talk

GA AND GC APPLIED TO PRE-SPATIAL ARITHMETIC SCHEME TO ENHANCE MODELING EFFECTIVENESS IN BIOPHYSICAL APPLICATIONS

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The classic vector analysis is unable to describe the Relativity and Quantum Field Theory so that an increasing attention to the geometric algebra (GA) and geometric calculus (GC) has been paid. We present an exponential, pre-spatial arithmetic scheme ("all-powerful scheme") to overcome the limitation of the traditional probabilistic modeling veil opacity in complex arbitrary multiscale system modeling. Most recent approaches take into consideration multivariate cumulative distribution function and all current implementations rely on statistic and probabilistic analysis only. To grasp more reliable representation of experimental reality researchers and scientists need two intelligently articulated hands: both statistical and combinatorical approaches synergistically articulated by natural coupling. We need to consider a model not only on the statistical manifold of model states but also on the combinatorical manifold of low-level discrete, elementary phased generators. *CICT* (computational information conservation theory) [1] new awareness of a discrete HG (hyperbolic geometry) subspace (reciprocal-space, RS) of coded heterogeneous hyperbolic structures, underlying the familiar $\mathbb{Q}$ Euclidean direct-space (DS) surface representation, shows that any natural number n in $\mathbb{N}$ has associated a specific, non-arbitrary extrinsic or external phase relationship that we have to take into account to full conserve overall system component information content by computation in DS [2]. Traditional $\mathbb{Q}$ numeric system elementary arithmetic long division remainder sequences can be interpreted as combinatorically Optimized Exponential Cyclic Sequences encoding hyperbolic geometric structured information, as points on a discrete Riemannian manifold, under HG metric [3]. They can encode both modulus and extrinsic phase information, which elementary phased generator intrinsic phase can be computed from. Phased generators can even offer a solution to parallel transport problems, taking into account associated components extrinsic phase relationships and their consonant or dissonant behavior. We show how to unfold the full information content of Rational numeric representation (nano-microscale discrete representation) and to relate it to a continuum framework (meso-macroscale) effectively. GA and GC unified mathematical language with *CICT* can offer a competitive and effective "Science 2.0" [2] universal arbitrary multiscale computational framework for biophysical applications.

REFERENCES

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