Effects of AI on the Future Job Market

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CSE 352 - Artificial Intelligence with Prof. Anita Wasilewska
Resources

http://www.pewinternet.org/2014/08/06/future-of-jobs/
http://www.nytimes.com/2014/05/28/technology/googles-next-phase-in-driverless-cars-no-brakes-or-steering-wheel.html?_r=0
http://www.nydailynews.com/life-style/royal-caribbean-introduces-robot-bartenders-article-1.2015449
http://www.hngn.com/articles/72374/20150225/independent-releases-list-jobs-affected-ai-development.htm
http://automatedinsights.com/about/
http://www.npr.org/sections/money/2015/05/21/408234543/will-your-job-be-done-by-a-machine
Historical Impact of AI on Jobs

image provided by: https://www.linkedin.com/pulse/20140831202856-24732011-the-industrial-revolution-where-are-we-now
Historical Impact of AI on Jobs

“The servant is himself an instrument which takes precedence of all other instruments. For if every instrument could accomplish its own work… if the shuttle would weave and the plectrum touch the lyre without a hand to guide them, chief workmen would not want servants, nor masters slaves” - Aristotle 350 b.c.e

Thousands of years ago, even Aristotle claimed that if automation became sophisticated enough to replace humans, society would have no need for human labor or slavery.

In the early 17th century Queen Elizabeth I and King James I refused to patent a knitting machine on the grounds that it might lead to unemployment for textile workers.

By the 18th century Great Britain took a less restrictive view of technology; planting the seeds for the industrial revolution.
Historical Impact of AI on Jobs

Technological unemployment became a hot button issue with academic debate between prominent economists and historical figures by 1870 concern faded; innovation from the industrial revolution was increasing prosperity for all, including the working class. Labor-economizing technology gave rise to new social movements/groups; such as the Luddites. The Luddites protested this new technology for phasing out skilled artisans.

image provided by: https://strangebehaviors.wordpress.com/2011/02/24/the-luddite-revolution-birth-of-a-brand/
Historical Impact of AI on Jobs

Luddites were part of a group called “domestic cottage laborers” who were most affected by the industrial revolution— but traditionally had low payment and low productivity.

Despite concerns, the revolution increased wages; i.e., approximately 30% increase from 1780-1850.

Technological change increased demand for other types of labor; that were complementary to the changes in tech—such as mechanics to fix machines, supervisors, and accountants.

Created social mobility: children of handloom workers could become engineers and operators. Misplaced fears of technological unemployment came from economists lacking the foresight to predict new job categories.
Jobs most likely to be automated

1. Telephone salesperson 99.0%
2. Typist or related keyboard worker 98.5%
3. Legal secretary 97.6%
4. Financial accounts manager 97.6%
5. Weigher, grader or sorter 97.6%
6. Routine inspector and tester 97.6%
7. Sales administrator 97.2%
8. Book-keeper, payroll manager or wages clerk 97.0%
9. Finance officer 97.0%
10. Pensions and insurance clerk 97.0%
<table>
<thead>
<tr>
<th>Job Description</th>
<th>Automation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching and educational professional (other)</td>
<td>0.8%</td>
</tr>
<tr>
<td>Secondary education teaching professional</td>
<td>0.8%</td>
</tr>
<tr>
<td>Senior professional at educational establishment</td>
<td>0.7%</td>
</tr>
<tr>
<td>Health services and public health manager or director</td>
<td>0.7%</td>
</tr>
<tr>
<td>Psychologist</td>
<td>0.7%</td>
</tr>
<tr>
<td>Therapy professional (other)</td>
<td>0.7%</td>
</tr>
<tr>
<td>Social services manager or director</td>
<td>0.7%</td>
</tr>
<tr>
<td>Speech and language therapist</td>
<td>0.5%</td>
</tr>
<tr>
<td>Education adviser and school inspector</td>
<td></td>
</tr>
</tbody>
</table>
What does this mean?

Jobs that involve more cleverness, negotiation, empathy, and helping others have a lower chance of being replaced.

Jobs that are more repetitive and monotonous are more likely to be replaced, in addition to jobs that have predictable routine tasks.

Images:
https://tse1.mm.bing.net/th?id=OIP.M63a72087be845e3f23928558757e4366H2&w=300&h=300&c=0&pid=1.9&rs=0&p=0&r=0
https://tse1.explicit.bing.net/th?id=OIP.Md0c0f786469c77b4d92ce0f39b588492H0&w=269&h=179&c=7&rs=1&qlt=90&o=4&pid=1.1
Possible Affected Industries

Automotive
Hospitality
Customer Service
Healthcare
Transport
Logistics
Home Maintenance
Manufacturing
Retail

Automotive Industry

Source: http://cdn1.itpro.co.uk/sites/itpro/files/2015/06/google_driverless_car.jpg
Safe Driving - Communication

Driving requires human communication - blinkers & car horns
Can this be replicated with AI?

Intersections being developed will have computer software that directly communicate.
Taxi drivers and other human road drivers will not be necessary.
Less fatal accidents on intersections which is where most accidents happen.
"Ninety-five percent of accidents are caused by human error and the reason we are focusing on intersections is that one quarter of all accidents occur in intersections and a third of all fatal accidents so taking the person out of the loop will be a huge advantage."

-PROFESSOR PETER STONE
COMPUTER SCIENCE, UNIVERSITY OF TEXAS
Jaguar Land Rover’s Smart Assistant will find the quickest route to the destination based on your schedule (calendar)

image source: http://techdrive.co/2014/10/artificial-intelligence-transform-auto-industry/
Subway Management by AI

Hong Kong subway system has a 99.9% on time record. Scheduling managed by artificial intelligence but still approved by humans. Checks train maintenance for compliance with local regulations.
How did they make the scheduling AI?

“We asked the experts what they consider when making a decision, then formulated that into rules – we basically extracted expertise from different areas about engineering works”

-Andy Chun, Scheduling AI designer
Hong Kong University

(Expert Systems like explained in class!)
Hospitality/Service

Images:
https://tse1.mm.bing.net/th?id=OIP.M9dcaa8f6ada4aafa3e15c2aa6015c872o0&w=300&h=300&c=0&pid=1.9&rs=0&p=0&r=0
Entertainment

via https://www.youtube.com/watch?v=pXhsUPtsiLU
Journalism

Automated Insights, an AI company, transforms Big Data into written reports. Many articles requiring data analysis no longer need to be written by humans. Articles can be written with the personality and versatility of humans.
Story #1

Denny’s Corporation on Monday reported first-quarter profit of 8.5 million dollars. The Spartanburg, South Carolina-based company said it had profit of 10 cents per share. The results beat Wall Street expectations. The average estimate of four analysts surveyed by Zacks Investment Research was for earnings of 9 cents per share. The restaurant operator posted revenue of $120.2 million in the period, also beating Street forecasts. Three analysts surveyed by Zacks expected $117.1 million. Denny’s shares have risen nearly 6 percent since the beginning of the year. In the final minutes of trading on Monday, shares hit $10.90, a climb of 61 percent in the last 12 months.

Story #2

Denny’s Corporation notched a grand slam of its own in the first quarter, earning a better-than-expected ten cents a share, as restaurant sales jumped by more than 7-percent. Operating revenues topped $120 million. Adjusted net income jumped 36 percent to $8.7 million. Denny’s is one of the nation’s largest full-service restaurant chains. The growth in sales suggests consumers are opening their pocketbooks for pancakes, eggs, and hash browns. Earnings were also helped by lower costs for raw materials. Denny’s results were also helped by the re-opening of the high-volume location inside the Las Vegas Casino Royale restaurant. After sales grew faster than expected in the first three months of the year, managers raised their sales forecast for the remainder of 2015.
Things to look forward to

Technology has replaced many jobs in the past. However based on past trends, technology has created more jobs than it replaced. Humans will adapt to these changes by creating new types of work. We will be able to focus on work that is less monotonous. We may have more leisure time, time to spend with family and friends, and time for self improvement.

Increased productivity.

Although technology has created more jobs the future is still uncertain.

Image: http://icdn2.digitaltrends.com/image/artificial-intelligence-2-640x0.jpg
Reasons to be concerned

Currently our educational systems are not preparing us for work in the future. We don’t know exactly what type of work people will be doing in the future, much less how we should prepare for it. Many high skilled workers are at risk of losing their jobs, and they might be displaced to lower paying jobs. In the past, technology has mostly replaced blue collar jobs (ex. labor). We should be prepared to lose many white collar jobs (office workers, accountants, bankers, etc.).

Some experts believe greater income inequality.

[http://images.forbes.com/media/2010/10/08/1008_mortgage-lending-director-slow-growing_400x400.jpg](http://images.forbes.com/media/2010/10/08/1008_mortgage-lending-director-slow-growing_400x400.jpg)
Conclusion - What to Expect

Expect a huge change in our job market, educational systems, and work productivity. Expect to work with an intelligent machine in the future, regardless of what industry you work in. Computer Science education will probably include more artificial intelligence topics.

Images:
http://static.guim.co.uk/sys-images/Guardian/Pix/pictures/2015/2/4/1423080073313/Businesswoman-Surrounded--009.jpg
http://img.scoop.it/1hRbyxImV7d5Lb1-Ove77oXXXL4j3HpxhjNQf_P3YmryPKwJ94QGRtDb3Sbc6KY
Possibly in the future...

via https://www.youtube.com/watch?v=NOHqxUpXxDQ
What could go wrong...

Thank You!