Is A.I. making the biomedicine's Newtonian moment?

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Abstract:
In 1687 AD, Newton published the theory of universal gravitation and the three principles of dynamics. From then on, the speed and interaction of objects became predictable, laying the foundation for the Industrial Revolution. Over the next two hundred years, great changes occurred in human civilization.

In 1972 AD, Nobel Prize winner Christian Anfinsen said in his acceptance speech that he dreamed that one day in the future, humans could "predict the structure of proteins, the building blocks of organisms, directly from the amino acid sequence." Thereafter, the operating principles of the body and the effectiveness of drugs are easier to understand and predict scientifically and accurately. Today, 50+ years later, the dream has come true step by step. In December 2021, Science Magazine selected "Successful Prediction of Protein Structure using AI", as the greatest scientific achievement of mankind that year. This research was later recognized by 2024 Nobel Prize.

In 2020, the ABI medical white paper selected Graphen, Google, and NVidia as the companies that would have the most significant impact on drug development. Graphen combines AI graph network computing, deep learning and generative AI to develop the Graphen Atom system, which includes protein structure, function, binding prediction, digestion and absorption metabolism model prediction, genome reasoning, etc., to generate new drug candidates with high specificity and low side effects, potentially may help treat 70% of human diseases in the future. In this speech, I will introduce how we develop how we develop the state-of-the-art AI technologies for biomedicine to realize this dream step by step.

Short Bio:

Dr. Ching-Yung Lin (林清詠) founded Graphen, Inc. in 2017 in New York and serves as CEO. Graphen's mission is to develop State-of-the-art AI technology for the well-being of mankind. A recent ranking ranked Graphen as the Top #9 AI company in the world. Graphen is headquartered in New York and has branches in Taipei, Tokyo, Hong Kong, Singapore, and Beijing.

Dr. Lin has been an adjunct professor in the Department of Electrical Engineering and Computer Science at Columbia University since 2005. Prior to founding Graphen, he was the Chief Scientist at IBM Corp and founder of the Network Science and Machine Intelligence Group at the IBM T. J. Watson Research Center. He joined the Watson Research Center in 2000 and was appointed an IEEE Fellow in 2011. He has also been an adjunct professor at New York University (2014) and the University of Washington (2003-2009). Inspired by the idea that the human brain is a network of billions of nodes, his interest has always been in artificial intelligence that enables full-brain functionality through fundamental R&D breakthroughs. In the past 20+ years, he has led tens of large-scale global AI projects, including one project of 40 researchers from Columbia, CMU, Northeastern University, Northwestern University, University of California, Berkeley, and Stanford Research Institute. His works were deployed in the United States, EU, China, Russia and Southeast Asia.

Dr. Lin has been an invited keynote speaker at more than 70 conferences, including serving as a co-speaker with the White House Chief Data Scientist at the 2015 American Medical Association Annual Meeting. He has also been invited to give speeches at the Federal Reserve, European Central Bank, U.S. Financial Supervisory Committee, Pentagon, etc. He is the author or co-author of more than 200 publications, holds 75+ patents, and cited more than 13,000 times with an h-index of 57. He was the 2009-10 Chair of IEEE CAS Multimedia TC and the General Chair of the 2009 IEEE International Multimedia Conference. In 2003, he initiated and led 111 researchers in video annotation at 23 institutes around the world, establishing the first-ever machine learning foundation in computer vision, a field that has driven AI innovation for more than 20 years. Dr. Lin's work has received 7 best paper awards and been featured four times in BusinessWeek magazine, including as a cover story in May 2009. Dr. Lin is from Tainan and received a PhD from Columbia University and a M.S. and B.S. in Electrical Engineering from National Taiwan University. In 2010, the IBM Career Review selected Dr. Lin as "a scientist most likely to have the greatest scientific impact on IBM and the world."