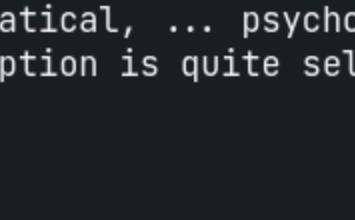


On Observers, Recursion, Boundedness, Ignorance and Transformations

A continuation of earlier thoughts on intelligibility [1]. An attempt to formalize a set of complex assumptions as an approach to understand arbitrarily unknown dynamical systems. (hopefully) Demonstrated by the generation of a Hutter, Marcus. "Hutter Prize" submission (enwik9 in XMB (+X% improvement)).



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Abstract

A proposed theory for understanding arbitrarily complex (dynamic) systems: An approach to 'practicality' in the face of arbitrary unknowns. As a conceptual framework on observers, necessarily, all possible knowable systems will fall within its scope. As such, failure to encompass computational, mathematical, ... psychological approaches would be a failure of the framework. Necessarily, this description is quite self-referential, and a persistent incoherence is a seeming certainty.

A set of complex Assumptions

It seems inconceivable that forming these assumptions, at the very least initially, bring with them a certain circularity. For its assumptions, in their seeming generality, will directly also apply to humans; and thus myself. A form of uncertain caution seems appropriate: especially since its arguments are abstract and are initially conceived from a perspective which is bound to have certain ignorances the provided theory is hoping to tackle (; or optimize on). But self-referentially, it renders itself to a similar uncertain scrutiny.

.. self-referential uncertainty : conceptual uncertainty

As such, better understanding of interpretation, whether deemed misinterpretation or not perfectly coherent but seemingly practical, is an expected goal. Note that this goal is vague and self-referential; this interpretation and expected interpretation of itself is likely to be volatile/chaotic. Similarly I'd expect better understanding of abstractness; its practical-ness and seemingly inherent danger. Another goal would be giving better grounding for these assumptions: While their abstractness could render them as not falsifiable, this doesn't necessarily mean they cannot be understood: their impact and their (perhaps) conditional correctness.

..

A less vague interpretation might be that this is merely a practical approach to a complex problem; and I might as well take that stance. The assumptions expressed in this paper can be considered as perceived impossibilities I currently cannot see a way around.

TODO: [latent (hidden) assumptions]

.. uncertainty within the assumptions

Similarly, since these ideas are here represented in such a way, that the

Defining these assumptions, refuting them, implications of refutation

Make a general argument here:

Nonetheless, one can always continue this form of argument with the following: However unintuitive it might seem, it may be possible to conceive of some seemingly contradictory system (; where system logically wouldn't be the proper word) in which any abstract notion of time wouldn't make sense. Practically, one might dismiss such a notion due to its seeming contradictions, but nevertheless if it can persist in a belief system it should spike curiosity as to how. One can counter the previous vague paragraph with the same thing as before again: Its abstraction has confusion generality. Always end each assumption with how they can be refuted? Mention observers, and how something doesn't need to make sense to any particular observer If one refutes this assumption of directionality, or any aspect of boundedness, however local, temporal, ... spacial. This refutation can be represented with

Time: Seeming non-trivial (perceived) directionality and implied Boundedness

A permeating assumption among all (perhaps hidden) assumptions is that of time. Not necessarily any particular perception or conceptualization of time, but a more abstract one: A subtle notion within concepts like computation, functions, dynamics, process, systems, change, ... transformations. While they might not necessarily be describing a system with a temporal dimension, their very conceptualization is one which one could equate to this abstract notion of time. (; the seeming temporal ignorance seems to only hold up in a certain reference frame, more on separability here).

A practical take on this might be the following: While one can abstractly construct systems which are ignorant of time, their very conceptualizations is describing a form of time, and the simplifications can be incredibly useful [footnote on mathematics?].

Some directionality, some dimensionality, already seems to indicate a form of boundedness, if not in the extreme, then at least at some level of description: locally, temporally, ..., spatially: a limitation [3].

...time

Whereas an abstract directionality doesn't necessarily distinguish between seemingly infinitely growing systems, further (perceived) boundedness, might.

One can separate this directionality assumption quite nicely from that of persistence.

Persistence: Seeming non-trivial (perceived) directional-invariance

The abstract idea of persistence is quite straight-forward: In some directionality, the 'next step' as it were, non-trivially limits access to the previous 'steps'. Note that this doesn't necessarily make any claims to 'causality' (at any level of description [4]), merely that previous states aren't perfectly preserved [5].

Hence, one should view this assumption as a further extension on that of directionality (time).

...persistence

Following from the assumptions of time and associated non-trivial persistence, one can start constructing additional assumptions.

One can, abstractly, construct systems which are 'free/ignorant' of some directionality (; time), at least internally in its definition. Building on the previous assumption of persistence, from this perspective this would be deemed an ignorant one: We currently perceive it as impossible to actually separate that system from time. No necessary conclusions need to be drawn as to its usefulness nor correctness: If it can persist, that is enough for this assumption.

...systems definition ignorant of internal time

And hence, we can make the following statement: Whether the perceived system internally recognizes a temporal dimension or not, is not necessarily obviously relevant to its persistence. Patterns (; abstractions), however implemented just as they can be non-trivially discovered, can be non-trivially forgotten [6].

...systems ignorant of time is forgotten through actualities

Certainly, in the face of non-trivial boundedness, strategies for persistence at any level of description is a perceived necessity if those levels of description are to persist. Among non-obvious candidates the strategy of expected re-discoverability is one which deserves additional mention. Patterns expected to be easily re-discoverable under boundedness would likely experience less pressure as to explicitly be preserved: Such an expectation, as a predication is an assumption however, and the mode of rediscovering subject to being forgotten (and then perhaps re-discovered) itself.

... (re-)discoverability

Ignorance: Separability, operating under Arbitrary Unknowns and constructing Abstractions

When one invokes some abstraction, conceptualization, pattern, assumption, prediction, infinity, ... , level of description like 'equivalence' without additional context; One invokes a certain generality. By doing so, one is giving the question a certain unanswerable property, which is perhaps a non-trivial necessity for all concepts. A perhaps more practical approach is saying conceptually, one will always be able to point out ways in which something is not equivalent, if only by observation, relative location, possible persistence, unknown differences, ... , time [1]. And thus how something seems to be equivalent under specific contexts and whether that is deemed appropriate, seems the relevant thing to an observer [7].

This brings us to a seemingly critical concept of abstraction. Importantly how it is implemented by this theory: I am currently bounded by a level of description which will only allow me to setup this theory in an inherently quantized way. However (un)intuitive the notion, if the construction of something actually infinite in any particular directionality (; or in its extreme in any possible direction) is possible [8], I do not know how [9]. It is much easier to suggest that these notions can be constructed through bounded constructs, and seemingly not necessary for practicality.

...bounded in some directionality (already indicated by time, and others)

From there the definition of an abstraction is seemingly trivial: Some imagined non-trivial directionality which is merely deemed as periodic; as an imagined perfect orbit which keeps happening. (; or: It is going in this direction, and will simply keep going in this direction) The directionality doesn't have to be trivial. The correctness of the imagined space for the direction doesn't need to be valid. The correctness of the orbit doesn't need to be valid. There is no need to construct its usefulness. If it can be constructed and can persist however fleetingly, that is enough for this assumption.

...imagined structure simply said to be repeating (in some context)

Thus resulting from this is that an idea like self-reference can only be maintained abstractly by ignoring aspects which would make each iteration of self-reference different [10].

...self-reference through ignorance

Such ignorance, doesn't necessarily have to influence the internal structure of the abstract definitions (nor necessarily takes away at their usefulness). However, if this idealization of the abstract structure is violated due to something arbitrarily unknown and is not corrected for, its persistence could be non-trivially altered. [reference to evolutionary biology?]

That brings one to another continuation on boundedness: unknowns.

TODO: [Unknowns..]

Since we assume boundedness, we start off by constructing a level of description which perceives some arbitrarily complex structure as a single thing. (In a certain way this would be the encapsulation of something arbitrarily complex)

Node: (...)

Ignorance: Operating under Arbitrary Unknowns and constructing Abstractions

TODO: [Link making the claim of actualizing an abstraction to being perfectly able to predict everything? - or that it seems to be the case. In the sense that any infinite dimension (open-ended) would require this: I will always be able to do x.]

TODO: [This is now a pattern: either that makes sense or not, arbitrary pattern construction can persist]

Inconsistencies can persist and their implications can be understood

TODO: [If one considers conceptual uncertainty and one of its abstract consequences; namely that some form of ignorance is necessary to do anything practical. One can start constructing]

TODO: [From persistence and boundedness one can construct the idea that in the extreme]

Assumption : Separability/Reduction/Transduction: Re-conceptualization, importance of representations/namings

A recurring notion around (at least human) observers is that of representations, interpretations: separability. While such notions often seem practical, at least to a human, in their extreme they don't necessarily seem that different, apart from how they are indeed, interpreted. What I mean to say with that is the following:

Trying to discuss observed patterns (; properties, ... , conceptualizations) such as differences between fundamental or emergent, and other seeming dichotomies, seem entirely unsatisfying. Certainly, in the abstract, one can say that the interpretations of their seeming differences have influence on observers (at least human ones). That alone suggests something of interest to an inquiring observer, which can perhaps be understood [continue on this later]. Leaving that aside, in the abstract, it seems that such a thing is always merely a matter of perception. Their seeming complexity, their associated ignorances, seem entirely dependant on the observer and their particulars. Similar to my phrasing of conceptual uncertainty.

... Perceived certainty seems achievable through a certain ignorance [practical], actual certainty of elimination of possible unknowns [extreme], does not. [Link this notion to time, if time is refuted, this is refuted]

interpretation/interaction used here as having no difference (; in the sense that as an observer one interprets one part as interacting with other parts?) ; Note that here one makes no necessary claim to their actual structure.

TODO: [Any Node ; already signals a certain boundedness, not an infinity in the extreme]

Any Node can be interpreted as Any Node
∞ ↔ → ∞ ↔

...anything can be interpreted as anything (no arity..)

TODO: [description might be flawed, therefore the persistence of the abstraction isn't guaranteed / or a different arity than expected exist]

...s

Generally refuted against some vboundedly refuted?

Assumption: The Circularity of defining Assumptions

This starts with a rather unintuitive notion.

Assumption: The Circularity of defining Assumptions

TODO: [Link making the claim of actualizing an abstraction to being perfectly able to predict everything? - or that it seems to be the case. In the sense that any infinite dimension (open-ended) would require this: I will always be able to do x.]

TODO: [Ubiquitous ..]

Formulation and Consequences

Let me now continue building on the formalization of these ideas, with these assumptions aside and the following acknowledgement: There may possibly be non-expressed assumptions which I am not able to explicitly state because of my own ignorance in the direction of non-perceived possibilities and especially in the direction of that which does this perceiving; myself [Show the formulation of this].

A demonstration: Compressing enwik9 to x86-64

Wrapping up

Footnotes & References

[1] Shawki, Fadi. "On the Intelligibility of (dynamic) Systems and Conceptual Uncertainty" OrbitMines Research (2022)

[2] Hutter, Marcus. "Hutter Prize"

[3] This limitation might again only hold up in a certain reference frame.

[4] Although, this assumption could be causality's building block.

[5] A curious thought experiment one might perform is that of accessing previous states as a non-interacting observer without the need of memory - other than having to persist the particulars which would allow for this - which would require memory (; non-trivial persistence).

[6] Which may be a way of saying that all knowledge, ... , structure, is inherently unstable: Some parts might be easy to rediscover, some might not be.

[7] Shawki, Fadi. "On the Intelligibility of (dynamic) Systems and Conceptual Uncertainty" OrbitMines Research (2022)

[8] A way to understand this concept is that of two perfectly identical things, being observed by two different observers/observations, will in the abstract have different consequences and are thus in the extreme, not equivalent. Hence, the notion of 'two perfectly identical things', is a seemingly incorrect notion, as they are not perfectly identical, in the directionality of observation/interaction. (However fleeting or long-lasting those interactions are)

[9] Or already implicitly achieved through arbitrary properties of this quantized construction which are not yet understood by this theory: Importantly, as demonstrated later, it does allow for this possibility through a similar statement of that of conceptual uncertainty.

[10] Again, under the assumption of possible actual infinities beyond their conception in this bounded way.

[11] The term 'ignorance' seems the most appropriate in a generic sense, although a possible visceral response could be resulting from this. It is used more as the overlapping abstract pattern behind concepts like: attention, naivety, ignorance, denial, avoidance, inhibitions, regulations, influence, ... , incoherent memories/persistence.

I prefer this one over the other likely candidate 'attention' ; as a stronger signal to possible unknowns. As far as I know this complexity is not easily expressible. But now I can speak of useful, unknown, unknowable, perceived, ... , self-referential ignorance.