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9 Algorithms Ch. 6

For the first time we are dealing with something that humans are better at than computer, that something is patter recognition. There are many forms of pattern recognition including face recognition, object recognition, speech recognition, and handwriting recognition. This chapters discusses how computers act intelligently and those algorithms include the nearest neighbor-neighbor trick, the twenty questions trick, and artificial neural networks.

The nearest neighbor trick is quite what it sounds like, you make an educated guess about some data depending on previous data you have seen. While this is not 100% accurate most of the time you can get a good idea about the data. The example in the book uses handwritten 2’s to show how the nearest neighbor trick can be used in the real world. It shows the number two written twice side by side. When you do subtraction of both of those images you only get a 6% difference. Where as when a two and nine are written together there is a 21% difference which makes the two 2’s nearest neighbors. A special property of the nearest neighbor trick is that it does not require any specific learning phase like the next algorithm, decision trees.

A decision tree is basically a pre-planned game of twenty questions. You start by asking questions and getting answers and keep following that path until you arrive at an answer. The point of a decision tree is that if you are given enough data, it is possible to learn a decision tree that can produce a legit answer. The computer takes training data from a person and will learn all about the results of that data. While it takes the computer some time to learn that data, it ends up being able t recognize patterns very quickly which pays off in the end. The weakness of this algorithm is that’s it can’t doing everything on its own and requires training data. The next algorithm is neural networks and is directly inspired by the way humans learn.

A neural network is meant to copy the way the human brain works. For a lot of computer scientists, making a computer that mimics the human brain is the goal. Alan Turing tried to do so in the 1900s and it has still not been totally perfected. Neural networks use the same principle as the brain in that the computer send signals from one place to another until an output in found. A weakness about neural networks is that the algorithm must be continuously tweaked and there is no room for error.

These three algorithms are the base of artificial intelligence and they can all be in use of some sorts in the real world. While the world is already making incredibly smart computers we are still waiting for that breakthrough where a computer can become smarter than a human. The big question is, should that be allowed to happen and how dangerous could that be.