

# Effect of Artificial Intelligence on Job Market

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**Abstract.** This article focuses on the possible impacts of AI robotics on job market and how to deal with it. The development of AI is not the first time in history when labour market faces huge restructure due to new technology inventions, the question is what the past tells about the future. The fear of AI robotics substituting human workforce remarkably resembles the “industrial revolution” when steam engines, looms and cotton gins were first invented, millions of labours across Europe and North America were under threat of unemployment. The result of industrial revolution turned out to be not as devastating as people worried, the transition in economy from handicrafts and agriculture to machine manufactory not only increased productivity but also more jobs and higher wages. By comparing the statistics and differences between AI and industrial revolution, the result again shows that despite the huge impact on unemployment in the short term, the long-term effects are positive. The fear of AI is unnecessary as long as the government seeks to post reasonable regulations on machines and subsidize the structural unemployment workers.

## 1 Introduction

Artificial intelligence (AI), in its broadest sense, is intelligence exhibited by machines, particularly computer systems. It is a field of research in computer science that develops and studies methods and software that enable machines to perceive their environment and use learning and intelligence to take actions that maximize their chances of achieving defined goals [1]. The development of AI led to worldwide panic in fear of machines replacing humans, for AI is capable of doing workloads at a much higher productivity and lower costs. This concern is not without reasons, according to IBM, a notable 77% of businesses are already integrating AI into their operations or actively exploring its implementation [2]. This article seeks to find both the positive and negative impact of AI on long term job markets, will the unemployment rate increase significantly as low skilled workers being eliminated by machines, and how might this change lead to market structure change? The huge impact of automation has already been examined twice in history, “the industrial revolution” when hand craft production was first replaced by machines, and “the information technology revolution” when computers and other electronic devices were invented and later introduced to normal people’s lives. When industrial revolution first happened in Britain, the market underwent transitions from hand works to machine works, new chemical and iron manufacturing lines were established, the development of machine tools led to heavily use

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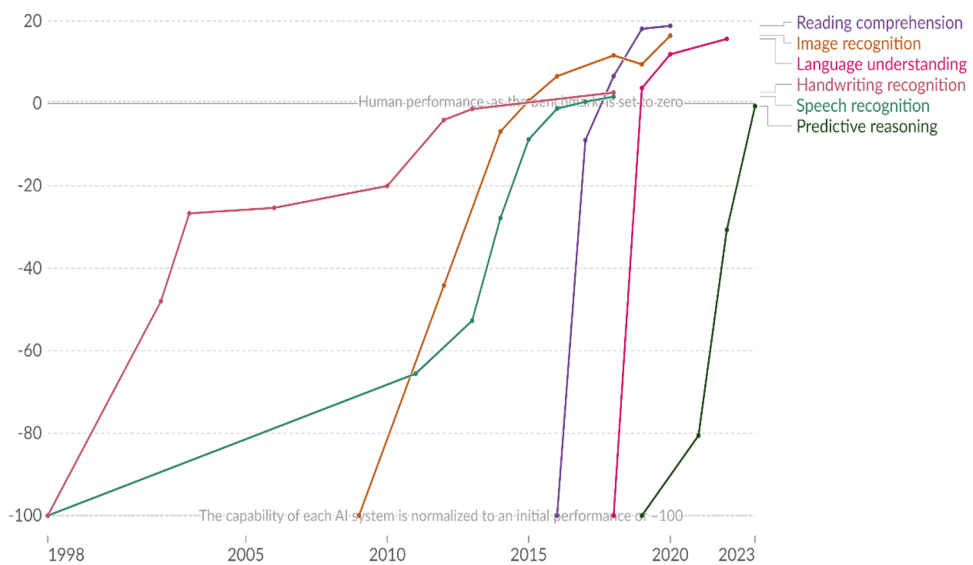
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of water and steam power, automation directly prompted increase in productivity and national income thus more capital investment. Other unexpected results raised such as population boom, shifts from agricultural sector to industrial sector, and urbanization etc. The overall effect of these consecutive events is complicated, but in the long term the unemployment decreased.

The research method for this article is to use similar historical events, such as industrial revolution and information technology revolution, along with basic economics theory to predict future outcomes. This allows people to get a better understanding of the future, about how AI and robotics can help reduce work done, improve productivity instead of replacing humans completely. AI has already been the reason of quite a fraction of total unemployment, in the near future this might become more trending, however decades after the job market will recover, just as it did during the industrial revolution.

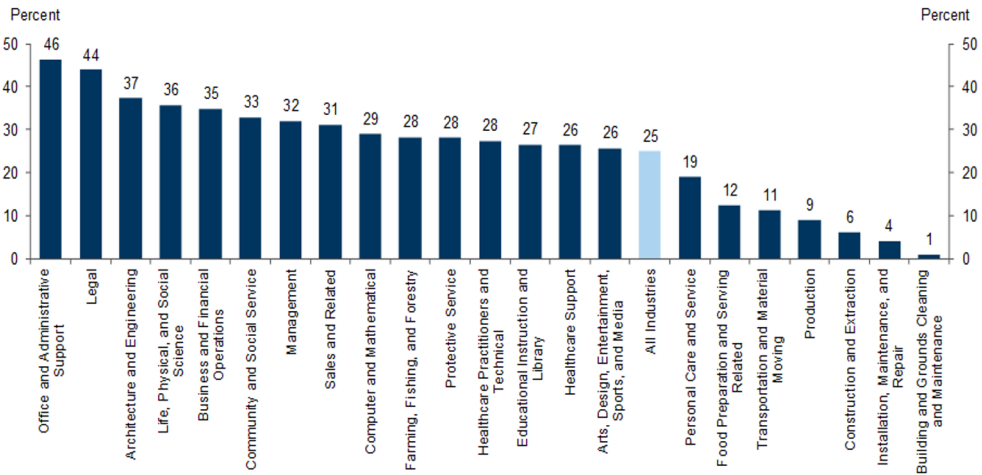
## 2 Current status of AI and robotics

Compared to when electronic tools were first invented, robotics and AI now are incredibly more transcendent than ever. From 1998 to around 2023, according to data collected from experimental tests, AI has surpassed human capabilities in every aspect, which include but not limited to reading comprehension, image recognition, language understanding, handwriting recognition, speech recognition and predictive reasoning (see Figure 1). For more than 10 years AI had slow progress, but recent years showed remarkable achievements, even though the results are based on specific benchmarking tests, they indicate massive potential.



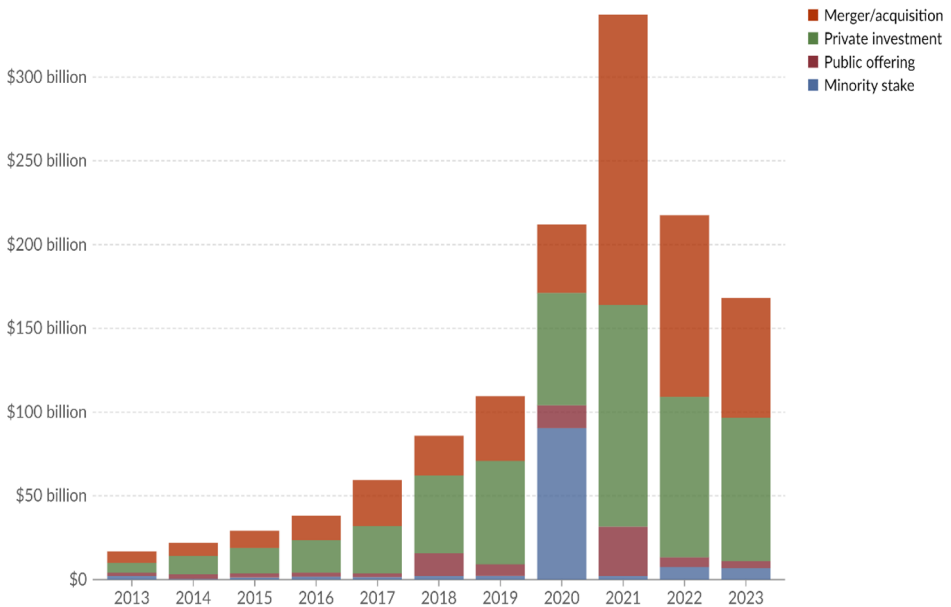
**Fig. 1.** Test scores of AI systems on various capabilities relative to human performance [3]

Decades ago, when AI were only first introduced people were dubious about it, but nowadays seeing the huge benefits behind it, businesses and firms are rapidly adopting AI for their interest. A 2023 McKinsey report reveals that 55% of organizations now use AI (including generative AI) in at least one business unit or function, up from 50% in 2022 and 20% in 2017 [4]. By 2023, nearly all fields of industry in the US were accompanied or exposed to automation by AI, the only difference is the weight used (see Figure 2) [5].



**Fig. 2.** Share of industry employment exposed to Automation by AI [5]

The widely use of AI had already showed the world its capabillity and potential. Investor were attracted and funded greatly in new developing fields of robotics and AI algorithms. Excluding the pandemic periods, Merger/acquisition has increased from aroundn 7 billion in 2013 to 174 billion in 2021, private investment and public offering similarly increased by over 20 times (see Figure 3) [3]. The count of newly funded AI companies spiked to 1,812 in 2024, up 40.6% from the previous year [4].



**Fig. 3.** Annual global corporate investment in AI [3]

However, the progress of AI and robotics raised concerns about how it might promote unemployment or wage decrease. According to Leontief, nearly the entire labor workforce will be replaced by AI in the foreseeable future, expanding unemployment rate to a higher

than ever amount [6]. A model constructed by Frey and Osborne suggested that 47% of the 700 occupations are likely to be computerisable in the next 20 years [7]. It is also found that the chance of unemployment is correlated to one's educated level, the lower the employee's education level, the more likely its wage and job will be negatively impacted by AI [8].

According to some data collected, there are already signs of AI dominating against humans. In May 2023, a total of 3,900 job losses in the United States were directly attributed to AI, accounting for 5% of all job losses during that month. This placed AI as the seventh-largest contributor to job displacement [2]. Another example comes from British Telecom's announcement, which stated their plan to fire up to 55,000 jobs by 2030, including 10,000 workers being completely replaced with some forms of AI robotics [9]. Under the circumstances, the fear of obsolescence is now rising rapidly among workers, from 2021 to 2023 all the full-time workers surveyed, no matter differences in gender, education level, age or income had seen increased anxiety about AI (see Figure 4) [10].

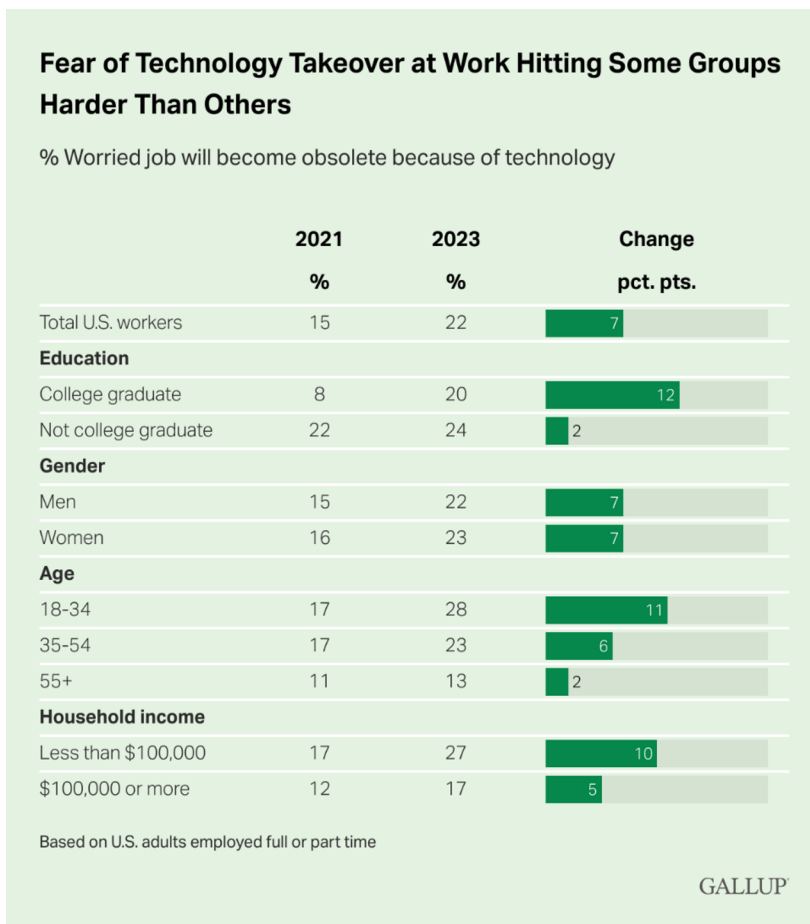


Fig. 4. Fear of AI investigated in groups [10]

### 3 Negative impact of AI on job market

The most significant and well know effect of AI is its possibility to destroy job market. Comparing to human labor, machines require lower cost to operate, don't get tired nor make

mistakes. This makes robotics the perfect substitutes for doing repetitive works that don't require sophisticated skills. Direct result of that is mass unemployment, especially for workers typically on assembly lines. Companies are already on their way to automation. For example, Alibaba as the world's largest e-commerce platform has already applied hyper automation to manage retail operations, including shipping, logistics and predictions, when customers bought or search for goods, the systems automatically compute the preferences and generate personal recommendations for other goods that might be of interest. Foxconn, the company that has more than 4% share of Electronic Manufacturing Services (EMS) is also embracing full automation, as early as 2016 Foxconn has already replaced 60,000 factory workers with robots, the general manager expected that this process is going to speed up in the future. The rapid adoption of AI can lead to short-term unemployment and economic disruption. Workers displaced by AI may struggle to find new jobs, leading to periods of unemployment and economic hardship. In the long run, when more automation takes place, some jobs will be gone for good, skill and wage gaps between workers widen. Poorly educated labor will have to do retraining and learn new skills to make a living.

Manufacturing tools such as looms during the industrial revolution replaced handicraft works, however despite the higher productivity, such machines are complements to human workforce as they require people to make use of it. AI robotics however have the ability operate fully on its own, this makes them more perfect substitutes to workers. The unemployment statistics during the industrial revolution wasn't quantified due to limitations at that time, but multiple riots were initiated at early period of the revolution because of massive job losses, full AI automation in the future will no doubt lead to even more dramatically unemployment and permanent job sector eliminations.

## **4 Positive impact of AI on job market**

Despite possible creative destructions leading to massive unemployment, AI can have huge positive effects on labor market. Just like how industrial revolution prompted new demand for jobs such as mining, railway construction and machine operator, AI has created new jobs especially in the creative work sectors. The development of more advanced AI demands more sophisticated algorithm and programming, at the same time the use of AI need to be monitored carefully to avoid ethics and security issues, which creates jobs such as cybersecurity and AI ethicist. The huge demand for these jobs will lead to increase in wages. AI is a perfect substitute for most of the repetitive works, when labor forces are replaced by AI, they can focus more on non-substitutable and labor demanding works, this leads to higher productivity. In addition, AI can make enterprises easier to thrive, for countries where there are shortages in labor market, firms can reduce cost by replacing employees with AI robotics, this potentially makes enterprises more profitable and easier to set up, when more entrepreneurs enter the market the hole of unemployment can more or less be filled. The overall effects combined improves national economic performance, and benefits the job market with better welfare, working conditions, lowered wage and skill gap etc.

## **5. How to deal with AI revolution**

To prepare against potential mass unemployment, the primary role should be played by the government. In the short run it could strengthen unemployment benefits, social security, and healthcare to provide temporary relief for displaced workers while they transition to new roles. At the same time firms and government should both subsidize career coaching for structural unemployed workers for new skills training so that they don't remain jobless, this can lead to upskilling and reskilling opportunities, fostering a more dynamic and versatile

workforce. In the long run, more national spending should be spared funding educations and enterprises, young labor entering the market should learn some basic programming and practical skills in making use of robotics AI.

At the same time, it should be clarified that AI cannot at least in the near future replace humans completely. According to Markus Schaefer, the head of Mercedes Benz's production, dealing with the degree of individualization and the many variants nowadays are still beyond the capability of robots, the company are saving money and safeguarding their future by employing more people [11]. There's still long way of technology improvements until AI and robotics become so advanced like those in the movies. Instead of being pessimistic about the future, the smartest decision is to actively adapt and evolve for the future.

## 6 Conclusion

In this article the possible effect of AI robotics on job market is discussed and analyzed. The history has already shown the result of automation once, by comparing it with AI revolution the future can be more or less predicted. On the one hand, AI is expected to automate a range of tasks across industries, leading to job displacement, especially in roles involving repetitive or predictable tasks such as manufacturing, data entry, customer service, and logistics. This displacement may exacerbate short-term unemployment and increase income inequality, particularly among low-skilled workers who may struggle to transition to new roles without significant retraining. On the other hand, AI is also creating new opportunities and driving job growth in fields like data science, machine learning, cybersecurity, and AI ethics. The technology's ability to enhance productivity and spur innovation can lead to the creation of new roles that require human creativity, problem-solving, and emotional intelligence—skills that AI cannot easily replicate. Moreover, the rise of AI augments traditional roles, enabling workers to focus on more complex, value-added tasks while leaving routine work to automated systems. This shift can improve job quality and satisfaction, fostering a more dynamic workforce. The threat of unemployment appears terrifying, but eventually the market will go through as they did for the industrial revolution. In the not distant future, the world might see a robotics and human blending working structure, with significantly improved working experience and the same time higher economic output for the whole society.

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