Artificial Intelligence Career Impact Evaluation — Cao

Assessing the Impact of LLMs on the US Labor Market and Your Professional Profile

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06/19/2023

Contents

1 Introduction

Hello, Cao! Welcome to your Artificial Intelligence (AI) career impact report! With this document, you'll be able to understand the impact of the advent of Large Language Models (LLMs), such as Chat-GPT, and Google Bard on 873 specific career paths, and on the whole US labor market, as well as on your own professional profile. We'll also break down what Large Language Models are, what they can and cannot do, and how we should interpretate their economic effects on our society.

To accomplish these complex objectives, we at Atlas Research developed this assessment and other state-of-the-art psychometric models and questionnaires using publicly available data from the Bureau of Labor Statistics (BLS) and the Occupational Information Network (ONET). Together, these databases describe 873 occupations, detailing for every one of them a set of 254 professional characteristics, such as employment opportunities, entry level of education, required skills, abilities and other competencies (rated from 0 to 100), as well as typical job activities, job hazards, and so on.

These highly reliable models and data, then, are employed by our Data Scientists with the aim of helping individuals navigate an everchanging economic environment, so as to fully realize their professional potential. In this context, fastly surging and disruptive technologies, like LLMs, may be considered threats by some people, as digitial automation proposes to improve or even substitute human labor and talent to various degrees. Indeed, when we think of such technologies, many of us worry about their impact on the economy, and on the livelihoods of our loved ones, and our own. For instance, we may find ourselves wondering things like: "Am I going to be replaced by Artificial Intelligence?"; "Will my

children find employment in this new economy? Or will Chat-GPT take their jobs?"; "Should I change majors now that AI is being widely adopted in the labor market?".
Here, we'll clarify many of these unsettling questions. In order to do so, we assess your most important competencies and job preferences, and quantitatively estimate the impact of LLMs on each of them. Next, we aggregate the impact on your entire professional profile as a percentage, indicating how much of your capabilities should still remain relevant after the advent of AI. Of course, we also perform the same analysis for each of the 873 occupations registered by the BLS, thus calculating the net effect of AI on the entirety of the US economy as well.
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2 What Is AI?

Artificial Intelligence (AI) are a collection of powerful machine learning and deep learning algorithms capable of mimicing some aspects of human intelligence. Such models have been theorized in fiction for decades, or even centuries for that matter — if we consider Ancient Greek myths' "automatons" as instances of AI —, but only recently have become actually capable of being implemented. Historically speaking, McCullouch and Pitts' 1943 work in Turing-complete "artificial neurons" is recognized as the first step towards what is generally termed "AI".
However, even though AI is a very broad topic, in this brief report, we'll be concerned only with the most modern advancements in the field, namely: Large Language Models (LLMs).

2.1 What LLMs Can Do

Because LLMs, like OpenAI's Chat-GPT and Google Bard, are subject to so much speculation — or even deliberate marketing-motived disinformation —, it is crucial to distinguish between *fact* and (science) *fiction* when talking about AI. Hence, below we list a few things these generative models *can* do:

1. Automate administrative activities, like writing and sending e-mails
2. Compose apparently original poetry
3. Generate apparently original digital artwork
4. Beat you in a game of chess
5. Score higher than you on the SAT Math exam
6. Give programming advice, and help debug code
7. Carry on a conversation by mimicing linguistic patterns
8. Correctly diagnose a disease, if properly "trained"
9. Sketch out a somewhat coherent blueprint to build a house
10. Tell a joke

2.2 What LLMs Cannot Do

Now, consider some of the things these models, in principle, *cannot* — and will never be able to — do:

1. Be self-aware, as AIs do not have awareness, much less a "self" to be aware of
2. Have consciousness in general
3. Think
4. Fall in love
5. Have aspirations and dreams
6. Create *truly* original artwork
7. Understand the output of its own generative algorithms

8. "Break free" from its "Computer Scientist masters" and program "itself"
9. Formulate questions
10. Do scientific research

3 Measuring the Impact of AI

3.1 Our Psychometric Factor Model

Having understood the genuine capabilities of LLMs, and hopefully having also cleared much of the science fiction misunderstandings surrounding them, we quantify the impact of AI in four instances: 1) in individual professional competencies; 2) in individual career paths; 3) in the entire US labor market; and 4) in your own professional profile.
In order to so, we've developed a factor-analytic comparative statics method to calculate exogenous impacts on particular variables based on these variables' factor loadings. In Psychometrics, factor analysis is an unsupervised machine learning algorithm utilized to clump together variables according to how they correlate to one another. These clusters of variables are called factors, and all 200 items in our psychometric questionnaires have been empirically assigned to 15 factors, via the estimation of SS factor loadings, which can be thought of as the "strength" of relationship of each item to each factor.
Since explaining the intricate statistical procedures employed in the construction of our factor-analytic models is not the main focus of such a brief report, we limit ourselves to listing the factors for which we estimated factor-loadings-based AI impact coefficients: "Discernment", "Mechanical Skills", "Health Science", "Transportation", "Management", "Social Skills", "Analytical Skills", "Business", "Dexterity", "Administrative Skills", "Building", "Intelligence", "Industrial", "Arts & Humanities", and "Robustness".

3.2 The Impact of LLMs on Professional Attributes

The impact of LLMs on a few of the attributes from our database is summarized in Figure 1 below. For brevity's sake, we only show the top 10 most negatively and positively affected professional competencies. To view the full 200 item list, access app.go2atlas.com.

Figure 1 makes clear that, while some job activities and competencies are expected to be negatively affected by the advent of AI, that is *automated* to a medium degree, other competencies should be more in demand by the labor market. Thus, as employees' time is increasingly diverged from menial, robotic tasks, these hours saved with AI-powered automation, then, can be utilized to perform the positively affected tasks.
In other words, we can — and should — think of this LLM-driven labor market transformation not only in the broader context of dying and surging career paths, but also within individual occupations themselves. Hence, more of our time will be employed in the positively affected competencies, as the negatively affected ones become automated. In general, we can say that our daily routines will change, for sure, but probably in a good way: we'll be more engaged in the genuinely "human" side of things, and less in *robotic*, repetitive, and monotonous activities.

3.3 The Impact of LLMs on Individual Career Paths

Furthermore, when we aggregate the individual professional attribute impacts exemplified in Figure 1 for each of the 873 registered BLS occupations, we get the expect impact of AI on every single career path. Here, we take a closer look at the most affected occupation, "Telemarketers":

The dumbbell plot above shows us the current professional requirements for "Telemarketers", compared to the expected requirements after the use of AI becomes widespread. As already stated, some skills are more relevant today than they'll likely be in the future, and alternatively other skills should gain more prominence. The aggregate AI impact score of "Telemarketers" is –21.05%, which means 78.95% of their skill set should still remain relevant with the advent of LLMs. Overall, this occupation is exposed to a

disruptive level of automation, and will probably face partial replacement by LLMs, though to a limited extent.

3.4 The Impact of LLMs on the US Labor Market

But, even though AI definitely will have an economic impact on society, the whole picture is not as grim as it appears. Indeed, it is easy to see that is not the case when we get a glimpse of the distribution of LLMs' impact on individual occupations with the aid of a histogram. A histogram is a data visualization tool which enables us to clearly see the dispersion of a given variable (displayed on the horizontal axis). It works by segmenting data into a desired number of intervals called bins, denoted by the columns on the graph. The height of each column is proportional to the frequency of data points within its bin. Hence, the tallest columns represent the most frequent intervals or classes of data, and as the columns decrease in height, so too the data points in a bin decrease in frequency.

Now, with the employment levels of each occupation, we can calculate the weighted impact coefficent of the advent of LLMs for the entire US labor market. Thus, we estimate an average impact of –13.00%, which is fairly close to the official OECD figures. Therefore, we assess the general economic impact of AI to be of a medium magnitude, as LLMs are relegated to play but an auxiliary function in the labor market. In terms of projected unemployement numbers, this translates into roughly 17,207,898 lost jobs.

3.5 The Impact of LLMs on Your Atlas Professional Profile

Finally, we can perform the same calculations for your own professional profile. By doing so, we find you to be impacted by Artificial Intelligence only to a minor degree, having an aggregate AI impact coefficient of –12.92%, which is very close to the market's average. For a more detailed analysis, your particular professional profile, and the resulting exposure to LLM-driven automation can be visualized in the following dumbbell plot:

4 Finishing Remarks

In this report, we investigated the economic impact of recent developments in the field of Artificial Intelligence, namely the advent of generative technology such as Large Language Models. We began by considering the genuine capabilities and inherent deficiencies of these models, in order to clear common misunderstandings surrounding LLMs and AI in general.
Then, using a factor-analytic comparative statics method, we quantitatively estimated the expect impact of AI on 200 professional attributes. We also aggregated these results for every one of 873 BLS registered occupations. We further aggregated AI impact coefficients using employment levels as sample weights to arrive at an overall economic effect of –13.00%, which means around 17,207,898 workers are expected to be unemployed in the short term due to LLM-driven automation.
However, concerning all of these economic pressures, we at Atlas Research don't think people should be too alarmed. In fact, we assess the AI transformation of the labor market to be more of a catalyst for positive readjustments within each occupation's competency requirements — shifting focus away from menial, robotic, time-consuming procedures, and allowing people to work on more active, and physically-oriented tasks. Thus, in any occupation we expect the time dedicated to administrative duties to decrease, while the remaining job responsabilities increase in importance.
At last, we estimated the impact of LLMs on your own professional profile, by applying the same methodology utilized with the 873 BLS occupations. In your particular case, we assess the level of exposure to AI-driven automation to be very close to the US labor market's average, and not disruptive, but mostly minor, and perhaps, even irrelevant in its nature.
With this, we now conclude your Artificial Intelligence Career Impact Evaluation. Again, this is but a brief overview of the impact of generative-AI-driven transformation on your professional profile, as well as on the whole economy. You can access much more detailed, in-depth reports by registering at app.go2atlas.com today. There, we offer a suite of varied assessments and career support programs, including highly qualified curated mentorships, career roadmaps, and more. Thank you for your time, Cao. The Atlas Team wishes you well. May you find your best professional future ahead!