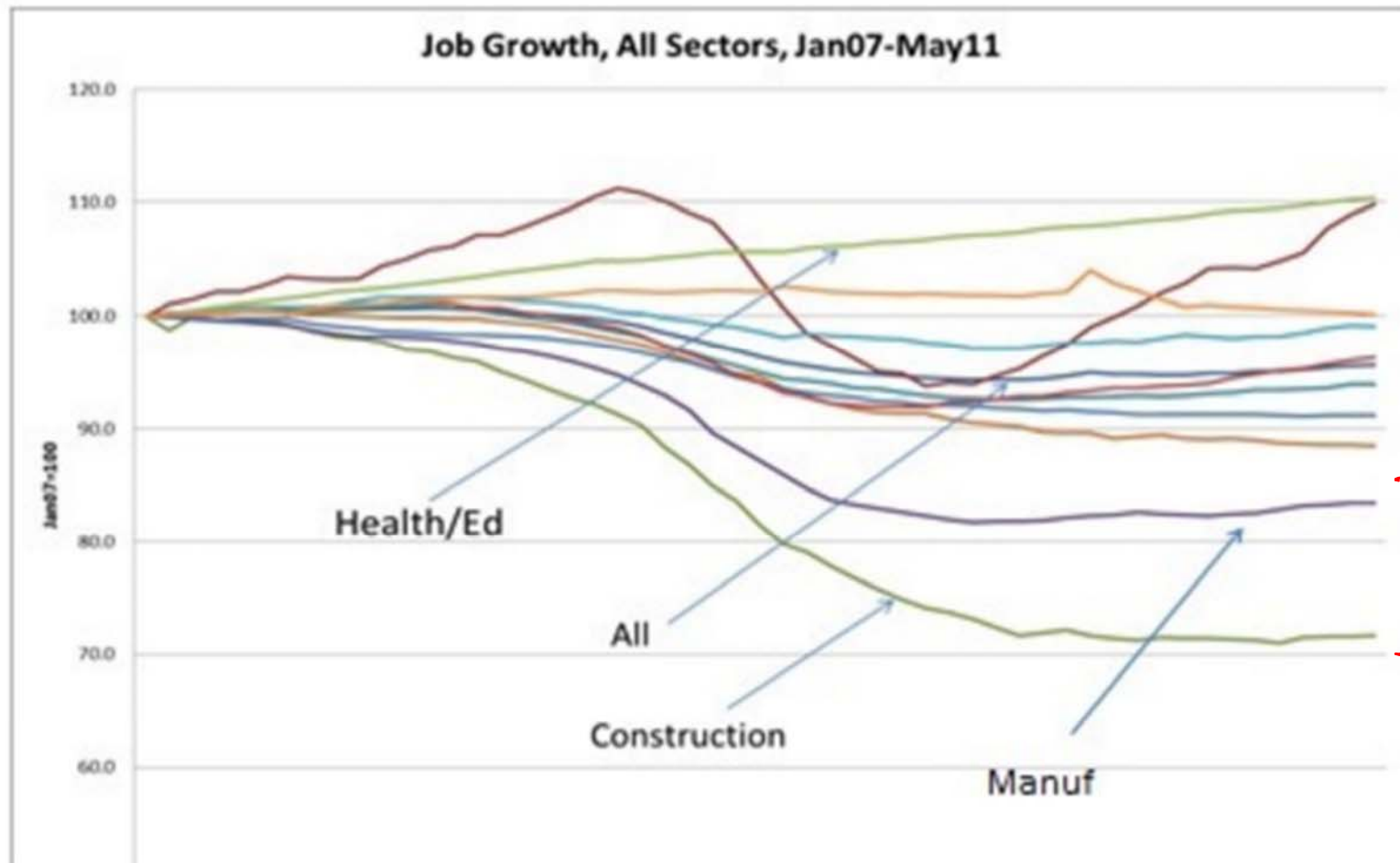
← Su 17 numbers not finalized

How is the Labor Pool Changing?

- ❖ Composition of U.S. Job Market over the Last 150+ Years
 - <http://www.visualcapitalist.com/visualizing-jobs-lost-automation/>



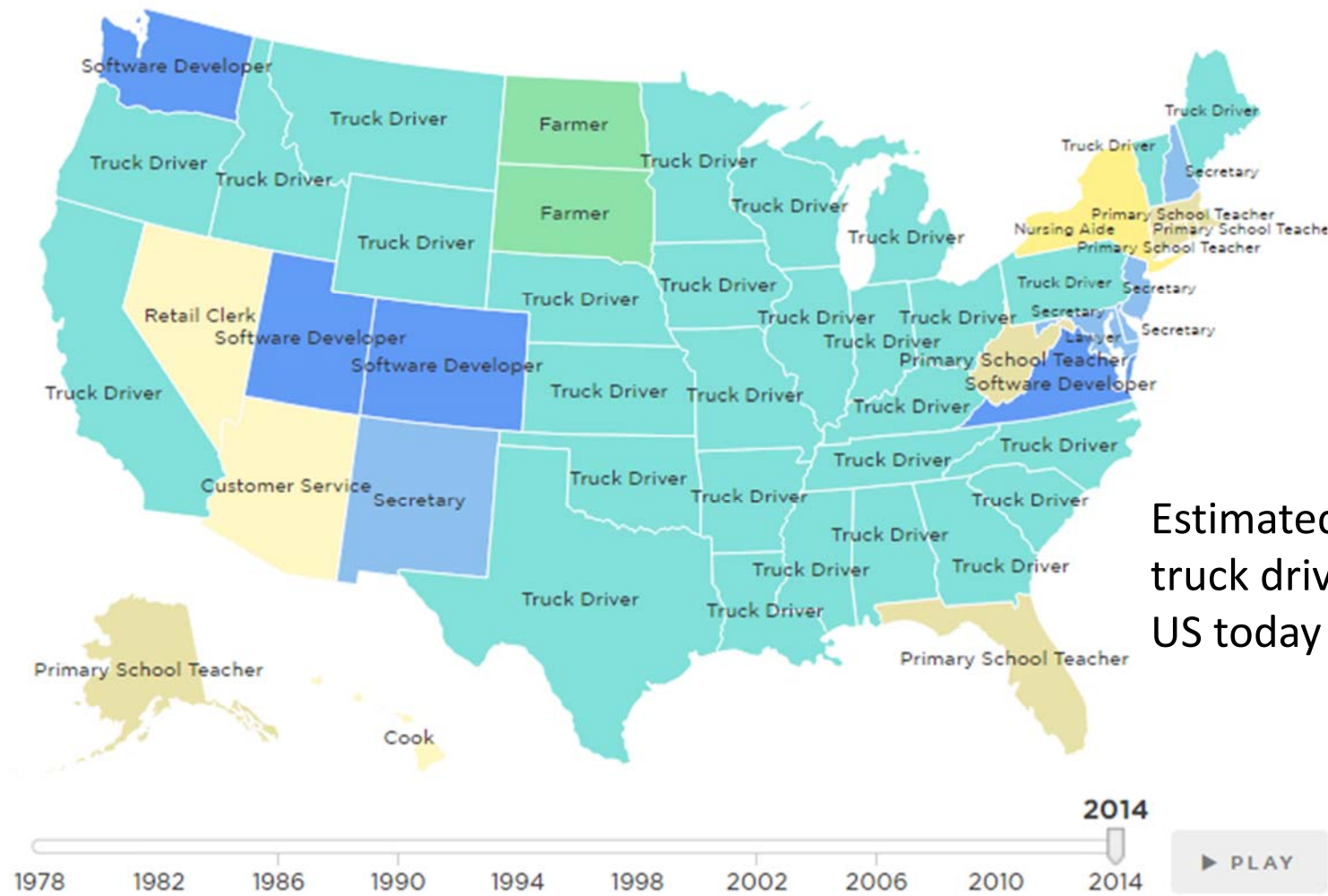
How is the Labor Pool Changing?



<http://www.washingtonpost.com/wp-srv/special/business/unemployment-where-are-the-jobs/>

How is the Labor Pool Changing?

The Most Common* Job In Each State 1978-2014



Estimated 3.5 million truck drivers in the US today

<http://www.npr.org/sections/money/2015/02/05/382664837/map-the-most-common-job-in-every-state>

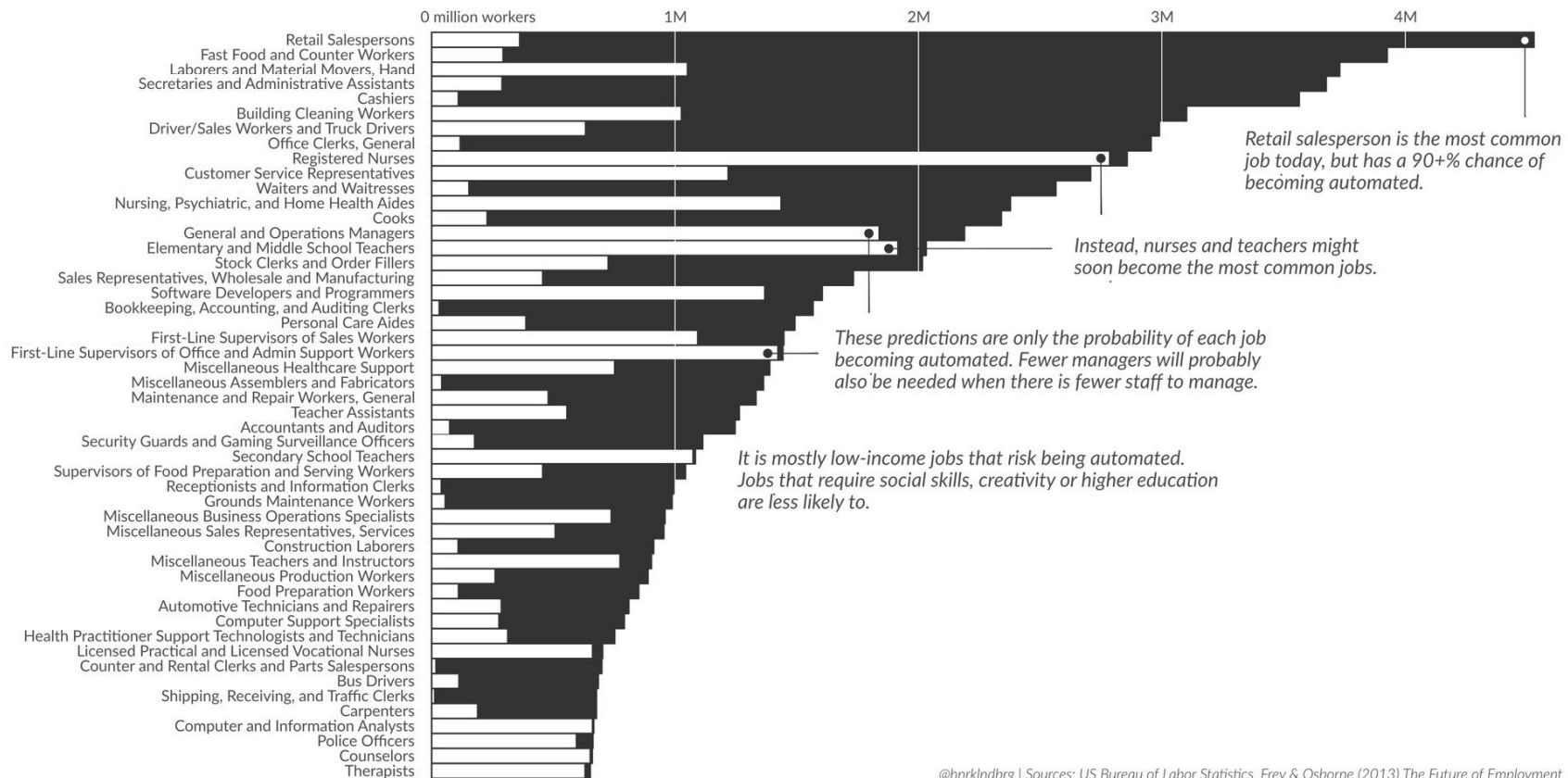
Visualizing the Jobs Lost to Automation

❖ <http://www.visualcapitalist.com/visualizing-jobs-lost-automation/>

The future of employment

About half of today's jobs will likely be done by computers in a decade or two. Automation has so far taken over mostly well-defined routine tasks, shifting jobs from middle-income manufacturing to lower-income service jobs. As computers get better at for example perception - think self-driving cars - those services jobs are likely next up to be replaced by machines. Frey and Osborne (2013) estimate the probability of each job becoming automated. Here are how their predictions apply to 2016 US employment statistics.

Black fields are jobs likely to be automated and white fields are jobs that are likely to remain.



Humans Need Not Apply

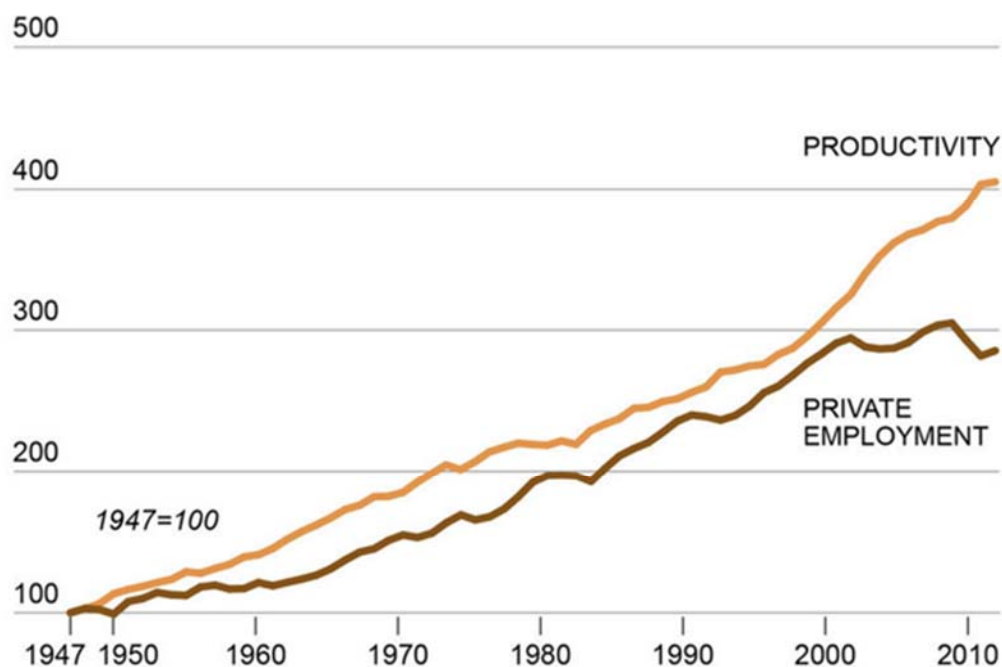
- ❖ More thoughts on your reading this week?
 - <https://www.youtube.com/watch?v=7Pq-S557XQU>



Labor and Output

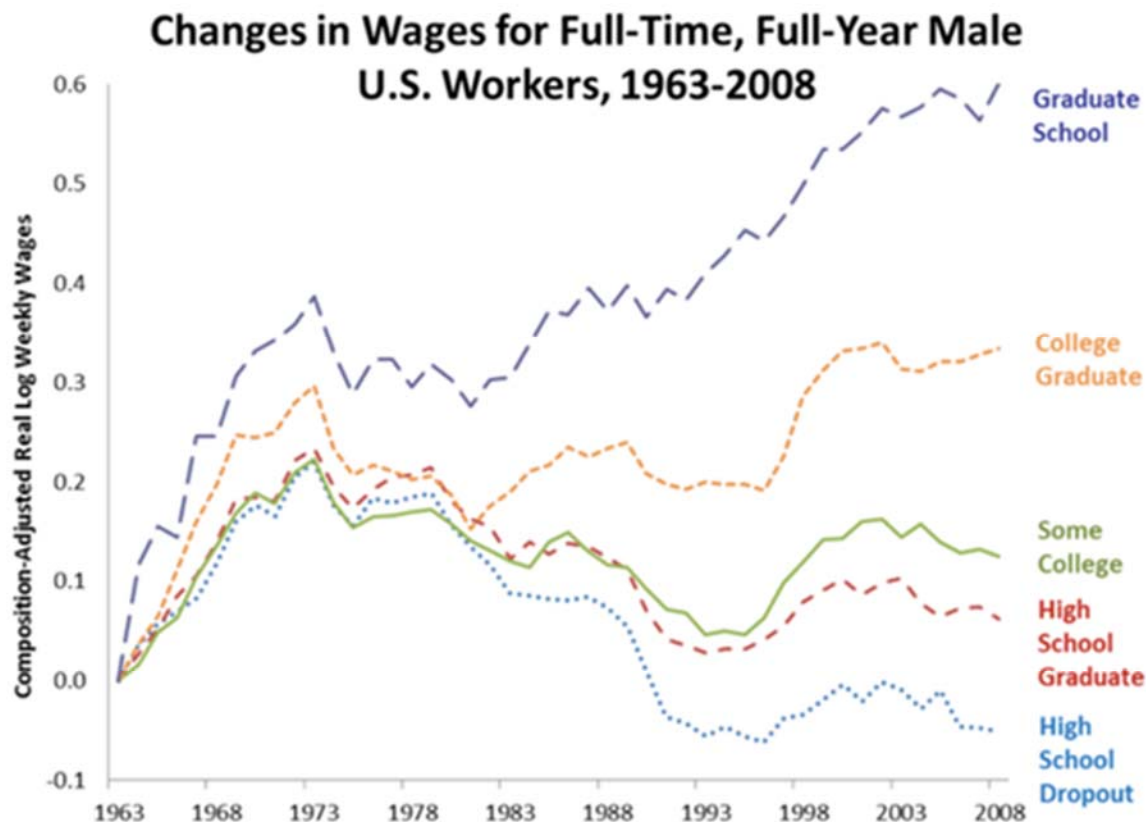
- ❖ Each worker generates ~4 times as much output as they did in 1947
- ❖ Productivity and total employment historically tracked each other in the US
 - Number of total jobs has stagnated since 2000 (140-150 million)

Productivity and employment in the United States, 1947-2011



Sources: U.S. Department of Labor, Bureau of Labor Statistics

Education and Wages



↑ more education becoming more and more necessary to be employable and sustain certain standards of living

Figure 3.5: Wages have increased for those with the most education, while falling for those with the least. Source: [Acemoglu and Autor](#) analysis of the Current Population Survey for 1963-2008.

“Why Workers Are Losing the War Against Machines”

- <http://www.theatlantic.com/business/archive/2011/10/why-workers-are-losing-the-war-against-machines/247278/>

What is the Future of Labor?

❖ Some opinions of experts:

- <http://www.pewinternet.org/2014/08/06/future-of-jobs/>
- No need to panic; new jobs will arise
- We'll move to more artisanal, small-scale modes of productions
- We'll need to reconfigure society to provide a decent standard of living for the less educated (*e.g.* guaranteed basic income)



Basic Income Createathon | San Francisco, Nov. 13-15, 2015

Join writers, artists, videographers, developers, and others to create content and media around the theme of a Universal Basic Income in the United States.

UNIVERSALINCOME.ORG

The Paradox of Leisure

- ❖ What does it mean when you have a world when you don't have to work?
 - <https://www.theatlantic.com/magazine/archive/2015/07/world-without-work/395294/>



Discussion Question

- ❖ Compared to our ancient small-group hunter-gatherer ancestors, are people's lives better with all of today's social and technological innovations?

Summary

- ❖ Computing affects the way we form opinions
 - How we decide to use the Internet shapes our opinions
 - Pariser: People will use the Internet to reinforce their preexisting beliefs (filter bubble)
 - Tufekki: Social networks help establish what's "normal"

- ❖ Computing affects social movements
 - Useful as a tool for coordinating actions and attracting support
 - Gladwell: Does not lead to direct action that challenges the status quo
 - Gladwell/Tufekki: Can prevent movements from properly organizing

- ❖ Computing affects jobs
 - Millions of jobs (domestic and abroad) may be automated away soon