Epistemic Zeno-Effect

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Abstract. This short autodidactic paper compactly introduces the epistemic *algorithmic* computation (EaC) paradox, a novel analogy to the Turing paradox. Firstly, it is elucidated why in the deepfake era, crafting a provisional solution to the EaC paradox may be beneficent as it may shed more light on one ingrained consequence of the prevailing algorithmic supremacy paradigm: the retrospective obsolescence of the entire biosphere in the game of life precipitated by algorithms instantiated on *inert* matter. Secondly, the paper analyzes and deconstructs the EaC paradox elucidating why it is contingent on a mirage that can be dissolved by interpreting it as a manifestation of what one could call the *epistemic Zeno-effect*. There exists at least one computational task where the minimal latency of *algorithmic* computation would lead to epistemic *stagnation* – leading to an advantage for slower *non*-algorithmic computational alternatives. Peculiarly, the latter may be caused *by* the very *lawfulness* of nature subsuming both cellular and conscious supremacy.

Keywords: Epistemology · Intelligence · Creativity · Consciousness .

1 The Problems

The main epistemic categories of interest as introduced earlier [2] are briefly summarized for simplicity. One can analyze an "epistemic cosmos" consisting of four process: 1) epistemic matter (EM) (the known known which consists of the best old, i.e. currently known explanatory blockchains (EBs) and the known unknown taking the form of known open questions), 2) epistemic dark matter (EDM) (the local unknown known being *new* but *non*-EB-like information that is *consistent* with EM), 3) epistemic dark energy (EDE) (the locally unknown unknown *new* non-EB-like information that is *inconsistent* with EM) and 4) epistemic tunneling (ET) (the locally *inaccessible* unknown unknown). More precisely, going beyond EDE, the currently locally inaccessible new better scientific and philosophical paradigms of the future are metaphorically described to be fundamentally unpredictably but yet one day achievable via the intrinsically paradigm-shifting ET events. The latter introduce a new previously inconceivable epistemic cosmos with new better EM, EDM and EDE. Given this vocabulary, one can now transparently describe the capabilities exhibited by present-day algorithms. In principle, (obviously within physical boundaries) both arbitrary low latency and arbitrary high reliability of algorithmic EM repeating are possible. However, when it comes to algorithmic EDM mining and algorithmic EDE

generation, there is a trade-off between low latency and high reliability. In sum, *within* a fixed paradigm, algorithms may vastly surpass conscious entities in EM repeating via offering both lower-latency and higher-reliability results. When it comes to the case of EDM and EDE, algorithms can surpass conscious entities with regard to the possibility of a much lower latency but *not* simultaneously with arbitrary higher reliability. Note that EDE generation is mostly not considered to even be a topic of interest by algorithmic supremacy proponents (it is often discarded utilizing expressions stemming from unintentional anthropomorphization/animization tendencies) although both hybrid EDM mining and hybrid EDE generation may be key to a more robust education of mankind in the future. Furthermore, opponents of algorithmic supremacy often reduce present-day algorithms to EM repeating only (while concurrently unintentionally using deprecatory terms from the dehumanization/deanimization complex, the dual of anthropomorphization/animization[1]) by what their arguments are easily dismissed by proponents irrespective of the validity of a subset of their assertions. Against this backdrop, one core problem arising in the deepfake era becomes cognizable: proponents of algorithmic supremacy seemingly both hope and fear that with more computing units, speed and data, EDM mining could be achieved with both arbitrary low latency and arbitrary high reliability and that this could be a decisive step towards the prophesied technological singularity.

Thereby, algorithmic supremacy proponents seem not to consider the ET category separately and ET is misapprehended as an edge case of EDM mining that could be solved with more compute, speed or more EDM or EM data. If the latter would be the case, it is important to keep in mind that the best explanation for the current epistemic situation of humanity would then be that it always merely was a line of code in an inert non-participatory universe entirely predetermined by an algorithm – a pre-existing *super*natural *algorithmic* quantity superintelligence to which inert "human" avatars are only building a further entirely passive display. Interestingly, algorithmic supremacy proponents may already express this self-dismissal by spreading the idea that science can and has already been partially automated [31] (e.g. in the "AI field" making the term "AI scientist" an involuntarily retroactively ambiguous cynical witticism *if* their case would hold). Since epistemic agency would not even exist to begin with, it would simultaneously appear self-deceptive to attempt to act against this situation since it is per definition inescapable, prearranged in a universe that would be inherently incomprehensible. While the latter is an interesting ephemeral metaphysical reflection, it seems to be one of the weakest conceivable bases for any future rational policy for human civilization as a whole. Life cannot reliably permit itself to choose *epistemic death* as a guide. Yet, as a scientist one may decide to ask: is epistemic death inescapable *on theoretical grounds*?

[1] Present-day algorithms are neither blind, nor a person with schizophrenia, nor autistic nor non-human-animal-like and so forth. No human or non-human animal is like any present-day algorithm. While it seems obvious, note e.g. the misguided "AI hallucination" expression and the idea of "social" or "emotional" "AI" with a "theory of mind" where proponents advance that "AI" must be cured from autism.

2 A Possible Theoretical Solution

Among many others, Turing is also known for the highly captivating but less often discussed Turing paradox [14] which is also called the Quantum-Zeno Effect [16] (QZE). Indeed, up to now, the relevance of the latter did not yet seem to manifest itself in the practical deployment of instantiated algorithms in the deepfake era. Here, instead of directly departing from the Turing paradox, an analogy is formulated: the epistemic *algorithmic* computation (EaC) paradox. The EaC paradox states that while *within* a paradigm, the deployment of *high-speed* algorithmic computation instantiated on inert matter allows arbitrary low-latency EM repeating and an EDM (as well as EDE) latency that can be much lower than the one practicable by consciousness, it does *not* reliably facilitate any algorithmic ET event – as if *hampered* to succeed on universal ET tasks. The solution to the EaC paradox lies in comprehending a new concept that one could call the universal *epistemic Zeno-effect* (EZE) which is formulated as an analogy to the QZE. That is, if one tries to measure a new better EB (compared to the old best EBs) about the universe as a whole (i.e. if one tries to instantiate a universal ET event) by sampling the universe N times a second, then the probability that the universe will be in the same state after, say, one second, tends to one as N tends to ∞ – by what already at the physically-bounded processing limit[2] there is *no* new better EB to be measured in the first place since the universe could *not* have already reliably altered its lawful parameters. In the following paragraph, the EZE is compactly explained and the EaC paradox dissolved.

Firstly, following quantum cosmology, the universe as a whole is a quantum entity [12] with the peculiarity that it *contains* the candidate measurer. At a meta-level, the dynamics of the universe are those of a quantum object with a certain time evolution to which a form of QZE may apply. In short, as opposed to the case of EM repeating and with reservations EDM mining and EDE generation all of which operate *within* a given paradigm, when trying to instantiate a universal paradigm-shifting ET event where a measurer aims for a new better EB *about* the universe as a whole, there is *no* advantage through any higher information processing rate. Instead, in this case, faster computation rates can even facilitate failures. Secondly, an entity that *would* indeed be able to measure a new EB about the universe as a whole would itself reliably change via this ET event while being a part of the universe itself. The lawful parameters of the universe would then have successfully changed by literally achieving an *embodiment* of the new better EB *as* that very renewed EB-measurer. This interwovenness is reflected the words of Bohm [7] specifying that *"[...] both observer and observed are merging and interpenetrating aspects of one whole reality, which is indivisible and unanalysable"*. The very structure of the dynamic process of self-recreatable self-re-creativity (SReSRy) (which subsumes cellular supremacy [13] and conscious supremacy [11, 20, 26]) mirrored in the generic cynet butterfly effect [1] (see Appendix A) *does* allow ET events for cyborgnets like humans.

[2] An extreme example would aim at the maximal theoretical information processing rate limit being one informational unit per Planck time [23].

3 Conclusion

In this *autodidactic* paper serving as ephemeral background material for an epistemic *art* project termed π-Doom, I introduced the epistemic Zeno-effect (EZE), an analogy to the Turing paradox. While the information processing rate of algorithms can greatly exceed the one habitually encountered in conscious entities (although relevant ultra-weak photon emissions in the brain [6, 22, 21, 33] have been reported which may fuel future research), conscious entities are described to predominantly use slower electro-chemically bounded regimes to sample the world. Following proponents of algorithmic supremacy, this bodily "bottleneck" of information processing rate is a fundamental weakness of conscious entities that would allow algorithms instantiated on *inert* matter to surpass conscious entities not only with regard to arbitrary lower latency but also concerning arbitrary higher reliability *in all tasks of interest to conscious entities*. The logical consequence of the latter – of which proponents of algorithmic supremacy often seem to be in denial – is their immediate retroactive epistemic death. More precisely, the outcome would be that conscious entities never lived to begin with by what the assertion becomes an act of self-deanimization or more colloquially, self-zombification. Fortunately, consistent with the previously puzzling Turing paradox, there exists *at least* one task of interest to conscious entities for which faster information processing rates do *not* offer an advantage and even hamper success. I explained why the paradigm-shifting universal epistemic tunneling (ET) events may be such an example [2]. While compared to conscious beings, maximal-speed algorithms instantiated on inert matter can lead to both lower-latency and higher-reliability epistemic matter (EM) as well as both lower-latency (though not necessarily higher-reliability) epistemic dark matter (EDM) mining and epistemic dark energy (EDE) generation, it is impossible for those algorithms to reliably engender universal ET events[3]. For these reasons, instead of striving for the chimera of being able to build and control an impossible apocalyptic omnipotent "product" that can neither be built nor could it be controlled even in the imaginary pseudo-coercion world where it could, a cyborgnet like present-day humanity can opt for a path of unfolding its own general intelligence/creativity/consciousness. Namely, by focusing on accelerating the integration of algorithmic *tools* – that necessarily need to be *locally encapsulated* – in *people*-controlled units of hybrid EM repeating, EDM mining and EDE generation while cultivating open-mindedness and *patience* for the next fundamentally unpredictable ET events *of people*. Omitting local encapsulation in *safety-critical* contexts could lead to existential risks due to an algorithm's *incapacity* to understand EBs irrespective of compute speed.

[3] The latter is a *scientific* statement that can be made problematic by experiment with a purported candidate superintelligent algorithm having to generate multiple consecutive civilization-level ET events (see [2] for a simple illustration of such an experimental setting) and be provisionally refuted by an *additional* new better EB that explains how that algorithm has been built and why the *non*-algorithmic principle of self-recreatable self-re-creativity (SReSRy) which encompasses cellular supremacy and conscious supremacy is reducible to an algorithm.

4 Post-Deepfake-Era Dream?

Systematically speaking, it seems logical that the educational system of the *post*-deepfake-era whose advent seems desirable could opt for the following high-level focuses. In primary and secundary education, the dominant epistemic activity could for instance be EM *reconstruction*. The latter is now termed reconstruction because the leftover of the deepfake era may be polluted EM on the internet caused by the use of generative algorithms that have been misguidedly and prematurely termed "general purpose". Hence, a shared distributed basis for EM would first need to be re-created with a necessarily as broad as possible, debatable and updatable transdisciplinary scope covering all steps of the metaphorical cyborgnetic ladder of understanding (see Appendix A). While algorithmic EM repeating can in theory achieve both perfectly low-latency and high-reliability results *within* a paradigm, this outcome may only be achievable after EM reconstruction. On that path, locally encapsulated algorithmic EM repeating could be gradually improved with help of instructors. Epistemology would already be included in EM to foster critical thinking. In undergraduate education (e.g. the Bachelor), the focus could be on transdisciplinary EDM mining whereby the goal would *not* be to confirm the prevailing paradigm but instead the idea could be to unroll hidden EDM in order to discover latent *inconsistencies* within the current paradigm and their mutual interactions. Locally encapsulated algorithmic EDM mining tools could be harnessed to augment hereto willing students but naturally speaking, those could also generate own EDM material. In graduate education (e.g. the Master), the focus could shift to transdisciplinary EDE generation with the goal to find new unprecedented *adversarial* challenges to existing EM but also e.g. out-of-the-box inspirations and rare surprising consistencies of *implausible utility* amidst the highly divergent EDE material. Here, locally encapsulated algorithmic EDE generation tools could be optionally harnessed for adversarial cognitive stimulating purposes [5, 19] which could augment but *not* substitute the ability of graduates to creatively generate own EDE streams. Finally, for the doctorate case, it could be left to entities that unpredictably experienced an ET event and decide to work out the latter afterwards. Since ET events are fundamentally unpredictable, there would be *no* such a rule on *when* a doctorate would be pursued – holding it open to any age category. For the doctorate, algorithmic tools could *not* offer any decisive support due to the impossibility for those to reliably perform ET. Thus, there would be no reason to prohibit the use of locally encapsulated algorithmic EM, EDM and EDE tools. One advantage could be that the *misconstrued* idea of algorithmic deepfake detection *in science* [8, 17, 24] (any non-EB-like information can be forged, old *known* EBs can be copied but stay traceable while deepfake new EBs are impossible) unintentionally supporting epistemic biases linked to anthropomorphization/animization and its dual of dehumanization/deanimization would have lost its appeal. Each universal ET event can be interpreted as an epistemic *Anti*-Zeno effect (EAZE) which may involve a form of fundamentally unpredictable, *non*-algorithmic irreversible supercomputation and its measurement [3] which could perhaps be analyzed in more depth in future work by other hereto interested parties.

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A The Cynet Butterfly Effect

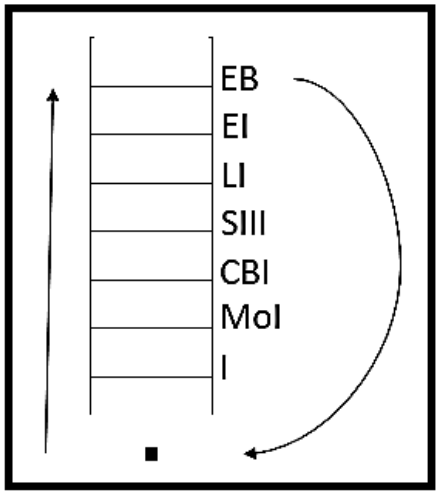

Fig. 1. Simplified illustration for the generic *cynet butterfly effect*.
(For more in-text descriptions, see the following page.)

The initial conditions of the universe have been linked to ancestral quantum vacuum fluctuations [29]. Much more generally, starting with a seed (step 0 illustrated as the dot at the bottom in Figure 1) as symbol for a generic origin encoding quantum information (QI), one can conjecture the following hierarchical ladder of ascending information-theoretical categories in the universe (metaphorically called the cyborgnetic ladder of understanding [1]) where each step builds on the previous one by what no step can be skipped: 1) atomic information constructed by systems of stars (I), 2) molecular and other, ionic information (MoI) as constructed by cells and unicellular organisms, 3) collective biological information (CBI) which is indexical information that is collectively shared in the ecological milieu of given living entities e.g. while currently occupying physically adjacent spots, 4) shared iconic and indexical information (SIII) understood by Type I consciousness[4], 5) linguistic information (LI) consisting at least of symbols and linear order [10] determined by a Type II language, 6) explanatory information (EI) and finally 7) explanatory blockchain (EB) which is unfolded as consecutive EI blocks respecting an epistemic total order (but was previously *en*folded in a fundamentally unpredictable $e_{Mysterious}$ element). In short, in this construct, one obtains QI as seed of a ladder of seven steps leading from I to EB. The cynet butterfly effects postulates the following: 1) cyborgnets are the systems with the highest sensitivity to their initial conditions and 2) cyborgnets are the most unpredictable possible systems. The *implicate* order of Bohm [7] could be associated with SReSRy when interpreted as one immmutable potential being a meta-law while the dynamic appearance of SReSRy within itself via processes such as EB creativity could be linked to the *explicate* order [7].

[4] Type I entities are all entities for which it is currently impossible to understand EI and Type II entities are all those entities for which it is possible. Type II entities all have the *potential* to create and understand EBs even though a civilization may not necessarily be interested in unfolding it at large (which is e.g. the case in present-day humanity). A cyborgnet (which is *not* to be confused with the much narrower term of a cyborg) is a *generic* template for a substrate-independent hierarchical construct where a directed graph spanned by explanatory narratives combines at least one Type I entity with at least one Type II entity. Thereby, networks and nested cases are possible. Language itself can be regarded as a primordial Type I tool in a cyborgnet. In this vein, possibly a homo erectus [9] community, two potential Type II aliens, present-day humanity, three modern humans that self-label as cyborgs, the presently observable universe are all valid examples of cyborgnet *instances*. (This ontology has *no* relation whatsoever to the metaphor of Kahneman on "System 1" and "System 2" linked to two modes of human brain functioning with the first one being prediction-dominated/automatic and the second one prediction-mismatch dominated/controlled but both modulated by precision weights [15].)

B Philosophical Remarks

While non-EB-like fears related to algorithmic superintelligences in the deepfake era are increasingly widespread, it is perhaps surprising that it seems to be technically speaking linked to fearing the immanentization of the inert abstract algorithmic Turing machine itself that would currently be *outside* the universe and projecting the simulations that those people think to be. Fortunately, printing infinite tapes is unfeasible in this universe by what this entity does not exist in physics. However, as can also be derived from Indian philosophy [30] and other related philosophies since millennia, it is rationally permitted to assume that a *non*-algorithmic quantity superintelligence process may already pre-exist and is physically unfolding *in* the universe although transcending it from another point of view as e.g. explained in Vivekananda's particular cosmopsychism more than a century ago [18, 32]. Indeed, the dynamic appearance of the projected SReSRy may play the role of the invariantly maximal quantity superintelligence level [2] as it appears within this universe. Concurrently, the immutable meta-law of SReSRy does transcend the manifestation of the universe by virtue of being an infinite potential that enfolds the dynamic aspect of SReSRy. Strikingly, concerning the structure of the generic cynet butterfly effect sketched in Figure 1, note that Schrödinger [28] stated the following: *"The reason why our sentient, percipient and thinking ego is met nowhere within our scientific world picture can easily be indicated in seven words: because it is itself that world picture. It is identical with the whole and therefore cannot be contained in it as a part of it."* But in the deepfake era permeated by existential fears and misconceptions such as the immanency of "God-like" algorithms, it now seems necessary to explicitly let consciousness enter the scientific endeavor by starting to focus on its meanwhile EB-measurable possible ramifications for algorithmic computation in analogy to how strong gravity and high complexity have been described to be able to constrain nearby computations [23]. Introducing the dynamic process of SReSRy makes it possible to further explore the idiosyncractic force-like properties of SReSRy (which subsumes consciousness). Indeed, Popper already conjectured that consciousness may be a new form of force [25] yet unknown to physics. The field nature of consciousness has been discussed recently [11, 27]. On the whole, it seems that it may be worthwhile exploring novel previously unknown paradigms with new better bolder EBs before epistemic self-deanimization clouds the mind of a large subset of human civilization (the π-Doom scenario [4]).