A Scientometric Analysis of Artificial Intelligence and Big data for well-being and human potential

Zonghe Zhang¹, Han-Teng Liao*¹, Xue Wu¹, Zhichao Xu¹

¹ New Media Research Center, Sun Yat-sen University Nan-fang College, Guangzhou, Guangdong, 510970, China

*Corresponding author’s e-mail: h.liao@oxon.org

Abstract. Technology has a significant impact on our way of life. Research on artificial intelligence and big data and the cross-field of human well-being plays an important role in guiding the application of science and technology to the people-oriented and good application direction. The reviews in this field focused on the achievements of artificial intelligence and big data in a specific field, such as subjective well-being/biobanks/Translational medicine (TM)/connected health (CH) and medical Internet of Things (mIoT). There is no bibliometric study on the use of artificial intelligence and big data to promote human happiness and health. To provide a systematic review of the literature on Positive Artificial Intelligence and Big data, this paper presents the main institutions, authors, funding agencies and disciplines, based on a scientometric analysis of 243 articles collected from Web of Science.

1. Introduction
Technology has a significant impact on our way of life. It is of great significance to study artificial intelligence and big data for well-being and human potential because it can point out the direction of the application of science and technology. Current technology practitioners are increasingly concerned about how to improve well-being and human potential through Artificial Intelligence and Big data. For example, people are using the Internet of things [1,2], social networking data [3], and artificial intelligence [4], to improve our Healthcare capabilities, and use Internet of things to build smart cities and Healthy Cities [5].

The reviews on this topic focused on the achievements of artificial intelligence and big data in a specific field, such as subjective well-being [6], biobanks [7], Translational medicine (TM) [1], connected health (CH) and medical Internet of Things (mIoT)[8]. There is no bibliometric study on the use of artificial intelligence and big data to promote human happiness and health. To provide a systematic review of the literature on Positive Artificial Intelligence and Big data, this paper presents the main institutions, authors, funding agencies and disciplines, based on a scientometric analysis of 243 articles collected from Web of Science.

2. Data and methods
Following the conventions of scientometric analysis, the paper first describes the query design and then explains the mapping protocols and strategies as follows.

2.1. Data query design
Gathering literatures from the platform of Web of Science, we deployed the queries as below:
• TS = ( "AI" OR "Artificial Intelligence" OR "machine learning" OR "Big Data" ) AND TS=("well-being" OR "Positive Technology" OR "Positive Psychology" or "Positive Computing")

About 283 articles were retrieved in November 2019. After deleting the irrelevant articles, there are 243 left. To help us with exploratory analysis, we used VOSviewer to draw the resulting graph.

3. RESEARCH MAPPING RESULTS
This paper aims to provide a literature review on the specific topic of well-being and human potential.

3.1. Annual trends
As is shown in the figure1, the publications on the topic began to appear in 1999 and increased rapidly in 2016, and the growth trend has been consistent.

![Figure 1. Annual Publication Trend from 1997 to 2019.](image)

3.2. Top disciplines
The top four disciplines are Computer Science, Psychology, Engineering, and Health Care Sciences & Services. We can see that the main research direction of this topic is to use big data and artificial intelligence as tools to study human happiness, Ecosystem services and Health care.

| Disciplines                      | %    | Main topics                                      |
|----------------------------------|------|-------------------------------------------------|
| Computer Science                 | 11%  | Data mining, machine learning, artificial intelligence |
| Psychology                       | 8%   | well-being, happiness, mental health            |
| Engineering                      | 7%   | Ecosystem services                              |
| Health Care Sciences & Services  | 5%   | Health care, mHealth                            |

3.3. Top institutions
The University of California System published the most literature on this topic. Apart from the Consiglio Nazionale delle Ricerche, a national research institution in Italy, the University of California system, the University of Pennsylvania and the Massachusetts Institute of Technology are all universities and are all based in us.

| Institutions                          | No. of Articles |
|---------------------------------------|-----------------|
| University of California System       | 20              |
| University of Pennsylvania            | 15              |
| Harvard University                    | 11              |
| Consiglio Nazionale delle Ricerche   | 7               |
| Massachusetts Institute of Technology | 7               |

3.4. Top funding agencies
The National Institutes of Health and the United States Department of Health Human Services funded the most published papers on the topic, followed by the National Natural Science Foundation of China.
Table 3. Top funding agencies

| Funding Agencies                                      | No. of Articles |
|-------------------------------------------------------|-----------------|
| National Institutes of Health                          | 19              |
| United States Department of Health Human Services      | 19              |
| National Natural Science Foundation of China           | 10              |
| National Science Foundation                           | 7               |
| National Institute of Mental Health                    | 7               |

3.5. Top published countries

Research on this topic is dominated by countries with established technology, the main literature is from North America and Europe. The United States has the most research on this topic, followed by the UK.

Figure 2. Top published countries.

3.6. Top cited authors

Breiman and Diener are the most cited expert on this topic. As can be seen from figure 3, cooperation between researchers on this topic is not high.

Figure 3. Top cited authors.
4. CONCLUSION

The purpose of this paper is to understand the research situation of Artificial Intelligence and Big data for well-being and human potential, and the results show that the heat of this research field has gradually increased in recent years, and North America and Europe are the main contribution areas. More and more researchers use big data and artificial intelligence as tools to study human well-being, ecosystem services and Health care. This article provides a reference point for researchers, funding bodies, policymakers, and industry professionals to study the application of artificial intelligence and big data for well-being and human potential.

With the increase in the convenience of data acquisition such as wearable devices, the Internet of things, music data and network usage data, there are more and more things we can do to promote human physical and mental health for well-being and human potential. Not just using smart wear to get physical health data to understand our health [1-4], using music data to understand and promote human mental health [9], future research can combine a variety of these data to research in the field of psychological problem identification and intervention.

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