



Does everyone understand the terminology ‘borrowed’ from computer sciences creeping into medical sciences?

Gurinder Singh^{1,2^}

¹The University of Kansas Medical Center, Kansas City, KS, USA; ²The University of Missouri-Kansas City Medical Center, Kansas City, MO, USA

Correspondence to: Gurinder Singh, MD, MHA. 10710 West 130th Terrace, Overland Park, KS 66213, USA. Email: gurindersingh555@hotmail.com.

Comment on: Li M, Zhou J, Chen Q, *et al.* Choroid automatic segmentation and thickness quantification on the swept-source optical coherence tomography images of highly myopic patients. *Ann Transl Med* 2022;10:620.

Submitted Apr 20, 2022. Accepted for publication May 05, 2022.

doi: 10.21037/atm-22-2054

View this article at: <https://dx.doi.org/10.21037/atm-22-2054>

Terminology used in computer sciences has gradually made in-roads into medical sciences (1-4). In the recent past, especially, during the last two three decades, computers and artificial intelligence (AI) has exponentially grown into almost every aspect of human life. Physical and clinical examination to derive inferences by trained human being is being fast replaced by computer gathered data and analysis. Such an example is the article by Li *et al.* (1) where the data analysis and the terminology used is computer based. I subtly suggested to the authors to change (or elaborate on) the terms used in the manuscript but they have continued to prefer the terms which are widely ‘accepted’ in published literature. These terms are commonly used and understood in the medical research field but need to be understood, I feel, by clinicians for application in day-to-day practice of medicine. I was not surprised to find out that medical students, residents in training and even clinical practitioners were not fully informed about such terms. That made me put together the following commentary that, I hope, will facilitate readers not familiar with the ‘borrowed’ terminology to make better sense of the article.

Since the concept was introduced in 1950s, most of us are familiar with the term ‘AI’. AI is computer generated information (intelligence) where computers are made to think and reason in a way ‘similar’ to human brain. Software programs are developed and fed to the computers for data analysis and derive inferences from it.

That leads us to the term “machine learning”. Machine learning is making the machines (computers) be able to

think and learn without explicitly programming for each and every step of data analysis.

It is further refined to make “deep learning”. Deep learning is the learning of a computer to analyze raw data fed to it and reach at some algorithm(s). That information is checked for accuracy (or inaccuracy) by human being. The refined data is further fed to the next ‘neural layer’ of ‘the computer’ (not neural layer of human brain) for better analysis, rechecked for accuracy (or inaccuracy) and fed to next neural layer of computer and so on; going deeper and deeper into the ‘computer brain’ for better and more refined data analysis. Deep learning is refining and improving the process of machines (computers) learn new things, and mimic how human brain learns new information.

Now we reach at the next term called “ground truth”. Ground truth is the term used in analyzing ‘satellite’ generated imagery of a particular location on the ground. Data gathered by satellite is compared with the ‘true’ information of materials and features on the ground’ gathered by human being. This term has been used in the published literature and in this referenced article (1) to compare the data gathered by the used technology with the ‘true’ information of the choroidal thickness as determined by clinical information, optical coherence tomography (OCT) or otherwise.

More and more published literature is accumulating in ophthalmic journals using these words and such terminology. Therefore, it becomes ‘imperative’ for the authors to explain and elaborate on such terminology,

[^] ORCID: 0000-0003-2850-4115.

which is relatively new in medicine but making inroads in medical field. I hope this above explanation would facilitate the readers not familiar with the terminology to better understand the article(s).

Acknowledgments

Funding: None.

Footnote

Provenance and Peer Review: This article was commissioned by the editorial office, *Annals of Translational Medicine*. The article did not undergo external peer review.

Conflicts of Interest: The author has completed the ICMJE uniform disclosure form (available at <https://atm.amegroups.com/article/view/10.21037/atm-22-2054/coif>). GS serves as an unpaid editorial board member of *Annals of Translational Medicine* from April 2022 to March 2024. The author has no other conflicts of interest to declare.

Ethical Statement: The author is accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Open Access Statement: This is an Open Access article

distributed in accordance with the Creative Commons Attribution-NonCommercial-NoDerivs 4.0 International License (CC BY-NC-ND 4.0), which permits the non-commercial replication and distribution of the article with the strict proviso that no changes or edits are made and the original work is properly cited (including links to both the formal publication through the relevant DOI and the license). See: <https://creativecommons.org/licenses/by-nc-nd/4.0/>.

References

1. Li M, Zhou J, Chen Q, et al. Choroid automatic segmentation and thickness quantification on the swept-source optical coherence tomography images of highly myopic patients. *Ann Transl Med* 2022;10:620.
2. Masood S, Fang R, Li P, et al. Automatic Choroid Layer Segmentation from Optical Coherence Tomography Images Using Deep Learning. *Sci Rep* 2019;9:3058.
3. Burlina P, Paul W, Liu TYA, et al. Detecting Anomalies in Retinal Diseases Using Generative, Discriminative, and Self-supervised Deep Learning. *JAMA Ophthalmol* 2022;140:185-9.
4. Baur C, Wiestler B, Albarqouni S, et al. Deep autoencoding models for unsupervised anomaly segmentation in brain MR images. In: Crimi A, Bakas S, Kuijf H, et al. editors. *BrainLes 2018: Brainlesion: Glioma, Multiple Sclerosis, Stroke and Traumatic Brain Injuries*. Cham: Springer, 2019:161-9.

Cite this article as: Singh G. Does everyone understand the terminology 'borrowed' from computer sciences creeping into medical sciences? *Ann Transl Med* 2022;10(11):618. doi: 10.21037/atm-22-2054