# Wolpert's Theorems about Mutual Unpredictability and the Impossibility of Subuniverses to Predict with Highest Resolution of Causality-Control are Rediscoveries of Concepts from Theory of Universe and Mind – Entangled with Unnecessary Mathematical Notation and Unsatisfiable Premises

Todor Arnaudov, 10.2025, The Sacred Computer, SIGI-2025

A response to: *Physical limits of inference, David H. Wolpert, 2007/2008**[1] etc.

This work is a chapter from the book "*Reflections on Everything*", or "*Listove*" (*Листове по всичко*), which is an appendix and the second-biggest volume from the hyperbook *"The Prophets of The Thinking Machines: Artificial General Intelligence and Transhumanism: History, Theory and Pioneers; Past, Present and Future"*, T.Arnaudov, 2025-1.2026 – all published at the yearlong virtual conference *"Self-Improving General Intelligence/Thinking Machines"* 2025, organized by *The Sacred Computer: Thinking Machines, Creativity and Human Development*, a virtual multi- and interdisciplinary AGI and Transhumanism research and development laboratory, created in 2000. The first classic works of Theory of Universe and Mind were published between 2001 and 2004. Core ideas from the theory were presented in a lecture at Technical University of Sofia in September 2009 and in the world's first university course in AGI at the University of Plovdiv "Paisii Hilendarski", Bulgaria in 2010 and 2011.

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The long abstract is created by ChatGPT as a reviewer on 14.4.2026 with minor edits on formating and repetitions.

[1] * Physical limits of inference, David H. Wolpert, MS 269-1, NASA Ames Research Center, Moffett Field, CA 94035, USA, https://arxiv.org/pdf/0708.1362 [Submitted on 10 Aug 2007 (v1), last revised 23 Oct 2008 (this version, v2)] Cited previous work with related conclusions:
* [46] D. MacKay, On the logical indeterminacy of a free choice, Mind, New Series 69 (273) (1960) 31–40. 42
* [47] K. Popper, The impossibility of self-prediction, in: The Open Universe: From the Postscript to the Logic of Scientific Discovery, Routledge, 1988, p. 68
* A "Wolpert's law" about mutual unpredictability was mentioned during a discussion on AGI list by Matt Mahoney in 8.2025, however without a reference. Some time later I found it. See:
* *Power overrides intelligence*, Todor Arnaudov, James Bowery vs Matt Mahoney, SIGI-2025, AGI List, 8.2025,https://twenkid.com/agi/download.php?file=Power_Overrides_Intelligence_Todor_on_AI_Aligners_SIGI-2025.pdf

**Abstract by ChatGPT**

This work presents a critical and comparative analysis of the theoretical limits of prediction, inference, and control in physical systems, focusing on the framework introduced by David H. Wolpert and its relationship to the Theory of Universe and Mind (TUM). Wolpert's theorems establish that no inference device embedded within a universe can achieve complete and error-free prediction, observation, or control of other devices, and that mutual perfect predictability between independent agents is impossible. These results are often interpreted as formal limits on knowledge, extending earlier ideas such as the impossibility of Laplace's demon.

The present paper argues that these conclusions correspond to principles previously articulated within TUM, where the universe is modeled as a hierarchical computational structure composed of interacting causality-control units (CCUs). In this framework, predictive and causal capacities are determined by the resolution of causality-control and perception (RCCP), with higher-level subsystems operating on compressed representations of lower-level dynamics. As a consequence, all subsystems exhibit bounded predictive power, limited memory, and partial control, while only the universe as a whole achieves maximal resolution and completeness.

The analysis further examines the assumptions underlying formal inference models, particularly the treatment of devices as independent entities. It is argued that, in physically realized systems, all subsystems are inherently correlated due to shared origin, continuous interaction, and embedding within a common dynamical structure. This challenges the applicability of certain formal premises and suggests that observed limits on prediction arise from structural and hierarchical constraints rather than solely from logical or computational restrictions.

Additionally, the paper critiques the use of highly abstract logical formulations – such as binary query models and paradox-based arguments – as insufficient for capturing the multi-scale, continuous, and physically grounded nature of real-world systems. Instead, it advocates for models that incorporate hierarchical organization, varying resolutions, and the interplay between compression and prediction.

The conclusion is that while formal results on the limits of inference are valid and significant, they can be more comprehensively interpreted within a broader framework that accounts for the hierarchical and embedded nature of cognition and physical processes.

## Introduction

Note that the term “device” and “control” (and control unit; causality-control unit) are used in TUM as well (устройство, управляващо устройство). Bold and [1], [2] is added by T.Arnaudov for the notes.
TUM – Theory of Universe and Mind
CCU – Causality-control unit; VU – Virtual Universe;
RCCP – Resolution of causality-control and perception;
POV – point of view
* See TUM and its principles and ideas and compare: both classic works 2001-2004 and the ones from SIGI-2025. Some resources and related discussions are available in:
* *Stack Theory is yet another Fork of Theory of Universe and Mind*, T.Arnaudov, SIGI-2025 https://twenkid.com/agi/Stack-Theory-is-Fork-of-Theory-of-Universe-and-Mind-13-9-2025.pdf
* See resources about TUM in other pages of volume “Listove”/Reflections on Everything and after this text.

## Wolpert vs Arnaudov

Start the comparison with the examples on page 4-7:

**D.Wolpert, 2007/2008: p. 4-7:** *“**Example 1:** a general-purpose observation device, capable of observing different aspects of the universe ... can ask questions: “Does S (t2) = K?” **.. ’yes’ or ’no’** - a binary function of u. F ...“(1)* either a “scientist” or *“inanimate” pieces of hardware; **Example 3:** .. **a general-purpose prediction device**, capable of **correctly predicting different aspects of the universe’s future.** The **prediction device** = a physical computer, and a scientist who programs that computer to make the **prediction** and interprets the computer’s output as that **prediction**. .. the scientist initializes it at some time t1 < t2 to contain some information concerning the state of the universe and to run a simulation of the dynamics of the universe that uses that information… **to “predict S (t2)”** only means the scientist **must program the computer appropriately**; the scientist must force the universe to have a worldline u such that χ(u) = c, and that must in turn cause ζ(u) to accurately give Γ(u) ..**Example 4:** .. a system that .. serve(s) as **a general-purpose recording and recollection device,** capable of **correctly recording different aspects of the universe and recalling them at a later time** ...“*

These definitions seem to observe the scientists as if they were not constituent parts of the universe, which are built from the same material and correlated and affected by it – see below. Compare to [Arnaudov, 2002], the three basic ways for predicting in the Universe computer by the subuniverses (CCUs), the hierarchical simulators of virtual universes etc. For example, humans believe they have “free will” and they do “*what they want”*, but what are the states of their *cells, or atoms?* How much of *that* do they know or control? This is addressed in TUM: RCCP, virtual CCU

etc. **Wolpert, p.12:** *"Prop. 1(ii) means that Laplace was wrong: even if the universe were a giant clock, he would not have been able to reliably predict the universe's future state before it occurred."*
**TUM, 2001-2004:** No subuniverse/computer is faster than the Universe Computer as a whole, neither it could have more or enough memory – everything in Universe is a kind of memory. Only the Universe computes the future with the highest RCCP and everywhere in its entire memory, however it does only for the next step. The higher-level virtual universes: compress, have memory of previous predictions and history; can focus on specific space-time regions of memory, which are smaller than the whole universe; can work at lower RCCP etc. that allows them to predict the future more steps ahead, even though at lower RCCP, confidence etc. before it really happens.

However, the higher-level universes are able to predict the future more steps ahead, because of the *redundancy* at the lower-level universes, which allows them "not to care" about all details and about *being unable* to predict it at the highest RCCP and thus to *"truly"* cause-control (see below) and not just to do it "virtually", which is sufficient for their *target* RCCP. Yet sooner or later this leads to errors and to "crash", though, and a given CCU's prediction would change to something else or "die".

Only the Universe as a whole, or from a higher level universe's perspective – the universe at the currently accepted as the lowest level, called also "physical" – is supposed to "*never halt"*or *crash* – from the POV, sensations and predictions of the encompassed higher level ones.

The "crash" here is not used in the sense of Turing Machine halt, ending of a program (a signal for completion); a system, device, agent, CCU crashes when it faces an illegal "opcode"/state and it can't deal with the exception; a virtual *universe never crashes* if at that level *all possible states* are implemented and covered, thus any possible instructions, condition, configurations etc. are acceptable, nothing is a *mistake* and "*fatal*" for the universe, therefore it never enters *undefined states*.

When a virtual universe at a given level has *incomplete implementation* – not all possible states at a lower level are defined *at the higher* - it can malfunction, be "hacked", deteriorate etc. An evaluator-observer detects that condition as changes in its properties, behavior, manifestations, states etc. which lead to recognition of the features of a lower level CCU, virtual universe etc. The errors lead to *collapse* into a new configuration, where the *highest* currently evaluated-observed version of the CCU/VU is some of the *constituent* lower-level causality-control units, or a newly formed system that is created by the interaction of the subuniverses in the new more "free" and malleable state, which was previously locked and forbidden by the higher level CCU; unlike the collapsed CCU/VU, the new system or the lower level CCUs/VUs are capable to take care of the *"undefined conditions/states"* from the POV of the "dead" *former* higher level system.

**Wolpert, p.23:** ***"6.2. Philosophical implications:*** *...general restrictions that must relate any devices in such a universe, regardless of the detailed nature of the laws of that universe. ... Say we have a device C in a reality that is* ***outside distinguishable.*** *Such a device* ***can be viewed as having "free will"****, in that* ***the way the other devices are set up does not restrict how C can be set up*** *[1]. Under this interpretation, Thm. 1 means that* ***if two devices both have free will, then they cannot predict / recall / observe each other with guaranteed complete accuracy. A reality can have at most one of its devices that has free will and can predict / recall / observe the other devices in that reality with guaranteed complete accuracy.[2:]*** *(Similar conclusions hold for whether the devices can "****control****" each other; see Sec. 7 below.) Thm. 3 then goes further and considers devices that can* ***emulate*** *each other. It shows that independent of concerns of free will, no* ***two devices can unerringly emulate each other.*** *(In other words,* ***no reality can have more than one universal device.****) ... these results could be called a "****monotheism theorem".***

**Todor:** [1]: However, in reality, in Universes like ours **this is impossible** *and it is not so*. The process of the *genesis* of the higher level virtual universes of the two or any "devices" **is common,** everything is produced as an unfolding from earlier states where the causal and spatial distance between parts of the current devices, subuniverses etc. were smaller and even if they now appear different and uncorrelated, at some point of time their earlier precursor were more similar, closer in distance and more related, possibly in some point of time or way of observing-evaluating they were the same entity – the simplest way to reach to that conclusion is that they are part of the same Universe.

In addition, as the *highest possible RCCP at the mother universe* is considered, the devices, subuniverses, parts of the Universes have influenced or interacted with each other not only in **their earlier states of genesis, but forever and in any moment** - as gravity forces etc., and other possible forces, "quantum entanglements", and continuing the first premise – indirectly, because by their existance they force or cause other dependencies and conditions which influence the possibilities of the other device, unit, subuniverse, CCU, agent, entity; "Markov blanket", "thing" – whatever we call it, define it, address it etc.

Qualititavely, all devices and subuniverses are undoubtedly correlated, they do depend on each other, they are in the same memory of the same Unvierse Computer, thus "they" *do influence: 1)* each other 2) what they could be and what they are at the moment; 3) what their behavior or "free will" could be in the future.

Therefore the premise, *as given*, is **wrong.**

**The *conclusion alone,*** that only the Universe as a whole can predict its future at the highest possible resolution of causality-control and perception, **is correct**, however **without the premise.**

There is a limit of predictability for a virtual universes/CCU, horizons either in time, space, precision etc., also about "self" – in TUM: *the eye can't see itself without a mirror*.

The higher levels work at lower resolution and are slower; they predict, but at either lower resolution/precision or at lower range, and overall: they are parts of the Universe and they both depend on the other parts in the past, present and the future; and they influence the other parts *now* and they *can* influence them in the future etc. This is stated in TUM, even in the early treatises from 2002.

* The device *can be viewed as … being set up independently* – yes, *it can be* ***viewed*** by an *evaluator* who does not search or cannot access the representation deep and "long" enough back in the past, in abstract representations at a lower RCCP; however how could the devices be supposed to predict at the highest possible resolution: they are *virtual* causality-control units, with the only "real" being the Universe as a whole. For example, the requirement is similar to asking an "unrestricted" video recorded at 160x120, which can represent completely random pixels in each coordinate at each frame, to be capable to represent precisely a 1920x1080 video with the same maximum per-pixel-level resolution and range: *without* "tricks" of redundancy in the enlarged canvas; without additional interpreter or decompressor, relying on additional memory and processing; without "cheats" with simple images: the 160x120 record should cover the full possible 1920x1080 spectrum.

This relation is obvious also simply by the qualitative differences of the *scales*, without any special formulas or theorems. Every subuniverse, even if it is "truly" independently defined and segmented, is only a *part* of the whole. How can it contain and compute the *whole* and know what is *outside* of its own limited bounds and range of accessible space?

Again, it *might*, but in special circumstances – if its predictions and transformations are actually driven by the universe as a whole or by a bigger encompassing subuniverse, and the predictions of the smaller included subuniverse reflect/map other phenomena elsewhere on other levels or locations, which are repeated in the smaller one; in these cases the encoding and predictions happen because they are "preprogrammed" and synchronized by an inter-level driver and matches, common genesis and connections of subuniverses at different levels of the Universe Computer. That case *was addressed* in TUM, e.g. in Universe and Mind 4, where the "*origin of the non-goal-directed matches, for the experiencing mind, between different levels of the Universe Computer*" was introduced as early as a sub-title.

"***7. Control devices … "***

***The Universe*** **controls you and everything** at the highest RCCP – that's explained in TUM. Its first and other titles are: "Conception about the *Universal*

*Predetermination"* and *"The Universe Computer"*.

**Wolpert: p.26:** *"In particular,* ***no device can control itself,*** *and no two distinguishable devices can control each other. In fact we can make the following stronger statement, which essentially states that if two partitions are refinements of each another, they must be identical: Theorem 5: If two devices C1 and C2 simultaneously semi-control one another's setup functions, then the partitions induced by X1 and X2 are identical."*

This is a restatement of ***Todor Arnaudov, TUM, 2001-2004:*** Only the Universe has "real" control, at the highest possible RCCP. The control of all other virtual universes = subuniverses = causality-control-units = machines = programs is only *virtual,* which means at a lower RCCP.

A true control is defined as: when one control unit records/writes in the memory of another control unit, a "slave", a controlled one, with a resolution of causality-control and perception that is *maximal* for the machine language of the universe where the *controlled CCU* is defined. In our universe at the lowest level, or at a "lower" or what we know about it, that is quarks, electrons, protons, neutrons etc.

Devices – the subuniverses – *believe* and "want" that they "*truly control*" and the future happens as they wish, and may have pseudo or "self-delusional" complete control in their subuniverses, when they set a selected level and precision, slice, area of a subuniverse as "physics"; a limit – the lowest level – with a given accepted RCCP which is *assumed* to be "*enough*" for "complete causality-control". Then they may assume that anything that is as precise within a given range/prediction horizon in time etc. is "enough" and counts as "complete control" *for them.* That phenomenon is addressed many times in TUM since 2001-2002, starting with the astronomically lower magnitudes of the intentionally and "consciously" caused-controlled bandwidth, compared to the bits required to describe the actual states of the system in the machine language of the universe – i.e. this suggests that it is the *lowest level* that controls the system and causes the changes in the lower-level universe, and *not the will of the agent*, when represented in these miniscule bits only; see also Ashby's "requisite variety"; other examples in UnM-3, which were a vision about the generative models for images and video – that the wishes of the characters in fairy tales to magic fish and genies are as short as just a few letters or words, but they may lead to the generation of whole castles in the real world, i.e. these generators should have an enormous memory bandwidth and complete the missing bits of the representation from their own records and models. That corresponds to the prompts, sent to generative models, and the ratio between the complexity of short prompts and the representation of the generative model as neural weights in memory, e.g. from just a few bytes or a hundred of bytes, to GBs or even hundreds of GBs.

UnM-4 in 2004 addresses this problem since the beginning with a revisit and refinements of the basic concepts by illustrating the levels of virtual universes with different RCCP and the virtuality of human conscious causality-control and "free will"

– humans use to believe, that as they can want to do something and they do it, that is a good enough proof for their freedom, free will etc., however they do not notice or admit that they do at a very low RCCP, usually described in words: verbs, nouns, adjectives etc. – *"I want to throw the coin behind the sofa"* or "on the floor" or "over there" etc. variants. In the real world, or in the "more real world", there are exact coordinates of exact particles and exact trajectories for each fraction of the second.

The idea of this example, almost literally, was rediscovered and repeated by Yoshua Bengio in his papers and lectures on "Consciousness prior" – in one video he demonstrates practically the same experiment, suggested in my work published 13-14 years earlier[2]: he throws a small object and explains that while we cannot predict the exact trajectory, we can predict that it will fall on the ground etc. The thought experiment in *"Universe and Mind 4"* is more elaborate and includes linguistic variants, which demonstrate that indeed natural language in that form can be used as a "world model" for prediction, however one with a lower RCCP, therefore the textual representation alone, without more precise "physical" records and formats, is insufficient for complete operation in the real world at a higher resolution of causality-control and perception[3]. This is also demonstrated in "AGI Digest" - "Chairs, Buildings, Caricatures …" - my letters to the AGI List from 2012, regarding the generalizations and that the lower level sensory concepts are not well suited for precise description with linguistic representation, or when they are represented like that they transform and degenerate into code and command languages, which list the format of the images and the content of the data points*.

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[2] A reference from the main volume of *The Prophets of the Thinking Machines, 2025;* In part "**Short chronology"** at page ~1010 (in the ed. In 6.11.2025) – "Предпоставката за съзнание и причинността: съвпадения между примери и обяснения на Йошуа Бенджио от 2018 година и на Тодор от "Теория на Разума и Вселената" от 2003-2004 г"*;* citing: "From Deep Learning of Disentangled Representations to Higher-level Cognition 52 735 показвания • 9.02.2018 г. Препраща към: "The Consciousness Prior", Bengio 2017: https://arxiv.org/abs/1709.08568 https://youtu.be/Yr1mOzC93xs?t=2486 Views now (6.11.2025): 74 941 (the throw of the object) Introduction a bit earlier: https://youtu.be/Yr1mOzC93xs?t=2354 **Yoshua Bengio, 2018:** "Something else, which I think is fairly new and connects with classical work with AI and knowledge representation and symbolic AI … "; Think about your thoughts; your conscious thoughts … there's something that comes to your mind… and it's very low dimensional … That's my claim … You can convert that into sounds, a sentence … Not everything is like this, I can do visual imagery and that's hard to verbalize; … but even if it's visual, it's very low dimensional and it concerns a very few aspects of the world …" (Then he demonstrates the predictability with an experiment with throwing a piece of paper etc.)
Compare the above with the first points of "Universe and Mind 4", which revisits and refines the expression of important basic ideas about prediction, compression and levels of abstraction, introduced in the earlier parts.This work was written and edited immediately after the publication of Universe and Mind 3 in the summer of 2003, and published in April 2004:
* „Вселена и Разум 4", сп. „Свещеният сметач", бр. 29., 4.2004
https://research.twenkid.com/agi/2010/en/Todor_Arnaudov_Theory_of_Universe_and_Mind_4.pdf
https://www.oocities.org/eimworld/4/29/pred4.htm

[3] This idea is an embodiment of the "information bottleneck" method.

* See main volume of “The Prophets of the Thinking Machines...”

Therefore, the CCU controls and causes only *virtually* and their models and representations are *incomplete or erroneus;* for that reason, the errors accumulate and sooner or later the *horizon* of their *allowed-operation-with-errors* ultimately finishes with an “*exception*”, which cannot be “caught”, which *destroys* the particular virtual machine = virtual universe; then the lower level VUs become more visible for the other VUs = evaluator-observers. When the higher-level machine crashes, i.e. it no longer controls “truly” *enough* even by its standards and the standards of the other competing machines, its niche is occupied by either the next machine down the hierarchy, or by another machine from a similar level, which was not yet located at that area, but arrives and takes over the space. That happens for example in the political states and “geopolitics”, in the markets in economy; in biology and ecology – when an organism dies, bacteria start to consume it and the lower-level chemical processes which do not involve the complex biological cycles of metabolism become prevalent. Then other organisms may detect this location and visit it, take these lower-level biological residuals which for them are “food” – a building material – and incorporate it in their own bodies: now they become “*masters*” of these lower level “*slaves*” and control them with a RCCP which is “*sufficient*” for them and for their *allowed-operation-with-errors* – for another cycle of existence, say two months for a skin cell, one or two days for a cell in the gut etc. Their precision for “self-evidencing”[4] however is not ultimate at the level of the Universe Computer, sooner or later the higher level CCU – the organism – cannot repair or reproduce properly a critical amount of “facilities” at different levels – either cells, “critical” parts of its “life-supporting infrastructure” – e.g. aterosclerosis building up, a blood cloth causing a stroke etc.

Thus, the subuniverses, besides “virtual” controllers are also *temporal*, while the Universe is “eternal” in the scale of the agents which are constructed/implemented/embodied inside its memory.

See also *“The Matrix in the matrix is a matrix in the matrix”*, 2003 - The universe controls you *anyway*. If a character in the movie does not like the Matrix in “The Matrix”, his very decision is still made by the “real” or “the more real” “Matrix’ – the Universe of which he is a part. The irony and parody in the movie is that Neo, Morpheus and Trinity have not escaped “The Matrix” – they only *deluded* themselves, because the *Real Matrix* in “The Matrix” is made of “atoms, molecules…” etc. and at *this* level it is not The Matrix of the *machines* that controls the humans, but *the lower-level Universe*, which controls *all of them*; going deeper, from a more global point of view for *another observer-evaluator* they are *not humans, machines* etc. – these are

[4] See Karl Friston’s school of “Free Energy Principle/Active Inference” reviewed in *The Prophets of the Thinking Machines …* (FEP/AI)

classes of intermediate or higher level artifacts, “features”, which are segmented by higher level CCUs, which have selected this particular point of view, slice, sets of features, RCCP etc. *“The thing in itself”* in Kant’s terms is different and the particular manifestation of its state in some visible, observable-evaluatable representation is *not only different*, but also *variable*, depending on the evaluator-observer and its specifics, limitations and *choices*. That may imply that there is some “invariant” representation at the lowest or “more invariant” at the “more-lower” level representation, from the point of view of the current.

…

**Wolpert:** p.27: *“9. Definition 12: A self-aware device is a triple (X, Y, Q) “*

Therefore the **triples** in mathematical notation solve the mystery of consciousness… The same criticism is valid for other definitions in all kinds of papers, which define or discover solutions of *metaphysical* problems ***with a notation*** in the accepted conventional mathematical manner:

If some definition in formal logic with a few letters is defined (formal, formalized) and the paper claims that *“if A then B”, where B is “this is consciousness, awareness, soul, …”*, then the *metaphysical* problem is solved. The same approach is applied in the recent *Stack Theory*[5], which is reviewed in “*Stack Theory is yet another fork of Theory of Universe and Mind.*

Michael T. Bennett’s work is explicitly centered around levels of the “stack” like TUM, but I didn’t find a notion of causality-control *hierarchy* and *levels* in Wolpert’s paper. There is *“semi-control each other”*, which is related to the concepts of resolution of causality-control and resolution of perception (RCC, RP, RCCP); it is possible that the choice not to define the structure like that was made in order to allow for more general types of universes, however it is also the usual way this kind of mathematical proofs are constructed – for example see “Stack Theory is yet Another Fork…”.

The devices *infer functions* – however how all these functions are realized as an *incremental process*, implemented in the real universe with its constituent interactions? This problem does not seem to be addressed as well. TUM also did not specify the details about the precise mechanics of the construction of the higher levels.

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* https://en.wikipedia.org/wiki/David_Wolpert :

***“Limitation on knowledge:*** *Wolpert has formalized an argument to show that it is in principle impossible for any intellect to know everything about the universe of which it forms a part, in other words disproving "Laplace's demon"[16] This has been seen as an extension of the limitative theorems of the twentieth century such as those of Heisenberg and Gödel.[17]*

[5] How To Build Conscious Machines, Michael Timothy Bennett, PhD Thesis, 2025 https://michaeltimothybennett.com/research

*In 2018 Wolpert published a proof revealing the fundamental limits of scientific knowledge.[18]"*

I don't think this requires any formalisation, as it is expressed in TUM. Of course, a subuniverse can't control truly the whole universe; it could *appear as it controls it*, when the part and the whole "dance together" and the part *believes* that its decisions or its *state* led to the move of the bigger system or the whole. However, yet the subuniverse has a limit of resolution, scope, breadth, capacity of what it can perceive and cause and it cannot access and manipulate *even its own representation* at a "sufficient level" – there's a stacking "control-drift", lower precision between the levels, scales, ranges.

The *believe* that an agent, a subuniverse, built in the memory, is more or equally powerful in prediction-causation as the Universe as a whole, *without* being the Universe itself – or its "authorized representative", – is a *by effect* of the virtual universes following the same principles and every CCU *desires and aims to be like the whole Universe* – to predict with the maximum precision, to make *their will come true* etc. Also, this phenomenon could be a result of the fact that the subuniverses are indeed "representatives", "delegates", "artifacts" of the Universe and the actual orders they execute at the highest RCCP are the ones of the *Master Universe* – in that sense, when the subsystems adopt the identity of the Ultimate system, each *virtual* subuniverse *"becomes the real Universe"* as well.

## Rediscoveries in:

*** Theories of Knowledge and Theories of Everything,** February 2018, DOI: 10.1007/978-3-319-72478-2_9, In book: The Map and the Territory, David H. Wolpert

https://www.researchgate.net/publication/323158254_Theories_of_Knowledge_and_Theories_of_Everything [Reads 347; ~21.10.2025]

*** New proof reveals fundamental limits of scientific knowledge,** Jenna Marshall, Santa Fe Institute, 2018 : https://phys.org/news/2018-05-proof-reveals-fundamental-limits-scientific.html ***"Not everyone can be right (...)****Wolpert's mathematical framework shows that no two inference devices who both have free will (appropriately defined) and have* ***maximal knowledge*** *about the universe can co-exist in that universe. There may (or not) be one such "super inference device" in some given universe—but no more than one. Wolpert jokingly refers to this result as "the* ***monotheism theorem****," since while it does not forbid there being a deity in our universe, it forbids there being more than one."*
*"... Bob and Alice are both scientists with* ***unlimited computational abilities****. Moreover, suppose that they both have "****free will,****" in that* ***the question Bob asks himself does not restrict the possible questions Alice could ask herself, and vice-versa.*** *(This turns out to be crucial.) Then it is impossible for Bob to predict (or retrodict) what Alice thinks at another*

*time if Alice **is also asked** to predict what Bob is **not thinking** at that time."*

**Todor:** Unfortunately **both premises are impossible:** 1) it is either assumed or implied that the unlimited computational capacity is impossible; 2) has more ***depth,*** *however* the theory in the paper doesn't address the *hierarchy* and the *constituent parts*.

If Bob and Alice are *independent*, they cannot belong and originate from the same universe, if it develops and unfolds the way our universe does - or as we believe it does and we perceive and experience it without cosmogony and looking so far in the past; at least so long as we know: **The future states are produced by transformations from previous states** (it could be possible in a given universe or our *older* states *or different types* of states to influence the current states differently etc., but *qualitatively* older states still influence the following; if they are Markovian and simple, the influence could be only from a given number of steps behind in a discrete development process etc.; the transformations could be entangled with complex graph of states etc. (see also S.Wolfram, J.Gorard's "branchial spaces", "ruliad" etc.)).

In order two agents, constructed *like that* and not just defined *without the process of their generation* from dependent and interacting constituent parts, to be ***truly independent*** in universes which develop *like that*, they should exist in ***parallel universes***, however then they **couldn't interact** and **know** about each other from interaction, thus they couldn't evaluate-observe themselves and it is the same like if they didn't exist for each other. Of course, the agents could ***speculate*** that *"it is possible, that other universes exist and their universe belongs to a multiverse"*, but that *thought* doesn't require another *real* universe to influence the characters and to cause this idea to be conceived. The nature of our own universe, which we can observe-evaluate as multi-scale, multi-modal, multi-resolution, multi-precision and segmented in subunits, subuniverses etc.; the development in space, time, nature of the systems etc. are *hints* which suggest these ideas and allow us *to think* about "multiverses", which *are* "*subuniverses*" and seem like "*parallel universes*" of *our own universe as we experience it*, and *from our own* points of view; however these subuniverses and *views* are at a *lower resolution* of causality-control than the "true reality and these representations are "*cheats*", because they do not track the full history sufficiently many steps back in time and do not evaluate the present state and time deeply enough to the really low-level causality-control units and forces etc. The *"virtual parallel universes"* in our universe and our views in fact *are not independent and parallel* at sufficiently low or at the lowest level – the level of the "real" or "true" control – where only the Master CCU rules: or the "Master Algorithm" in Pedro Domingos's parlance. We could speculate and extrapolate that possibly our universe could be like a particle itself, which is part of another even bigger entity: a universe of universes etc. and if the principles of TUM are applied and continued, that is a possible and reasonable consequence.

Bob and Alice's questions "don't restrict" each other only in the abstract and extremely low-resolution way, in which such mathematical definitions are usually given, without the genesis and the actual representation and structure of these agents. How many cells they have, how many atoms, protons, neutrons, electrons; how to describe their precise states, coordinates, energies, interactions etc.; how old *these* entities are, how they actually came into being from their earlier states. These are and were the real or "more real" agents or entities to be evaluated regarding the "real" causality-control and universe, not 10 bits of verbal definitions and logical operators *in the mind* of a sophisticated evaluator-observer, also defined with an enormous amount of detail.

The premises could be satisfied, but only for subuniverses, regions, slices; at lower resolution virtual universes, but for them some of the *"hard problems of real causality-control"* are *relaxed.*

On the other hand, a ***strict*** impossibility *in principle* is also ***wrong***, even if the premises could be fulfilled at the lowest level: *"Then it is impossible for Bob to predict (or retrodict) what Alice thinks at another time if Alice is also asked to predict what Bob is not thinking at that time."**

The systems can be connected, synchronized, similar in their design and experience, or have related development and to have matching states, without a need to transfer the corresponding information or as much as it could be required for other less related or unrelated causality-control units. They could be "entangled" by their design. (Yes, that breaks the requirement that *"they don't restrict the question"*, which from the start makes the problem ill-defined as explained above.)

In TUM that's addressed as the "strange coincidences" and *matches;* one of the sub-titles of Unviverse and Mind 4 explicitly mentions one of the suggested sources and reasons for them - the common genesis and the connection between the CCUs in their "backend", which itself is connected also with the nature of the development of the Universe and Mind involving compression-prediction. The earlier states of the Universe are supposed to be in a more compressed state, which results in more *repetitions* in its less compressed future states. That means more **"clones"** appear: production in high volumes, more similarities, copies, easier reproductions and predictions.

Let's address the second point:

*"Then it is impossible for Bob to predict (or retrodict) what Alice thinks at another time if Alice **is also asked** to predict what Bob is **not thinking** at that time."*

A "liar's paradox"-like *trick*: asking two counter-part "inference devices" in parallel to predict each-other, while A is asked to predict what the other is thinking – say what the content of some part of its memory contains, i.e. would be read if accessed – and B is asked to predict what the other is *not thinking*, i.e. it is supposed to be *"the opposite"*, so there is a contradiction etc. – this makes the amount of available computing resources or the impossibility of unlimited computing resources irrelevant

for the problem.

The experiment reduces “the world” or the universe, which is supposed to be multi-level, multi-scale … to trivial boolean algebra and “yes/no” questions – to extremely low resolution and low information, inadequate for the problem at hand, and almost meaningless alone.

The case shows a *third causality-control unit* C, which asks and *controls* A and B, for example the author in his thought experiment, and in fact it can and it does predict, tha*t “they can’t predict”*… That’s the “God” device which sets the questions in both “free will” agents’ minds in the same time *independently* (although they are not independent as argued above), “they don’t restrict each other”, but they actually do, and by the way – what is the purpose of asking yourself what someone *is not thinking* – that includes “everything, but one thing” – and what is “a thing” etc. If it is just “yes/no” – what’s the purpose of that alone, if it’s not connected, related, derived etc., and what if one “cannot predict that” (what if it can – what more information she would gain?).

**J.Marshall, 2018:** “*Wolpert compares this proposition to the **Cretan liar's paradox**, in which Epimenides of Knossos, a Cretan, famously stated "all Cretans are liars." Unlike Epimenides' statement though, which exposes the problem of systems that have the capability of self-reference, Wolpert's reasoning also applies to inference devices without that capability.”*

**Todor:** This nonsensical paradox and its deceptive nonsense is also addressed by TUM - in Universe and Mind 4, published in 4.2004. In my analysis the paradox is “*maximized*” with additional absurds: the liar is from the village of *Liarseville* and he says that all inhabitants of Liarsville are liars, so he asked whether he lies when he says that.

Obviously it is an ill-defined problem in a meaningless virtual universe of a very high level which alone is useless; or simply said: this is *bullshit* of someone who tries to outsmart somebody else, but fails; the “liar’s paradox” also demonstrates an ill-behaved “adversarial” agent with bad intentions.

The problem with the paradox *is not only in self-reference*, it is namely in the “bad intentions” and the attempts of *the agent* to *cheat* – pun both intended and not intended.

The Greek author of the paradox himself is also cheating, he tries to play “smart”, but it works only for ones who *want* or *allow* to be fooled by this bullshit – as the section in UnM4 concludes – either if he lies or if he does not in the specific case, *he is still* “a liar” – a *cheater*.

Another reason the paper reviewed here, along with other similar mathematical studies, does not react to this nonsense in the same way as I do, is that their definitions are **not hierarchical, multi-scale, multi-range, … etc.** and don’t have **degrees of match.** Like the usual mathematical formalisations they are **flat.** That’s one of the

problems of the simple Turing machine, which is not appropriate for analysis of thoughts and agents with realistic, "our universe-like" complexity – they could be constituent parts of realistic models; the representations of the universe, simulations etc. could be build with simple Turing machines, but a flat representation easily "hangs" and "deadlocks" itself – "the halting problem". The solution is to use *many of them* concurrently, to have interrupts, preemptiveness, time-outs; multi-scale architecture, "operating system", competing devices etc.

See my recent conclusions from the appendix "*Algorithmic Complexity*", mentioned below in appendix *Listove* as well, where I also criticize these disadvantages of a *single* Turing machine or a simple computational model. The whole *Theory of Universe and Mind* itself is also a criticism of the "single-thread" model for definition, implementation and application and for *understanding* of a human-like mind and thought process, especially for *human* evaluator-observers, because of our own way of thinking like that, which is reflected in the theory.

[13.4.2026: This is one of the problems of the so called "Symbolic AI" or the "GOFAI" – the brittleness is due to the flatness and the insufficient complexity, substance, "requisite variety" of the respective representations etc., *and not because of their discreteness* and other properties per se. See "*Genesis: Creating Thinking Machines*" (future work): * Neural Networks are Also Symbolic: Conceptual Confusions in ANN-Symbolic Terminology, T.Arnaudov, 14.4.2019 * https://www.researchgate.net/publication/403730363_Neural_Networks_are_Also_Symbolic_Conceptual_Confusions_in_ANN-Symbolic_Terminology
* https://artificial-mind.blogspot.com/2019/04/neural-networks-are-also-symbolic.html etc. in *The Prophets of the Thinking Machines.*

* Algorithmic Complexity, T.Arnaudov, 7.2025 - an appendix to "The Prophets…", SIGI-2025

*** Universe and Mind 4** (the complete Bulgarian original):
https://eim.twenkid.com/old/4/29/pred4.htm
Regarding the Liar's paradox see sect.21:":
*"21. Размитата логика (fuzzy logic) и размита ли е всъщност"*
*(See a quote from the original text in the appendix to this article below. )*
https://research.twenkid.com/agi/2010/en/Todor_Arnaudov_Theory_of_Universe_and_Mind_4.pdf - from page 20, starting with a discussion on Truth and a quote from the previous part "Universe and Mind 3". The translation wasn't refined and perhaps could be improved.

@Vsy, LLMs with the Bulgarian text: "Translate to English:…"

**Todor:** One may argue that the original Liar's paradox is about "mathematical logic", set theory, "self-reference", Goedel theorem, formal languages with "sentences" with classical logic boolean logic etc., while *I address also the real world*. See also Goedel's incompleteness theorems and Tarski's:

*** Alfred Tarski's undefinability theorem;** language, meta-language, object language; * https://en.wikipedia.org/wiki/Tarski%27s_undefinability_theorem
*"no sufficiently rich interpreted language can represent its own semantics.*
*A corollary is that any* ***metalanguage*** *capable of expressing the semantics of some* ***object language*** *must have expressive power exceeding that of the object language."*
*'p' is true iff p' …*
*** Continuous Model Theory,** Chen Chung Chang, H. Jerome Keisler, 1966 – an extension of Tarski model – mathematical logic; *"the relation between formal logic and its interpretations, or model";* sentence; truth/false (binary, boolean); … https://books.google.bg/books?id=uiHq0EmaFp0C&pg=PR12&source=gbs_selected_pages&cad=1#v=onepage&q&f=false – 1990 edition

**Todor** [30.10.2025]**:** In the TUM and the Universe Computer this problem is solved by hierarchical causality-control units, multi-scale, multi-range, multi-precision, … low-level operations etc., where the basic semantics is the state of the system and relations between the transformations etc. Also, one of the solutions is to understand and *accept* the *potential multiplicity* – that there is *no single unified solution* and "proof" for some formulations – the causal credit assignment depends on the specific chosen filter of ranges, scales, domains etc. A related phenomenon is the *"integral of infinitesimal selves"*[6] from TUM and the "quantum entangled" state of indeterminacy – this is a situation when the evaluator-observer measures, perceives, detects signals with a lower resolution than the one of the virtual unvierse *of the observation*. The evaluator-observer has insufficient representational capacity and performance to keep up; virtual universes try to sample and reflect the real one or "more real ones" – lower-level ones.
…
* https://en.wikipedia.org/wiki/David_Wolpert – *"Limitation on knowledge"*; Wolpert has formalized an argument to show that it is in principle impossible for any intellect to know everything about the universe of which it forms a part, in other words disproving "Laplace's demon".
* https://davidwolpert.weebly.com/professional.html
* https://phys.org/news/2018-05-proof-reveals-fundamental-limits-scientific.html

**NASA** (where D.Wolpert was affiliated/some early citation refer to missing URLs:) https://www.nasa.gov/intelligent-systems-division/ The NASA Ames Intelligent Systems Division ... mission-driven, user-centric research and development in computational

[6] See *"Analysis of the meaning of a sentence …"* and *"Nature or Nurture: Socialization, … No Intrinsic Integral Self, but an Integral of Infinitesimal Local Selves (…)"* – full referenes below. Similar or related points of view are expressed in the schools of thought of Andy Clark; Karl Friston and his colleagues' Free Energy Principle/Active Inference; Michael Levin's body of work: *"every intelligence is collective intelligence"* etc.; John Vervaeke et al. "Relevance Realization" etc. As far as I know Theory of Universe and Mind precedes all of them. See *"The Prophets of the Thinking Machines…"*

sciences for NASA applications .. ground and flight software systems and data architectures for data mining, analysis, integration, and management; integrated health management; systems safety; and mission assurance; … Autonomous Systems and Robotics (ASR), **Collaborative and Assistant Systems (CAS)** https://www.nasa.gov/intelligent-systems-division/collaborative-and-assistant-systems/ (...)

*** Wolpert, Chaitin and Wittgenstein on impossibility, incompleteness, the limits of computation, theism and the universe as computer-the ultimate Turing Theorem,** December 2016, In book: Philosophy, Human Nature and the Collapse of Civilization Michael Starks (2016)Edition: first, Chapter: 54Publisher: Michael Richard Starks, [Articles and Reviews, 2006-2016
https://www.researchgate.net/publication/309155697_Wolpert_Chaitin_and_Wittgenstein_on_impossibility_incompleteness_the_limits_of_computation_theism_and_the_universe_as_computer-the_ultimate_Turing_Theorem

Also at: https://philarchive.org/rec/STAWCA-4 – 2016
https://philarchive.org/archive/STAWCA-5 (revised 2019)

… Michael Starks mentions that he didn't find any comments about the universe as computer, regarding David Wolpert's work - he *"have not found a single citation";*

***M.Starks:*** *One cannot build a computer that can predict an arbitrary future conditionof a physical system before it occurs, even if the condition is from a restricted set of tasks that can be posed to it—that is, it cannot process information (though this is a vexed phrase as many including John Searle and Rupert …) faster than the universe"*

*"Wolpert says he shows that 'the universe' cannot contain an inference device that can 'process information' as fast as it can, and since he shows you cannot have a perfect memory nor perfect control, its past, present or future state can never be perfectly or completely depicted, characterized, known or copied"*

These are ideas from TUM. They are an obvious consequence of the framework of TUM – Universe Computer with hierarchical multi-scale … prediction as the core operation of the building blocks – causality-control units – where the smallest are forming bigger subuniverses, which try to work like the whole and predict better etc.

*"Wolpert also notes the critical importance of the* ***observer*** *("****the liar")*** *and this connects us to the familiar conundrums of physics, math and language."(…)*

**Bounded rationality**

*"Finally, one might say that many of Wolpert's comments are restatements of the idea that no*

*program (and thus no device) can generate a sequence (or device) with greater complexity than it possesses. … There are obvious connections to the classic work of Chaitin, Solomonoff, Komolgarov and Wittgenstein and to the notion that noprogram (and thus no device) can generate a sequence (or device) with greater complexity than it possesses. …*

*Even a 'God' (i.e., a 'device' with limitless time/space and energy) cannot determine whether a given 'number' is 'random' nor can find a certain way to show that a given 'formula', 'theorem' or'sentence' or 'device' (all these being complex language games) is part of a particular 'system'*

**Todor:** In TUM *nothing* is random for the universe as a whole – it is so *for an evaluator.* In TUM something or a piece of data, signal, record, entity, event is *classified* as "random" in the sense that it lacks "*order*" or is less *predictable/compressible than expected/wanted;* or it counts as "*unpredictable*" /*incompressible"*, while the object is *expected* to be predictable and compressible *"if the data were ordered/not chaotic/not random"* – both in Shannon's information-theoretic and in Algorithmic information-theoretic sense. All is measured by an *evaluator-observer* which is a *virtual universe* and incomplete, unless it matches the whole universe. (…)

* M.Starks is a pioneer in stereo vision technology and has contributed to video games (Atari, Amiga) etc.

(…)
*D.Wolpert is most famous in AI/ML with:*

* **No free lunch theorems for optimization**, DH Wolpert, WG Macready, IEEE transactions on evolutionary computation 1 (1), 67-82, 18168, 2002

1 ~ " Theory of Universe and ***Math***", as a word play with the titles. See also Max Tegmark's Mathematical universe, reviewed in Listove from *The Prophets* …

**@Vsy:** Continue, refine, complete, extend …

* See also related discussions in the sections about Consciousness and Panpsychism ~ p. 250: ***Agency cannot be a purely quantum…***; and then:
* Todor Arnaudov's review and interpretations of concepts from Causal potency of consciousness in the physical world by Danko D. Georgiev; etc.

## * Some publications from the classical TUM, the world's first AGI courses in 2010-2011 etc.

* A github page of TUM, created since 2023: https://github.com/Twenkid/Theory-of-Universe-and-Mind

* See also the related appendices from SIGI-2025:
* Unviverse and Mind 6, Is Mortal Computation …, Stack theory is yet another …, The main volume (for example the list of schools of thought and researchers and the whole); in **"Power overrides intelligence"** there is a mention of "Wolpert theorem"[7].

* Original home page of "Society Razum" of The Sacred Computer: https://eim.twenkid.com/old/razum/index.htm Archived page from January 2005: https://web.archive.org/web/20050112110951/http://eim.hit.bg/razum/
**Bgit.net links – see at archive.org**
* https://web.archive.org/web/20050112211003/http://bgit.net/?id=65395
* https://web.archive.org/web/20050114204244/http://bgit.net/?id=65835
https://research.twenkid.com/agi/2010/Todor_Arnaudov_Theory_of_Hierarchical_Universal_Simulators_of_universes_Eng_MTR_3.pdf (English) – Lecture slides for the AGI course, already the English translation uses "Causality/Control units (CCU)"
*https://research.twenkid.com/agi/2010/Todor_Arnaudov_Theory_of_Hierarchical_Universal_Simulators_of_universes_MTR.pdf (Bulgarian – a shorter version)
*** Translations of Universe and Mind 3 and 4 from 2011**
https://research.twenkid.com/agi/2010/en/Todor_Arnaudov_Theory_of_Universe_and_Mind_3.pdf
https://research.twenkid.com/agi/2010/en/Todor_Arnaudov_Theory_of_Universe_and_Mind_4.pdf (The English translation is incomplete, e.g. a section about the strange coincidences – low probability, for the experiencing mind, matches between different levels of the universe computer ..)
* https://www.oocities.org/eimworld/4/29/pred4.htm Вселена и Разум 4 – оригинал на български
* https://www.oocities.org/eimworld/3/25/pred-3.htm Вселена и Разум 3 – оригинал
* https://eim.twenkid.com/old/eim18/predopredelenost2.htm - Писма между 18-годишния Тодор Арнаудов и философа Ангел Грънчаров (Вселената сметач, Схващане за всеобщата предопределеност 2, Вселена и Разум 2, Сметачолюбецът и човеколюбецът и др. [Arnaudov, 2002]: Letters between the 18-year old Todor Arnaudov and the philosopher Angel Grancharov (The Universe Computer, Conception about the Universal Predetermination 2, The Computerphile and the Anthrophile etc.)
* https://www.oocities.org/eimworld/eim18/predopredelenost2.htm …
* https://www.oocities.org/eimworld/eimworld13/izint_13.html - „Човекът и мислещата машина: (Анализ на възможността да се създаде мислеща машина и някои недостатъци на човека и органичната материя пред нея)" = Man and Thinking Machine: Analysis of the possibility of a Thinking Machine being created and some disadvantages of man and organic matter in comparison", 2001 – български.
Another translation: "*Analysis of the Possibility that a Thinking Machine Could be Created and Some Disadvantages of Man and Organic Matter in Comparison"*
* „Анализ на смисъла на изречение въз основа на базата знания на действаща мислеща

[7] Mentioned by M.Mahoney witho no reference. I discovered it two months later from another paper, while searching for "Universe as Computer" etc.

машина. Мисли за смисъла и изкуствената мисъл “, Т.Арнаудов 2004
https://web.archive.org/web/20040402125725/http://bgit.net/?id=65395
http://artificial-mind.blogspot.com/2008/02/2004.html (some remarks)
* “Analysis of the meaning of a sentence, based on the knowledge base of an operational thinking machine. Reflections about the meaning and the Artificial Intelligence”, Todor Arnaudov, 18.3.2004 (in Bulgarian; translated in English in 1/2010: https://artificialmind.blogspot.com/2010/01/semantic-analysis-of-sentence.html - the paper is split in 4 parts, titled:
* Part 1: Semantic analysis of a sentence. Reflections about the meaning of the meaning and the Artificial Intelligence http://artificial-mind.blogspot.com/2010/01/semantic-analysis-of-sentence.html
* Part 2: Causes and reasons for human actions. Searching for causes. Whether higher or lower levels control. Control Units. Reinforcement learning. http://artificial-mind.blogspot.com/2010/02/causes-and-reasons-for-any-particular.html
* Part 3: Motivation is dependent on local and specific stimuli, not general ones. Pleasure and displeasure as goal-state indicators. Reinforcement learning.
http://artificial-mind.blogspot.com/2010/02/motivation-is-dependent-on-local-and.html
* Part 4 : Intelligence: search for the biggest cumulative reward for a given period ahead, based on given model of the rewards. Reinforcement learning.
http://artificial-mind.blogspot.com/2010/02/intelligence-search-for-biggest.html
[See the multiple conceptual matches with the 2024 theory of meaning in AGI by Thorisson & Talevi: links in “Stack theory is yet another … and in the list of appendices of *The Prophets* in the end of *Listove*.]
* Some titles of the papers in English may be mentioned in several variants with minor differences, due to different translations choices or short versions..

* Nature or Nurture: Socialization, Social Pressure, Reinforcement Learning, Reward Systems: Current Virtual Self - No Intrinsic Integral Self, but an Integral of Infinitesimal Local Selves - Irrational Intentional Actions Are Impossible- Akrasia is Confused - Hypothesis about Socialization and Eye-Contact as an Oxytocin Source, T.Arnaudov, 30.11.2012, Artificial Mind, https://artificial-mind.blogspot.com/2012/11/nature-or-nurture-socialization-social.html

## * A discussion about “The Liar’s Paradox”from Universe and Mind 4, Todor Arnaudov, April 2004:

Translation from 2011, some corrections from 2012 [it needs more corrections]. After the translation, see the original text in Bulgarian. The notes in square brackets are from the original translation. The note in curly brackets { see the whole…} is from 2.11.2025.

--- BEGIN of a quote from TUM, UnM4 ---

**21. Fuzzy logic and is it really fuzzy?**

[Also Truth, comparison … ]

Fuzzy logic is based on, they say so, partially true and partially false statements, whose truth is defined in fractions, instead of binary true/false in classical logic.

However is fuzzy logic really fuzzy?

(…) *{ see the whole text discussing Truth as match and recognition of objects – different views of a slice of bread and apple in all of their states etc. ..}*

**“The paradox” of the liar**

Goodliar from the village of Good Liarsville once said, that all of his fellow villagers and him are liars, and then he asked is he lying if he says this?

If he lies, then he's not a liar, therefore he doesn't lie. However, he's from Good Liarsville, therefore he's a liar. What a “paradox”, I'm totally confused!? Really?!

I'm sorry, but I wouldn't even really call this a “paradox”, but a play of words and “pseudo wisdom”. What I'd answer to this Goodliar character is:

- I don't know [whether] ~~do~~ you lie or not, [because] there is not enough input data.

I'd ~~say~~ tell him also that he's a liar anyway, no matter [if he is] is he lying in this very moment, because probably he's trying to trick me that he's wise (sorry, he failed).

One or two sentences in this or similar “paradox” cases are not enough to imagine a definite non-ambiguous [picture of] what this is all about. For example, many people would believe that they know what a “liar” means once they hear the word.

Well, what does a liar means? [Unfortunately],

The practical value of general concepts in execution of direct [immediate, specific] actions is... fuzzy in such cases.

Which one of all possible meanings and happenings [events, stories, memories, interpretations] that our mind has for a “liar” the story teller meant in this particular case?

What does it mean to be “from Good Liarsville”? Was Goodliar born there or he lives there, or he's a fan of the football team of the village? Or he has relatives there? Or he is originally from a village in this commune. It is possible that liars are the ones for whom one of this is true, but not all, and anyway - being a liar [in

common sense] does not mean that you're lying in every single sentence.

Therefore it's impossible to conclude is Goodliar lying in this very situation or not, as it's impossible to say definitely in more realistic cases from the daily life ~~live~~, where there are no [artificially] tangled premises and consequences [causes and effects].

In reality there are many causes and many possibilities to explain what's happening [and why]. Sometimes input data is not enough to find a [persuasive] proof only on their basis.

According to my current understanding, mind works with specific concepts, and not general; in specific concepts everything is as precisely defined as possible, while with the general concepts, there are too many undefined which easily lead to "paradoxes", i.e. to insufficiency of input data for determining whether a statement belongs to a group. [set/class]

Said otherwise [In other words], the description of the story is black and white, but we're asked what color is it. Or there are many colors on a picture, evenly spread, and we're asked to specify of what color is the picture: only one single color.

Overall, in the above conditions the asking unit has too low a resolution of perception and not enough memory in order to think as precise as the evaluating unit – us. [The answer of the question requires from the evaluating unit to lower the resolution of the input and to lose details].

The one asking the questions does not understand [discriminate, recognize, perceive] all details we do, and in order to communicate with it, we should act according to its model. We see the indefiniteness and the simultaneous "truth" and "false" [error, mismatch] of each possible actions, according to our own resolution of perception, but we should [are forced to] select from the offered possibilities.

In case we're asked to select only one feature of all and there is no "I don't know" option, then mind would create a model for selection of some of all, based on other, lateral data; of data which did not come from this specific situation.

Since the device proposing us the possibilities lacks brains to differentiate black-and-white and color image or a motley and one-colored picture, then this device is forced itself to lower the resolution of perception and to delete part of its memories [records] that otherwise we would have [possessing higher resolution of perception]

This device can call a motley picture with one color and can have it's defined reasons, but apparently it would not be able to make inferences about many colors placed on onesingle canvas simultaneously.

## **22**. **Is there an absolute truth?**

The truth, as we generalized above, is a **coincidence** between pieces of knowledge. "Absolute truth" is a coincidence reaching the goal/target/desired precision, where the comparison is performed in the last known level for the pieces of

knowledge being evaluated, at which the evaluator is capable to check [to make comparisons].

"Absolutely absolute" truth are the data, recorded in the memory of universe at zeroth level. At this level, all possible cases of interaction between the particles are (should be) defined; each particle knows how to react to any possible impact.

At 0-th level of Universe, any comparison with memory is a truth – a full match is found – and there are no mistakes. The parts at a higher level are dependent [originally: subordinate to] of the lower levels. The higher levels are manifestations [consequences, results...] of the lower ones.

The higher levels have lower bandwidth and lower [raw] computing power, compared to the lower. That's why the 1-st level – physical world – cannot process data faster than the 0-th level. (Principle of uncertainty; [apparent unpredictability] )

"The relative relativeness" starts from the consecutive levels in the Computer.

**The higher levels interpret data from the primary memory.**

**Interpretation** is translation of a given set of features/characteristics of one universe, as features of another universe. **During the interpretation** [to a higher level], **"mistakes" and "untruths" happen** – coincidences with [a] lower than target probability and precision [the ultimate target is no mistakes and untruths]. This happens, because the features of the sub-universes cannot always be mapped exactly; different sub-universes are not identical and the interpretation leads to distortions and mistakes. [Also, higher level lacks enough bandwidth and computing power to avoid it.]

*** Вселена и Разум 4, Тодор Арнаудов – Тош, 4.2004, сп. „Свещеният сметач"**

**"21. Размитата логика (fuzzy logic) и размита ли е всъщност**

Размитата логика се основава на използване на - казват - частично-верни и частично неверни твърдения, чиято истинност се описва с дробни числа, вместо с двоичните - вярно/невярно, които описват формалната логика. (...)

**"Парадоксът" на лъжеца**

Благолаж от Лъжево Конаре казал, че всички лъжевоконарци са лъжци и попитал дали лъже, като го казва.

Ха сега де! Ако лъже, то значи не е лъжец, следователно не лъже. Но той е от Лъжево Конаре, значи е лъжец. Какъв "парадокс"! "Оплете" ми се мисълта?

- Какъв ти парадокс? На това аз му викам "игра на думи" или "лъжемъдрост". И бих отговорил на тоя Благолаж, че не знам, защото няма достатъчно входни

данни. Всъщност бих му казал също, че е лъжец (независимо дали в конкретния случай лъже или не), защото вероятно би искал да ме заблуди, че е мъдър (да, ама не успя).

Едно-две изречения - в случая, както и в повечето случаи - са недостатъчни за да си представим еднозначно за какво става въпрос, макар че много хора (като тези, които си мислят че това е "парадокс") - дори и много умни, уж - си мислят, че като им кажат "лъжец" знаят за какво се отнася.

Та какво значи лъжец? Приложната стойност на обобщените понятия в извършването на преки действия е... размита в подобни случаи. Кое от всички значения и случки, които имаме в паметта си за "лъжец", е имал предвид тук този, който ни е разказал настоящата?

Какво значи "от Лъжево Конаре"? Че е роден там или че живее там или че е от "отбора по футбол на Лъжево Конаре? Че има роднини от там? Че е от някое село в тази община? Може би лъжци са всички, за които е вярно някое от всички, но не всички. Това че си "лъжец" не значи че лъжеш във всяко изречение.

Така че не можем да кажем лъже или не. Както не можем да го кажем и в по-действителни случаи от ежедневието, където няма заплетени предпоставки и следствия.

В действителността има много причини и много възможности да се обоснове нещо. Понякога входните данни са недостатъчни, за да се намери обосновка само на тяхна основа. Според сегашното ми разбиране, при мислене разумът работи с конкретни и определени понятия, а не с обобщени; в конкретните понятия всичко е възможно най-определно, докато с обобщените - неопределеностите са много - лесно може да се стигне до "парадокси", т.е. до недостатъчност на входните данни за да се определи принадлежността на дадено твърдение към определена група; другояче казано, описанието на случката е черно-бяло, а ни питат какъв цвят е тя; или има много цветове, всеки от които е по-равно с другите, и ни задават въпрос: какъв цвят е картината, като трябва да кажем само един цвят.

Обобщено казано: в тези случаи задаващото въпрос устройство има недостатъчно висока разделителна способнсот на възприятието и недостатъчна памет, за да мисли като нас. То не хваща всички подробности, които ние и, ако искаме да общуваме с него, трябва да действаме по неговия модел, като - въпреки неопределеността и едновременната "правилност" и "грешност" на

всяко възможно наше действие според нашата разделителна способност - изберем някоя от предлаганите възможности - щом искат една от всички и няма възможност "не знам", ще си създадем модел за избор на някоя от всички въз основа на странични данни; на данни, които не са дошли пряко от конкретния случай.

Щом устройството, което ни предлага възможностите, "няма мозък" за да направи разлика между черно-бял и цветен образ, или между пъстра и едноцветна картина, то тогава ще бъде принудено да мисли с по-прости образи, които - щем, не щем - намаляват разделителната способност на възприятието и изтриват част от спомените, които ние бихме могли да имаме за случката. Например пъстрата картина за нас, за измисленото опростено устройство с по-ниска разд. способност на възприятието може да бъде наречена само с един от цветовете си. Това ограничение няма да позволи на устройството да прави изводи, свързани с много цветове върху едно платно.

**22. Има ли абсолютна истина?**

Истината, както обобщихме, е **съвпадение** между късове знание. **"Абсолютната истина" е съвпадение, с желаната точност, извършено на последното известно за случая равнище, на което оценяващото устройство е способно да прави проверки.**

За "абсолютно абсолютна" истина в СВП приемаме данните, записани в паметта на Вселената от нулево равнище. За нулевото ниво са описани всички възможни случаи на взаимодействия между частиците; всяка частица знае как да отговори на всяко възможно въздействие.

**На нулевото равнище на Вселената всяко сравнение с паметта е истинно - намира се пълно съвпадение - и грешки не съществуват.** Частите от по-горно равнище са подчинени на по-долните равнища. По-горните равнища са прояви на по-долните.

По-горните равнища имат по-ниска пропускателна способност на паметта, сравнено с по-долните.

По-горните равнища имат по-ниска изчислителна мощ от по-долните равнища.

Затова например първото равнище - физическият свят - не може да обработва данните от паметта по-бързо от нулевото равнище. (Принцип на неопределеност.)

"Относителната относителност" започва от следващите равнища на Сметача. В тях се извършва тълкуване на данните от Първичната памет.

Тълкуването представлява превеждане на едни особености на една вселена, като други особености на друга вселена.

**В тълкуването се допускат "грешки" и "неистини" - съвпадения с по-малка от целевата вероятност и точност - защото особеностите на подвселените не винаги са еднозначно съпоставими; различните подвселени не са еднакви и превеждането на данните от една вселена като данни за друга вселена води до изкривявания и грешки.**

–- END of the quote from TUM, UnM4, 2004 –