Comparative Networks beyond Algorithms

Genetic networks rely on specific contacts as well as unit densities. The units are mobile and interact in a defined space. I feel comparing these two networks might provide interesting insights.

There has been much speculation on the similarities between different networks. Given that a network is the group of interconnection between just about anything, it is easy to identify similarities.

As is often the case the devil is in the details. The use of different terminologies between diverse networks leaves much space for speculation and allows seeming similarities to exist which the specific details would not support.

One common term that reoccurs is algorithm. If an algorithm is a “set of rules in problem solving” then it would be necessary to describe these rules as well as why and when they were applicable.

As a side not it is worth noticing that the very concept of algorithm has a historical origin in expressed in step-by-stem procedures. While this may have started in the field of mathematics, has been used to describe recipes to search engines.

The algorithm came to its heyday in the description of Von Neumann architecture computer software.

In this case an algorithm was implemented in a stored program running in a computer memory.

However the supremacy of algorithm as the units of programs while of upmost importance now has a rival. As is often the case even todays Artificial intelligence programs build on algorithms however the algorithm is at a lever on which the actual AI is implemented and not central to the results of the AI itself. Of course at the primitive level of today’s AI, the algorithm has an extreme influence on the AI results. However this is trivial for example in the intelligence exhibited by humans.

This immeasurable gap between Ai and human intelligence begs the question of the place for the concept of an algorithm in our brains.

I was once asked by a professor in philosophy, do you really think a person uses a rules when approaching a stop light.

My answer was the behavior when approaching a stop light can be described as a set of rules much like the previous generation of “rule-based systems. And in that respect the answer is yes, however the human mind is not a rule based system and any seemingly based rules are only the result of the need to communicate ones thought process.

These presented “rules” themselves are the product of a complex network of interconnected participants each presenting its own view of the real time situation. This network of interaction can only be described as algorithmic or rule based in its simplest and lowest common denominator at a sub cellular level

In these rule-based systems the rules were predefined hand-crafted rules. The rules were static and limited by the original conception and often lead to brittle ridged decisions. These systems were often know as expert systems mirroring the a limited small set of rules that an expert might see as relevant in a limited set of circumstances It is also obvious that trying to describe an experts rezoning in a set of simple rules has enormous limitations. As opposed to an accrual expert, these system lacked common sense and lack of creativity as well as a rigidity of a simple set of rules.

Any comparison of networks should take in to consideration the many levels a network may have. Each level may appear to exhibit “rules”. One woman’s rule is another woman’s ?????????????

As in the case of expert systems the number of rules is small and the source of the rules can be quite complex and dependent on an unknown ??????????.

Another aspect that should be considered is the confluence of implementations as an indication of similarity. A particular implementation might have evolved in a particular environment and a similar functionality might be quite different given a different environment. This might be a function of the particular technology or the result of special or temporal limitations and not central to the function.

For example when comparing an ant colony as a network, the ant is the central sub unit. In traditional neurology, the neuron is the central sub units. Does one compare these different subunits activity as central to the resulting network? In the case of the ant the neuron was not the central unit, but the ant itself with the ant’s input/output properties as a mechanism. The internal effect of these sensory units is only available at the behavioral level.

Even in this simple case one can begin with the gene network of the lonely cell, then of the neural network and then its interaction with its colony mates. The same goes for the human, while the neural network is several orders of magnitude more complex.

Similar comparisons can be made between an ant colony network and the internet. In this case the computer network is vastly simpler and on the level of its components drastically different from a biological colony. Leaving this I will precede to what I consider hopefully a more relevant network.

The genetic network is composed of interacting molecules. These molecules have a “surface” of interaction that could be compared to an ant’s sensory apparatus. The sum total of these molecular interactions can be seen as a different kind of colony. Perhaps even the single cell should be seen as multiple colonies, with each sell organelle pictured as a different colony.

For simplicity let’s see the cell as a colony, it is the unit of reproduction and is made of an unintelligent set of units. I am tempted to all at least the complex molecules creatures of some simple sort.

The example of an invading virus could be used to emphasize this point.