

Will AI replace most of the workers in financial field?

In March 15, 2016, as the Alphago beat Lee Sedol 4-1 to win the five-game Go match, a kind of chess which is regarded as the last line of defense for privileging human over machines or robots, the concept of artificial intelligence, AI for short, appeals a great deal of attention from various fields. Since then, more and more people are considering since AI can handle so much sophisticated problems like Go, can AI help me solve the problems that I met in life or work? Especially for the management of a corporation, who have been always puzzled about how to manage workers, they might be more willing to consider the possibilities that employing a submissive AI to work for them. In fact, many high-tech companies like Google, Microsoft, Amazon and Facebook have applied AI technologies in their products to improve the performance of some specific applications. Besides that, many traditional financial companies like BlackRock have applied AI in their systems to help the management make better decisions. And this trend is spreading across the entire financial field. This research paper considers whether the AI technology will take over most of the job positions in financial field in the future by responding to the following questions:

1. How widely and deeply has AI been applied in financial field?
2. Why AI is a better choice other than human workers for financial company?
3. What kind of jobs would probably be taken over by AI?

Comparing to human workers, AI is more effective and cheaper for routine jobs which constitute a large part of the job positions in financial companies. It seems inevitable and grim that AI will take over most of human workers' jobs in the financial companies in the future.

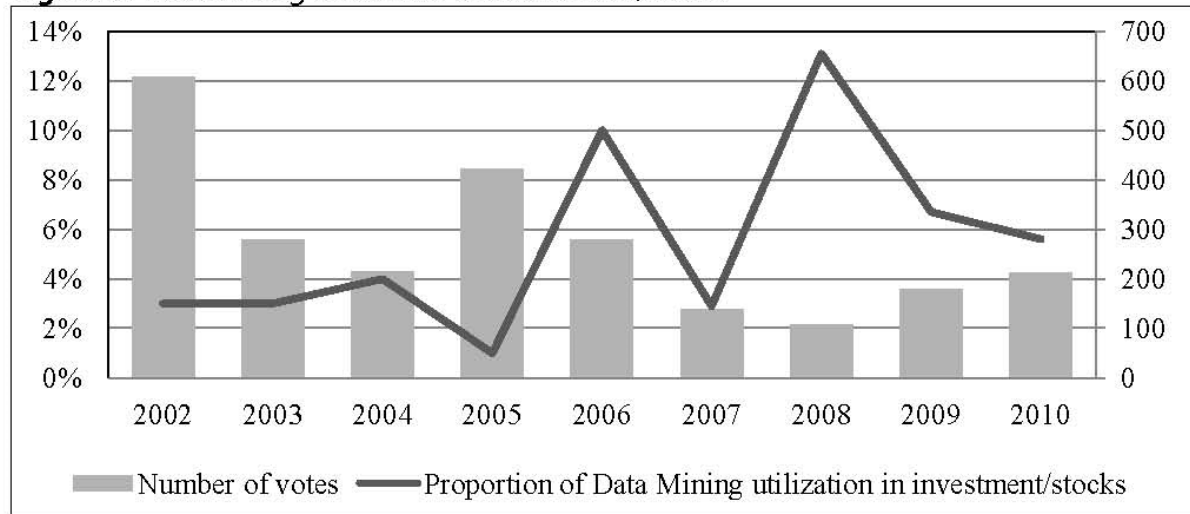
How widely and deeply has AI been applied in financial field?

AI has been applied in multiple dimensions of the financial industry, from trading to research to wealth management. Since about 1990s, people got start to use AI technologies to predict stock price. According to a poll undertaken by KD Nuggets in 2010 (Figure 1) there was an increasing trend in utilizing data mining technique, a kind of AI technology that is often used to design quantitative trading tools, in investment until 2008. Nowadays, almost every significant financial institution utilizes AI technologies to build some models to control risk and manage their money. For example, BlackRock, the world's largest asset management company, operates a proprietary artificial intelligence program, called Aladdin, to manage risk on behalf of its clients (Lin, 2016, p.162). As Lin (2016) pointed, during the financial crisis of 2008, the US federal government turned to BlackRock and Aladdin for guidance on critical decisions, and it shows how powerful the AI technologies could be (p.162). According to Hilovska and Koncz (2012), there are six typical AI technologies being applied in financial field so far: Data Mining, Expert Systems, Genetic Algorithms, Fuzzy Systems, Artificial Neural Networks and Agent-based Computational Economics. Artificial intelligence is not a new concept in financial field, and its application is being developed rapidly and profoundly.

The application of AI technologies has largely changed the organization of the modern finance companies. In 2000, Goldman Sachs employed 600 equity traders for its New York trading desk. But today, it just employs two traders with the machine doing the rest of the work (Maney, 2017, p.47). According to Lin (2016), JPMorgan Chase probably employs more software developers than Google and more technologists than Microsoft in recent years (p.161). This

phenomenon indicates the trend of modern financial companies are becoming high-tech organizations.

Figure 1: Data Mining utilisation in investment/stocks



Note: Number of Votes depicts the absolute number of data miners participating at the poll and the percentages are relative to the number of votes

Source: KDnuggets Pool, 2010[Online].[s.a.].[Cit. 2010-02-01]. Available at:
<http://www.kdnuggets.com/polls/2010/analytics-data-mining-industries-application.html>

Why AI is a better choice other than human workers for financial company?

For most of the tasks in a financial company, AI performs faster, more accurately, more impartial and so on. Work in a financial company that now takes hours, days or weeks of human labor may well be completed in minutes or seconds by AI. According to Barry Libert and Megan Beck (2017), *“The processing power of four smart consultants with excel spreadsheets is miniscule in comparison to a single smart computer using AI running for an hour, based on continuous, non-stop machine learning (p.3)”*. Because of the massive computing power and extraordinary precision of supercomputers on which AI runs, Artificial Intelligence will be able

to collect and analyze huge quantities of data, books, tweets, news reports, financial data, earning numbers and anything that is related to its tasks, and yield accurate and reliable results. Which means decision making with AI support can partly eliminate the bounded rationality of decision maker to make better decisions with more relevant data and information (Hilovska and Koncz, 2012, p.62). Besides, AI don't suffer from the irrational "animal spirits" that move humans. As a management assistant, AI can appropriately recognize and reward performance of the workforce without considering their gender or race. AI can also help make resource allocation decisions based on the money input and profits other than personal preference of the decision maker. Obviously, comparing to human workers, who are limited by their physical strength, processing power of the brains and emotions, AI is more suitable for general tasks in financial field.

In addition, the potential huge cost reduction also appeals financial companies to replace human workers with AI. As Maney (2017) showed, the average compensation for staff in sales, trading and research at the 12 largest investment banks is \$500,000 (p.47). If these banks replace most of their workers with AI, there will be an astronomical number of cost being reduced. Similar financial companies could apply similar AI technologies. Even though the cost of research and development of an AI technology seems very high for a single company today, it remains a fraction of the total potential reduced cost of all financial companies that apply that technology in the future. As a replacement to the human workers, AI is cheaper, faster, more accurately, and more impartial.

What kind of jobs would probably be taken over by AI?

The work that can be broken down into a series of discrete tasks, which are relatively predictable and tend to repeat over and over again, would most probably be occupied by AI (Martin, 2013, p.37). For example, the working process of bank tellers could be divided into four stages- receiving, translating, transmitting and feedback. These tasks are fairly simple that AI could totally handle them. In fact, the automatic machines of self-service have significantly reduced the number of bank tellers. In the future, AI will replace the bank tellers and even eliminate this kind of job.

Furthermore, some job positions that seem creative like trader, fund manager, financial advisor, may well be taken over by AI. A large part of what is paid for with managers' and advisors' service is data analysis and presentation. These workers are very good at gathering, cleaning, processing, and interpreting data from disparate sources, but AI is even better. The AI technology of data mining can be used to efficiently collect and analyze data, while another AI technology of expert systems can be used to emulate the reasoning process of a human expert and make high quality decisions (Hilovska and Koncz, 2012, p.65). Consequently, only people who engage in the truly creative occupations such as the designer of AI algorithms, creator of trading strategy, and decision maker will not be replaced by AI.

Conclusion

Due to the higher performance and lower cost, AI will eventually replace most of the human workers in financial field. In fact, AI technology has been applied in financial field for a few decades, and it is a dispensable part of modern finance. AI exceeds human workers in many ways such as processing speed, amount of memory, precision, impartiality and endurance. In

the future, most general job positions like traders, fund managers would be taken over by AI, and easy jobs like bank tellers will even be eliminated. Only the truly creative jobs such as designers of AI technologies and decision makers will be definitely remained. That means large amount of people will lose their jobs. What should they do next? That is a fairly serious issue deserves to be considered by government and every common people.

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