

Technological Unemployment

Module 12 of a course on *Ethical Issues in AI*

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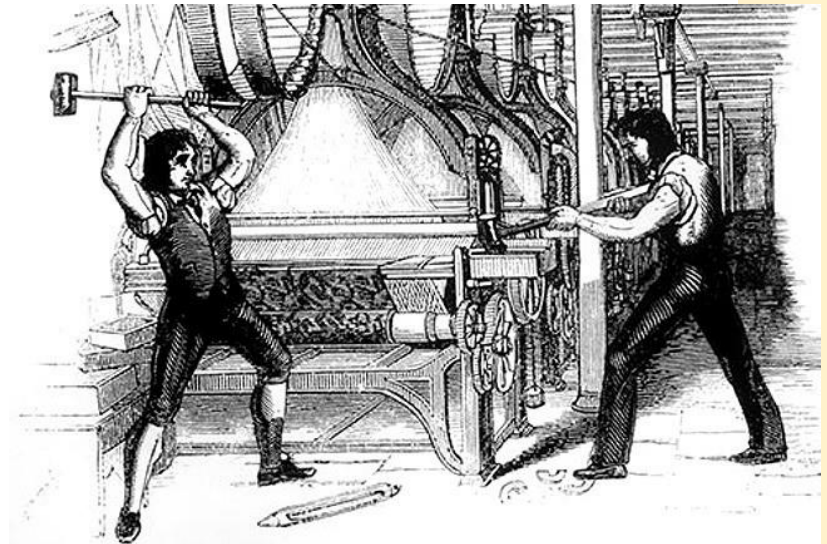
Future of employment

- The first **Industrial Revolution** destroyed countless jobs.
 - *Will AI and the **fourth industrial revolution** do the same?*



Future of employment

- One opinion: the economy will **adjust**, as before.
 - *The **Luddites** were wrong.*
 - They smashed machines, believing that **mechanization** would lead to mass unemployment
 - But **new jobs** replaced the old ones.
 - The **same** will happen in this century.
 - For example, “**prompt engineers**”



Future of employment

- ...although the “adjustment” brought 150 years of **violent strikes and political revolution.**



Destruction in Chicago from Pullman strike, 1894



Bolsheviks storming the Winter Palace, St Petersburg (Petrograd) Russia, 1920

Future of employment

- Another opinion: It will be different this time
 - *AI will lead to mass unemployment with **no historical precedent.***
 - Because it replaces human **brains.**
 - Current **labor shortage** may only hasten the trend by incentivizing automation.



Future of employment

- Robotic manufacturing
 - *No human in sight on many a factory floor.*
 - Main reason for shrinkage of middle class, not offshoring.



Future of employment

- Warehousing, retailing are shedding workers by the day.



Robots in Amazon fulfillment center
750,000 hired so far

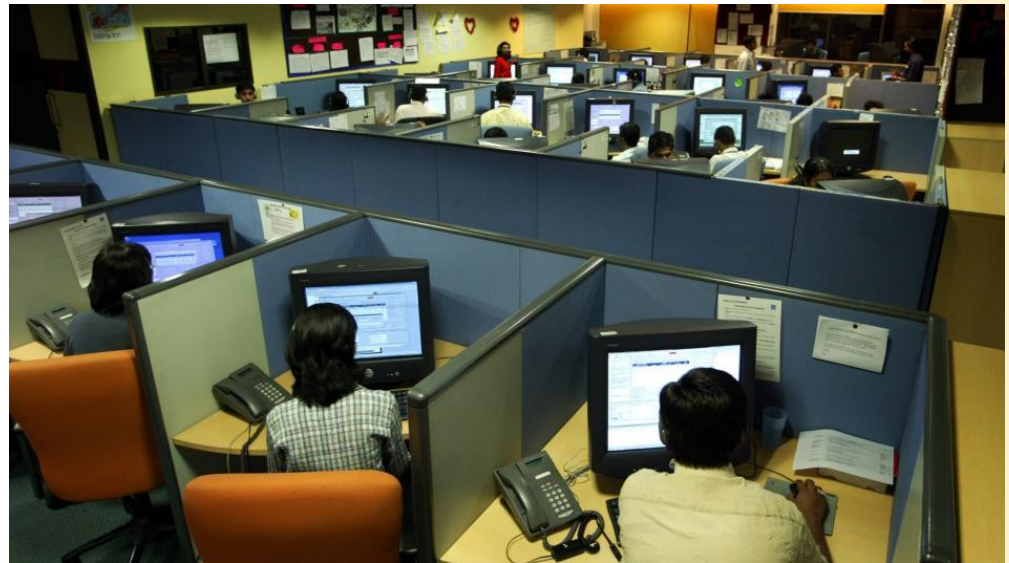
Future of employment

- Self-driving vehicles will take over transport.
 - *3.5 million truck drivers will be out of work in U.S.*
 - *What happens to 1.7 million Uber & Lyft drivers in U.S.?*



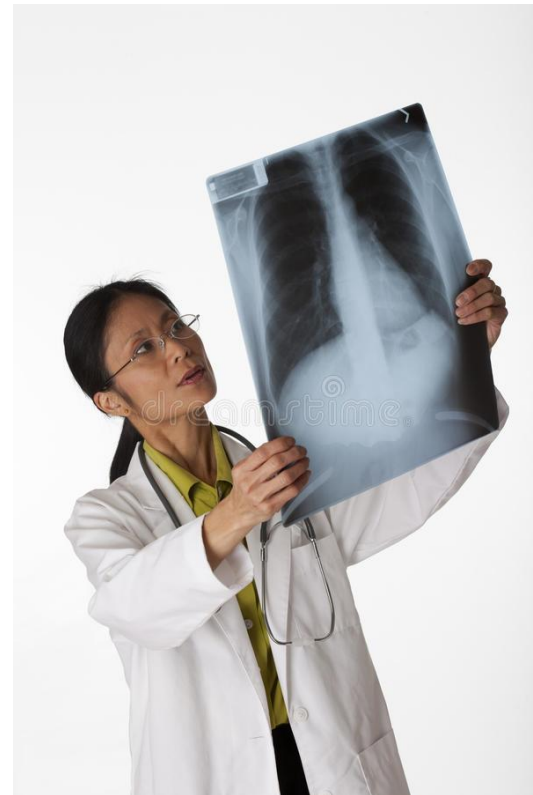
Future of employment

- White-collar tasks to be replaced by deep learning
 - *Loan processing*
 - *Stock trading*
 - *Investment advice*
 - *Credit rating*
 - *Online ad placement*
 - *Job applicant screening*
 - *Parole decisions*
 - *Teaching!*



Future of employment

- Medical technicians may become obsolete.
 - *Is AI better than humans at reading medical scans?*



Wealth distribution

- What to do?
 - *We need some kind of **wealth redistribution** from AI-intensive industry to the general population.*
 - *We already have this for **manufacturing***
 - Manufacturing is extremely labor productive.
 - The economy **redistributes** this wealth in various ways.
 - But the redistribution mechanism is **failing** even for manufacturing.
 - What will happen when **AI takes over**?

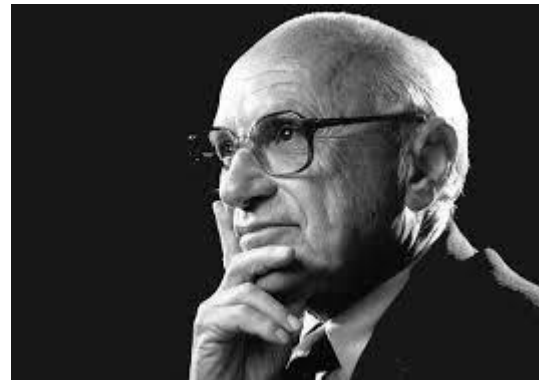


Wealth distribution

- One proposal: **Universal basic income**
 - *An old idea from the political left and right.*
 - Advocated by staunch libertarians Milton Friedman and F. A. Hayek in 1960s, as well as Andrew Yang today.



F. A. Hayek
1899-1992



Milton Friedman
1912-2006

Wealth distribution

- One proposal: **Universal basic income**
 - *Current examples:*
 - Alaska Permanent fund (\$800-2000/yr).
 - 30-40 [small-scale tests](#) worldwide.
 - *What does business do in the meantime?*



Worker ownership

- Proposal: **Workers as capitalists**
 - *Workers own and perhaps manage the workplace.*
 - Famous example: Mondragon Cooperative in Spain
 - 80,000 employees



Worker ownership

- As AI-based technology displaces jobs...
 - *Workers can use **self-layoffs**.*
 - They **reduce their work week** to a couple of days.
 - ...effectively laying themselves off most of the week.
 - ...with **no reduction in pay**.
 - *This works because **they own the technology!***
 - ...and reap the rewards of its increased **productivity**.
 - Wealth distribution **within the firm** rather than by the government.



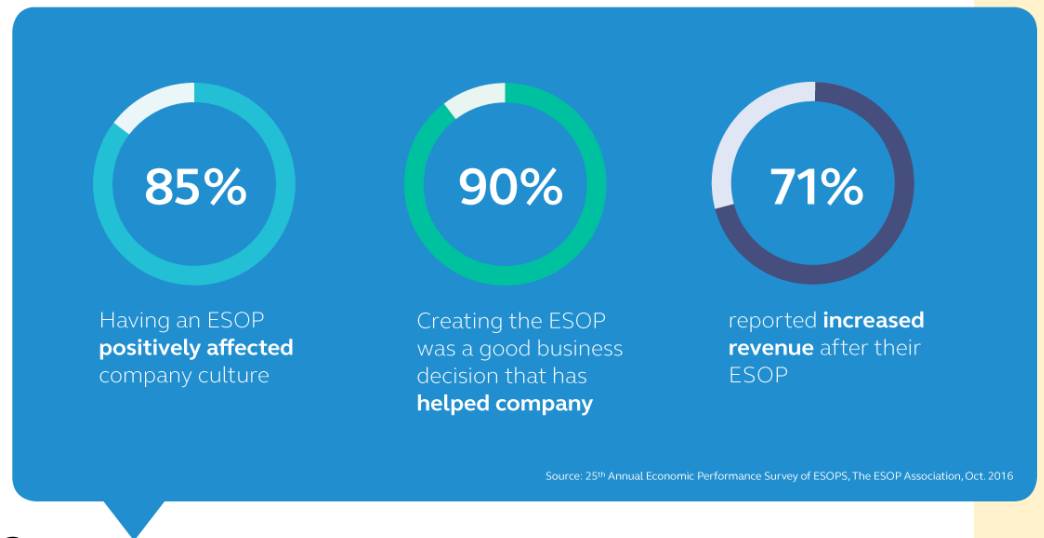
Worker ownership

- A small step in this direction: U.S. **ESOPs**
 - *Can be completely or partially employee owned.*
 - *Some 100% employee-owned companies:*
 - Publix Supermarkets (255,000 employees)
 - Winco Foods (18,000 employees)
 - Penmac Staffing (10,000 employees)
 - Brookshire Brothers (7000 employees)



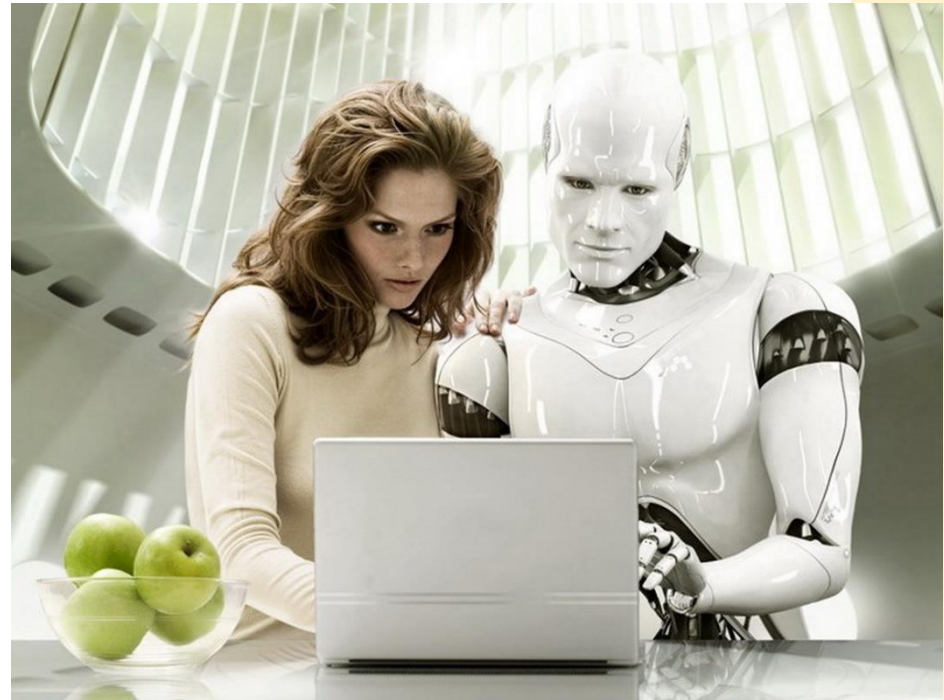
Worker ownership

- Pros:
 - *Workers own the technology and benefit directly.*
 - *Democracy in the workplace.*
 - *Entire work force benefits.*
- Cons:
 - ***How to raise the capital?***
 - *Must ultimately cede some power to outside investors?*



Augmentation

- Human/machine partnership
 - *Machines **enhance** human capabilities rather than **displace** them.*
 - Humans **train** their robots...
 - ...to avoid humanizing “cobots”
 - *Some AGI promoters are already backing into this position.*



A firm's ethical dilemma

- Automate and lay off workers?
- Resist automation and lose competitiveness?



A firm's ethical dilemma

- Failure to automate is **ungeneralizable**?
 - *Reason to resist automation: continue to provide good-paying jobs.*
 - But today's good-paying jobs exist only because **past employers** have **adopted new technology**, despite layoffs.
 - Failure to do the same is **not generalizable**.

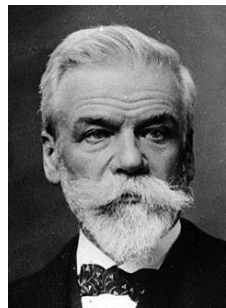


A firm's ethical dilemma

- Failure to automate is **ungeneralizable**?
 - *This misunderstands labor history.*
 - Most new technology is introduced by starting **new firms**, not by laying off workers in existing firms.
 - This causes layoffs in other firms, but generalized refusal to lay off workers in one's **own firm** is consistent with technological progress.



Brunel



Solvay



Ford



Westinghouse



Jobs

A firm's ethical dilemma

- **Utilitarian** arguments
 - *Try automation with **augmentation**.*
 - Clearly utilitarian if feasible.
 - *Try delayed automation with **attrition**.*
 - Benefit to workers may outweigh utilitarian cost of delay.
 - *If **competition** forces automation now, do it.*
 - Far more utilitarian to automate than to go out of business.

