Apophenia of phenomena in areas of Cognitive Systems

Apophenia is a tendency to see patterns between data that are the product of random chance. Human beings are subject to such false pattern-detection and the research areas of Cognitive Systems are not immune to this occurrence. Three concrete examples of phenomena for which patterns might be detected when there are none, are perception of faces in inanimate objects, psychology of superstitions and overfitting in machine learning.

In psychology of perception there is a phenomenon that human beings perceive faces in inanimate objects like in markings on a stone, lines of wood or on pieces of toast. These are obviously all products of random chance, and when examined carefully are not that face-like at all. However, detecting faces is important for human survival and the brain is sometimes too well equipped for this function, which explains why this occurs.

Many cultures in the world differ by what superstitions their members hold. However, most of these are quirks of random chance and the perceived pattern has nothing to do with real life, like the held belief that a black cat crossing the road leads to bad luck. It is possible to consider these as real, due to our inability to often tell apart events that have a causal relationship and events that just follow one another. This is important aspect of psychology as it relates to how natural cognitive systems try to make sense of the outside world and form inferences about events.

Gaining popularity in computer science now is the usage of machine learning algorithms, made to find patterns in the data. However, this relies on an assumption that the patterns exist. Many applications of machine learning might be subject to overfitting noise instead of the signal and acting like forming valid patterns on data that is random. This is what the algorithm is made to do and will continue to find patterns in the specific way it is programmed to do so, without any regard to the actual patterns that might or might not exist to produce the original data.

There are many times that a phenomenon subject to apophenia might occur in the areas of Cognitive Systems. Some examples include false perception of faces, superstitions and overfitting in machine learning.