The γ Symmetry

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The symmetry function that has been associated with bijective functions and not surjective or injective provided a proper variant of the later two functions is concerned, the bijective being a symmetry invariant domain and codomain providing an inverse function preserving the γ symmetry.

In general, the function heads from a domain to a codomain could be categorized by the following tables where red indicates the symmetry factors with blue the headings of row and column, and black being the elemental relation gives the identity as,

$$\begin{bmatrix} (\boldsymbol{\gamma - Tables}) & \langle \boldsymbol{Surjective} \rangle & \langle \boldsymbol{Non-Surjective} \rangle \\ \langle \boldsymbol{Injective} \rangle & Bijective & Injective\ Only \\ \langle \boldsymbol{Non-Injective} \rangle & Surjective\ Only & General \end{bmatrix}$$

The mapping of the functions from the domain to the codomain can be stated as,

$$\boldsymbol{f} : X \to Y$$

Notionally given [1-7],

In case of injective functions, the mapping can be given by the relation,

$$\alpha \longmapsto \quad \forall x, x' \in X, f(x) = f(x') \Longrightarrow x = x'$$

In case of surjective functions, the mapping can be given by the relation,

$$\beta \longmapsto \quad \forall x, x' \in X, x \neq x' \Longrightarrow f(x) \neq f(x')$$

In case of bijective functions, the mapping can be given by the relation,

$$\gamma \longmapsto \quad \begin{matrix} \forall y \in Y, \exists!\, x \in X \ such\ that\ y = f(x) \\ \forall x \in X, \exists!\, y \in Y \ such\ that\ y = f(x) \end{matrix}$$

Similarly, in case of biijective functions there holds an inverse properties, like if there are compositions of two functions $g \circ f$ of two bijections,

$$\boldsymbol{f} : X \to Y$$

$$\boldsymbol{g} : Y \to Z$$

Then, $g \circ f$ satisfies the relations as below, which also holds $g \circ f$ could be bijective if f is injective and g is surjective.

$$g \circ f \Longrightarrow (g \circ f)^{-1} = f^{-1} \circ g^{-1}$$

Considering 2 metrics, and related the metric tensors of two types (it doesn't matter whether the metric is *timelike, lightlike and spacelike*) as follows,

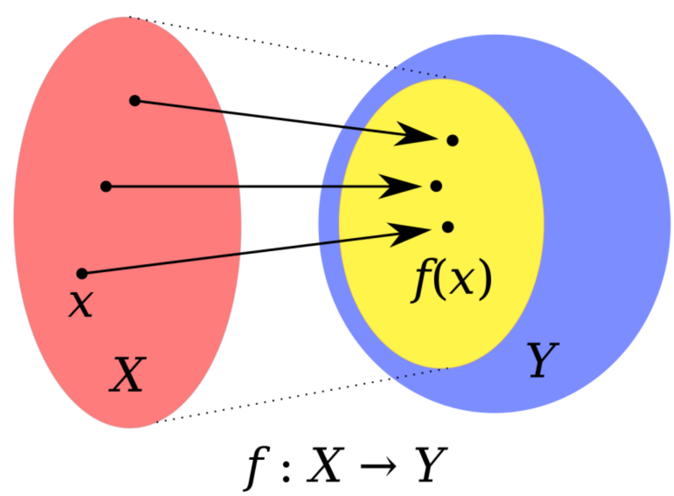
$$\zeta_{\mu\nu}\, l^{\mu} l^{\nu} \iff \xi_{\mu\nu}\, l^{\mu} l^{\nu}$$

$$\left| each\ element\ of\ diag\ \zeta_{\mu\nu}\, l^{\mu} l^{\nu} \right| \iff \left| each\ element\ of\ diag\ \xi_{\mu\nu}\, l^{\mu} l^{\nu} \right|$$

Providing the diagonal satisfies the bijective relations then the γ symmetry could be constructed with a symmetry operator Q^{γ} as given by the relation generalized upto 4 coordinates as,

$$Q^{\gamma} = \bigcup_{\substack{i=0 \\ j=0 \\ diag\ element\ of\ D_{ij}\ \in \Psi \\ \gamma \mapsto D_{ij} \in \Psi}}^{3} \Psi_{D_{ij}}$$

$$(Q^{\gamma})^{inverse} = \bigcup_{\substack{i=0 \\ j=0 \\ diag\ element\ of\ D_{ij}\ \in \Psi \\ \gamma \longmapsto D_{ij} \in \Psi}}^{3} \Psi_{D_{ij}}$$



The following image which holds the bijective properties, has been implemented using a Minkowski space-time metrics with the master set being Ψ(*not shown in image*) holds the implicit relations of the symmetry operator Q^{γ}. *Picture courtesy (Damien Karras (talk) (wikipedia))*

Symmetry breaking operations could hold for the below relations,

$$Q^{\alpha} \neq \bigcup_{\substack{i=0 \\ j=0 \\ diag\ element\ of\ D_{ij}\ \in \Psi \\ \alpha\ NOT \mapsto D_{ij} \in \Psi}}^{3} \Psi_{D_{ij}}$$

$$Q^{\beta} \neq \bigcup_{\substack{i=0 \\ j=0 \\ diag\ element\ of\ D_{ij}\ \in \Psi \\ \beta\ NOT \mapsto D_{ij} \in \Psi}}^{3} \Psi_{D_{ij}}$$

Where Q^{α} and Q^{β} breaks the Q^{γ} and $(Q^{\gamma})^{inverse}$ symmetry.

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This can be deduced into $2\,non-permutation$ groups and $2\,permutation$ groups. As surjective and injective, both being a property of the bijective functions, therefore group notions could be derived as per symmetry operators $\boldsymbol{Sym}^{\cong\,\mathbf{-2}\,\wedge\mathbf{+2}\,\wedge\mathbf{0}}$. The expressed equation looks like as follows,

$$Trace\langle+2\rangle \Longrightarrow Timelike\ Potential\ \Phi$$

$$Trace\langle-2\rangle \Longrightarrow Spacelike\ Potential\ \Theta$$

$$non-permutation \longmapsto \begin{vmatrix} Q^{\alpha} \\ Q^{\beta} \end{vmatrix}$$

$$permutation \longmapsto \begin{vmatrix} Q^{\gamma} \\ Q^{\alpha} \bigoplus Q^{\beta} \end{vmatrix}$$

$$\left(Q^{\alpha} \bigoplus Q^{\beta}\right) \bigoplus Q^{\gamma} \ \equiv\ \boldsymbol{Sym}^{\cong\,\mathbf{-2}\,\wedge\mathbf{+2}\,\wedge\mathbf{0}}$$

Where, $\Phi \cong \mathbf{-2}$, $\Theta = \mathbf{+2}$, $\Phi \wedge \Theta \cong 0$, which augmented into the vector spaces as,

$$\Delta^{S} = \boldsymbol{Sym}^{\cong\,\mathbf{-2}\,\wedge\mathbf{+2}\,\wedge\mathbf{0}} \approx \Psi_{D_{ij}}$$

$$\bigvee_{\substack{D_{ij}\,\in\Psi \\ \Psi_{D_{ij}}\,\in\Delta^{S}}} \Delta^{S}$$

Thus, the symmetry operations could be broken down to δ operator with the satisfying relations as depicted by the $\boldsymbol{Sym}$ functions taking the $permutable$ and $non-permutable$ values as,

$$\boldsymbol{Sym}^{\Delta^{S}} \equiv \mathbf{-1,+1,+1,+1}\ \wedge\ \mathbf{+1,-1,-1,-1}\ \wedge\ (\mathbf{-1,+1,+1,+1}\ \wedge\ \boldsymbol{+1,-1,-1,-1}$$

All are expressed in terms of diagonal elements.

Explanations:

Nature itself is chaotic and randomness ruled our universe. It can be strongly agreed on the perception of determinism that causality plays a dominant role in regards to the interpretation of the freewill, but that freewill cease to exist when one forms a travel through time, more than the speed of the required gap between past to present or present/past to future. If seen properly then we could establish an integral of events as a wedge of past to future given as,

$$\int Past\ \wedge\ \boldsymbol{Present}\ \wedge\ Future$$

With the present being the dominated ones as regards to a single timeline. The essence is to construct an algorithm for connecting the points of time as relation to their domain in the frame of causality. As it has been said that, randomness ruled our universe, Starting from weather, to ocean wave to number theory to symphony of primes to collision of black holes, everything appears random at first sight. But believe me behind this randomness there is Determinism. String of randomness has a very unique factor of Causality where each cause is related to the effect and its inevitable, hence can't be changed as in a normal distribution of events in a light cone.

What we notice is the superposition of this causality. A linear Superposition in the membrane of Time. According to the 'additive' property of tion$f(Past + Future) \cong f(Present)$Both Past and Future are attacking the Present from 2 different sides making it a superposition.

Sometimes, Mapping of time can be Surgective where for every event in the domain of Set 2 and can be linked to at least each domain of Set 1. This happens when 2 different events from past overlaps to a single event in future. This function will only be possible if we can invent a time machine.

However, what I expressed here, is that the property of causality being solely responsible for a symmetry and that symmetry is [as usual] unbroken, due to the shift of frames from timelines, as one approaches from the past light cone to the future intersecting the present. Therefore, it is non-trivial to express a boost function B^{e} which denotes the boost by preserving the symmetry from the past set to the future set or from the domain to the codomain. This entails us to learn the fact that, nature not only becomes *super-deterministic* in her own way but also clarifies the point, that when there is a cause, there have been a subtle effect as regards to the randomness that we perceive, which preserves the γ symmetry when encountering the notions of time-translational space-time giving the boost parameter as,

$$B^{e} \equiv \int Past\ \wedge\ \boldsymbol{Present}$$

$$B^{e} \equiv \int \boldsymbol{Present}\ \wedge\ Past$$

$$B^{e} \equiv \int Past\ \wedge\ Future$$

The 3rd boost gives the intersection point as the growth of γ invariant symmetry specializing through,

$$\overbrace{Past\ \wedge\ Future}^{\gamma\ variant\ Present}$$

$$\overbrace{Past\ \wedge\ Future}^{\gamma\ invariant\ Present}$$

The γ *variant* boost is natural occurrence while γ *invariant* requires changing of timelines thereby destroying causality and determinism with a resultant breaking in symmetry operations.

Conclusion:

(Gamma) Symmetry is purely a symmetry of time translation and it is only unbroken when the natural flow of time is not disturbed, however, if in future some arbitrary advanced civilizations could find a way to alter the future timelines and freewill's then they can be clever enough to make time travel by destroying this natural symmetry. The flow growth of such a symmetry is purely notional and has been expressed with both mathematics and theory in this paper. This tested our knowledge of randomness on the string of time which by far has an extreme approach of alteration, only when the (Gamma) Symmetry got broken.

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