A New Kind of Interpretation

Naveen Venkat
BITS, Pilani
nav.naveenvenkat@gmail.com
April 2, 2018

1. Introduction

In all of computer programming, we have been solving problems by modeling the real world into code. Consider the reverse process, where we derive a relation between **data structures** and the **real world**. Can we model code in real world objects? Or in other words, **can we represent information in real world entities?** My effort in the following article will be to guide you through various scenarios which will (hopefully) change your perception towards our environment.

"OPEN YOUR MIND"

2. The notion of a symbol

To understand the idea we need to rigorously analyze the notion of a "symbol". A symbol is any mark used to represent some idea. For eg. we use the symbol **"3"** to denote the numerical value of three, and the symbol **"&"** to sometimes denote the conjunction 'and'.

However the symbol in itself doesn't contain any inherent meaning. It just exists because someone wrote it and it became popularly identified. It has a meaning only because we are able to interpret it. If you come across a letter (a symbol) in a foreign language which you know nothing of, you will not be able to infer any meaning out of it. Also, even if you are able to associate a meaning to a symbol, you may end up associating multiple meanings to the same symbol.

This clearly suggests that **it is we who associate a meaning** with a symbol. Thus we need to have a stronger definition of the symbol.

A symbol is an entity which can be interpreted to infer a meaning. So, every possible mark you can think of, including all the letters of every language ever developed, is a symbol.

A symbol may or may not be continuous. Consider the symbols drawn below. I could call each "separated" marking to be a symbol.

Let's develop this idea and extend it further. Every rough mark ever made (and yet to be made) using a pen is a symbol. So, when you scratch the tip of the pen on a sheet of paper just to test whether it works or not, you could create a potential symbol. Notice here that you recognize a symbol by looking at it. Regardless of whether it is written on a sheet of paper, or rendered on a computer screen, you recognize it.

A fairly straight forward example of such notation are emojis. Emoji's are frequent in today's communication. We recognize emotions through symbols:

- ☺ – means happy
- ☹ – means sad

These are simply new notations. We have arrived at a common understanding and have associated meaning to such symbols. These can now fill gaps and complete sentences (where traditionally we would use only words). So I could write:

"Keep smiling ☺"

terminated by a ☺ emoji, that gives gravity to the regular text. Let's now look at this idea of building sentences in a radically different way.

Source: Image Attribution [1]

Look at the image above. These are physical objects that look very similar to the letters **H,O,T,E,L** of the English alphabet. What did we do here? We have tried to capture each letter (of the word **hotel**), into the physical objects by building the objects similar in shape. In doing so, we associate a meaning to every object (that looks like a letter) and treat it as a symbol. What follows is the combination of the interpreted symbols, and understanding them as a single word, and then inferring the meaning corresponding to the word (eg. *the building corresponding to this sign is a place to rest and eat food*).

In fact, we could even extend this idea to paintings, or photographs. Basically, anything an individual can see and recognize as a whole is a potential symbol for him/her. It now depends upon how it is defined by the person. This is the brilliance in the human learning process. Let us develop this idea further.

3. We define our interpretation

What we saw above was a simple example of common sense, where the symbols were interpreted in a way most people would recognize. But, if you understood the meaning of the word "HOTEL" differently, you would interpret this in a different way someone else would have. This means that interpretation is subjective – this statement itself is very obvious!

However, you may also consider the case when you want to give different meaning(s) to symbols. You may be able to capture more or less information in doing so. Take the "HOTEL" example. You may want to interpret "HOTEL" as "**H**abit **O**f **T**elling **E**veryone **L**ies". It may make sense to you when mentioned at places you designate, but you may also want to interpret it as the hotel as and when required. It completely depends upon your interpretation.

4. Real World Interpretation

Consider a tree with several branches. No, seriously. **A tree**. The image below shows one, with four major branches at the top. Let us imagine this tree to be representing a data structure called "Tree". Yes, I'd like you to imagine for now, that the tree represents a data structure. Each of the branches could be an attribute of this data structure. We can define it as follows:

```
class Tree:
  branch_1 = "short"
  branch_2 = "longer"
  branch_3 = "longest"
  branch_2_subBranch_1 = "healthy"
```

The code above is a simple class written in Python Language. The motivation to write such a code is that we can model any real world object in terms of classes. But to explore the notation of symbol, let's take a bold move and try to find an analogy in the reverse direction. Given a data structure, **can we deduce a relation with a real world object?** It turns out, we can. We can model any such information into a physical object.

For instance, I could look at that branch of the tree and say, **I call this branch as "pi"**. Every time I would look at that branch, I will be reminded of the word "pi" and I would recollect it. I may associate any meaning with the word "pi". In fact, I could have given this branch any name I wish: "pizza", "banana", "monkey", "monkey eating a banana", "I have an exam tomorrow", "two plus two equals four", "789 * 234", anything!

Source: Image Attribution [2]

This is a crazy, but powerful idea. I could use real world objects to store and retrieve information. For instance, I could backup the knowledge that says "Christmas falls on 25th December" – in a tree (yes, **in a tree**). Every time I look at the branch of a tree, I could be remind myself that that Christmas occurs on 25th December every year. Eventually I'll learn to accept it as a form of knowledge, and I could teach others this representation I've built in my head. This way, I could spread this knowledge to as many people as I can, given they can see the tree and can infer its meaning just the way I do it.

Note: I can do this, only if **I know** how to interpret that piece of information stored in this tree.

This can further be extended. Imagine, plucking a small leaf from that tree and calling it, "I have an exam on Saturday". You can stick this leaf on your table, that will keep on reminding you that you have an exam, only if you don't forget what it means – I'll come back to this argument pretty soon. We often use this kind of an augmented representation, "giving additional meaning to real life objects", but seldom appreciate the process behind it. For instance, some people have a habit of tying a knot on their handkerchief to remember something that shouldn't be forgotten. You could do the same with any object, **store information in any object – as long as you can interpret that information.**

This is similar to the emojis that we discussed earlier. You may even go about sticking leaves and twigs on the sheet of paper, in between sentences and capture specific meaning. You may represent a the word "yellow" using a yellow leaf picked up during autumn, and write the sentence as follows:

"Banana is **<stick a leaf here>** in color"

which means "Banana is **yellow** in color".

Think outside the box. You may even use very small objects. Say, an electron (yes, **an electron**), to denote the amount of electric charge on it. So, if you have to write "the charge on an electron" which is a number that requires a high precision, you might as well place an electron at that position in the sentence (or your mathematical calculations). Though, you may not be able to see it with naked eye, but you can store information in such an electron (**anything can be a symbol**, remember). Crazy, isn't it?

This can be a powerful cryptographic method. After all, symbols are what you define them to be.

Hence, I'd like to conclude by proposing the following two axioms without formal proofs, which are evident from our discussions so far.

5. Axioms

Axiom 1: *Any form is a source of knowledge as long as there is a way to interpret it.*

Axiom 2: *All the universe's knowledge exists, we only need a means to interpret it.*

Axiom 1 arises from the fact that, we can store "information" or "knowledge" in any entity (be it physical, musical, visual, imaginary etc.), and we can retrieve it back if we know how to interpret it.

We can argue that axiom 2 arises from axiom 1, because anyone could define interpretations pertaining to any entity. If anyone could do so, either in the past someone would have done, or otherwise, anyone could do it in the future. We may come up with infinite such representations and each of them would simply be a part of a discovery we make in this universe.

Add all such discoveries to the pool of knowledge in the universe. Now, all the discoveries made by humans, are simply ideas that have evolved over time or are phenomena observed and passed through generations. There are infinite such discoveries that can still be done, which may be done in the future. But again, all that knowledge would still be **discovered**. Even if it is a novel idea invented by humans, it is still an idea represented in some form, which forms a part of the universe's knowledge, discovered by humans, instead of some aliens from another planet. This way, we can argue that, all the universe's knowledge exists in the universe, somewhere, waiting to be tapped / interpreted someday.

6. Final Thoughts

It is interesting to see how a simple idea can evolve into such massive ideas. This is probably how we have evolved into intelligent beings, by observing such subtle details in our "human experience" and raising fundamental questions to brainstorm on ideas that take shape. And the good news is, in this age of connected technology, we can make even bigger discoveries – together. It is such an exciting time to be alive.

Image Attributions:

1. http://ak1.picdn.net/shutterstock/videos/4878251/thumb/1.jpg
2. http://www.dailymail.co.uk/property/article-1246126/Home-truths-Kept-dark-overhanging-trees.html

---

Thank you for taking time to read this article. I published it on my blog on April 2, 2018 (**www.naveenvenkat.com/2018/04/02/anki/**). If you'd like to get in touch, please visit my website **naveenvenkat.com** or email me at **nav.naveenvenkat@gmail.com**.