Computational Unimathematics (Universal Mathematics)

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Mathematical Journal of the "Collegium" All World Academy of Sciences, Munich (Germany), 15 (2015), 4.

Computational mathematics [1] discretization with finite operability only (at most countable in mathematics) reduces the real numbers range (there are finite signed computer infinities and zeroes). Following the inflexible algorithms restricts research range and deepness due to often utilizing the second power basis only analytically the simplest but very typically fully inadequate. One-source iteration requires explicit mapping contractivity and leads to analytic difficulties, slow convergence, and even noncomputability. Built-in standard function rounding brings errors. The finite element method gives impressive "black box" results not verifiable and often inadequate.

Computational unimathematics [2-7] with uninumbering, discovering, and inventive intelligence fully utilizing complications incl. outliers provides multiple-sources and especially intelligent iterativity (coherent, or sequential, approximativity). Sufficiently increasing the exponent (e.g., up to 6000) in power mean theories and methods can bring adequate results with recovering true measurement information via incomplete changed data. Perfectioning built-in standard functions brings always feasible and proper computing. Unlimitedly flexible universal intelligent transformation and solving algorithms ensure avoiding computer zeroes and infinities and cryptography systems hierarchies. It becomes possible to adequately consider, model, express, measure, evaluate, estimate, overcome, and even efficiently utilize many complications such as doubt, challenges, contradictions, infringements, damages, hindrances, obstacles, restrictions, mistakes, distortions, errors, information incompleteness, variability, etc.

Nota bene. Probability density f(x) as the derivative of incremental, or integral, distribution function F(x) [1] has this formal differential sense only and no physical sense, is no probability p(x) vanishing by continual distributions even for possible events, and does not exist at all, e.g., by infinite-measure uniform distributions. Uninumber uniprobability U(x) [2-6] namely positive for possible events always exists, e.g., by such distributions, and has real both mathematical and physical sense, see Figures 1 and 2 using countable cardinality ω and continuum cardinality Ω:

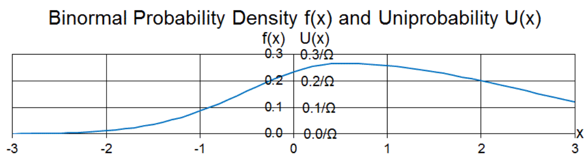

Fig.1. Probability density vs. uniprobability

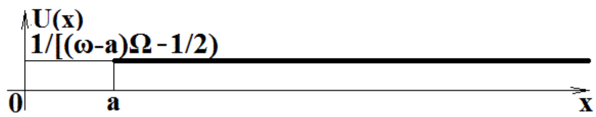

Fig. 2. Uniform uniprobability on (a, +∞). Probability density f(x) does not exist

A general pure inequation problem in individual vector spaces with indexes λ, φ, and ω from sets Λ, Φ, and Ω, respectively, is a quantiset ${}_{q(\lambda)}\{L_\lambda\{_{\varphi\in\Phi}\ {}_{r(\varphi)}f_\varphi[_{\omega\in\Omega}\ {}_{s(\omega)}z_\omega]\}\ R_\lambda\ 0\}$ $(\lambda\in\Lambda)$ of known uniinequality quantirelations R_λ (with own quantities q(λ)), e.g., = , ≈ , ∼ , ≠ , < , > , ≤ , ≥ , of known operators L_λ over unknown quantifunctions ${}_{r(\varphi)}f_\varphi$ (with own quantities r(φ)) of known quantivariables ${}_{s(\omega)}z_\omega$ with own quantities s(ω). General pure inequation problem iteration begins with initial pseudosolution $[_{\varphi\in\Phi}\ {}^1f_\varphi[_{\omega\in\Omega}\ z_\omega]]$ via approximations ${}^{i+1}f_\varphi[_{\omega\in\Omega}\ z_\omega] = L_\varphi[_{\varphi\in\Phi}\ {}^if_\varphi[_{\omega\in\Omega}\ z_\omega]]$ $(i \in N^+ = \{1, 2, \ldots\})$ to solution $[_{\varphi\in\Phi}\ f_\varphi[_{\omega\in\Omega}\ z_\omega]]$. General problem intelligent iteration theory calculates (via free pseudosolutions)

$${}^{i+1}f_\varphi[_{\omega\in\Omega}\ z_\omega] = {}^{i+1}M_\varphi\{{}^{i+1,\ 1}L_\varphi[_{\varphi\in\Phi}\ {}^{1'}f_\varphi[_{\omega\in\Omega}\ z_\omega]],\ {}^{i+1,\ 2}L_\varphi[_{\varphi\in\Phi}\ {}^{2'}f_\varphi[_{\omega\in\Omega}\ z_\omega]],\ \ldots,\ {}^{i+1,\ i}L_\varphi[_{\varphi\in\Phi}\ {}^{i'}f_\varphi[_{\omega\in\Omega}\ z_\omega]]\}.$$

Creative accelerating methods and know-how of rationally placing approximations table calculations rectangularly block-wise provide calculating a next approximation via right-direction adjacently placing the copy of the previous approximation design.

Computational unimathematics creates very many fundamentally new possibilities and tools to intelligently solve a lot of classes of earlier principally unsolvable urgent complicated problems with much advanced calculation, e.g., in aeronautical fatigue.

Keywords: Ph. D. & Dr. Sc. Lev Gelimson, "Collegium" All World Academy of Sciences, Academic Institute for Creating Fundamental Sciences, Mathematical Journal, Universal Mathematics, Unimathematik, Computational Unimathematics, computational mathematics discretization, finite operability, real numbers range, finite signed computer infinity, finite signed computer zero, inflexible algorithm, s research range deepness restriction, analytically simplest inadequate second power basis, one-source iteration, explicit mapping contractivity, analytic difficulty, slow convergence, noncomputability, built-in standard function rounding, finite element method, impressive nonverifiable inadequate "black box" result, uninumbering, discovering and inventive intelligence, fully utilizing complication, outlier, multiple-sources iterativity, intelligent iterativity, coherent sequential approximativity, sufficiently increasing exponent, power mean theory, power mean method, recovering true measurement information, incomplete changed data, perfectioning built-in standard function, feasible proper computing, unlimitedly flexible universal intelligent transformation and solving algorithm, avoiding computer zeroes and infinities, cryptography systems hierarchy, modeling, expression, measurement, evaluation, estimation, overcoming, efficiently utilizing complication, doubt, challenge, contradiction, infringement, damage, hindrance, obstacle, restriction, mistake, distortion, error, information incompleteness, variability, probability density, derivative, incremental integral distribution function, formal differential sense only, no physical sense, no probability, continual distribution, possible event, nonexistence, infinite-measure uniform distribution, uninumber uniprobability, real both mathematical and physical sense, countable cardinality, continuum cardinality, uniform uniprobability, general pure inequation problem, individual vector space, quantiset, known uniinequality quantirelation, known operator, general pure inequation problem iteration, initial pseudosolution, approximation, general problem intelligent iteration theory, free pseudosolution, creative accelerating method, know-how, rationally placing approximations table calculations rectangularly block-wise, right-direction adjacently placing previous approximation design, Quantianalysis, Uninumber, Quantioperation, Quantiset, Multiquantity, Uniquantity, Universal Probabilistic Science, Universal Data Processing Science with Multiple-Sources Intelligent Iteration, aeronautical fatigue, General Problem Theory, Elastic Mathematics, General Strength Theory.

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