Il lavoro al confine: tra persone e macchine

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Il futuro del lavoro: 2013
Dalla sostituzione…

THE FUTURE OF EMPLOYMENT: HOW SUSCEPTIBLE ARE JOBS TO COMPUTERISATION?*

Carl Benedikt Frey[†] and Michael A. Osborne[‡]

September 17, 2013

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Abstract

We examine how susceptible jobs are to computerisation. To assess this, we begin by implementing a novel methodology to estimate the probability of computerisation for 702 detailed occupations, using a Gaussian process classifier. Based on these estimates, we examine expected impacts of future computerisation on US labour market outcomes, with the primary objective of analysing the number of jobs at risk and the relationship between an occupation's probability of computerisation, wages and educational attainment. According to our estimates, about 47 percent of total US employment is at risk. We further provide evidence that wages and educational attainment exhibit a strong negative relationship with an occupation's probability of computerisation.

Keywords: Occupational Choice, Technological Change, Wage Inequality, Employment, Skill Demand

JEL Classification: E24, J24, J31, J62, O33.

1

47%

Frey, C. B., & Osborne, M. A. (2017). The future of employment: How susceptible are jobs to computerisation?. *Technological forecasting and social change*, *114*, 254-280.

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GPTs are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models

Tyna Eloundou[1], Sam Manning[1,2], Pamela Mishkin*[1], and Daniel Rock[3]

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Abstract

We investigate the potential implications of large language models (LLMs), such as Generative Pre-trained Transformers (GPTs), on the U.S. labor market, focusing on the increased capabilities arising from LLM-powered software compared to LLMs on their own. Using a new rubric, we assess occupations based on their alignment with LLM capabilities, integrating both human expertise and GPT-4 classifications. Our findings reveal that around 80% of the U.S. workforce could have at least 10% of their work tasks affected by the introduction of LLMs, while approximately 19% of workers may see at least 50% of their tasks impacted. We do not make predictions about the development or adoption timeline of such LLMs. The projected effects span all wage levels, with higher-income jobs potentially facing greater exposure to LLM capabilities and LLM-powered software. Significantly, these impacts are not restricted to industries with higher recent productivity growth. Our analysis suggests that, with access to an LLM, about 15% of all worker tasks in the US could be completed significantly faster at the same level of quality. When incorporating software and tooling built on top of LLMs, this share increases to between 47 and 56% of all tasks. This finding implies that LLM-powered software will have a substantial effect on scaling the economic impacts of the underlying models. We conclude that LLMs such as GPTs exhibit traits of general-purpose technologies, indicating that they could have considerable economic, social, and policy implications.

1 Introduction

As shown in Figure 1, recent years, months, and weeks have seen remarkable progress in the field of generative AI and large language models (LLMs). While the public often associates LLMs with various iterations of the Generative Pre-trained Transformer (GPT), LLMs can be trained using a range of architectures, and are not limited to transformer-based models (Devlin et al., 2019). LLMs can process and produce various forms of sequential data, including assembly language, protein sequences and chess games, extending beyond natural language applications alone. In this paper, we use LLMs and GPTs somewhat interchangeably, and specify in our rubric that these should be considered similar to the GPT-family of models available via ChatGPT or the OpenAI Playground (which at the time of labeling included models in the GPT-3.5 family but not in the GPT-4 family). We examine LLMs with text- and code-generating abilities, use the term "generative AI" to additionally include modalities such as images or audio, and use "LLM-powered software" to cover tools built on top of LLMs or that combine LLMs with other generative AI models.

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80% -> 10%
19% -> 50%

Eloundou, T., Manning, S., Mishkin, P., & Rock, D. (2023). Gpts are gpts: An early look at the labor market impact potential of large language models. *arXiv preprint arXiv:2303.10130*. (Cornell University)
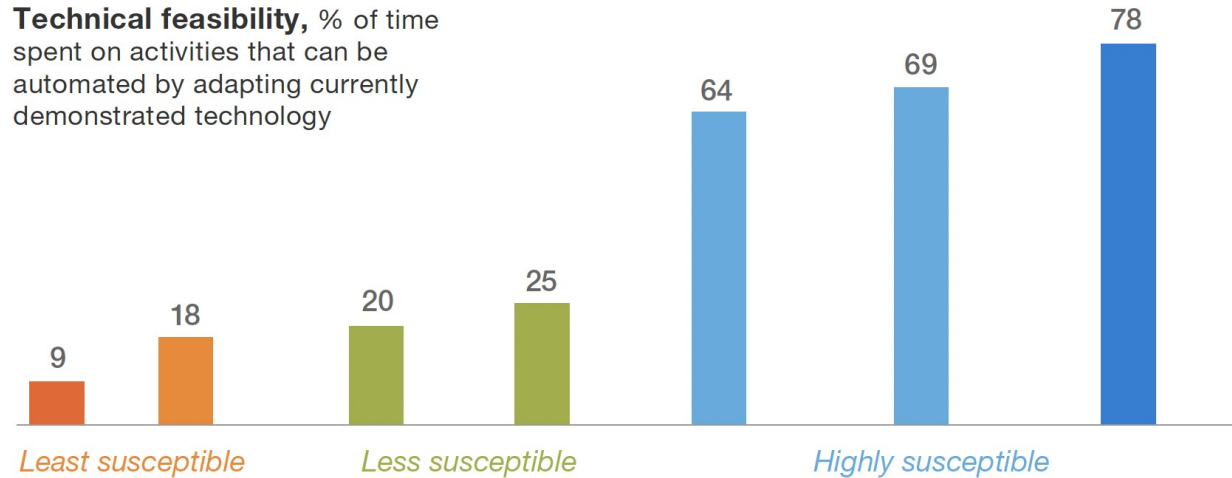
4

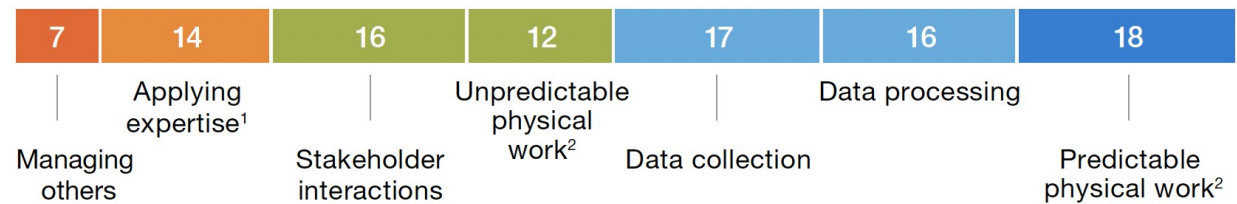Pensare al lavoro come una serie di attività che possono essere svolte dalla tecnologia o dalle persone

Attività difficili da automatizzare (nel 2016)

➤ Gestione dei collaboratori

➤ Presa di decisione

➤ Interazione tra persone

Technical feasibility, % of time spent on activities that can be automated by adapting currently demonstrated technology

78

69

64

25

20

18

9

Least susceptible   *Less susceptible*   *Highly susceptible*

Time spent in all US occupations, %

| 7 | 14 | 16 | 12 | 17 | 16 | 18 |

Managing others

Applying expertise[1]

Stakeholder interactions

Unpredictable physical work[2]

Data collection

Data processing

Predictable physical work[2]

In practice, automation will depend on more than just technical feasibility. Five factors are involved: technical feasibility; costs to automate; the relative scarcity, skills, and cost of workers who might otherwise do the activity; benefits (eg, superior performance) of automation beyond labor-cost substitution; and regulatory and social-acceptance considerations.

Chui, M., Manyika, J., & Miremadi, M. (2016). Where machines could replace humans-and where they can't (yet). *McKinsey Quarterly*, July

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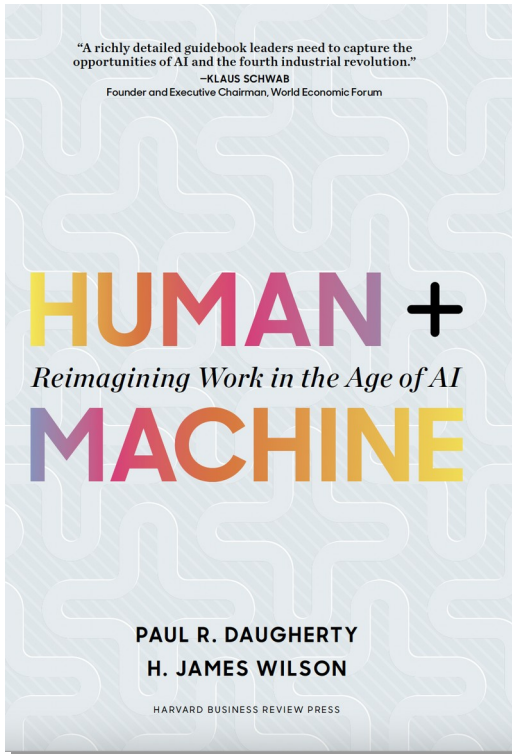
The missing middle

Lead	Empathize	Create	Judge	Train	Explain	Sustain	Amplify	Interact	Embody	Transact	Iterate	Predict	Adapt
Human-only activity				Humans complement machines			AI gives humans superpowers			**Machine-only activity**			
				Human and machine hybrid activities									

Book cover:

"A richly detailed guidebook leaders need to capture the opportunities of AI and the fourth industrial revolution."
—KLAUS SCHWAB
Founder and Executive Chairman, World Economic Forum

HUMAN +
Reimagining Work in the Age of AI
MACHINE

PAUL R. DAUGHERTY
H. JAMES WILSON

HARVARD BUSINESS REVIEW PRESS

Supporto alle attività umane

- Potenziamento capacità analitiche e decisionali
- Supporto alle attività di interazione con i clienti
- Potenziamento abilità pratiche e forza fisica

Essere umano

Macchina
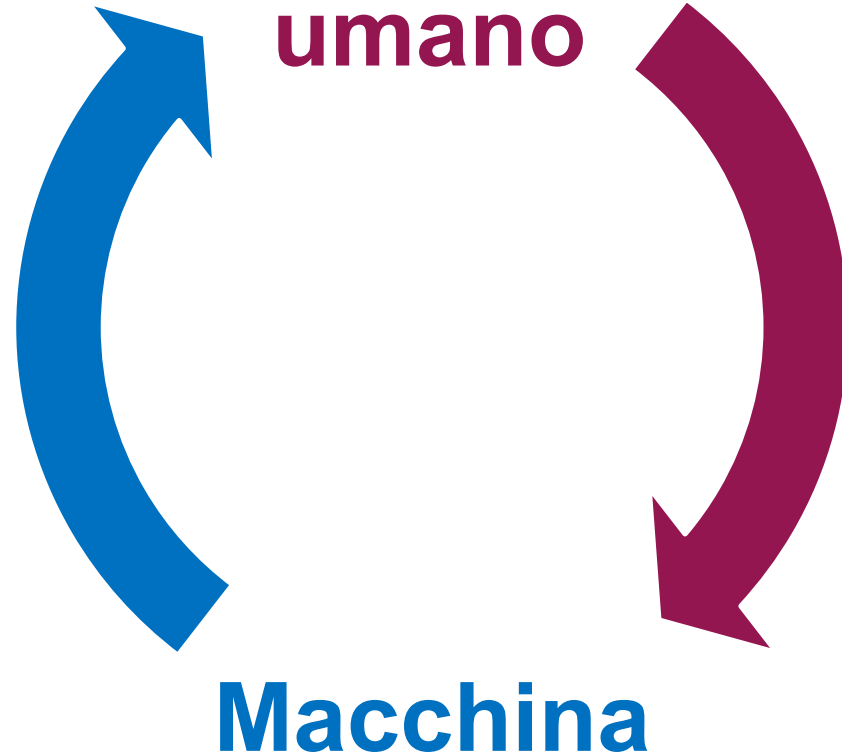
Supporto allo sviluppo della tecnologia

- Addestrare (es. app traduzione, medicina, finanza, emozioni)
- Spiegare il funzionamento e le decisioni a utenti non esperti
- Programmazione decisioni, etica

Un confine che si muove nel tempo