

# Artificial Intelligence An Engineering Approach

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ELE 382  
11.13.06

Computers are getting faster, capable of performing massive computations at incredible speeds. Humans are creative, insightful, and powerful. Artificial Intelligence tries to couple a computer's insane computation with the ability to learn and to adapt, in essence think like a person. To the majority of the world, this is either scary as anything, or the greatest idea ever. To biomedical engineers, it can mean great advancements.

Using the technology of Artificial Intelligence, machines can be used to accelerate the world we are creating.

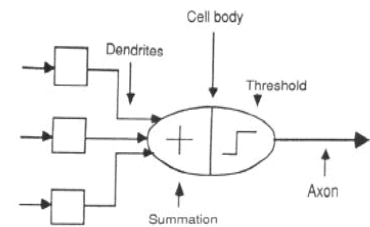
The idea started as early as the 17<sup>th</sup> century with Rene Descartes envisioning animals in the future being complex machines, at least partly. The idea evolved as the 1900s approached, and in the 1950s, algorithms began to be produced. The 60s and 70s brought promising ideas and mechanical methods of computation. The 80s and 90s began to use neural networks to model the neuron, in an effort for engineers to be able to build such neural networks.

The brain sends its signals through a network of neurons connected by dendrites and axons, which meet at the synapse. Learning involves the rearranging of the synapses, changing the internal workings of the mind.

This gives room for learning and advancing.

Although computers are extremely powerful, they are limited to what humans program them with.

Artificial Intelligence aims at bridging that gap by training computers, as opposed to programming them. This idea is called Pattern Recognition and it involves inputting various input patterns and providing the system with a given output. The more input patterns received 'teach' the system, and when it encounters a pattern it does not recognize, the computer will provide an output that is the least different from all the possible



outputs. The model to represent a neuron is very similar to that of a real neuron, with the possible inputs coming in, with one output out. There are to be two modes, the teaching mode and the using mode.

The implementations of this technology are vast. Many consumer products will benefit from AI, such as household items and games. Video games today are already very close to AI. There are business implementations, and more importantly medical implementations. Such include cardiovascular mapping and the artificial nose. Another is the Instant Physician, which provides courses of action depending on patient history and symptoms.

## Sources:

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