A Book of Notation

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A Brief Communication on Omnitonal Musical Notation

Omnitonal Musical Notation will be discussed as a novel visual mode of musical notation that is based upon time. The two major dimensions within a graphical communication of the notation are time in seconds upon the horizonal or x-axis and frequency upon the vertical or y-axis. The brief considerations of such a notation are given such as that of its use as being conducive to a more expansive notation for composer both human and machine. The notation presents opportunities for greater forms of both musical and visual expression in the creative endeavors of sonic communication. The author admits that the notation is difficult for humans to learn given our bodily limitations, but with the emergence of novel technologies the notation will become more accessible as time progresses.

The availability of musical expression has been limited in its scope in recording through notation the aspect of number in time. There is a range of sound that is recognized by the human auditory system and we as a civilization have crafted several notations that communicate without difficulty the vibration of air through which sound permeates existence. The most popular modern musical notation is well known across the world even to those who have never written or played to its visual communication. I will suggest, however, that our shared notation for music that dominates society's interaction with sound does not fully capture the range of frequency that is available to the composer. I wish to present a different way of visualizing musical notation that I have named Omnitonal Musical Notation.

In Figure 1, one way of presenting Omnitonal Musical Notation is provided. The horizontal or x-axis relies on the progression of time in seconds and the vertical or y-axis is also in a way time based through the use of frequency to denote the communication of sound. As such, Omnitonal Musical Notation provides a timed based perspective on musical notation. Furthermore, the y-axis in this presentation utilizes a geometric sequence as the progenitor of octave communication. The sequence is $r_n = 2^{n-1}$ where the terms are limited to the scope of that which is provided in Figure 1. 16 Hz is inaudible, but humans are able to hear in between 20 Hz and 10,000 Hz, though the last term used is 8,192 Hz due to the ease of reading the graph

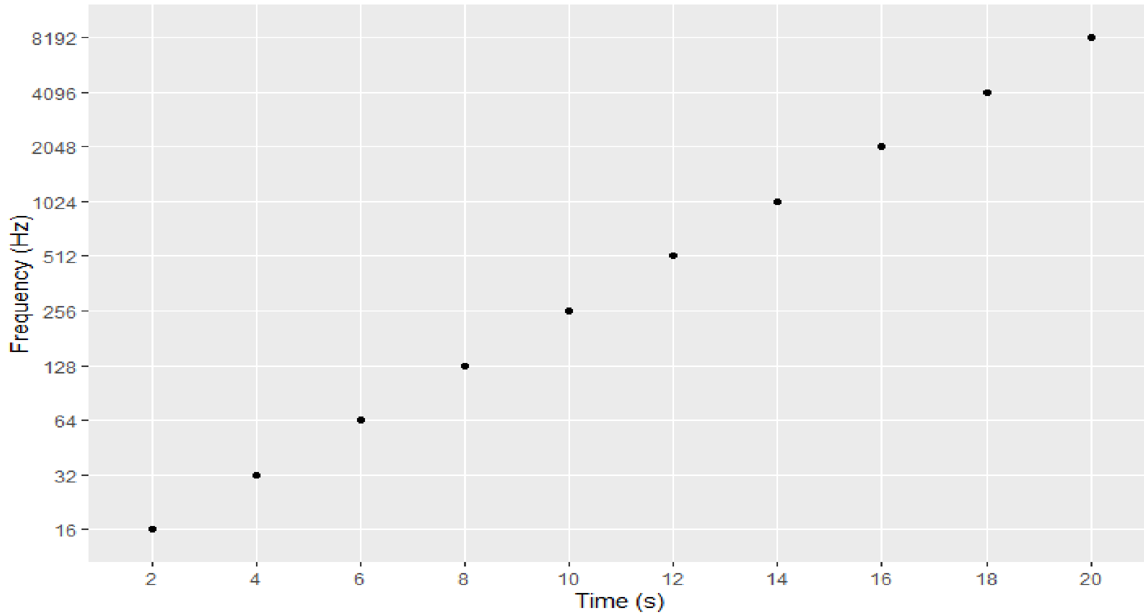

Figure 1: An example of Omnitonal Musical Notation presented in graphical form.

What should be mentioned is that in Figure 1 the frequencies presented lend themselves to the aesthetic quality of mathematical communication through the use of a simple geometric sequence using natural numbers. But, the user of such a notation could use different tonic datums for octave presentation on the graph such as 440 Hz or 432 Hz. It matters little what the artist chooses as the markers on the y-axis since no matter the way in which the frequency is denoted upon the graph, all frequencies within the range of human hearing can be shown for interpretation. The problem of the modern musical notation which is taught in our society lacks the ability to easily notate the complete frequency available to the composer for the creation of sonic works of art. Omnitonal Musical Notation lends itself particularly well to the composers of electronic music.

What should be said is the modern musical notation is dominant due to its ability to be learned by many and what should be admitted about Omnitonal Musical Notation is that it is difficult if not impossible to learn using human organs of perception without the aid of technology. While it may be difficult to read in this notation, with tools of artificial intelligence and other technological tools it may be possible to interpret the visual aspect of the notation that lends itself to the production of musical arrangements that go beyond the current capabilities of the popular modern notation in communicating all frequencies available to the palette of human hearing. And further the artificial intelligence applications are broader in musical composition by machine intelligence due to the wide range of frequencies that serve as the available sonic canvas of selection for human and machine alike.

There also exists the beauty of such a system of notation that lends itself to the visual arts. An application of the notation could reach into the aesthetic both visual and auditory that can be presented to the musicians of the world. Omnitonal Musical Notation can be thought of as a novel notation that communicates the whole of sound in a visual way that lends itself to mixed media creative endeavors.

Omnitonal Musical Notation provides a new way to represent sound for composers who are evolving alongside technology to present musical creations in a way that evokes forward the composition of all frequencies within its domain of musical craftwork. The science of frequency can communicate sound and it exists as a reference to sonic waves that the listeners and makers of music already enjoy. This novel notation can bring forth greater creativity and may become far more popular in certain circles of composition due to the progression of technologies that can interpret the mode of communication used.

Light and Dark Charge Notation

Franklin could stand up to me. At least in his prime. But, not many can doubt the truth that notation is an area of mathematics where symbolism is so important. See figure 2 below for a charge notation that is rather different to the dominant modern form.

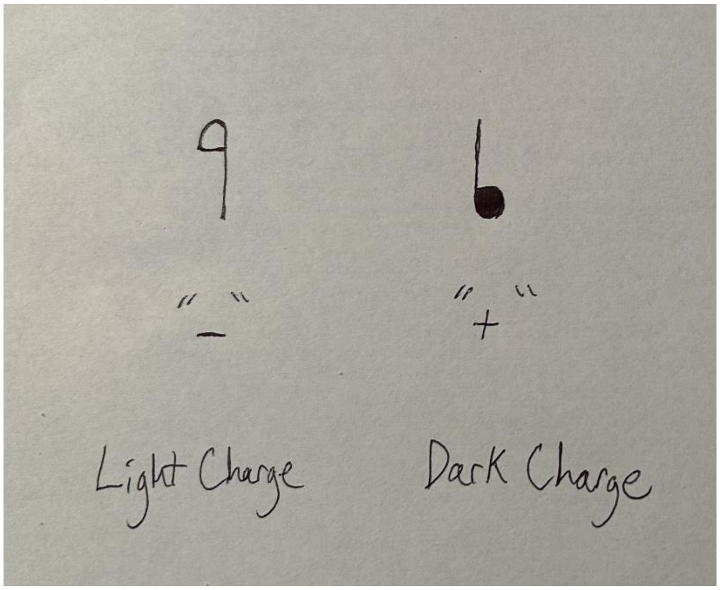

Figure 2: Light and Dark Charge

But, why light and dark? Light for positive does not make much sense since electrons which move in orbit of neutrons and protons can cause the formation of photonic activity. And as the opposite occurs, yes indeed protons are charged positive and could simply be dark charges in the atom with neutrons gray as a true neutral color. Thus the electron could be white, or light charge and the positron, black, for dark charge. Black, White, Gray. How beautiful and elegant of an atom? And spin can be seen rather clearly with the attached line to light and dark charges.

Psi Arithmetic

There is no need for the confusion of dot and cross products in looking towards a novel system of basic arithmetic operations as shown below. The Greek letter Psi is used in different vantage points to establish the symbolic representation of the system for arithmetic. By using only one symbol which "rotates" to designate a different operation an ease in learning at a young age most certainly can occur versus the dominant system of today in American mathematics. Please see below for a proper example of all 4 operations being shown.

$$2 \;\psi\; 3 = 5 \qquad \text{[Addition]}$$

$$2 \pitchfork 3 = 1 \qquad \text{[Subtraction]}$$

$$2 \in 3 = 2/3 \qquad \text{[Division]}$$

$$2 \ni 3 = 6 \qquad \text{[Multiplication]}$$

In addition, 2 adds to 3. In subtraction, 2 subtracts from 3. In division, 2 is divided by 3. And in multiplication, 2 multiplies 3.

Given the above, a system of notation for arithmetic for the modern era is shown to exist based upon the Greek letter Psi.

Young Notation for Calculus

In figure 3 below the summation integral is called to perform the summation of multiple different integrations according to each function used. For instance four different volumes shown with four different functions to describe them could be added together using the summation function. The integration is performed as we can say four times and the sum of the four integrated functions derived. Or one function can be used with a single variable if needed in which case c = 1. There are many possibilities.

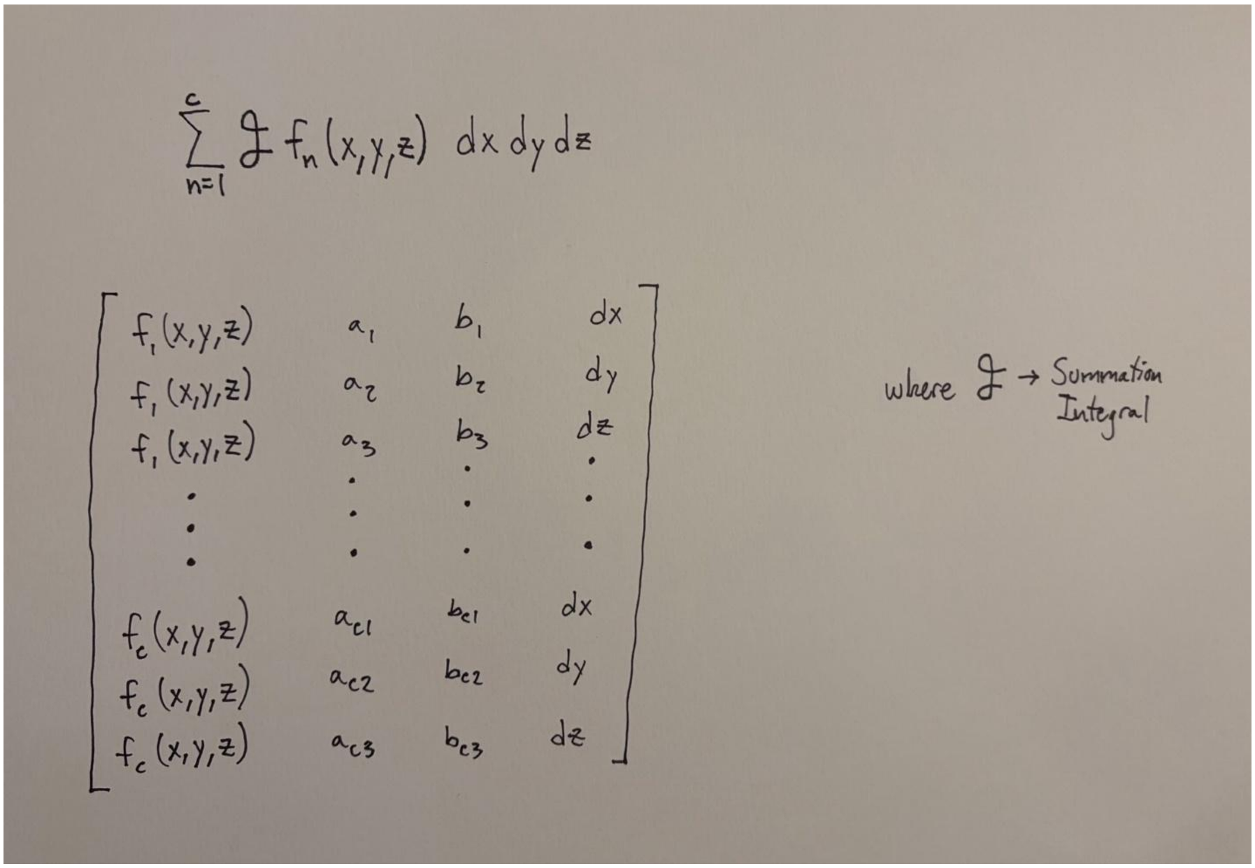

Figure 3:Young integral notation.

Below in figure 4 single variable delta notation for differentiation is shown.

In figure 5 partial differentiation is shown.

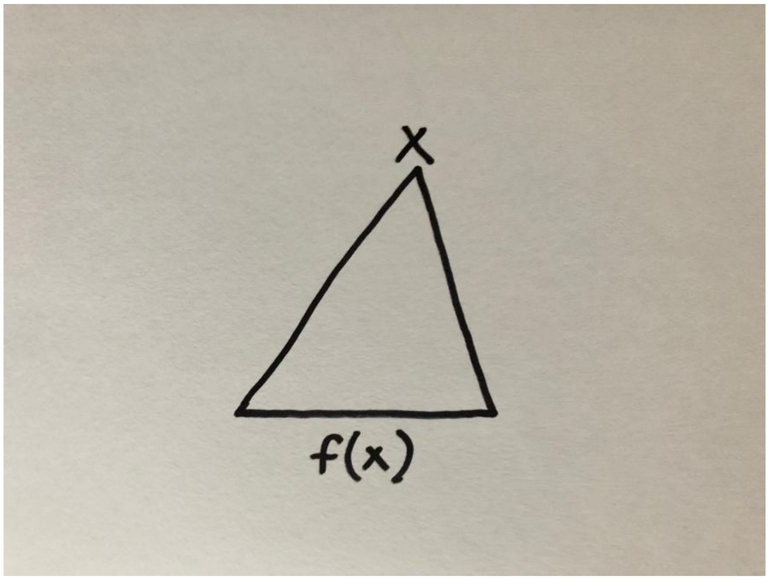

Figure 4:Delta Notation for single variable differentiation.

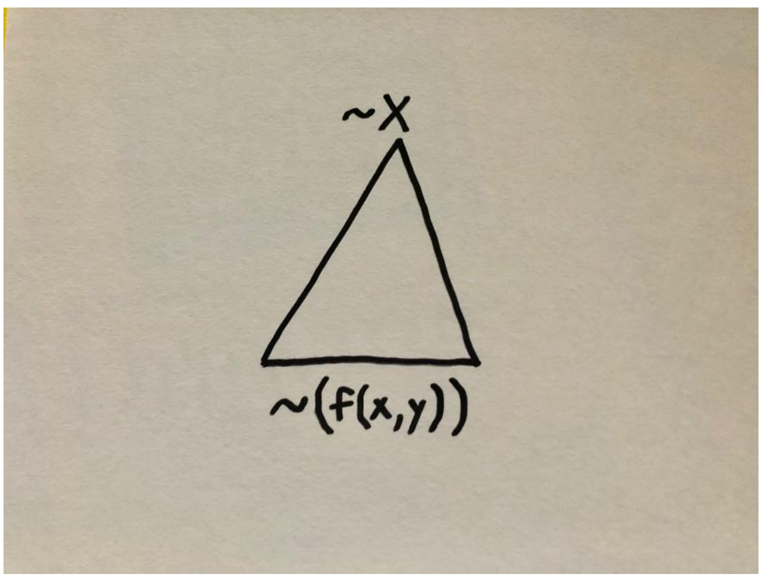

Figure 5: Delta Notation for partial derivative (~ = partial derivative)

Young Neural Network Architecture

The notation for a computer brain lies in network architecture.

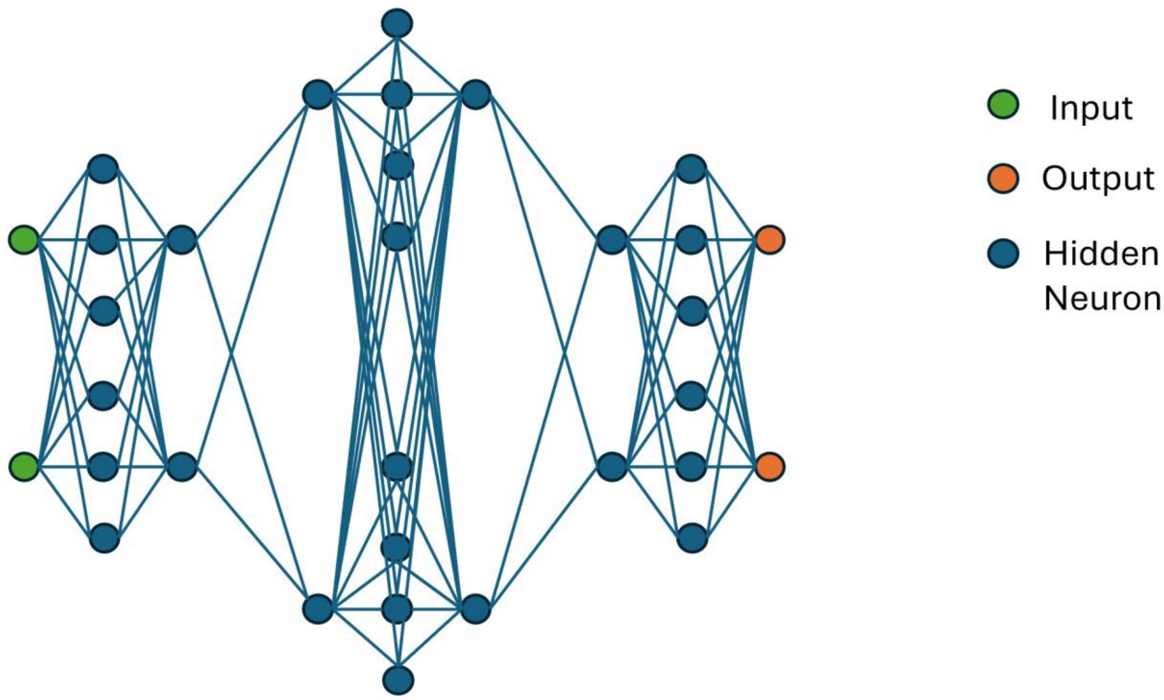

Figure 6:Neural Network