A Nature Inspired New Golden Age

A discussion on how Artificial Intelligence came into reality and how Neural Network's idea was inspired by the concept of a scientific brain copying the basic features of a biological brain as that of a bee.

Optimism and ambition for artificial intelligence were flying high when the subject was formalized in the 1950s. Initial successes saw computers playing simple games and proving theorems. Some were convinced machines with human-level intelligence would appear within a decade or so. But artificial intelligence proved hard, and progress stalled. The 1970s saw a devastating academic challenge to the ambitions for artificial intelligence, followed by funding cuts and a loss of interest.

It seemed machines of cold hard logic, of absolute 1s and 0s, would never be able to achieve the nuanced organic, sometimes fuzzy, thought processes of biological brains. After a period of not much progress, an incredibly powerful idea emerged to lift the search for machine intelligence out of its rut. Why not try to build artificial brains by copying how real biological brains worked? Real brains with neurons instead of logic gates, softer more organic reasoning instead of the cold hard, black and white, absolutist traditional algorithms.

Scientists were inspired by the apparent simplicity of a bee or pigeon's brain compared to the complex tasks they could do. Brains a fraction of a gram seemed able to do things like steer flight and adapt to the wind, identify food and predators, and quickly decide whether to fight or escape. Surely computers, now with massive cheap resources, could mimic and improve on these brains? A bee has around 950,000 neurons - could today's computers with gigabytes and terabytes of resources outperform bees?

But with traditional approaches to solving problems - these computers with massive storage and superfast processors couldn't achieve what the relatively minuscule brains in birds and bees could do.

Neural networks

Neural Networks emerged from this drive for biologically inspired intelligent computing - and went on to become one of the most powerful and useful methods in the field of artificial intelligence. Today, Google's Deepmind, which achieves fantastic things like learning to play video games by itself, and for the first time beating a world master at the incredibly rich game of Go, have neural networks at their foundation. Neural networks are already at the heart of everyday technology - like automatic car number plate recognition and decoding handwritten postcodes on your handwritten letters.

This course is about neural networks, understanding how they work, and making your own neural network that can be trained to recognize handwritten human characters, a task that is very difficult with traditional approaches to computing.