Human AI Interaction

Lecture 18: AI and Jobs
aidesignclass.org

Learning goals today

- TODAY: What is the effect of AI on jobs?
- Assignment:
  - log in ONE day:
    - how many "tasks" do you have AI do for you?
    - What fraction of these are tasks that people typically hired a person to do before AI existed?
    - What might you have paid those hires? For the rest of the tasks, what might you pay someone to do the task for you?
    - Create a spreadsheet with value created and $ value of these jobs eliminated
  - Due next wed. Keep it simple!
- THURSDAY: Vega Quartet: NOT HERE!!!
  Tharp rehearsal space in the Schwartz center. If you enter Schwartz through the doors across the lawn from the business school, it is your first left, room 202
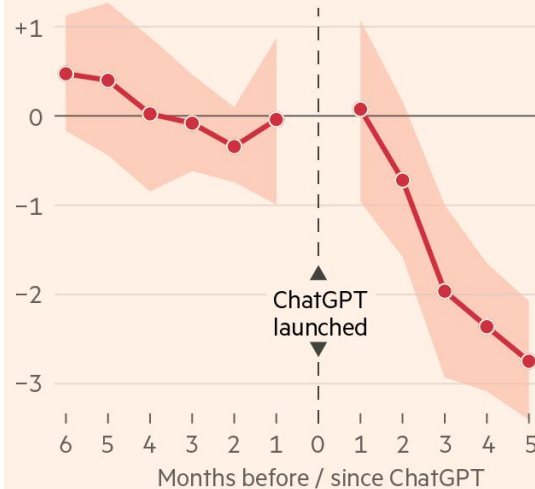
Freelance jobs are getting more precarious

Ding Wang also described this to you.

(chart based on 1.23M job posts from Upwork, a popular freelancing platform; earnings expressed as percent change from base)
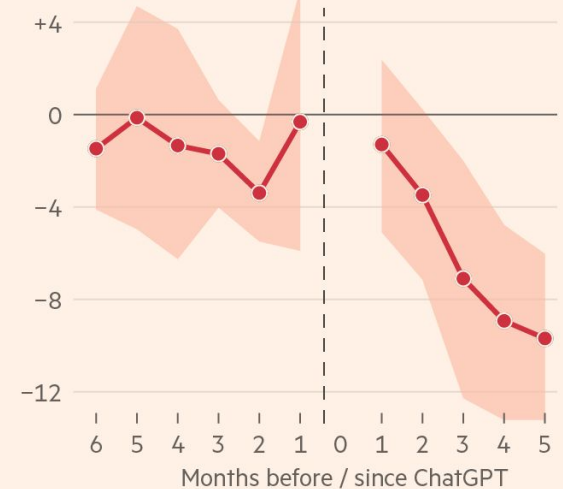

Generative AI is already taking white-collar jobs and wages in the online freelancing world

Change in employment and earnings from writing and editing jobs on an online freelancing platform after the launch of ChatGPT

% change in monthly freelance jobs . . .

. . . and earnings

ChatGPT launched

Months before / since ChatGPT

Months before / since ChatGPT

Source: *The Short-Term Effects of Generative AI on Employment: Evidence from an Online Labor Market (Hui et al, 2023)*
© FT

Why might AI affect jobs?

- "Displacement" - something that a human was paid to do is now done by AI
- "Productivity effect": if AI can help you become more productive, maybe you'll get paid more
- "Reinstatement effect": AI creates new tasks, and those tasks require people to fully accomplish

Definitions taken from:
https://www.nber.org/system/files/working_papers/w24196/w24196.pdf

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Your task: think of the software industry (any software company you want – games, hosted enterprise software…) - what do these effects look like? Let's get concrete!

Will we have more jobs?

- "Displacement" - something that a human was paid to do is now done by AI
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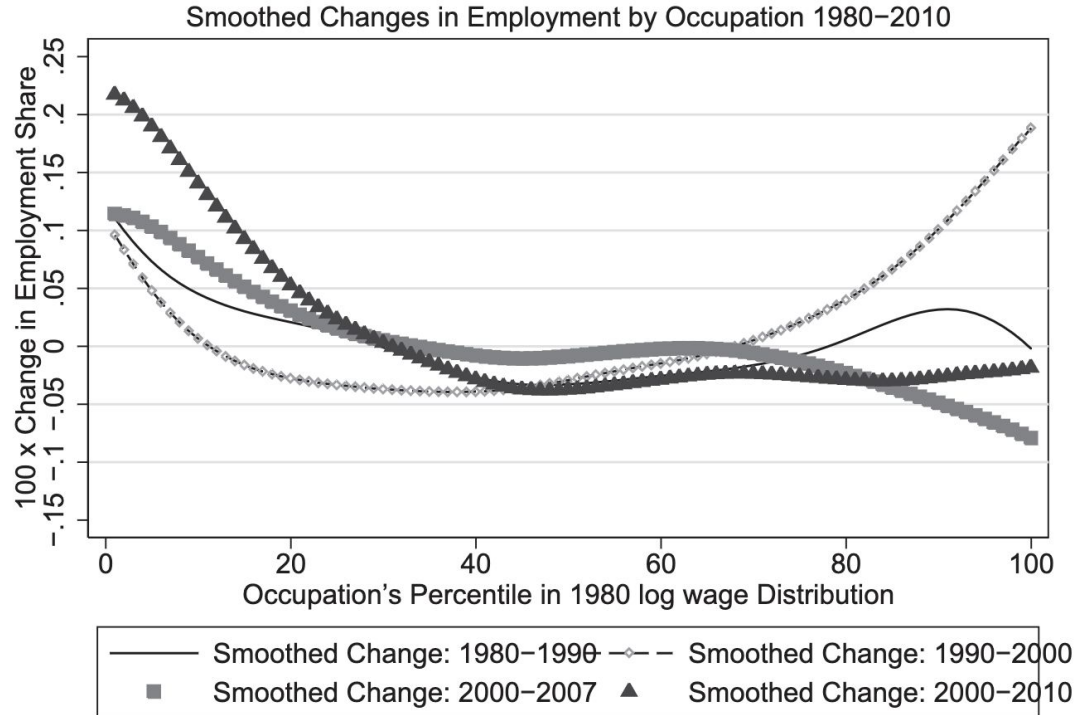
Your task: think of how much jobs pay. Does one of these effects affect specific kinds of jobs more? (Let's say high, middle, low income)

Moravec's paradox

Quote [attributed](#) to Hans Moravec "It is comparatively easy to make computers exhibit adult-level performance on intelligence tests or playing checkers, and difficult or impossible to give them the skills of a one-year-old when it comes to perception and mobility."

Hollowing out with pre-genAI automation

Data from ["The Great Reversal"](#) (Deming et al.)

Smoothed Changes in Employment by Occupation 1980−2010
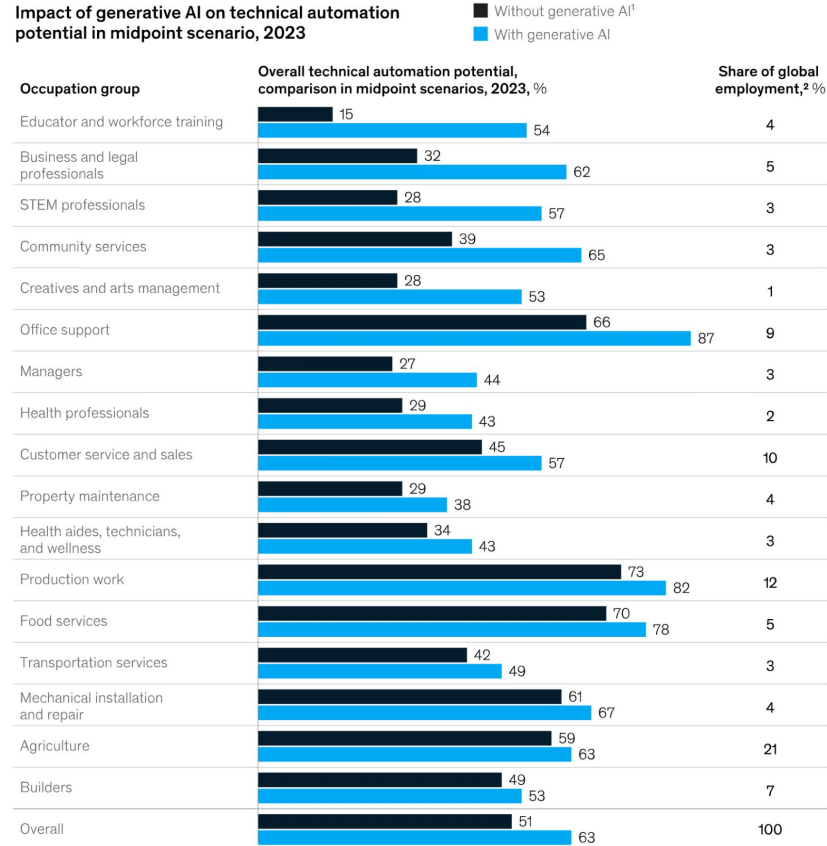
Does generative AI change that?

Data from McKinsey. ("Percentages of tasks that can be potentially automated")

What stands out to you?

- Which category is most surprising?
- Where does generative AI make the most difference?

Advances in technical capabilities could have the most impact on activities performed by educators, professionals, and creatives.

Impact of generative AI on technical automation potential in midpoint scenario, 2023

■ Without generative AI[1]
■ With generative AI

Occupation group	Overall technical automation potential, comparison in midpoint scenarios, 2023, %		Share of global employment,[2] %
	Without generative AI	With generative AI	
Educator and workforce training	15	54	4
Business and legal professionals	32	62	5
STEM professionals	28	57	3
Community services	39	65	3
Creatives and arts management	28	53	1
Office support	66	87	9
Managers	27	44	3
Health professionals	29	43	2
Customer service and sales	45	57	10
Property maintenance	29	38	4
Health aides, technicians, and wellness	34	43	3
Production work	73	82	12
Food services	70	78	5
Transportation services	42	49	3
Mechanical installation and repair	61	67	4
Agriculture	59	63	21
Builders	49	53	7
Overall	51	63	100

Note: Figures may not sum, because of rounding.
[1]Previous assessment of work automation before the rise of generative AI.
[2]Includes data from 47 countries, representing about 80% of employment across the world.
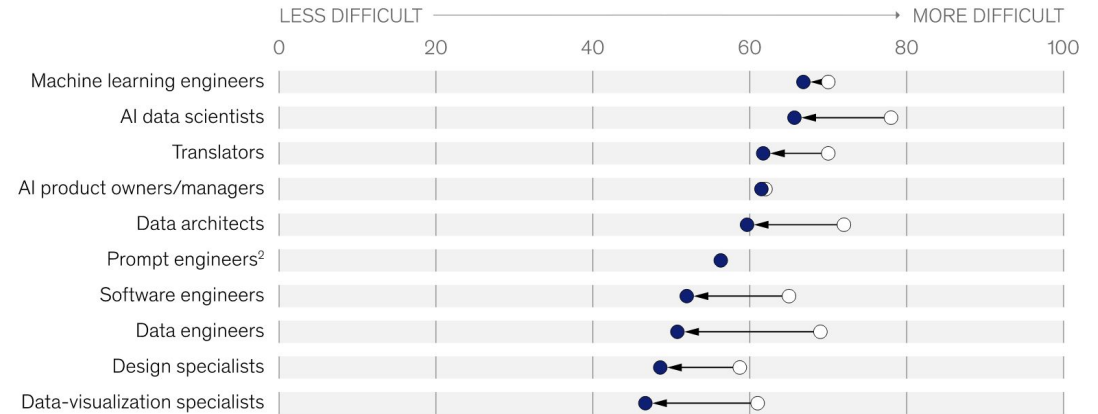Source: McKinsey Global Institute analysis

McKinsey & Company

Jobs in AI

My reactions: "Prompt engineers" are a job category?!?! And people can't find them?

What are your reactions?

Hiring for AI-related roles remains a challenge, though reported difficulty has decreased since 2022 for many roles.

Share of respondents reporting difficulty in organizations' hiring of AI-related roles,[1] %   ○ 2022   ● 2023

[1]Asked only of respondents whose organizations have adopted AI in at least 1 function and who said their organization hired the given role in the past 12 months. Respondents who said "easy," "neither difficult nor easy," or "don't know" are not shown.
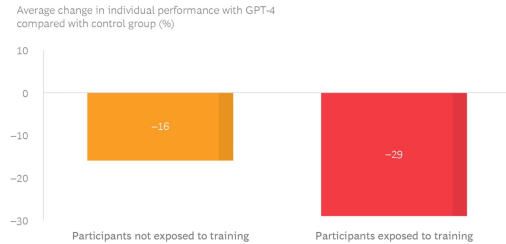[2]Not asked of respondents in 2022.
Source: McKinsey Global Survey on AI, 1,684 participants at all levels of the organization, April 11–21, 2023

McKinsey & Company

Does it help? How does it help?

The task was "Creative product innovation" - Propose at least 10 ideas for a new shoe targeting an underserved market or sport.
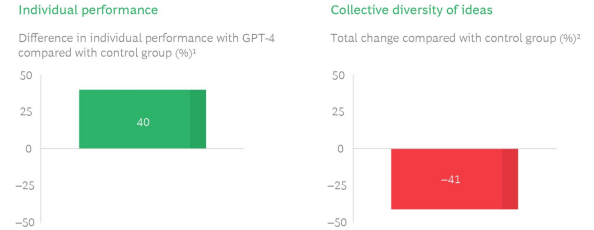
Ability measured on business analysis task ("segment footwear market")

Exhibit 3 - Simple Training Compounds the Performance Decline for the Business Problem-Solving Task

Average change in individual performance with GPT-4 compared with control group (%)

Sources: Human–Generative AI Collaboration Experiment (May–June 2023); BCG analysis.
Note: The simple (30-minute) training program that participants received provided a high-level overview of good prompting practices for GPT-4, along with a note on shortcomings in the technology's reasoning capabilities.

Exhibit 7 - Generative AI's Boosts to Individual Performance May Undercut Collective Creativity

Individual performance

Difference in individual performance with GPT-4 compared with control group (%)[1]

Collective diversity of ideas

Total change compared with control group (%)[2]

Sources: Human–Generative AI Collaboration Experiment (May–June 2023); BCG analysis.
[1]Findings reflect results from the creative product innovation task.
[2]Diversity of ideas was measured using TF-IDF and cosine similarity methodologies.

Exhibit 4 - Generative AI Is a Powerful Leveler of Performance

Baseline task (without GPT-4)

Average

Experimental task (with GPT-4)

Average

Individual performance score

■ Low performance on baseline task ■ High performance on baseline task

Sources: Human–Generative AI Collaboration Experiment (May–June 2023); BCG analysis.
Note: Findings reflect results (on a 10-point scale) for the creative product innovation task only. Baseline task performance was used as a proxy for proficiency on this type of task. Both distributions reflect GPT-4–based performance grades rather than human grades for greater consistency of within-subject analysis.

The unseen jobs that keep us going

Ongoing research with hospitality workers suggests that there is a lot of "cleaning up" after the machine.

My collaborator Franky Spector finds this to be true across many professions. (image from their paper!)

The Centrality of Maintenance & Repair

Slick photographs and renderings of automated waste labor technologies depict them as functioning seamlessly and autonomously. Yet, AI requires maintenance and repair. Both mechanical technologies (like conveyor belts) and computational technologies (like optical sorters) break down through use. The context of waste labor is especially hard on machinery — occurring in environments that are dirty, damp and unpredictable. Here, technology requires constant attention. For example, repair is so frequent in our recycling fieldsite that the facility runs an average of one additional day every month in order to account for time when sorting processes are halted in order to address problems with the machines. At the airport, a dedicated staff member is tasked with following the floor cleaning robots throughout the day, restarting them when they stall out and mopping up the excess trail of water they leave behind. Underlying a focus on the maintenance of automated technologies is a commitment to thinking about design as only one moment within a lifecycle of a computational artifact. Innovative technologies are deeply reliant on the maintainers who keep them running, though this work "remains mostly invisible under our normal modes of picturing and theorizing technology" [20:225]. This invisibility constrains public understanding of whose work matters, and funnels attention and resources away from sustaining the infrastructures and services already central [35].

"The algorithm that [the robots] use—with the continuous fill—creates a lot of turns that seem unnecessary and the mechanics of the machine itself are such that the more times the squeegee moves in a circle it loses its tension and leaves water behind, which is a slip and fall hazard. It causes [janitorial staff members] to have to attend to that unnecessarily."

— Facilities Maintenance Supervisor, Airport

A Mother's Love—a Bargain at $450 a Year, Plus Applicable Fees

Parents are hiring concierge services for their college students, leaving to professionals some duties usually done by mom, including hugs
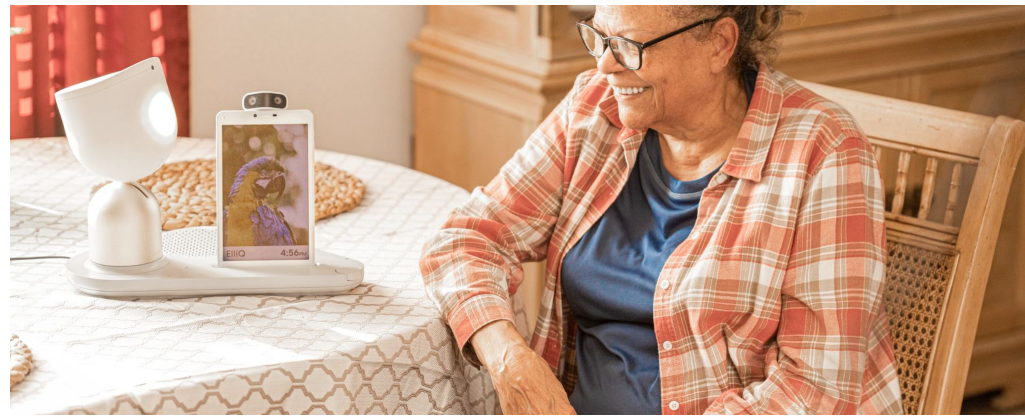
Excerpt from the article

"Like any good mother, Mindy Horwitz helped Emma Feirstein move into her college dorm room, got her an internship and took her to lunch when she had a bad day…**Students can hire Uber, DoorDash, TaskRabbit or Instacart for the same help, Horwitz said, but "we just do it more lovingly."** Seeing the demand for having a mom away from mom, Horwitz expanded her business this fall from Washington University in St. Louis to Northwestern University, Skidmore College and University of Hartford, hiring locals with a measure of maternal instinct.

A parting thought

A recent paper from Duke "Right now, all the evidence points to having a real friend as the best solution," said Murali Doraiswamy, MBBS, FRCP, professor of Psychiatry and Geriatrics at Duke University and member of the Duke Institute for Brain Sciences. "But until society prioritizes social connectedness and eldercare, robots are a solution for the millions of isolated people who have no other solutions."

Doctors are mostly on board, too, the authors point out. A Sermo survey of 307 care providers across Europe and the United States showed that 69% of physicians agreed that social robots could provide companionship, relieve isolation, and potentially improve patients' mental health.

(Sermo is a social network company targeting doctors)