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REALITY, INFORMATION, AND INTELLIGENT OBSERVER

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ABSTRACT: *What is scientific path to fact of realty through its observed information? Is reality continuous or discrete as **0**s, **1**s information?However, up to now both information and its connection to reality have not scientifically conclusive definitions, neither implicit origin. What is information being observed? And how is the observed information connected with reality of observation?The scientific path emerge in observing a multiple impulses inter-active yes-no actions modeling information Bits. Multiple interactions build Universe independently of their origin, and reality is only the emerging interactions-universal actions. Or information is phenomenon of interactions bringing certain reality with information of observing bits encoding an image.Multiple interactions are random composing random process which covers both the interacting bits and the process certainty. Uncovering the bits and information process, carrying certainty through observation of the random process, runs an Observer. Otherwise, the information, carries reality its observation, creates certain information process from which emerges the Information Observer. The observed information creating its Observer connects reality, information, and Observer.Solving these problems requires formal probabilistic approach where the notions of object, particle, and image are replaced with the probability of their events observation. Observing these events' probabilities models Markov process whose sequence of interacting yes-no impulses carry both bits' hidden information covered by entropy of the process correlations and certainty revealed by maximal observing probability. The impulse of the interactive No-action cuts the maximum entropy, while its Yes-action transfers a cutting minimum to the next impulse, thus creating the maxmin-minimax principle, decreasing the uncertainty along the observing process. The hidden entropy releases an attraction of the correlation being cut. The impulse minimax probabilistic a priori and a posteriori observing actions convey the process probabilistic causality in the entropy logic along the observations. Merging action and reaction of the interactive impulses generate a microprocess within a bordered impulse bringing together probabilistic a priori and a posteriori actions on edge of predictability. The emerging microprocess runs superposition and entanglement of the impulse yes-no conjugated entropy fractions. The fractions entangle during the time interval before the space is formed, composing two qubits and/or Bit which set up the information process, and beginning with reversible logic within this impulse created geometry. When the impulse interacting actions curve the impulse space geometry, such interaction logically erases previous form of the entangled space entropy creating asymmetrical logic Bit as a logical Maxwell demon. With approaching probability one, the impulse' attracting interaction captures energy of such a real-certain interactive action physically erasing the entropy of bit logic.The erasure costs compensation of high–quality (quantum) energy of the physical process for entropy of lesser quality carrying the initial Markov diffusion. That removes the causal entropy of the asymmetrical logic, bringing asymmetrical Information logical Bit as certain impulse Bit. Such a Bit is naturally extracted at minimal energy measure equivalent to entropy ln2. The virtual probabilistic (entropy) interaction becomes real*

physical Bit. Bit is memorized at cost of Landauer's energy, working as Maxwell Demon. The memorized impulse includes information Bit and free information, enclosing hidden information of cutting correlation of the Markov process impulses, which measures interaction. Statistical micro-thermodynamics describe the interacting energy of the microprocess ensemble. Multiple Bits self-organize information macroprocess, performing functions of Weller's Bit-participator. Along the multi-dimensional observing process, each memorized information binds the reversible microprocess with irreversible information macroprocess. The cutting entropy is automatically converting to information conveying the process logical information causality, certain logic, and complexity. The process free information self-cooperate the Bits in triple information units. The triplet units assemble information network (IN) encoding the units in information geometrical structures enclosing the triplets' code. The IN triplets request the needed information generating a logic of probing impulses, sequentially cutting the observing process entropy measure and encoding new information units in the IN. The memorized and encoding information frizzed the interactive reality units Multiple INs bind their ending triplets, enclosing Information, cognition, and intelligence of the interactive reality units The Observer cognition assembles common units through multiple attractions in resonances loops at the forming IN triplet hierarchy. The distributed cognitive logic self-controls encoding of the intelligence in a double helix coding structure (DSS). The Observer clock time intervals open access to external energy at each specific level of the IN multiple hierarchy, enabling the memorization the hierarchy of the Bits encoding an explicit image. Information Bits become hierarchical measure of certain reality on the path from uncertainty. Multilevel interactions bring the multilevels reality and its information hierarchical measure.The intelligent Observer, self-reflective to the DSS logic, enables reading and understanding the message meaning. The Information Path Functional integrates the multiple interactive dynamics in the finite bits, which observe and measure reality during the time integrating path to reality. The time and space of reality exists only as the discrete units of information. That brings the information measure to Wheeler's fundamental constant of Nature. The basic physical laws describe continuous reality. The Interactive Integrated Information Dynamics describe the observing interactive dynamics of doublet-triplet logic, the IN formation, integration the logic, memory, cognition, encoding the intelligent observer in triplet code, which further encodes physical information, cognition, intelligence including consciousness, motor function, enable create AI intellectual brain in the discrete reality.

KEYWORDS: reality, interaction; random impulse; interactive observation; causality; logic; information; certainty; information process; micro-macroprocess; information path functional; triple structural unit, triplet code, observer hierarchical structure; encoding the structure geometry; double spiral triplet coding structure; self-forming cognition and intellect; recognizing meaning; designing AI observer; applications.

INTRODUCTORY

Introducing notions: reality, observation, uncertainty, certainty, information, information observer

In book [1A], the eminent scientists discussed various aspects of information, from quantum information to biological and digital information, in order to understand how Nature works.Most discussions focus on unproven physical phenomena (like multiple Universe, "everywhere is conscience", complexity emerging through cosmological and biological evolution, others whose origin is still unknown. However a concept "that all reality is information and all information is reality, and the universe is composed of bits of information" is close to ours. But how the bits of information emerge from reality is not discussed. According to concept [2A]:"It from bit symbolizes the idea that every item of the physical world has at bottom—at a very deep bottom, in most instances—an immaterial source and explanation; that what we call reality arises in the last analysis from the posing of yes-no questions". *This concept is most closely related to ours.*

We add that "information bits models multiple yes-no *actions.* Inter-actions unify all yes–no actions in physics and human being behavior. That why reality is not inactions–statists but a *dynamic phenomenon of interactions*, which create information".Other concept [3A] is that "information makes no sense in the absence of something to be informed—that is, a conscious observer capable of choice, or free will."We agree that information should be observed, adding concept observation and its observer to ours. For example, searching information on Web, a potential observer of this information sends probing impulses interacting with Web observing events and activating its brain neurons impulses until actual information fact appears for the observer. *This observer becomes observer of this information or the Information Observer.*

Similar examples are in scientific research, searching certain facts-information by multiple experiments-probes, or observing unknown particles, planets in a yet unknown Galaxy, tracking their probable or real interaction. Like an astronomer traces unobserving planet measuring image of its probabilistic trajectory until it become most probable and informative; or a physicist traces a trajectory interactive particles in an Accelerator. Observers are everywhere from communicating people, animals, different species up to any *interacting* subjects, accepting, transforming and exchanging information.

This brings concept of *Observer interacting in Reality.*
The questions are: What they actually observe?
Do they observe Reality? What is Information they observe?
And how is the observed information connected with reality of observation?
What is the time of observing reality? And how reality, information, observation, and the time, integrating a path to reality, are connected? All these questions are still unanswered.
The known publications *do not explain* the connection *Reality-Information-Information Observer.*
Interaction is fundamental reality building structure of Universe from deep levels of physics: four fundamental interactions (gravitation, electromagnetic, weak, and strong) toward different chemical, thermodynamic, biological, human observation, up to brain neurons' inter-active actions, cognitive, intellectual, communication, all forms of life. They evolve in various substances of our world. Some reveals reality as *actuality* (which acts, or interacts).

What is scientific path to uncover the fact of realty through its observed information?

However, up to now both information and its connection to reality have not scientifically conclusive definitions, neither implicit origin, and *interactions were not considered as phenomena of reality.* The formal recursive yes-no inter-action is an impulse modeling elementary information unit-bit (or 1|0,0|1 qubit) independently on their physical nature-from elementary particles up to any multiple interacting objects. Since interactions are fundamental phenomena building structure of Universe, they bring our concept: "*information is natural phenomenon of interactions, and observing information measures a certain reality".*

Reality as a natural physical existence is abstract entity only as universal interaction. But each observation creates specific certain reality of the observed interaction as the bits of discrete impulses encoding explicit image. Hence, to observe reality, as inter-actions, the observation, carrying reality, should convey impulses. The sequential observing interacting impulses convey information process that integrates the discrete observations. *Where interaction is, there is a reality, and information transferring the interaction.* For example, interactions of a discussing, being memorized could in and places as frozen reality.
Each observation is act changing an observing process like its measurement. That generates an interactive observation.

Exchanges between the interactive actions contribute connecting and binding these actions. The interaction of multiple impulses is source of randomness modeling series of random impulses.Multiple interactive impulses compose random process which conceals (hides) the interacting information bits and random process' reality. Such *observation* is a *random process of interactive impulses.*The observation is a form of measurement: classical or virtual when, for example, Bayes probabilistic observing interactive impulse is a primary indicator of a potential probabilistic certain reality. While before the measurement, at beginning of this process there are no facts about reality, the beginning is uncertain or imaginary, *virtual* regarding the facts certainty. How uncover a path from uncertainty to certainty-as the fact of realty, focusing not on physics of observing process but on its information-theoretical essence?
In observing interactive processes, the subsequent yes-no interactive actions, converting the observed uncertainty to observing certainty, creates information Bits carrying certain reality.
Uncovering the bits and hidden reality through observation of the random process reveals the information process that *creates Information Observer*.

What *runs* binding the Bits in *information process* during the observation of the multiple interactive impulses? How to find the information process uniting multiple certain bits that reveals multiple facts?The other question are: How to restore the information impulses carrying certain Bits, hidden in random observations, using the observing probes, which primarily interacting, able generating the randomness? What is fundamental source of random interacting impulses, which potentially cover the information bit and their sequence in information process? How to measure the rapprochement of the observing process uncertainty to certainty and extract a certain physical bit? How to rebuild the information process from multiple sequence of observing bits hidden in interactive random process? How does the observing information create the Information Observer?These are fundamental questions, essential for Science and Applications, rising at observing multiple

events and processes in physics, biology, cognition, cosmos, economy, sociology, experimental science, learning, reading, acquiring knowledge, examining investigations, playing games, dealing with many human activities; for example, in human interactive communications, discussions searching facts (truths).

Consequently, "what is the common in all of these" and how to use that common ground for answering the essential questions above? *The common is reality as interaction which brings the discrete interactive reality as a source of information in the interactive observations.* That primary includes the interactive processes at different levels: from quantum microprocess to multiple physical macroprocesses up to human interactions. That creates different levels of information quantity and quality evolving in an intellect and conscience. Multilevel interactions bring the *multilevels' reality and its information measure.* Understanding these processes and their regularities requires information laws describing development of the Information Observer from a discrete observing reality. Since basic physical laws describe continuous reality, the sought information laws should describe interactive processes resulting from integration the impulse observation in discrete reality. Such study requires more general and formal approach aimed on artificial design of human thoughts. Here we focus on the joint notion of information and reality, the observer's generating multilevel micro-macro processes, emerging cognition, intelligence, and their information-physical regularities.
(Below I present my Main New unpublished Results from my http://arxiv.org/abs/1602.05129 with the needed author References at the end). This paper was accepted for presentation and publication at the Intelligent Systems Conference (IntelliSys) 2020.

FOUNDATION OF THE APPROACH

Axiom

Multiple interactions build Universe independently of their origin, and reality is only the emerging interactions. Reality is abstract entity only as universal interaction.
The observed interaction creates a specific certain reality.

Corollaries

1. Natural interactions unify a sequence of interactive impulses Yes-No (or No-Yes) actions. Each real (certain) inter-action is opposite yes-no action modeling elementary Bit of information or a discrete impulse of 1|0, 0|1 qubit. Information is phenomenon of interactions which also bring reality.
2. Bringing reality, as interactions carrying information, requires the observation conveying the impulse information.
3. Each observation is act changing an observing process that generates an interactive observation.

The interaction of multiple impulses is source of randomness, which model series of random impulses. . Multiple interactive impulses compose random process in a surrounding random field [1], which covers the the random process' reality through the interacting information bits.
The field random process and its states (events) are formally considered independent of specific substances conserving energy of actual (real) events.

4. Uncovering a real Bit and/or multiple Bits, qubits from random process provides the observation process of probabilistic interactive impulses. Disclosing the Bit discrete impulses requires interactive cuts of the random process during a virtual probabilistic impulse observation.
5. Reaching the observing certain reality runs the interactive process probability approaching one when the real cut delivers the impulse high quality (quantum) energy. That exposes Bit emerging from the observing specific impulse interactions as unit of information, information process, carrying explicit image and certain reality, creating Information Observer with a Net of assembling multilevel interactive information units.
Information emerges as phenomenon of interactions and an observed measure of the interactions.

Essence of mathematical modeling methodology implementing the Axiom and Corollaries

Our formal model of a probabilistic observation runs axiomatic probabilities of a random field [1]. The field connects sets of possible and actual events with their probabilities. The field's energy covers actual events. Each triad specifies the observation. Multiple triads generate multi-dimensional observations. The probability field's triad emanates a sequence of probing events which form Markov chain [1:25].The chain processes independent random increments which carry discrete Yes-No actions↓↑ modeling potential information Bits whose sequence depends on each triad. These impulse probabilities virtually observe the running chain by multiple interactive acts. A probabilistic observation of at least two discrete impulses of the chain connects a minimum of three its random events in mutual correlation during the observing random time. The Markov chain under such observation transforms into Markov diffusion process [2]. The process transitive probabilities define Bayes probabilities [1:77], whose sequential a priori-a posteriori probabilities bring probabilistic impulse observation of the Markov diffusion process. Each observing action↓, in a sequence of these probabilities, virtually cuts entropy of the impulse correlation from the initial Markov diffusion process. During the impulse switching time, the action ↓ transfers to actions ↑ the cutting entropy minus entropy spent on the transferring. The cutting entropy decreases the Markov process entropy and increases the entropy enclosing within the impulse interactive actions↓↑. Each following interactive impulse of the Bayes probabilities, observing the Markov process, maximizes the entropy of the Bayes observing process impulses. The multiple Bayes observing impulses generate the secondary Markov diffusion whose entropy increases comparing with that in the initial Markov process. Under such observations, the Markov diffusion evolves to a Lévy process [3]. The Lévy process independent random increments model multiple observing impulses of the random bits. The Lévy-Khintchine decomposition [3:113-117] characterizes any Lévy process in terms of three components (the Lévy triplet) one of which is the Lévy measure. This measure describes the distribution of the Lévy process potential jumps.Until any two time intervals of the process' independent random increments do not overlap, the jump absent and Lévy measure is zero. The overlap is a merge of the yes-no impulses, when Lévy measure is nonzero, finite. The merge of the yes-no impulses indicates zero random bit. When Levy measure becomes finite, the jumps have started. The jumps initiate a microprocess within the observing Levy process, which releases the entropy-uncertainty hidden in the cutting correlation, finally generating a non-random real bit. At the merge, the probability of the impulse carrying a bit is zero. It means there is no

reality, defined by the interaction, when the microprocess starts. With zero probability of the microprocess start, it is unpredictable.The information process starts when the microprocess generates real qubit and/or bit. The considered path from emerging probabilistic impulse observation up to zero impulse identifies virtual (uncertain) process covering hidden information, which precedes the starting information process.

A Mathematical model of raising the jumps

Consider a one dimensional Levy process [4] $\{X(t), t \in [0,\infty)$ defined by a Brownian motion $W(t)$ and a jump process $\varsigma(t)$, where $X(t) = \alpha t + \sigma W(t)$ is Markov process with continuous part and $\varsigma(t) = \int_R zN(t, dz)$ is a jump process with independed components. It is peace-wise constant with right–continuous and left limits, the jump height at time t as $\Delta\varsigma(t) : \varsigma(t) - \varsigma(-t)$.

For any Lebesque measurable set $D \not\in 0$, the jump measure of $\varsigma(t)$ defines $N(t, D) := \sum_{s:0<s\le t} I(D \mid \Delta\varsigma(s)$, where $I(D \mid x) = 1$ if and only if $x \in D$ is the identity function.

Here $N(t, D)$ is number of jumps of size $\Delta\varsigma(t) \in D$ which occure before or at time t, which is a random number depending on the sample path of $\{\varsigma(t), t \in [0,\infty)\}$.

The average number of jumps of size $\Delta\varsigma(t) \in D$ in a unit of time, as the jump rate ν, is called Levy measure:

$$\nu(D) := E[N(1, D)] = E[\sum_{s:0<s\le t} I(D \mid \Delta\varsigma(s)]. \quad (1)$$

The Levy measure can be extended on the n-dimensional Levy process [3].
It follows, if Lévy measure is zero, the jump absent.

About the experimental frequencies forming Markov chain

Probability of random events (inter-actions) defines ratio of a favorable event numbers to total number of events. This ratio measures frequency of the multiple events.

When this ratio grows, satisfying symmetry, or equal possibility for the experimental frequencies, independence of the events, and Big Number Law, defining frequency stability, then formulas below counts probability of the random events for that experimental frequency.

Specifically, with occurrence in multiple tests *m*-events frequencies f_m^i in *n*-sequence they approach experimental probability:

$$E[f_m^i]_{n\to\infty} = P_m^i, \quad (2)$$

where mathematical expectation for these frequencies theoretically satisfies to Big Number Law.

Hence the multiple interactions frequencies produce the random events‘ probabilities, while a sequence of the independent random events, with conditional probabilities depending only on previous event, forms a random process-*Markov chain* [1:25].

2.3. The integral measures of the virtual and information processes

The *integral measure* of the observing *process* trajectories formalizes an *Entropy Functional* (EF)[5,6] which is expressed through functions drift $a^u(t, \tilde{x}_t)$ and diffusion $b(t, \tilde{x}_t) = 1/2\sigma(t, \tilde{x}_t)\sigma(t, \tilde{x}_t)^T$ of Markov diffusion process $\tilde{x}_t$:

$$\Delta S[\tilde{x}_t]|_s^T = 1/2E_{s,x}\{\int_s^T a^u(t,\tilde{x}_t)^T(2b(t,\tilde{x}_t))^{-1}a^u(t,\tilde{x}_t)dt\} = \int_{\tilde{x}(t)\in B} -\ln[p(\omega)]P_{s,x}(d\omega) = -E_{s,x}[\ln p(\omega)],$$

(3)

and the probability density measure $p(\omega)$ on the process trajectories.

The process entropy EF specific is its connection with time of observation $(T-s)=T_o$.

Cutting the EF by the impulse Kronicker function determines the discrete increments of information $\Delta I_k[\tau_k]$ for each impulse during its time interval τ_k.

(The EF cut off [6] models the observing discrete interacting impulse).

Information path functional (IPF) [7] integrates the cutting information increments during time interval T_I of observing information, where $T_I = \sum_{k=1}^{m}\tau_k$.

The IPF integrated impulse information measures a certain reality.

The sum of the discrete increments along the path of the cutting process intervals approximate the IPF I_p in a limit

$$I_p = \lim_{m\to\infty}\sum_{k=1}^{m}\Delta I_k \times[\tau_k] \qquad (4)$$

Each EF $\Delta S_k[x(\tau_k)]$, cutting on invariant impulse measure $[x(\tau_k)]$, is proportional to the impulse time interval $[x(\tau_k)]\sim[\tau_k]$, it satisfies $\Delta S_k[x(\tau_k)]\to\Delta I_k[\tau_k]$.

The minimax variation principle (VP)[8] for the EF-IPF determines invariant information increments $\Delta I_k[\tau_k]$ and size of the cutting impulse time intervals $[\tau_k]$.

Along the VP extreme trajectory, these invariants satisfy the following relations: $\Delta I_k = \Delta I_{k=1}Q^{m-1}$ and $\tau_k = \tau_{k=1}Q^{-(m-1)}$, at coefficient of decreasing $[\tau_k]: Q=3$.

That leads to the IPF in form

$$I_p = \lim_{m\to\infty}\sum_{k=1}^{m}\Delta I_{k=1}3^{m-1}\times\tau_{k=1}3^{-(m-1)} = \lim_{m\to\infty}\sum_{k=1}^{m}[\Delta I_{k=1}\times\tau_{k=1}], \qquad (5)$$

which, for invariant impulse information measure $\Delta I_{k=1} = |1|_k = 1Nat$, brings

$$I_p = \lim_{m\to\infty}\sum_{k=1}^{m}[|1|_{k=1}\times\tau_{k=1}] = \lim_{m\to\infty} m[|1|_{k=1}\times\tau_{k=1}]. \qquad (6)$$

Here $\tau_{k=1}$ is time interval of the impulse starting information process; thus, the starting $[|1|_{k=1}\times\tau_{k=1}]$ is fixed.

The observing time $T_I = \sum_{k=1}^{m}\tau_k$ determines the sum of geometrical series sequence of $\tau_k = \tau_{k=1}3^{-(m-1)}$:

$T_I = (1-3^{-(m-1)})/3^{-1)}$ which at the limit $T_{\text{Im}} = \lim_{m\to\infty} T_I(m) = 3/2$ identifies the finite time on the observing extreme trajectory. During this time, the number m of the observing the IPF contributions is limited:

$T_{\text{Im}} = \tau_{k=1}\sum_{m} 3^{-(m-1)} = \tau_{k=1}3^{-1}m, m = 9/2\tau_{k=1}$ at limited $\tau_{k=1}$.

That also limits value of the IPF observing during T_{lm}: $I_p = m[|1|_{k=1} \times \tau_{k=1}] = |1|_{k=1}\, 9/2.$

Generally, at any $Q > 0$, upper time T_I in the IPF functional is limited by

$T_I = \lim_{m\to\infty} \tau_{k=1} Q^{-(m-1)} \to 0$, (7)

as well as $\min I_p = \min[\lim_{m\to\infty} \Delta I_{m-1} x(\tau_{m-1})] = \min[\lim_{m\to\infty} \Delta I_{m-1}[\tau_{m-1}] \to 0$, which limits the above sum of I_p at $m \to \infty$, and therefore, the cutting *Entropy Integral converges in the Path Functional*, and both of them are restricted at the unlimited dimension number. (The sum I_p at $m \to \infty$ does not diverge since the limit of the min I_p is zero).

Moreover, for the invariant impulse, its geometrical measure $M_{gk} = |1|_{gk} = \pi$ is proportional to the time measure $[\tau_k] : [\tau_k] = \pi p,\ p = 1/\sqrt{2} : M_{gk} = p \times [\tau_k]$ at constant $p = 1/\sqrt{2}$, while the information and geometrical measures hold invariant [10]. That leads to limited

$I_p = \lim_{m\to\infty} \sum_{k=1}^{m} [\Delta I_k \times [\tau_k]] \to \sum_{k=1}^{m} p \times [\tau_k]^2 \to 0$ at $\tau_k = \tau_{k=1} Q^{-(m-1)}$. (8)

The density of information for each following impulse

$D_k[\Delta I_k] = \Delta I_k / \tau_k = \Delta I_{k=1} Q^{m-1} / \tau_{k=1} Q^{-(m-1)} = (\Delta I_{k=1} / \tau_{k=1}) Q^{2(m-1)}$

is substantially growing along the observing extreme trajectory. In the limit, at $Q > 0$:

$D_m = \lim_{m\to\infty} \sum_{k=1}^{m} [(\Delta I_{k=1} / \tau_{k=1}) Q^{2(m-1)}] \to \infty \cdot$ (9)

Since the time transition to each following IPF' Nat decreases, each such Nat integrates all preceding Nats concentrating the integral information in the final IPF Nat. Such Nat of infinite density cannot exist as real.

Or such reality measure is unobservable even during finite observation time (7). It measures absolute reality. The time, starting the information process of the discrete information impulses, begins its IPF integral information measure in Information Macrodynamics [9,10]. This integral information measure on the extreme trajectory of information impulses is limited measuring certain reality; while the impulse information measure density growing to infinity reaches an absolute and unobservable reality. The IMD formalism evolves to Interactive Integrated Information Dynamics (IIID). The minimax variation principle for the EF-IPF determines equations of IIID which formalize the information regularities of observing random process, and information measures of its interactive reality. The IIID integrates the multiple interactive dynamics in finite bits, which observe and measure reality during the time integrating path to reality.

Essence of Information Process and Intelligent Observer The Information process emerges within observing random Levy process, starting with unpredictable (probability zero) merge-overlap of the yes-no impulses creating random jump with conjugated entropy fractions beginning a microprocess. The emerging microprocess runs superposition and entanglement of the impulse yes-no conjugated entropy fractions. The fractions entangle during the time interval before its space is formed, composing two qubits and/or Bit which set up a reversible logic within this impulse created geometry. When the impulse interacting actions curve the impulse space geometry, such interaction logically erases previous form of the entangled space entropy creating asymmetrical logic Bit as a logical Maxwell demon. With approaching probability one, the impulse‘ attracting interaction captures energy of such a real-certain interactive action physically erasing the entropy of

bit logic. The erasure costs compensation of a high–quality energy of the physical (quantum) process for entropy of lesser quality carrying the initial Markov diffusion. That removes the causal entropy of the asymmetrical logic, bringing asymmetrical Information logical Bit as certain impulse Bit.

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The process free information self-cooperate the Bits in triple information units. The triplet units assemble information network (IN) encoding the units in information geometrical structures enclosing the triplets' code.

The IN triplets request the needed information generating a logic of probing impulses, sequentially cutting the observing process entropy measure and encoding new information units in the hierarchical IN. Multiple INs bind their ending triplets, enclosing Observer Information, hierarchical reality, cognition, and intelligence [11]. The Observer cognition assembles common units through multiple attractions in resonances loops at the forming IN triplet hierarchy. The distributed cognitive logic self-controls encoding of the intelligence in a double helix coding structure (DSS). The Observer clock time intervals open access to external energy at each specific level of the IN multiple hierarchy, enabling the memorization and encoding the hierarchy of these Bits. These Bits become hierarchical measure of certain reality on the path from uncertainty. The Intelligent Observer, self-reflective to the DSS logic, enables reading and understanding the message meaning. The IIID describe the emerging doublet-triplet logic, the evolving hierarchy of the information process with IN formation, integration the logic, memory, cognition, encoding the intelligent observer in triplet code, which further encodes physical information, cognition, intelligence including consciousness, motor function, enable create AI with intellectual brain.

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