Abstract

In this research investigation, the author has detailed about the Scheme of construction of Natural metric for any given positive Integer. Natural Metric can be used for Natural Scaling of any Set optimally. Natural Metric also forms the Universal Basis for the Universal Correspondence Principle between Quantum mechanics and Newtonian Mechanics. Furthermore, Natural Metric finds great use in the Science of Forecasting Engineering.

Theory

One Step Evolution Scheme Of Any Element Of Any Higher Order Sequence Of Primes

Consider any element of any higher Order Sequence Of Primes [1], say

\[ k^h \cdot b = c_1 \cdot c_2 \cdot c_3 \cdots \cdots \cdots \cdot c_{k-1} \cdot c_k \]

where \( c_1, c_2, c_3, \cdots \cdots \cdots, c_{k-1}, c_k \) are Primes (Standard) of First Order.
We now consider any one of \( c_i \), (among \( i = 1 \) to \( k \)) and evolve it by One Step. By One Step Evolution of \( c_i \), we mean if \( c_i \) is the \( g_i^{th} \) Prime Metric Element of the First Order Sequence Of Primes, i.e., the Standard Primes, then, the \( (g_i + 1)^{st} \) Prime Metric Element of this First Order Sequence Of Primes is the One Step Evolved Prime of \( c_i \). Therefore, for \( k \) values of \( c_i \), we have \( k \) values of \( b \). However, only those cases of Evolution must be considered wherein \( 1^{c_{(g_i + 1)}} \neq c_j \) for \( j = \{1 \) to \( k\} \). Here, the notation \( 1^{c_{(g_i + 1)}} \) indicates that it is One Step Evolved Prime of \( c_i \). The 1 on the North Left indicates the Order of the Sequence Of Primes to which it belongs and \( (g_i + 1) \) indicates the location number of this element \( 1^{c_{(g_i + 1)}} \) along the Prime Metric Basis of Standard Primes. Let us say, we have now \( l \) values of \( b \) after ruling out such cases of aforementioned kind. We now pick the lowest number of this Set and call this as \( b_{(h+1)} \), with notation being explicit. We call this \( b_{(h+1)} \) as one step Evolved Prime of \( b_h \). Also, one can note that for a set upper limit \( U \), we can find the entire list of \( k^{th} \) Order Sequence Of Primes (upto say, \( U \)), using [1], [2]. Using this list as well, we can find \( b_{(h+1)} \). A seasoned reader of author’s literature can now also infer the One Step Devolution Scheme of Any Higher Order Sequence Of Primes.

**One Step Evolution Of Any Given Positive Integer**

Firstly, we consider any Positive Integer \( s \), which we know can be written as \( s = (p_1)^{a_1}(p_2)^{a_2}(p_3)^{a_3} \ldots \ldots \ldots \ldots (p_{n-1})^{a_{n-1}}(p_n)^{a_n} \) where \( p_i, i = 1 \) to \( n \) are positive integers.

We now re-write \( s \) as
\[
 s = q(r_1.r_2.r_3 \ldots \ldots r_{m-1}.r_m) \quad \text{where } r_i, i = 1 \text{ to } m \quad \text{are all distinct Primes of First Order and } q \quad \text{only has Prime Factors (maybe even repeating) which must}
\]
be in $r_i$, or rather the repeating or Non-Repeating Prime Factors of $q$ are the Subset of the Set $\{r_i\}_{i=1}^{m}$. We can therefore now write $S$ as

$$S = \left( r_1 \cdot r_2 \cdot r_3 \cdots r_{m-1} \cdot r_m \right) + \left( r_1 \cdot r_2 \cdot r_3 \cdots r_{m-1} \cdot r_m \right) + \cdots + \left( r_1 \cdot r_2 \cdot r_3 \cdots r_{m-1} \cdot r_m \right)$$

Now, since we know how to evolve $r_1 \cdot r_2 \cdot r_3 \cdots r_{m-1} \cdot r_m$, and as $S = q \left( r_1 \cdot r_2 \cdot r_3 \cdots r_{m-1} \cdot r_m \right)$, we can find one step evolved $S$ by first naming $\left( r_1 \cdot r_2 \cdot r_3 \cdots r_{m-1} \cdot r_m \right)$ as $m_{t_i}$, i.e., $m_{t_i} = \left( r_1 \cdot r_2 \cdot r_3 \cdots r_{m-1} \cdot r_m \right)$ and writing one step evolved $S$ as $S = q \left( m_{t_i} \right)$. A seasoned reader of author’s literature can now also infer the One Step Devolution Scheme of any given Positive Integer.

Example:

Considering the number 752

$$752 = 2 \times 376$$

$$= 2^4 \times 47$$

$$= 2^3 \times (2 \times 47)$$

$$= 8 \times (2 \times 47)$$

$$= \left( 2 \times 47 \right) + \left( 2 \times 47 \right) + \cdots + \left( 2 \times 47 \right)$$

One Step Evolution of $\left( 2 \times 47 \right)$

Cases:

1. $\left( 3 \times 47 \right) = 141$
2. $\left( 2 \times 53 \right) = 106$

Since, 106 is the smallest among all the cases, we say that $\left( 2 \times 53 \right) = 106$ is the One Step Evolved Element of $\left( 2 \times 47 \right)$.

Hence, 752 one step evolved is $8 \times \left( 2 \times 53 \right) = 8 \times 106 = 848$
Hence, the next term of 752 is 848 along the Natural Metric of 752.

One Step Devolution of $\left(2 \times 47\right)$

Cases:

1. $\left(2 \times 43\right) = 86$

Therefore, we say that $\left(2 \times 43\right) = 86$ is the one step devolved element of $\left(2 \times 47\right)$.

Hence, 752 one step devolved is $8 \times \left(2 \times 43\right) = 8 \times 86 = 688$

Hence, the previous term of 752 is 688 along the Natural Metric of 752. Therefore, now 688, 752 and 848 are along the Natural Metric of 688.

References

2. TRL Positive Real Order Sequence Of Primes Finding Algorithm. {Rendition To Completion} (Universal Engineering Series).
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