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Commentary

The Role of Artificial Intelligence Literacy in Biomedical Research and Education

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Commentary

Artificial intelligence is everywhere

Artificial intelligence (AI) is changing the world, and education is no exception. AI will change the way we work, the way we learn, and the way we live [1]. The global AI market, estimated to be $4.06 billion in 2016, is now projected to reach $170 billion by 2025, representing a compound annual growth rate of 55.6% from 2016 to 2025. "The most significant economic gains from AI will be in China (26% boost to GDP in 2030) and North America (14.5% boost), equivalent to a total of $10.7 trillion and accounting for almost 70% of the global economic impact"[2]. By 2028, the GDP impact of AI, in our forecast, will reach some $18.5 trillion globally.This tremendous growth of AI's impact is bound to induce a severe shortage of trained and skilled professionals for all economic sectors, including biomedical science and engineering. One can expect massive educational and training initiatives in the US educational sector in the form of degrees, courses, curriculum changes in higher education, and K-12 as well.The market is currently experiencing this trend with for-profit certification agencies, online course providers, and relatively unqualified eLearning platforms. Examples are Udemy, Coggno, Data camp, or even publishers. These courses, however, do not lead one for an accredited credential or recognized by any educational or governing body. Furthermore, the content, learning standards, and instructor credentials, in many instances,are far from a recognized university-level course/faculty leading a student to a certified diploma or a degree. Yet, the average enrollment in an AI-driven e-learning instance attracts over fifty to sixty thousand learners worldwide with a "Gainful Employment" objective. These are driven by what is commonly known as "Developing Rewarding Hobbies"[3]. Under the emerging federal administration, we hope the department of education will recommend the inclusion of an AI course in the general education curriculum. AI literacy today is where Computer Literacy was back in the mid 1980's. The rest is history.

The prominent role of AI in COVID-19 and biomedical research

The role of Artificial Intelligence is immense amid COVID-19. There are three specific areas where machine learning and deep learning have significant prominence.

a. The rapid increase in the velocity of the spread is out of control. The infection started with a rate following a route of arithmetic progression, moving to a geometric progression by August of 2020. Currently, COVID-19 is at a stage of exponential growth. According to the CDC COVID-19 Tracker, there are 1.1 million cases in the past seven days, as of 11/20/2020 [4]. Each state has a different rate of progression. Thus, beyond statistical forecasting, we need to project the infection spread using machine learning at every state, county, city, and zonal level [5].

b. Without miraculous improvements in our supply chain management (SCM) technology, a COVID-19 vaccine with efficacy is at least eighteen months to two years away.

c. A volume of seven hundred million to eight hundred million vaccine administration is needed for the entire US population with some in reserve, plus damage estimates [6]. We need to start 1.1 million vaccine administration a day, FROM TODAY (11/20/2020), to complete the task in two years at the latest. Realistically, it might be 3 to 3.5 years with advanced and speedy production and SCM infrastructure. AI has a significant role in the distribution, with forecasting, prediction, logistics, and robotics.

d. To the common public, an accuracy of 94% as opposed to97% we suppose, does not make much difference in understanding a potential vaccine's efficacy. "Thanks to engineering applications, machine learning is making it possible to model data extremely well, without using strong assumptions about the modeled system"[7]. AI methods and robotics, however, are not visible in our current biomedical curriculum, beyond limited references, if any, in the research methods paradigm [8]. We believe the contemporary algorithms can classify, detect and predict the likelihood of an event, object, or outcome of a biomedical target variable using vector-based AI models, much faster, with granular visualizations [9].

Boosting AI education and readiness in biomedical sector

There are some 5,300 colleges and universities in the United States, everything from beauty schools to Harvard [10]. Currently,"there are a growing number of universities offering AI-related degrees, mostly in the US and Canada." [11]. We find these courses primarily in CIS, engineering, or computer science degrees. We have conducted an initial forecast with data from the US Educational Statistics [6]. Considering the top 10 college enrollment growth by major, including Business, CIS, Engineering, and Health Science, we can expect an Artificial Intelligence course required by some 4.5 million students by 2028 in STEM and Biomedical education. Projected post-secondary enrollment is 22 million students in the US, which correlates with the National Center of Educational Statistics estimate [12]. As an additional note, worldwide growth in higher education enrolment is expected at a monumental 300 million enrollments by 2030 [13]. This trend represents an excellent opportunity for educational publishers, educational technology, and workforce training sectors. China is aiming to gain "AI Supremacy" by 2030. AI education in China starts at the elementary level[14]. The United States, European Union, and the rest of the world are also to boost the AI education and readiness without being left behind.

Conclusion

Education is the key to compliance like the mask-mandate, acting as a responsible citizen for the next person, and maintaining the discipline of social distancing when it comes to COVID-19. There will be other pandemics. The world needs an understanding and education of managing the macro crisis to contribute to the more significant cause. As common knowledge, artificial intelligence will improve social responsibility, public health awareness, and scientific progress momentum. In reality, that awareness needs to start early on, at the secondary education level, in the US.

References

1. Keng S, Yizhi M (2018) Artificial intelligence impacts on higher education. AIS Electronic Library (AISeL), USA, pp. 1-5.
2. Gerard Verweij, Rao Anand (2019) PwC's global artificial intelligence study: Exploiting the AI revolution. PwC Whitepaper, USA.
3. Yash Sharma (2020) Are udemy courses accredited? Learner's Hub, USA.
4. (2019) United States COVID-19 cases and deaths by state. CDC COVID Data Tracker, USA.
5. Ritanjali M, Thangeda R, Sugasi RP, Kumar N (2020) Analysis and prediction of COVID-19 trajectory: A machine learning approach. Journal of Public Affairs pp. 1-8.
6. (2020) Frequently asked questions about COVID-19 vaccination. Coronavirus Disease 2019 (COVID-19), USA.
7. Kording Kp, Benjamin As, Farhoodi R, Glaser JI (2018) The roles of machine learning in biomedical science. In: National Academy of Engineering. Frontiers of Engineering: Reports on Leading-Edge Engineering from the 2017 Symposium. National Academies Press, USA. pp. 1-140.
8. Kenneth FR, Koprowski R, Skufca JD (2014) Machine learning, medical diagnosis, and biomedical engineering research–commentary. Biomed Eng Online 13: 94.
9. (2019) How many universities & colleges are in the US? Education Unlimited, USA.
10. Cabe Atwell (2019) More colleges offer AI courses toward degrees. EE Times. NCES, USA.
11. (2020) Online Codebook. NCES, USA.
12. Hussar WJ, Bailey TM (2020) Projections of education statistics to 2024. In: Institute of educational sciences, (43rd edn), USA. pp. 1-174.
13. (2018) Study projects dramatic growth for global higher education through 2040. ICEF Monitor, USA.
14. Yang Charlotte (2018) AI education in China starts young. Society & Culture, China.