

THE EMERGENCE OF ARCHITECTURE

Abstract

The purpose of this investigation is not to define architecture, nor is it an attempt to answer questions about its essential nature. The field of architecture is elusive in both scope and meaning, even within an individual's lifetime. This complexity is evident in philosophical literature that has tried to reduce architecture to one or more of its fundamental aspects, given the emergent nature of the discipline.

Instead, this work embraces an interdisciplinary dialogue involving philosophy, architecture, aesthetics, and mathematics. The aim is to initiate a discussion about various qualities of the types of concepts within the realm of consciousness. Then generate what is known as a phase portrait in dynamical systems, allowing us to examine conceptual inquiries related to architecture. Ultimately, this investigation seeks to reveal qualitative insights into the limits of architectural conception, where anything beyond those limits will be deemed nonsensical.

The obvious challenge for such an endeavor is to create a panoramic view without the bias of a single field of knowledge, in contrast to antecedent efforts in similar investigations. There remains also a risk of encountering pseudo-science in the vast potential of interdisciplinary territories.

Keywords: architecture, philosophy, mathematics, aesthetics, concepts phase portrait, convergent and divergent concepts, horizon, aesthetic space, mathematic space.

The question of “What is architecture”?

How does one go about answering such a question? Is a single definition expected to emerge? Are we supposed to consult history in our attempt at the answer? Or is there something intrinsic in it awaits our unmatched intuition to disclose? And if history is the wiser, how is it able to shed light on this quest? Should one analytically look at different circumstances as parameters and observe the architectural answers to deduce humble conclusions? But judging by our linear temporal prison; how can one with certainty build causal connections out of what we inherited of it?

Furthermore, what about all the “might have been” circumstances and answers, are they not architecture, just because they have not seen the light in our linear time? what about the future ones, are they for the same reason not architecture? And even if the temporal prison is our only chance at getting anywhere near an answer; where do we start? Is there such a thing as the beginning of architecture? Shall we perhaps start with the invention of the term itself, however nebulous that is? But that is the term not what it refers to? How can we go about breaking this hermeneutic circle? Or should we give up the quest all together, as to say; architecture is what architects do?

Not quite yet. As all human endeavors are ones of the mind, and the world is what appears to us, not the thing in itself, mapped on the structure of our consciousness, projected on its fabric. Architecture is no different than other aspects of the life-world. So, there is hope after all, hope in a priori understanding, as much as there is hope in understanding any other aspect.

In looking at history, it is crucial to observe it qualitatively, for if observed analytically, proper insights would be discouraged amidst the mist of temporal illusions of causality. In doing so, one is none the wiser, any more so, than our ancestors looking at the night sky in hope of making sense of the universe, then forged shapes of star constellations resembling pictures from their immediate surroundings. A picture such as a scorpion bares no insight about its constituent celestial bodies, any more than a sequence of events of history bare to their constituent phenomena. One is better left alone with their own misrepresentations of the world than to consult history, as it is the easiest path to misconception. Yet it can prove fruitful when observed qualitatively, for when we observe it as a sample pool of what is possible, these skewed pictures of time become windows to our own consciousness, iterated over time and among the many human subjects. In other words, stripping away the time dependency in history and whatever state of affairs remain isolatable, then valid deductions could be drawn. In the process of change the conclusions that could be drawn are unreliable, for its hard to deduce patterns, that’s where history is needed, to be able to move fast enough, that the local changes move to the background and global changes become clearer, as to say, moving on a sinewave slowly, the observation would be limited to the local change, that in turn fails to offer any qualitative insight, where on the other hand, in moving fast enough, the sinewave’s oscillation pattern of peaks and valleys become clear. So the faster things change the similar they are, and the slower they change the more different they seem, where the human attention however is far greater on the things that change over the things that remain the same.

So how does the world appear to us? Or more importantly what are the forms it takes in the space of our consciousness? Even more precisely what is the form that bares most insights regarding our inquiry?

The concept form among creatures of consciousness is in a special state of attention, they obtain validity beyond the concrete manifestations that can be embodied in them from the life-world, and show more the consciousness operational nature, in contrast to other forms, such as desire, memory, etc.

Concepts exist independent from information and memory, they are instantaneous, and intentional. They remain suspended until they are needed to carry experiences of the world on their trajectories. A person with severe dense amnesia knows what a human is without knowing a specific person, knows what is thinking even if they are incapable of remembering their thoughts. Building concepts is the product of understanding as well as means for understanding, they form our reasoning and are formed by it. We model them over the window of our time for the means of constructing a picture of the life-world compatible to an extent with our experiences, they are the idealized form that we construct and reconstruct through life and from history.

So, what are concepts?

The human spatiotemporal condition is one of consciousness as ordering system of thoughts, where time in this context is understood as any intrinsically ordered set, serving to provide orderings over thoughts (not the real time). and space is understood as the pattern of juxtaposing of thoughts (not the three-dimensional space). Concepts therefore are the patterns of thoughts over time as part of an abstract system. In essence concepts could be understood as trajectories of thoughts in the consciousness space.

So, to better phrase our initial inquiry, of what architecture is, in a point of approach that can offer insight; one is ought to ask what makes an architectural concept an architectural one? And that formulation implies other categories of concepts, as to say what makes a mathematical concept a mathematical one? Or aesthetic concepts, philosophical, moral, and so on?

This kind of formulation suggests the existence of such a thing as a qualitative differentiation of concepts. For if such a differentiation is non-existent then there would have been no need for the invention of these different terms that obviously refer to different fields of conceptual inquiry.

For orientation, what we are trying to do here, is to create a space of all possible concepts trajectories, then observe their behavior qualitatively to produce what is called a phase portrait in dynamical systems, then linearize around architectural concepts, to deduce qualitative insights about architecture, then hopefully produce something quantitative.

Mathematics is particularly an interesting start for this line of enquiry. The Galilean mathematization of the world is the beginning of the natural sciences, which makes mathematics a proper system of abstraction of the life-world. More interestingly is that mathematical concepts have the character of uniqueness and existence, in the sense that they always converge to a specific point of their state, and this point is always unique, which entails that two trajectories can't intersect, otherwise at the point of intersection, two possibilities emerge, conflicting with the principle of uniqueness, therefore, validity. Moreover, that what obtains mathematical validity today remains so for time to come, or if taken to extreme it encourages the intuition of having been so even prior their existence, which makes them accumulative in nature, even if other mathematical spaces are invented, no contradiction could be inferred, and if contradiction is the case, then it loses its mathematical status.

In essence, mathematical concepts have convergent trajectories in the space of consciousness. Furthermore, they are not only valid over time but among human subjects, meaning that they obtain universal validity, which classifies as stability, as to say they have stable trajectories.

One can't help it wonder if mathematics does not tell us more about the nature of our consciousness than we wish to admit, hence the possibility of its existence. Nonetheless, if that is the case of stable concepts, isn't it safe to assume the contrasting type (non-convergent concepts)? As to say, there are ones that do not stabilize, meaning that no matter how long and how many of human subjects they take to iterate, they can't reach an ultimate state? This type of concepts form the majority of human experience. They tend to diverge, thus their inability to obtain universal validity. Furthermore, they can't hold onto their validity over time, even potentially within an individual. That in turn makes them not accumulative but transient in nature, hence their constant movement through the space of consciousness as they iterate. These concepts could be classified as unstable concepts.

The obvious question is; if the value of stable concepts is obtained in their ability to converge, what is the value of unstable concepts obtained in?

Since the unstable have no endpoint, they can't be reasoned, for how can one reason what is constantly shifting in value and validity? In contrast to the stable ones, whose value can't be questioned, due to their ability to carry multiple aspects from the life-world onto their trajectories yet consistently can arrive after a finite set of iterations to a specific point of convergence.

Therefore, it is not only that divergent concepts have no universal law for judgment, but it would also be fallacious to look for one, thus the need to obtain their value differently. Consequently, the pattern of their trajectory is the only

parameter through which value could be obtained. The evaluation of this pattern can't be created privately however, it rather needs to claim universality through their soul existence in the social context. Their iteration requires many human subjects to happen, and the ability of people to see their divergence pattern, determine their truth or meaning, in contrast to stable concepts, which could sufficiently be iterated within one individual, and yet are valid.

A resemblance could be observed between qualities of the unstable concepts and the idea of taste; a phenomenon intimately connected to the idealization of self among a community, hence the tone of morality and ethics in their judgment. Let us assume for now that the realm of the unstable concepts then is the realm of truth and meaning, as in it the possibility of the untruth or meaninglessness exists, thus withholding these terms from the realm of mathematics, hence stating that something has a mathematical truth is at best redundant, alone should suffice to say that it is mathematical.

History is rich of examples of unstable concepts, such as aesthetic, moral, psychological, social, etc... this type of concepts is sensitive to the concrete manifestations from the life-world as well as to the subject observer. To put it differently, any change in the concrete state of affairs from the life-world has a direct relation to their trajectory. Nevertheless, these qualities are no judgment of inferiority to their value or validity, for reasons that will be clear to us as we move forward in describing the qualitative portrait of concepts.

To sum up, there is a binary typology of concepts that form the space of consciousness, convergent (stable), divergent (unstable), otherwise it implies the inconceivable existence of concepts that are stable and unstable simultaneously. Consequently, there must exist a boundary in between. However, the term boundary can't answer questions about the nature of this phenomenon; Does it have a thickness, as in is there any inhabitants in it? Is it dynamic, as in does it react to the changes in both sides, or does it have a hysteresis effect? Is it evolutionary, or accumulative in nature, as in does it contain its history, or is it the sum of all its shapes in history? Is there a difference in quality between the bounding regions in contrast to regions far deep in the two types? Is it the result of the binary construction, or is it the cause?

Obviously, the term boundary is too nebulous to give us any qualitative insights about this phenomenon, in contrast to term horizon. That term is usually used to describe a perceived discrimination between two states of affairs observed from the subjective point of view of the observer. Such as to say a landscape horizon, meaning the observed end of an agreed upon identification of the landscape from a point of perspective and the start of the sky. Or the horizon line in perspective constructions, which is defined as the projection of the perpendicular plane on the observer's plane at the sight point, differentiating between what lies above or below this line. Or in physics the event horizon of a black hole as the key space-time change, describing the point after which light can't escape the gravitational field of the black hole. Or the predictability horizon of chaotic systems, which describes the point where the divergence between trajectories dependence on their initial conditions is no longer tolerable, where counterintuitively the contrast of divergence tolerance around this point is dramatic. This point converges to a specific value as the accuracy of initial conditions measurement exponentially increases, e.g. the weather predictability horizon is ten days where in the solar system is 5 million years, being unique for each system, serves as its fingerprint.

Looking at these usages of the term horizon, one can't help but recognize the common grounds, such as to say that a key criterion of evaluation was established, and then discrimination is observed. But also, it shows that horizons have no thickness or have infinite resolution, the line itself is not an entity, yet it is an object of observation. Or as to say that in this line the entirety of the discrimination criteria has been captured to a level that the line became the symbol of this criteria, even to the extent that it is the form of its encompassing model.

So let us not confuse the terms horizon and boundary with one another; a boundary can have thickness and be an entity, it requires no observation, it could discriminate but also connect, it is causal of the discrimination not an effect off it, or it can hardly deliver an account of what is bounding it. They are the result of categories thinking; by taking continua, breaking them into categories, then label them. Boundaries are the product of simplification not abstraction of the life-world, which has many disadvantages, such as the differences between inhabitants of the same boundary is

underestimated, where the differences between neighboring inhabitants of neighboring categories is overestimated, and they compromise the perception of the full picture, usually through overestimating the category in attention.

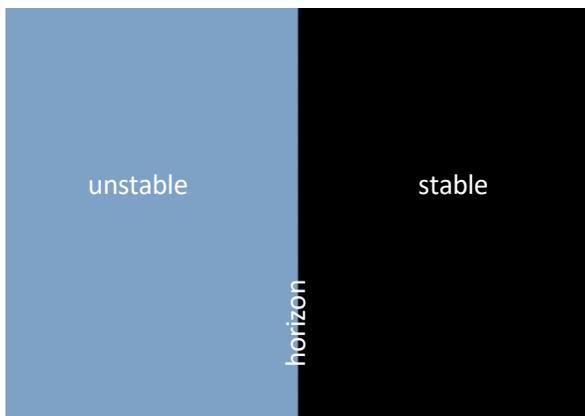
In our case also the horizon sits between an accumulative and a transient region, therefore, one can safely assume that the horizon itself is evolutionary, as a result of iterations of points in the bounding regions, meaning that the history of all iterated concepts is imbedded in its shape.

Having established the appropriateness of the term, let us observe the resulting portrait of the space of consciousness. There are only three objects in this portrait: the horizon and its bounding regions.

- The stable region is accumulative.
- The unstable region is transient.
- The horizon in-between is evolutionary.

To uncover more properties, let us analyze our portrait, which shall at the moment remain two dimensional for simplicity.

Although our system is binary, it is still far from boring. The horizon has become a point of reference for the two regions even if it is the result of their adjacency. And although both regions are contrasting in various ways, the horizon's shape is still an element of continuity. As stated earlier in the model; a point in this two-dimensional plane is either in the stable or unstable region. Therefore, the horizon's curve must belong to both and must be infinitely sharp, due to the binary origin of its birth.



01- Objects of the phase portrait

Evolutionary also suggests that it holds onto information from its history, which makes sense, where if a neighbouring point is declared convergent or ultimately divergent then it remains so. Yet how could a curve hold onto its shape, and still be infinitely sharp? That could only happen if the curve could offer more detail with the attempt at sharpness, this is known as fractals in mathematics; shapes that remain constant in complexity as they iterate.



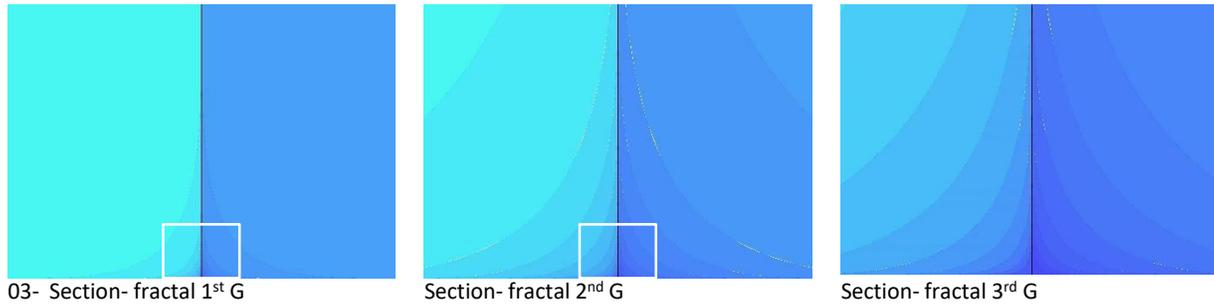
02- fractal 1st generation

fractal 2nd generation

fractal 3rd generation

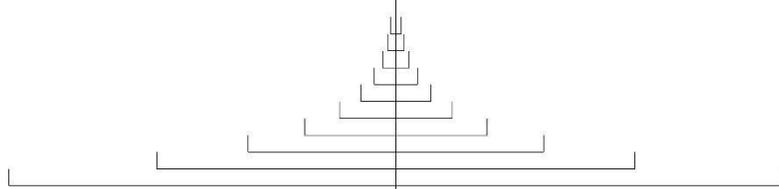
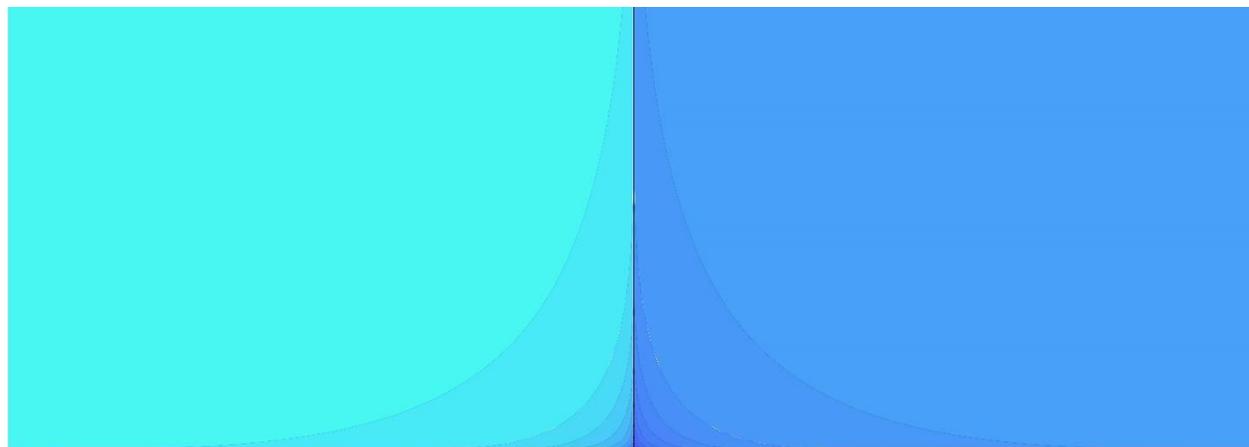
Infinite sharpness implies that the shape is precisely and ultimately known, which begs the question; how could a shape be evolutionary and infinitely sharp simultaneously? This is a matter of observation of humanity at large at the time in

question. Although the ideal nature of these regions is obvious, we only can observe the cases that were iterated in our consciousness, otherwise it would suggest that all mathematical, scientific, aesthetical concepts, and so on, are already known to us. The sharpness of the horizon does not imply the sharpness of our observation. It is as if the fuzziness remains constant the more we iterate its shape in the effort to sharpen it. Meaning that the measuring yardstick diminishes in size linearly to its resolution.



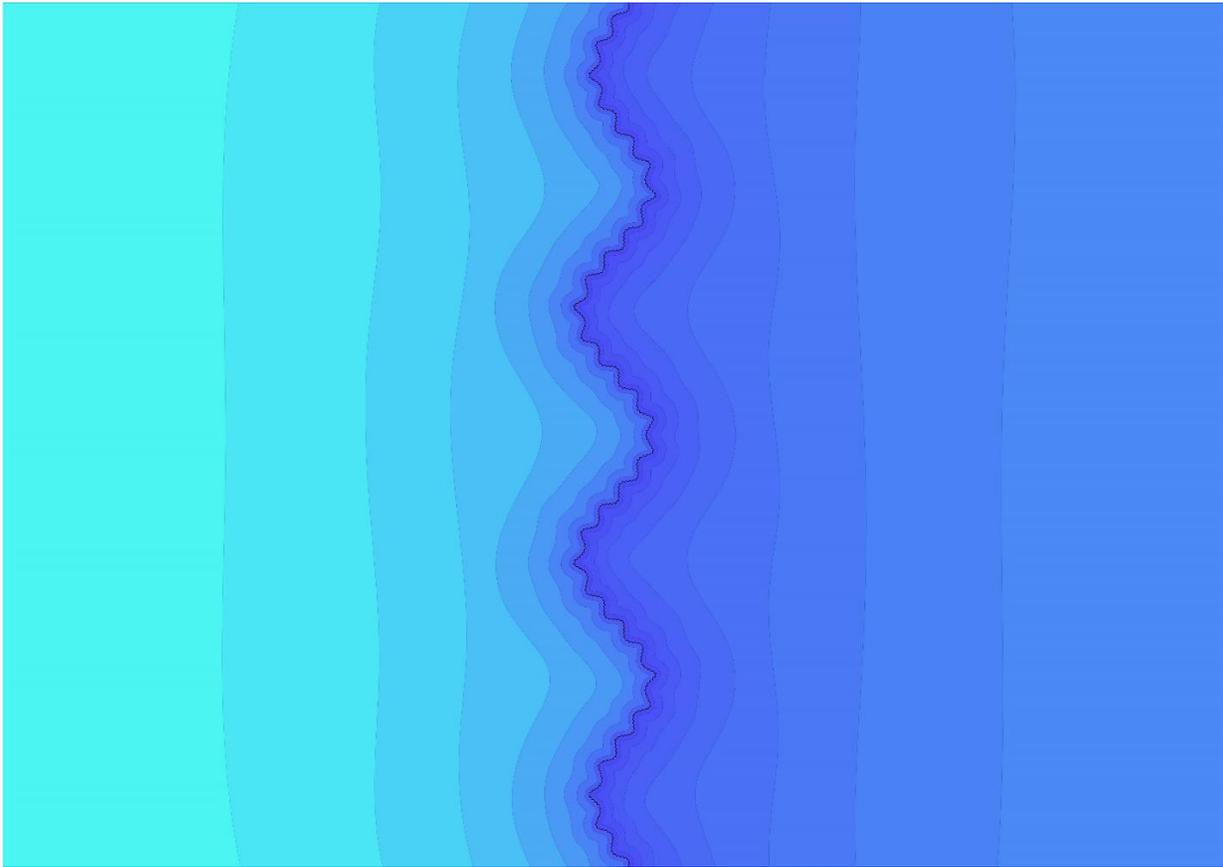
The fuzzy region around the horizon at any point in history could resemble the zeitgeist, which implies that the observed horizon's shape is a human artefact, yet the ultimate qualities of consciousness all together is the universe's artefact, hence the possibility of the existence of consciousness existing in the big bang.

Combine the fractal nature of this curve and the fuzziness of observation, it could only suggest that its bounding region, must have high sensitivity, as in a point in that region remains stable and unstable until observed, and the closer it is to this curve the more sensitive it is. The fuzzy region could be called therefore, the sensitivity window.



Sensitivity windows

04- vertical section, showing the fractal nature of sensitivity window.



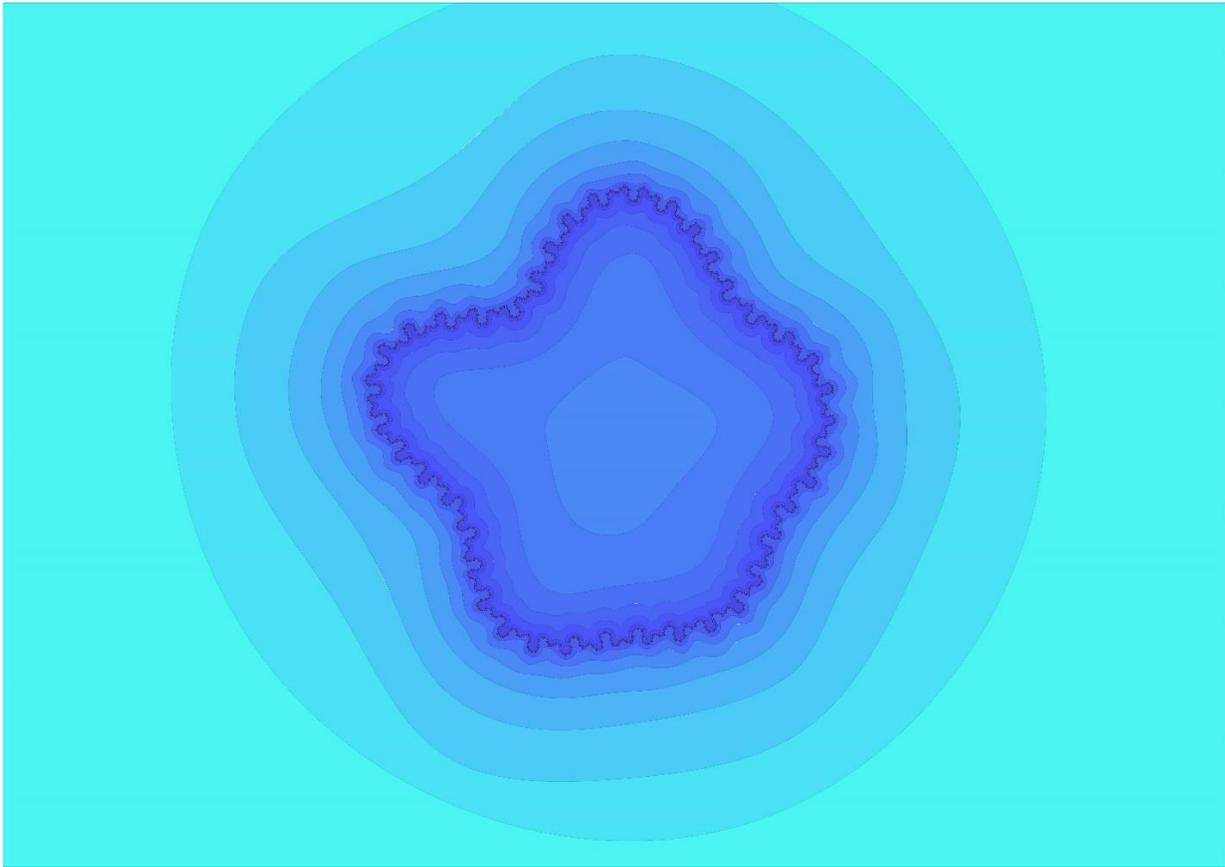
05- top view, showing sensitivity in relation to horizon curve.

What about the points far from the horizon in both regions, does it mean that they are known? contrariwise, it only implies that they are known to be either stable or unstable, yet their trajectories or end state in the case of stable are still unknown, even if they are insensitive to observation.

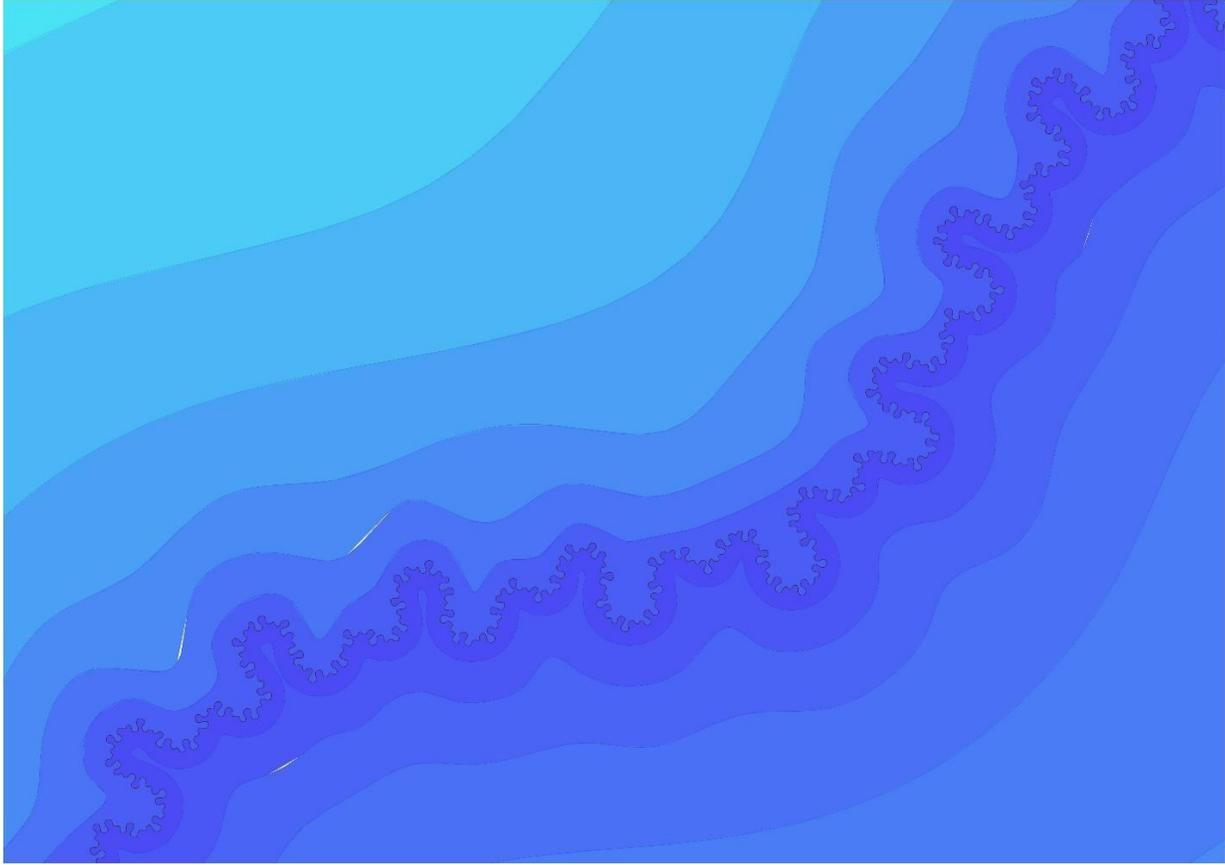
Naturally, there are infinite concepts, yet if the stable concepts relate to the idealization of the world and the unstable concepts relate to the idealization of self in the world, consequently it must imply that unstable concepts have a far larger infinity than the stable ones, as there are far many humans as there are worlds. This is only natural if we imagine all possible aesthetic concepts in contrast to all possible mathematical concepts. This differentiation could be considered as the difference between countable and uncountable infinities.

Yet for the purpose of our portrait we need to occupy a finite space, an approach common in mathematics, by reducing the dimension or complexity, while maintaining the qualitative integrity of the resulting skewed model. And since the convergent trajectories imply that the end point as well as all points in between are observable, then it is safe to assume that the entirety of the stable region is observable in our projection. Meaning that the horizon is entirely observable as well. Where the divergent trajectories have no end point, and are ultimately inconceivable, they can't be entirely observable in our portrait.

The picture would so far look like a quasi-circular finite stable region in the middle surrounded by an infinite unstable region, separated by an infinitely long horizon, hence being fractal.



06- concepts portrait



07- concepts phase portrait- zoom in, showing the fractal continuity.

Nevertheless, this particular shape as well as the oscillating concave-convex behavior of the horizon, are used here just to serve as a placeholder for a method of differentiation and detail continuity, they are not to be taken as additional information of the consciousness space behavior, rather for the fact that oscillation is the simplest dynamic model, as it preserves its complexity in two states only and the gradient in-between.

*Here, building the case for dynamism of consciousness is needed for later.

It seems however, due to the sensitivity window and the fractal nature of the horizon, it has become the origin of birth for new spaces of both regions. Combine this with the fact that, by design, trajectories can never cross this curve, this can only suggest that the horizon is a repellent curve. Meaning that concepts trajectories in both regions move away to either converge in the stable region or eventually explode to infinity outside our portrait in the unstable region.

And if that is the case, then it implies the impossibility for the two types of concepts to interact. Yet how does that reflect on our initial inquiry about architectural concepts all together? What does that mean for the cliché intuition that architecture is between art and science? What does between here exactly mean? Or should we maybe say, it is the merge of art and science? As if whatever distillation mechanism took place in consciousness to separate the two types of concepts is not only understandable, but also reversible. That all seems too mucky and arbitrary to me. Maybe that is the reason architecture is too difficult to define, or maybe it is the reason why architecture is usually shrugged off by philosophical investigations as a field of aesthetics. Or maybe, just maybe, we should give up, and rely on architects' genius in winging it yet always landing on their feet. I don't think so; as architecture is a dangerous and resources heavy public activity, that influences every individual and society, it is the background of everything we do, it is the measure of civilizations, it interacts with all aspects of being human, it is the human's nature, or if taken from a bizarre perspective; the human is nature's way of making another nature.

Let us shift our attention to philosophy for a minute; in the context of our portrait, we know that philosophy can address any aspect of the life-world without discrimination, it's measured by its ability to irreducibly show perspectives of phenomenon that are previously unconceived. It is ultimately at a privileged position to distinguish between stable and unstable concepts. Which in turn would position philosophy at the horizon itself, as the repellent force moving concepts on their proper trajectories, shrinking the sensitivity window actively, and as a result create new spaces. That by no means implies the fact that philosophy does not make mistakes, or it can alter the horizon's essence. Hence, the actual nature of things acts as a damping factor for nonsensical philosophy, even if it took humanity a while to recognize, as well as an accelerator for the insightful philosophical perspectives. Meaning that eventually the truth will be revealed, yet it relies on philosophical motivation to mobilize concepts trajectories. This position explains the intuition that philosophy is the birthplace for the natural as well as the social sciences.

Yet Wittgenstein did try to put limitations on philosophy, not in the range of concepts, but in its mechanism. Counting on whatever language has embodied in it through convergent evolution from human logic and representation; by stating that the misuse of language and misunderstanding of symbolism lies at the core of nonsensical philosophy. Which sounds to me a lot like the misuse of the stable and misunderstanding of the unstable. Nevertheless, one can't help it but question; What lies at the core of nonsensical architecture?

Architecture is supposed to ultimately be part of the world, this much is relatively uncontroversial, even if most of the time it never reaches there, the world is still the destination. This fact must have an essential influence on the nature of architecture. Architecture must, therefore, share an ability with the world's occupants in being in it. Representationally, this ability could be construed as the ability to occupy space as the human intuition of the world. Furthermore, architecture by design is supposed to be the world that we create for the ideal self. Architecture then must have a shared ability with the world itself; the ability to allow and inhibit being within, which could be construed as the ability to become a new space.

To deliver an account of space here is well beyond the scope of this article. However, the allowing and inhibiting properties of space is well represented in mathematics. A mathematical space refers to the set of conditions, axiomatization, or groups of transformations that are strictly possible or proper inside a certain construction method. In

other words, refers to the ontology of a certain mathematical construct. Comparatively, in the process of architectural conception, every architecture will automatically allow certain states of affairs to exist and inhibit others from existing, and the sum of these properties will count as its construct, in other words, the new space. For differentiation, we will refer to the world space as “Space” with a capital S, and the architectural space as “space” with a small s.

To conclude, architecture characteristically, is the creation of a space that has the ability to occupy Space. In the context of our concepts phase portrait; the ability to occupy Space belongs to the stable region, as architecture becomes part of the world that we idolized by moving on mathematical trajectories, meanwhile stripping away truth and meaning. Where the intention of being a space itself belongs to the unstable region, as it is the world that we construct in efforts of idealizing oneself in the world, among a community, thereby regain meaning and truths.

The question remains; how can a space occupy Space? As we know by now that the two types of concepts do not interact, yet architecture is potentially meant to be a singular object, where both types coexist somehow. To answer that let us see how can anything occupy Space? A fish, a tree, a molecule, etc.; they all have versatile properties that enable them to exist in the world, yet due to the nature of the stable region of consciousness, we can only observe these abilities mathematically by translating them into patterns that reveal different facts in the different fields of the natural sciences. And due to the spatial nature of patterns as they are intuitively represented in our consciousness, patterns become the means to occupy Space. However, each being is defined in the different fields of science in a specific scope of Space scale relative to the conceptual identification of this being. These scopes could be construed as the occupation windows, otherwise patterns would have to extend to infinity, rendering them space itself not an inhabitant of it. A tree, the way we identify the concept “tree” to be, occupies space through a certain hierarchy of patterns, limited to a certain scope of occupation in Space, embodying all its physical properties, which in turn become legible to us as a tree. It would make no sense to include the scope of its molecules as part of the definition, as it would add no property to the tree’s identification, differentiating it from other things. And if this is the case of how we analytically and qualitatively observe the world’s occupants, how does that reflect on whatever we intend to create as part of it? Naturally we will first conceive of the patterns and their occupation window in order for us to be able to put it out there to start with. But how is architecture then different than other things we create? As the architectural product is a space, patterns and occupation windows from the stable region, become also the manifestation of the ontology of the specific architectural construct, allowing and inhibiting states of affairs from the unstable region.

In essence, the patterns and occupation windows duality, is the connection between the Space and space. Embodying abilities from both the aesthetic and the mathematical region, however disjointed and independently existing within the same duality. Furthermore, this construct, implies a set of limitations on both regions and the duality. It implies that only the set of aesthetic concepts that could be reduced to the set of patterns and occupation windows, simultaneously only the set of mathematical concepts that could be reduced to the same duality, are all what could be intentionalized by a certain architecture. In other words, only those physical properties that are described by the entirety of the duality, and those aesthetic arguments that are described by the entirety of the duality, are the set of the entire things that could be shown by an architecture. And to address anything outside this limit in the context of that architecture is simply nonsense. Hence, drawing the Wittgensteinian boundaries in the architectural context; nonsensical architecture happens through the misuse of geometry and the misunderstanding of space with a small s.

Well, philosophy has observed the world, then acted as a repellent force creating both regions, where architecture has observed both regions in effort of creating a world. As if, somehow it has managed to naturalize and de-idealize mathematics, and in the process regained meaning. And whatever repellent mechanism took place in philosophy to intentionalize both regions, took the reverse function in architecture to intentionalize the horizon itself, as an attractive force. Which is only logical as stated earlier; the horizon’s shape is the only element of continuity between the two regions. To put it bluntly, as if philosophy and architecture observe the same thing from opposite perspectives, incapable of observing one another. That might explain the malfunctioning relation between the two so far.