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**EDITORIAL**

# Connections

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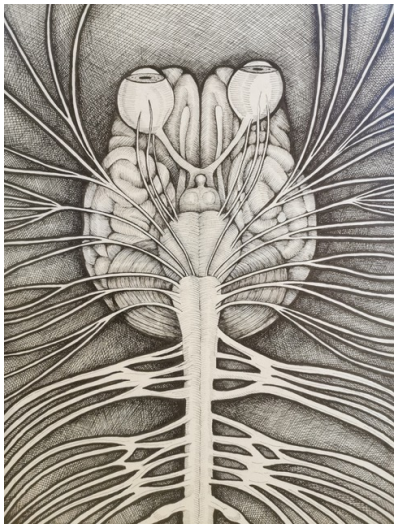

The human brain contains around 86 billion nerve cells and about as many glial cells [1]. In addition, there are about 100 trillion connections between the nerve cells alone. While mapping all the connections of a human brain remains out of reach, scientists have started to address the problem on a smaller scale.

The term artificial neural networks (ANNs or simply neural networks (NNs), encompassing a family of nonlinear computational methods that, at least in the early stage of their development, were inspired by the functioning of the human brain. Indeed, the first ANNs were nothing more than integrated circuits devised to reproduce and understand the transmission of nerve stimuli and signals in the human central nervous system [2].

The correct way of doing it is to the first study human behavior. The human brain has a biological neural network that has billions of interconnections. As the brain learns, these connections are either formed, changed or removed, similar to how an artificial neural network adjusts its weights to account for a new training example. This complexity is the reason why it is said that practice makes one perfect since a greater number of learning instances allow the biological neural network to become better at whatever it is doing. Depending upon the stimulus, only a certain subset of neurons are activated in the nervous system.

Recently, Moreau et al., [3] published an interesting paper studying how artificial intelligence can help doctors and patients with meningiomas make better treatment decisions, according to a new study. They demonstrated that their models were capable of predicting meaningful individual-specific clinical outcome variables and show good generalizability across the Surveillance, Epidemiology, and End Results (SEER) database to predict meningioma malignancy and survival after specific treatments.

Statistical learning models were trained and validated on 62,844 patients from the SEER database and a model scoring for the malignancy model was performed using a series of metrics. A free smartphone and web application were also provided for readers to access and test the predictive models (www.meningioma.app).

The use of artificial intelligence techniques is gradually bringing efficient theoretical solutions to a large number of real-world clinical problems related to the brain (4). Specifically, recently, thanks to the accumulation of relevant data and the development of increasingly effective algorithms, it has been possible to significantly increase the understanding of complex brain mechanisms. The researchers' efforts are creating increasingly sophisticated and interpretable algorithms, which could favor a more intensive use of "intelligent" technologies in practical clinical contexts.

Brain and machine working together will improve the power of these methods to make individual-patient predictions could lead to improved diagnosis, patient counseling, and outcomes.

**Figure Credits:** Dr. Henrique Tardelli

We gratefully appreciate his contribution.

Dr. Henrique Tardelli is a plastic surgeon and an illustration artist.

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