Artificial intelligence: Should you be scared?

Dr Andrew Botros

Glebe Voices, July 19, 2017

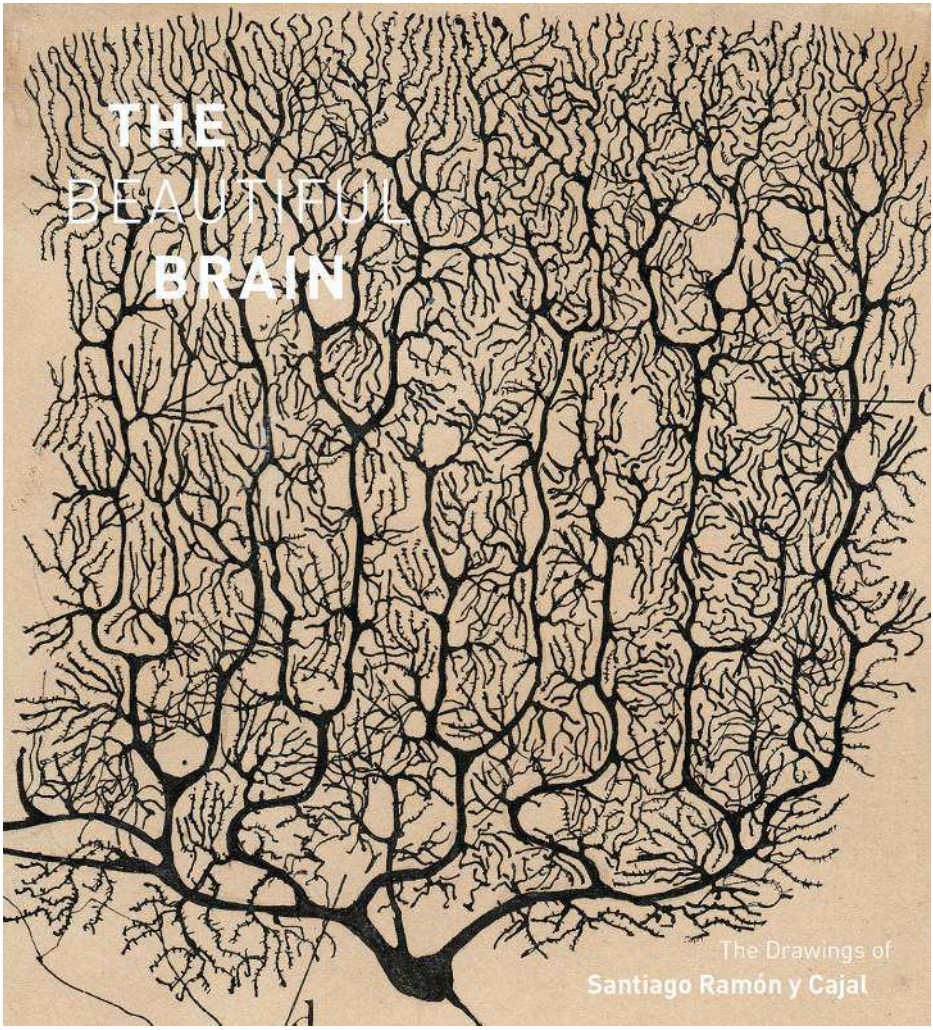

Fig 1. Drawing of brain tissue by Santiago Ramón y Cajal, 1899. Ramón y Cajal won the 1906 Nobel Prize in Physiology or Medicine.

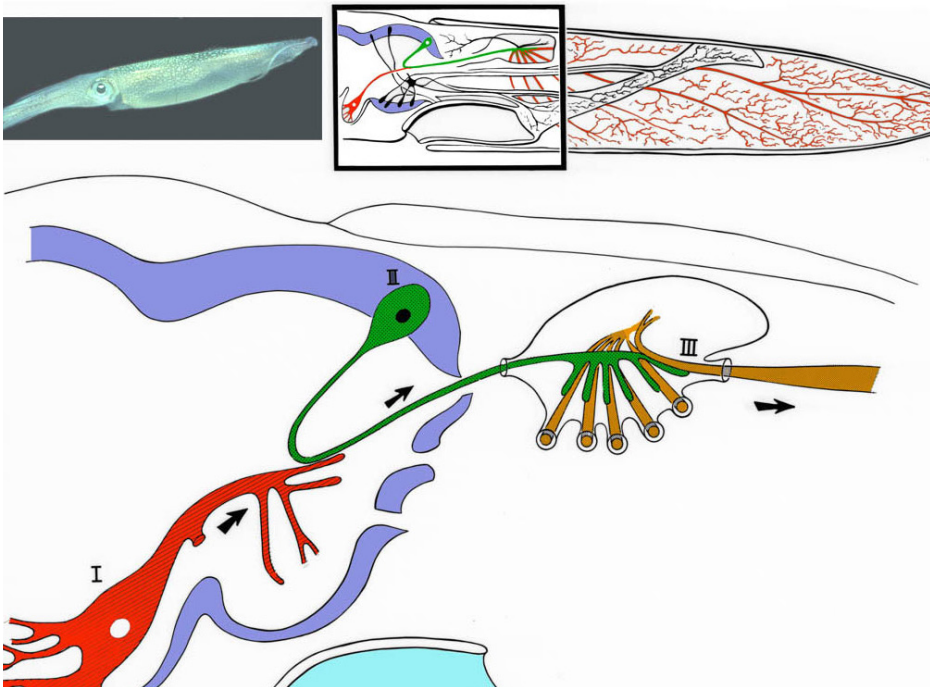

Fig 2. The squid giant axon (III), a single neuron typically around 0.5mm in diameter. Action potentials are transmitted from neurons I to II to III for propulsion.

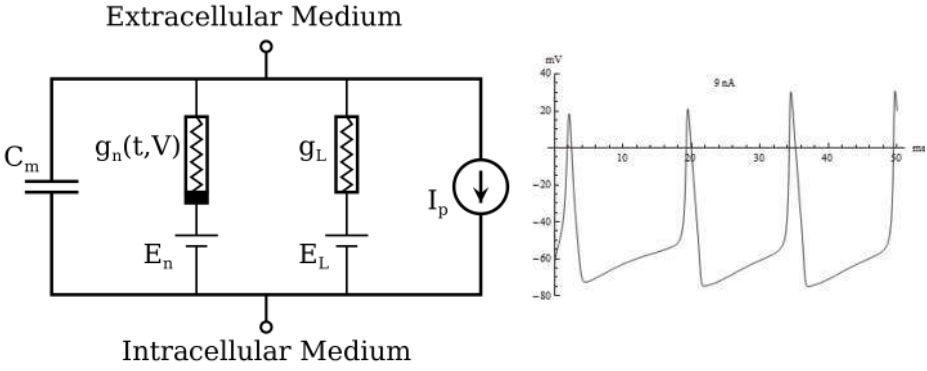

Fig 3. The Hodgkin-Huxley model of the neuron and its action potential. Alan Hodgkin and Andrew Huxley won the 1963 Nobel Prize in Physiology or Medicine.

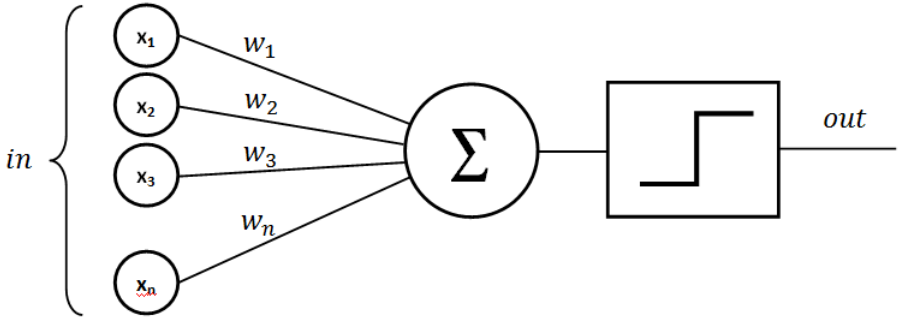

Fig 4. The *perceptron*, the computational unit of *artificial neural networks*, a machine learning techinque. Like an action potential, the output is 1 if the weighted sum of the inputs is great enough, 0 otherwise.

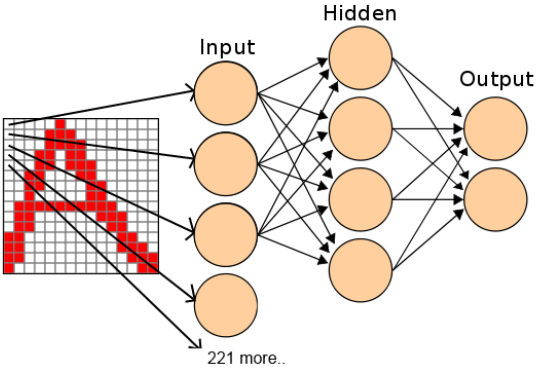

Fig 5. A neural network for optical character recognition (OCR). Right: Australia Post advertisement introducing postcode squares, 1990.


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AutoNRT™: An automated system that measures ECAP thresholds with the Nucleus® Freedom™ cochlear implant via machine intelligence

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Fig 6. Flipping the neural network on its head: my own artificial intelligence system which recognises action potentials, 2007. **Download at expressiveeng.com.au/cochlear**

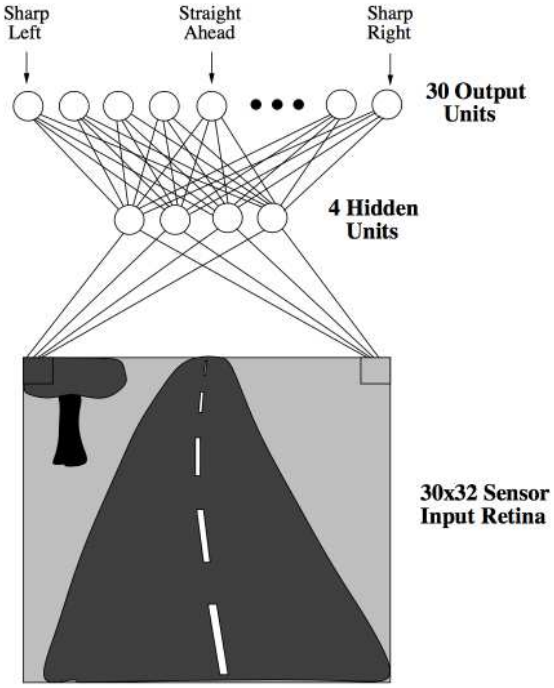

Fig 7. Back to the future: the concept of a car driven by a neural network, in Mitchell, *Machine Learning*, 1997.

Autonomous cars have achieved sufficient accuracy through the use of *deep* neural networks, typically needing cloud computation. The first death by autonomous car occurred in Florida, 2016, involving a Tesla.

Fig 8. One of Google's server farms in Iowa, enabling cloud computing.