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The Universal Concept Of Finite Repetance With Equity, Modification Or Absence Of Repetance, How Mathematics Is Incomplete

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Utmost important: The following content does in no instance aim to contradict existing science. The Author simply sees nature as easier as desribed by modern mathematics and finite and discrete, seemingly continuous. Instead of infinite and continuous that modern mathematics does. The Author is well known with the fact that physics and mathematics are two diffrent things. But as physics uses mathematics as it toolkit, the toolkit really has to be adjusted at its core axioms in order to make progress.

Axiom 1 (There are no infinities, only finite smallest units that are repeated diffrently)

Infinities do not exist, the smallest units of the universe are finite, and as everything is built from them, all objects, functions, and ratios evolve in complexity as their repetitions accumulate. There are no circles and also no cycles, but reocurrent finite repetance. And functions and transcendental numbers and irrational numbers are evolving with the finite size of objects. As well as the computable representations per passed time. Seemingly fixed sized object's and their ratios depend on the total sum of its parts (wich is growing if the object gets bigger, lesser over time or are static but differ in size).

Axiom 2 (Every concept is modificated or nearly equal through time, and hence follows the universal concept of finite repetance)

Every concept can be described by finite repetance, with equity, modification, or absence, and these repetitions themselves evolve, leading to increasing refinement and structural complexity over time or withheld it with equity or near equity.

Axiom 3 (Time is a necessity for dynamic evolution and vice versa)

Time is a direct necessity of a self-growing concept such as finite repetance, as infinite repetance would not allow observable change. And as well a self-growing concept would be a consequnce of finite repeating time. The evolution of repetance over time is what enables increasing complexity and structure.

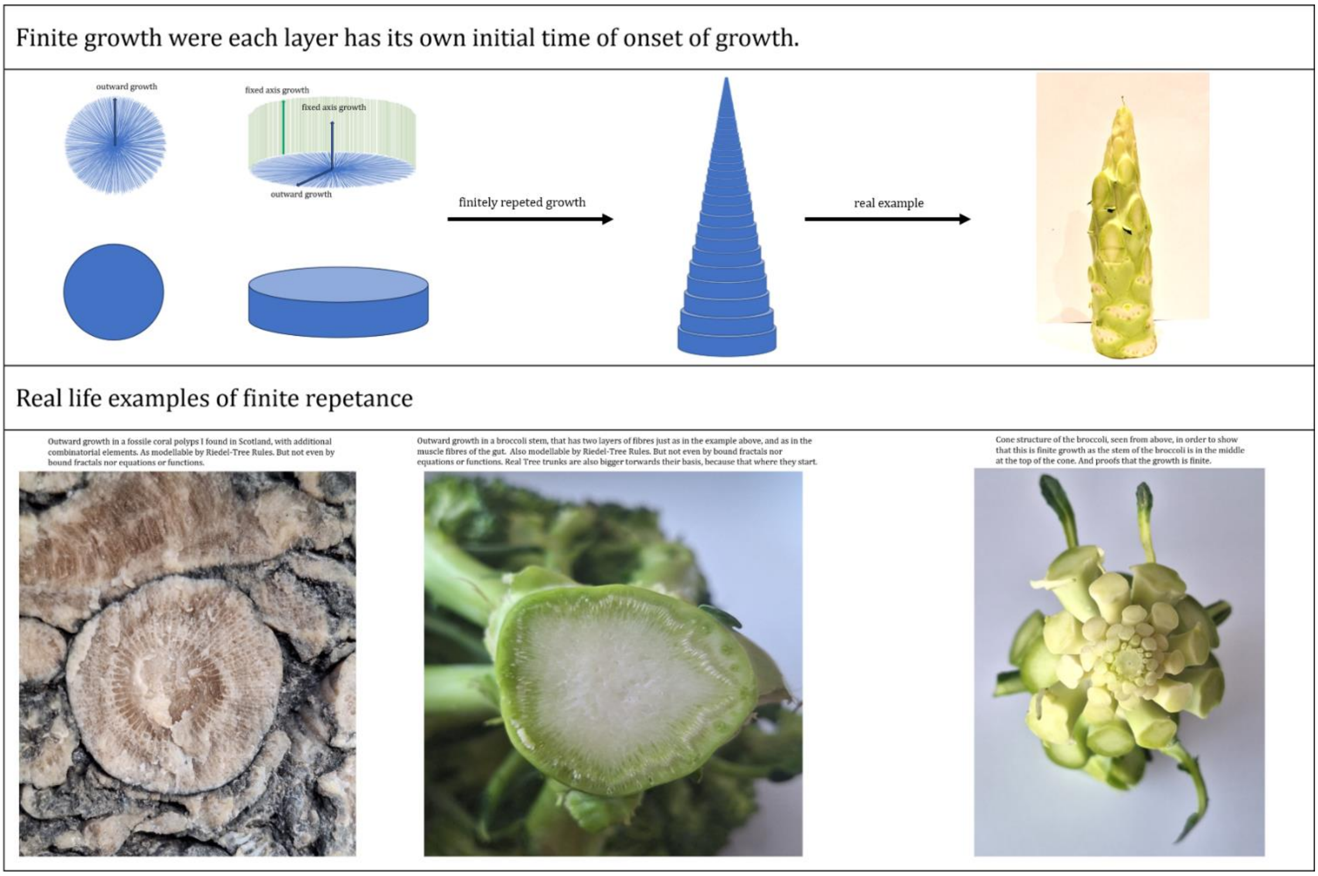
Axiom 4 (The origin of the universe remains unknown)

The first of all smallest units that is copied in diffrent ways makes up all that is observable. Its true nature can only be observed finitely, but its true nature remains unknown.

Axiom 5 (Ergodicity and determinism become irellevant.)

The system is deterministic at every instance but non-deterministic between every two instances as a consequence of commutativeness and non-commutativeness if Riedel-Tree Rules. QM measurement and interpretation problems and the Heisenberg Uncertainty.

The concept of universal finite repetance does not replace mathematics, it simplifies it by replacing unesscesary complex concepts that involve infinities and still respecting it.



This Graphic is from the 16.02.2025

"The elemental particles are mapped into the future with almost perfect equity. Wich makes them not just vanish. I sit in my chair, at my desk and I don't just vanish.

I am repeated finitely with near perfect equity and almost no modification, at least my elementary particles are.

Those particles are electrons, or quarks that build protons, neutrons that again build atoms, atoms wich are less perfect, but still don't disintegrate all the way up to the bismuth nuclei.

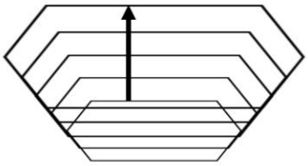
But now the structures that they form again, are far more perfectly finitely repeted. Hence there has to be more finite repetance with modification. Wich opens up for chemistry to happen! Wich again opens up for Biology and Evolution and all that arises with it, like any other -ology, -ism, -tation. More modification means in a way, more energy as well. More finite repetance with modification(per time), repetance is an aspect of the dimensions as space and time, we mention that later . Those atoms jiggle besides each other, Brownian Motion. And the greater the energy is, the higer is the finite repetance with modification rate. So to speak more degrees of freedom. Cold states are low in finite repetance with modification and watm states are high in finite repetance with modification. The elementary particles have the highest of all finite repetance with equity.

Hadronic/leptonic matter: Solids have the highest finite repetance with equity, but the lowest finite repetance with modification. Liquids have the most moderate finite repetance with modification. Gases have far greater finite repetance with modification and far lower finite repetance with equity. And plasmas they are special even in that manner of how much modification they experience." 16.02.2025

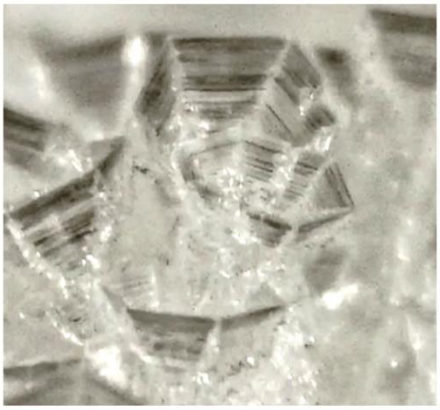
Why the u. c. of finite repetance is the only possibility to show the chaotic behavior of the observable world

As the system gains smallest units over time (due to water in the air) it grows outwards. This one would be modellable by equations as well. But the equations take into account the lenghth of the sides of the hexagons, but assuming infinitesimals... How could one increase them? One would need more of them. More infinitesimals. This is of course nonsensical. One needs smallest units of finite size. Now it becomes easy to see the finite repetance with modification that needs granularity, hence smallest units.

Outward growth, gain in particles

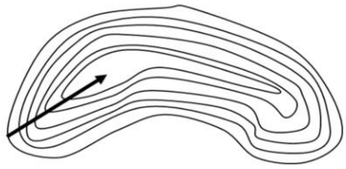


Ice crystals I photographed

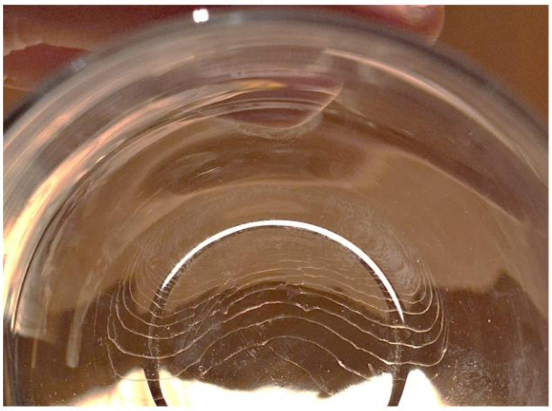


As the system looses smallest units over time (due to evaporation) it grows inwards. Its easy to see the finite repetance. The chaotically curvy lines are not modellable with equations, but by increasing the amount of smallest units per time and finite repetance with modification.

Inward growth, loss in particles



Condensing tap-water leaving residues in the drinking glass



This graphic is from the 18.02.2025

Concept of finite repetance with equity, modification or absence of repetance

The concept of repetance is a novel concept that I introduce, but that seems to be everywhere. As an inherent part of nature, systems or a sets contain parts that together make up the system or the whole set. Each part that makes up the system can be defined as the systems or the sets smallest unit. This must not actually be the smallest scale like the planck-scale in physics. This could be a brick-stone, a brick-stone is the smallest unit of a wall, it repeats with angular displacement right on the other smallest units boundaries (another brick-stone). If we woud a wall, a Tree-Rule would be the underlying path that would explain how the wall is assembled the shortest possible way. (would also be a causal path). There is a far more complex description of Tree-Rules for that brick-stone, that has to be inserted into the Tree-Rule with brackets. Then every layman could use the rule and it would still be accurate as someone who knows the exact Tree description of a brick-stone could paste it into the brackets and the description would be most concise down to the particle physics/path integral level.

Repetance of concepts with equity, that means essentially copying somethin throughout time. Your pen infront of you is build in a strong way and it will be repeated with near equity. Say it wont disintegrate the next five minutes, until you write with it, then it looses in kon the paper, wich would be repetance with modification. If your pen were to suddenly dissapear in an explosion that would not even be the absence of repetance. Its parts would still experience repetance with modification and then after disintegration they would experience repetance with near equity.

Processes like that we can observe all over the place, so common even, in chemical reactions, in biological interactions, in everyday life, in our kitchen and our plates, in ourselves and in the city and in our nature we inhabit. We see defined smallest units experience repetance over time. A large number of water molecules experiences repetance on some topology that experience repetance with more equity in its repetance than the water molecules. They move within the geometry towards energetically favorable positions. While doing so there are many rock in the path, in the way. The river branches, because the most favorable repetance is the one that favors least resistence. The water molecules are the defined smallest unit here and they experience an angular displacement over time. Also effectively moved trough space over time by that angular displacement and even without, because without angular displacement means we keep an equal angle over time. Since they are following the path of least resistence, the concept of repetance follows thermodynamics. Once in the billions one would see a violation, such that it aligns with the principles in statistical thermodynamics.

The two braches of a Tree can also conerge into one single but bigger path. That we observe everytime two rain drops find there way down on the window and merge.

Repetance over time is universal and yet no one has defined the term, but I'm sure every one is so used to repetance that this soon spark awe. It did for me too. In the following I will give even more examples. But it is important to highlight that this repetance is finite. Not as we see in fractals infinite. Fractals model nature very beautifully but at the cost of assuming infinity. Finite repetance aligns more with reality, as our cauliflower, our broccoli or romanesco has not infinite resources and hence can't create something infinite.

What is a Riedel-Tree (applied rule of finite repetance)?

An s-Tree is the sequence of copies in a system of equal parts, the branches give the steps of copies(1,2,3, 4.5, 3/2 copies of the smallest unit and in wich angle to the previous). This creates a hierarchy of nature, where the smallest unit of planck length and time are highest up. The smallest of all smallest units must be whole in order to avoid infinities and discreteness. The copies of the smallest unit are carried on, or partially, or changed carried on (with modification), or not at all carried on.

A smallest unit itself is the o-Tree, the origin that a bigger structure of equal building blocks arises from. That makes it far more elemental troughout the micro and macrocosm, and applicable across fields, because with the same rule a lightning forms, are river branches, water flows in a leaf, most efficient is where the least resistence is, and natures rules themselves favor that making it a perfect fit.

The smallest unit of them all is the planck lenght and the planck time. A smallest unit of a bigger system can be an electron in a discharge, an atom in a metal bar, a molecule in a substance, a crystal on a structure of crystals, a cell of a onion skin, a hexagon in a bee hive, or a brick of cement in a wall or a car besides another car with no angular displacement, and another one form a traffic jam (line of cars), Plant cells and vacuoles all together repeat to a finite boundary and hence make a leaf. This would not be possible with infinities, if they had a boundary the would converge with the infinitesimal, but there are no infinitesimal molecules to build with in the first place. Repetance is universal. Repetance with equality or with modifications or non repetance over time. We find this principle of repetance both in the micro and the macrocosm. **For that it is universal troughout fields. Finite Repetance described by Riedel-Tree Rules can create both finite functions and equations. Thats how they differ from fractals and even bound fractals. Those approximate modern calculus as much as finitely and with discrete steps possible.**

The displacement per time of an $\boldsymbol{o\text{-}Tree_{mD}}[\mathbf{1}\text{-}\boldsymbol{size}](\mathbf{1}\text{-}\boldsymbol{branches_{\theta}})$

$= \boldsymbol{s\text{-}Tree_{mD}}[\mathbf{1}\text{-}\boldsymbol{size}](\mathbf{1}\text{-}\boldsymbol{branches_{\theta}})$

Are there predetermined dimensions, linked to the angle. There could be even lower or higher dimensions to the plane of the Tree

How many branches 'copies' must be made to obtain the structure?

How is the amount of that bigger structure that consists of o-Trees (smalles units of a system) organized, at wich angles?

$$\text{s}-Tree_{mD}[1\text{-}size](1-branches_{\theta})$$

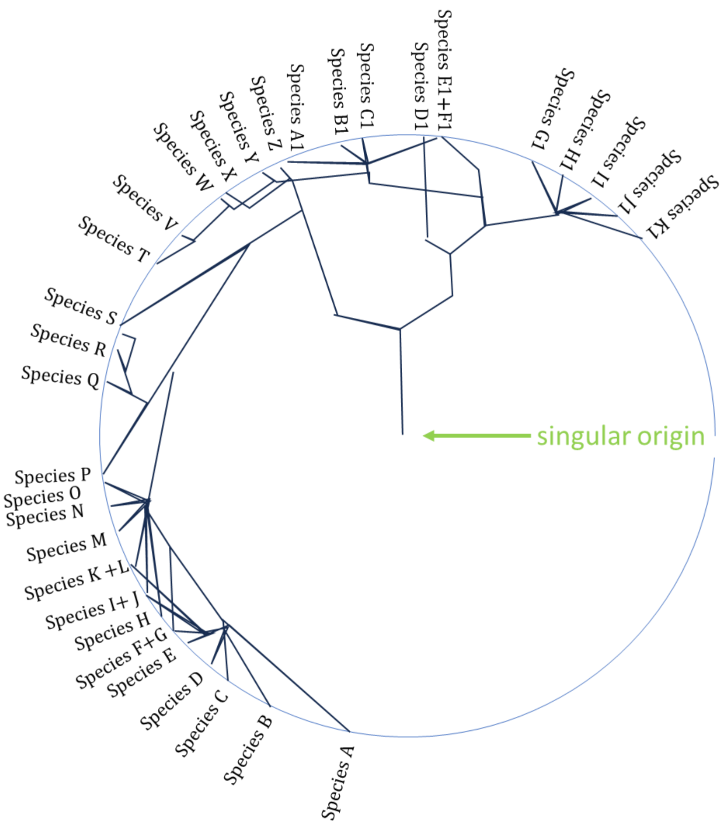
An s-Tree is a sequence of repetited smallest units of a system (o-Trees).

How many smallest units (o-Trees)
Make up this bigger structure that can repeat?
What do we chose to be the smallest repetited unit (a lepton, an atom, a water molecule ,a crystal, a biological cell, a hexagon in a bee hive, a brick stone?)

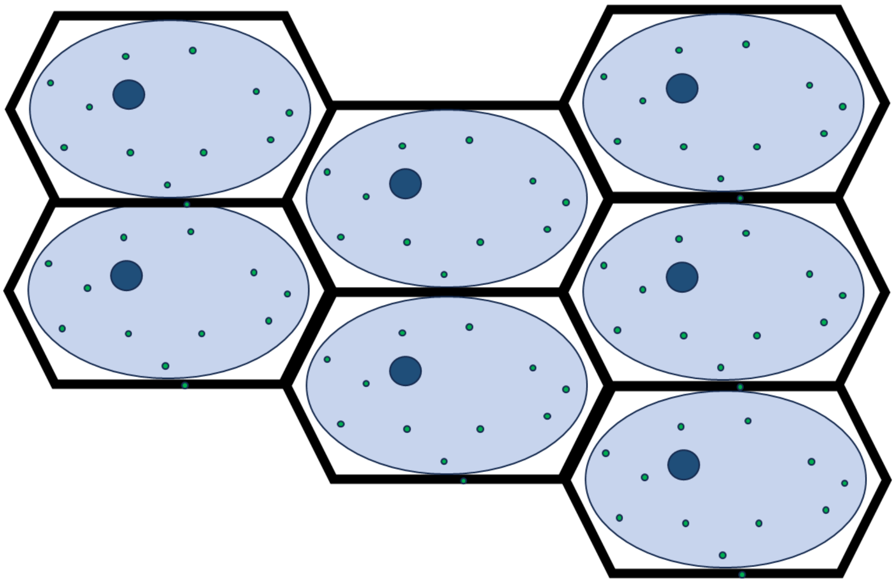
Applications In Biology

Hoewer has seen a comprehensive tree of life in biology seens the concept of repetance over time, and its change over time by Riedel Travel Sets. They can either copy a whole set of information or change it with each step.

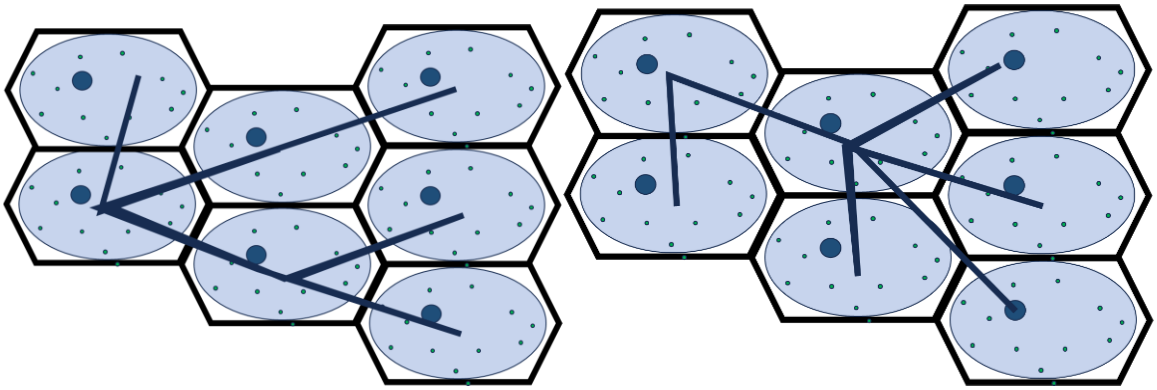
This becomes very clear in the case of evolution, where the Set would be resembled by the genome wich has coding and non-coding parts (copied by a travel set), and the active parts of DNA on the chromosomes curled up on the histones on the chromatin that are passed on with the gametes of a single parent or two parents of each species and where the genes are modified in the reproduction processes. A strong reminder that it must be formulated in such way that it is not only the concept of repetance, but precisely universal repetance with equality or with modification or non repetance over time. The diffrent level of finite repetition with modification at diffrent scales drives an intelligent evolution in a neo darwinistic manner that respects genetics and its rules.



If we have a little look on onion cells under our light microscope we will it see as well, those elongated hexagonal shapes, of wich each represents a smallest unit.

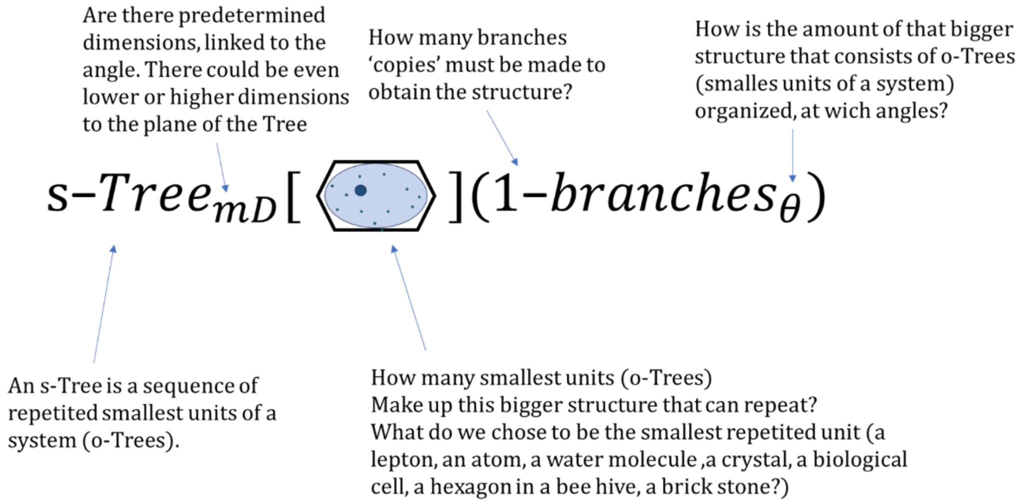


If we now imagine what the Riedel-Tree Rule for this construction of single onion-cells would look like, we obtain the following:



Or other ones, butt hat depends on the initial conditions.

We would need to write a Riedel-Tree Rule that looks something like this:



Here single cell is repeated over time at an angular displacement given by the angle theta. The Tree descriptions that would make up the cell must be fitted into the square brackets. Obviously this is a simplification of all the thousands of Tree Rules that would form the cell. But once the concept 'cell' is defined or has appeared it can be copied throughout time or modified over time or die out and stop to be carried on. Than it can't be an o-Tree anymore (in this specific case the single onion cell is our o-Tree, and the continuation or modification is our s-Tree). Each step is a unique Tree, commutative to one Tree Rule at a time. And we have to add others upon them in order to combine those diffrent non-commutative structures.

$$s\text{–}Tree_{mD}\left[\ (z(y(x(w(...))))\ \right](1\text{–}branches_{\theta})$$

The finite description would be accurate down to a single quant. So that each next bigger description doesnt has to take into account the next smaller s & o-Riedel-Trees Rules. Gravity play sno role in quantum mechanics but becomes emergent at large scales. Humans dont just split into two and converge back into one when they meet an obstacle in their way but particles can. This is a hierachical explanation of way each respective level of reality has its own description of finite repetance, i. e. its own respective Riedel-Tree Rules describing it.

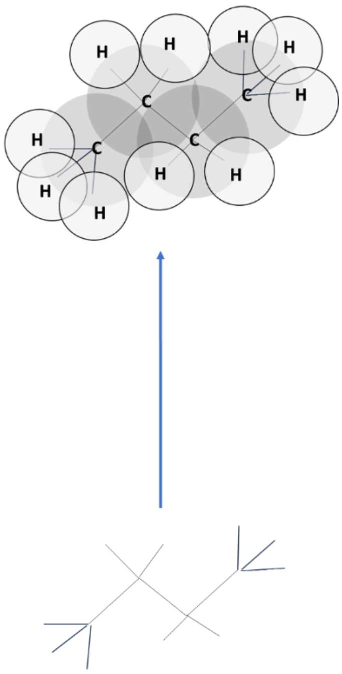
According to **Axiom 4** the innermost description '(...)' in the graphic is unknown. And thats all we can do, accept that we dont no what particles are made of or what the universes temporally first smallest unit was. Thats remaining an epistemiological boundary. In that manner we describe everything finitely and dont have problems modeling fluids and singularities. There is only the remaining acceptance that we cant know it all, no absolute determinism.

Applications In Chemistry

All molecules can be modeled as a combination of Riedel-Trees, as in this graphic:

$$\text{s-}Tree_{mD}[\ \text{C}\ ](1\text{-}branches_{\theta_1})$$
$$+\ \text{s-}Tree_{mD}[\ \text{H}\ ](3\text{-}branches_{109.5°})$$

C_4H_{10} *Butane*



$$\text{s-}Tree_{mD}[\ \text{C}\ ](1\text{-}branches\ _{2.\ 109.5°})$$
$$+\ \text{s-}Tree_{mD}[\ \text{H}\ ](2\text{-}branches_{109.5°})$$

$$\text{s-}Tree_{mD}[\ \text{C}\ ](1\text{-}branches_{4.\ 109.5}°)$$
$$+\ \text{s-}Tree_{mD}[\ \text{H}\ ](2\text{-}branches_{109.5°})$$

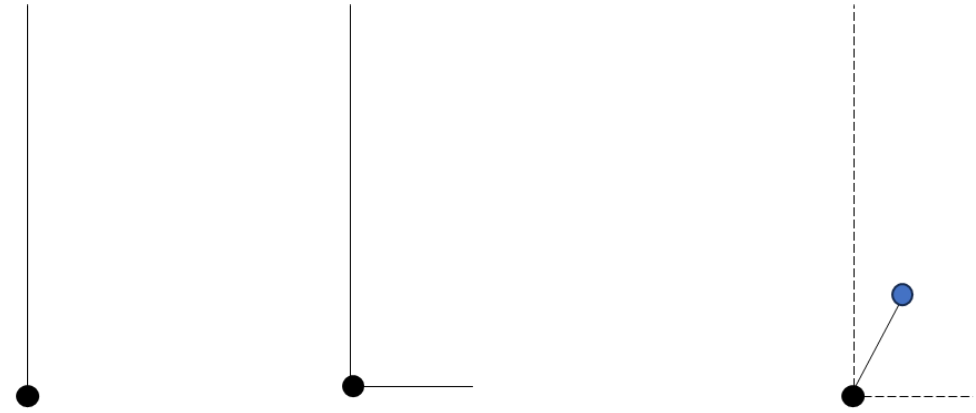
$$\text{s-}Tree_{mD}[\ \text{C}\ ](1\text{-}branches_{1\theta_1})$$
$$+\ \text{s-}Tree_{mD}[\ \text{H}\ ](3\text{-}branches_{109.5°})$$

Although we had to figure out the Riedel-Tree discription for an atom in order to do that, wich could be hard as we don't exactly know how we would make quarks and leptons as well as the gauge bosons such as the strong and weak nuclear force or the electrons that would make the trees much more complex, but also better aligning with QM. Here it also remains open if a discrete wave particle nature would give the exact same probabilities as given by the wave function. But since **the Riedel-Trees can be used to model the path integrals** this should be no problem.

Discrete Calculus

First of all, continuous has still some advantages in calculating, but both fill each other out. As Riedel $k \times o\text{-}Tree_{mD}[size](n\text{-}branches_{\theta})$ have several branches, thus creating $k \times o\text{-}Tree_{mD}[1 - size](1\text{-}branches_{\theta})$, with respective angles θ they can by overlapping the angles induce a preceeding another $o\text{-}Tree_{mD}[size\ induced\ of\ the\ former\ ones](n\text{-}branches_{\theta})$. One can picture this as multiple, in this case two vectors, that influence each others size. In classical, continuous calculus where we assume infinitesimals dy, dx, we have values for the x and y axis, or really n-axis, here being two diffrent branches of same respective angle to each other but diffrent size. Together those values meet in the coordinate system and graph out the function of $f(x)$ or $f(x, y)$ or $f(x, y, z, \dots, n)$ in multivariate calculus and have in each point a tangentline that shows us the slope of that function. This works incredibly well but at the cost of assuming infinitesimals and tangent lines that expand infinetely into the plane. Also forming a discrete but approximated continuous graph grows recursive and time also does grow in a non-linear manner but recursive one that is seemingly invariant as a consequence of Riedel-Tree Rules. And diffrent aggregate states have diffrent degrees of freedom, higher repetance rate(warm), or lower (cold). Brownian motion arises as well from finite repetance. Riedel-Trees are the answer to how one can make a discrete circle as by an equation, while at the same time making a squiggly line that we previos called graph of a function f(x). Now we have one thing for it all and the area under a curve for examples can be found by an new integral where we check how many planck lengths fit in between our two Riedel-Trees. A branch drawn from every smallest unit of the squiggly line we once called graph and now a series of ***k×o-Tree$_{mD}$[planck-size](1-branch$_{\theta}$).*** Hence unifying equations and functions!

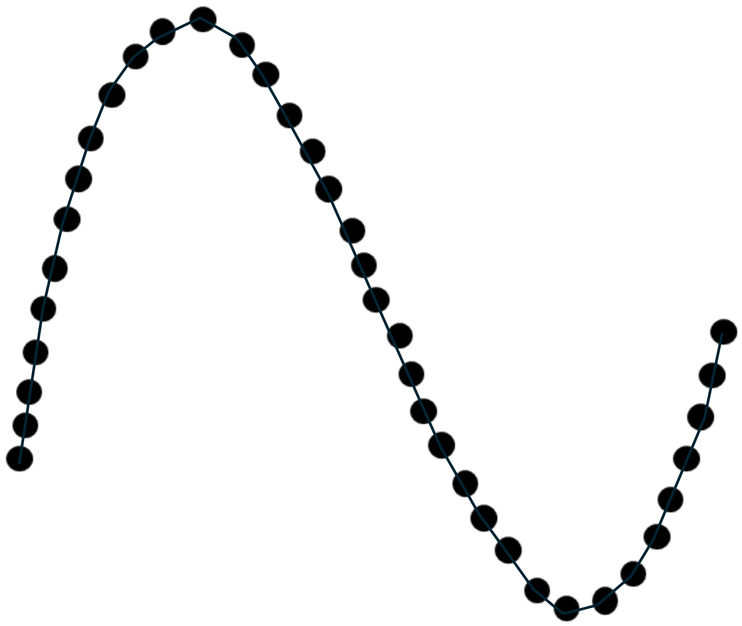
Discrete calculus, as it arises from the Riedel-Tree Rules and only of the special case of 1-branchial o-Trees, assumes granularity, a smallest size, wich most realistically would be the planck-length l_p and planck-time t_p. A Riedel Tree $1 \times s\text{-}Tree_{mD}[1 - size](1\text{-}branches_{\theta})$ is only a line of finite and defined size as it consists of a given amount of smallest units, conceptual dots become l_pUsing o-Trees for a discrete calculus would make sense. We have to use $1 \times o\text{-}Tree_{mD}[1 - size](1\text{-}branches_{\theta})$ to hold the Trees as small as possible, to approach continuity, while still maintaining discreteness as much as possible with the constraint of using l_p and t_p. In the following is shown how the first element of a discrete path



$1 \times o\text{-}Tree_{mD}[3 - size](1 - branch\ _{\theta})$ → $1 \times o\text{-}Tree_{mD}[1 - size](1 - branch\ _{\theta})$ → $1 \times o\text{-}\ Tree_{mD}[1 - size](3 - 2\text{-}\ branches_{\frac{\pi}{2}})$

$1 \times o\text{-}Tree_{mD}[new - size](1new - branche\ _{new\ \theta\ depending\ on\ sizes\ and\ \theta 1})$

Easily graphs used in continuous calculous can be approximated to 35 decimal places behind the comma using the planck length computationally, something that would be indistinguishable to the human eye from continuous even though it would be discrete! If Riedel Trees approximate the function $f(x) = \frac{x^3+3x^2-6x-8}{4}$ it would approach it with outstanding precision, but without the cost of assuming infinitesimals. Wich creates blow ups in partial differential equations in modern Fluid Dynamics and singularities in BH singularitiues.

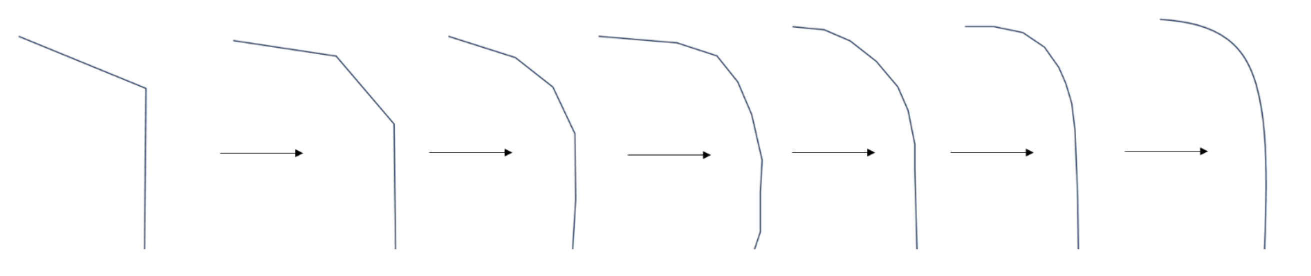


$$approximating\ f(x) = \frac{x^3 + 3x^2 - 6x - 8}{4}$$

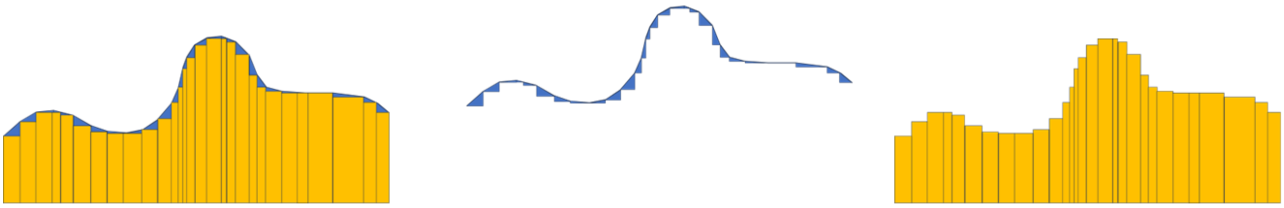
The Basis from wich discrete calculus arose

Evolution of the discrete-graph

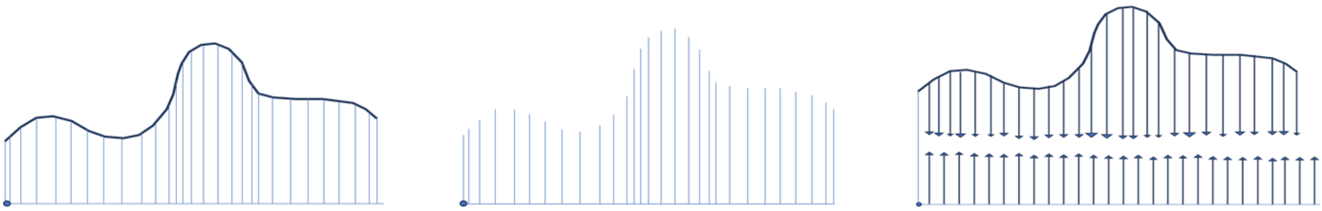
Evolution of the $\sum_{\theta_1}^{\theta_{n\to+t}}$ $o\text{-}Tree_{mD}[size](1\text{-}branch_{\theta n})$, and hence the discrete graph



Continuous Integral, Discrete Integral



The defined integral in continuous calculus can be calculated by antiderivating a function and substract the lower limit from the upper limit. Infinitesimals are assumed to calculate the area under the curve.



- The curve is a discrete Riedel-Tree.
- The defined integral in discrete calculus can be calculated by having an o-Tree with two initial branches. Or two o-Trees with one initial branch in the same m-Dimension (…,plane, volume, hypervolume…).
- Those Trees originate in a temporally previous Tree that is the coordinate system in wich they are relative to each other.
- Branches are smallest units that are ‘copies of the initial one’ by Riedel Travel Sets in space aligning with forward time, and hence causality.

- As those are build with the building blocks/smallest units of same length or divisibility by the planck-length and time (l_p, t_p) so they always will match up in a temporally previous Tree of sufficient size. There are gaps at the boundaries of those temporally previous Tree, but within it, everything relative to each other seem continuous. Those smallest units are 'copied' in space along forward time and in such way become branches.
- The braches from both Trees fill up all area between both Trees, are the area to be precise, and as any s-Tree consists of copies of o-Trees, smallest units, any path in that enclosed area can be taken.
- Continuous must be credited for being more neat to calculate the area under a curve as the Trees are together. They could be used together for the greatest applicability. But can be helped again where it fails by the other one.
- To the previously called x-axis (just another series of branches with no modification to there angle=straight). Also two branches can always match up by havin branches consisting of smallest units in between them. If you have building blocks of the same length, no matter how big you build a structure, you can always connect any one block to anotjer one in the same plane of blocks (same forward time). *blocks are actually areas in the plane

o-Tree and s-Tree hypothesis

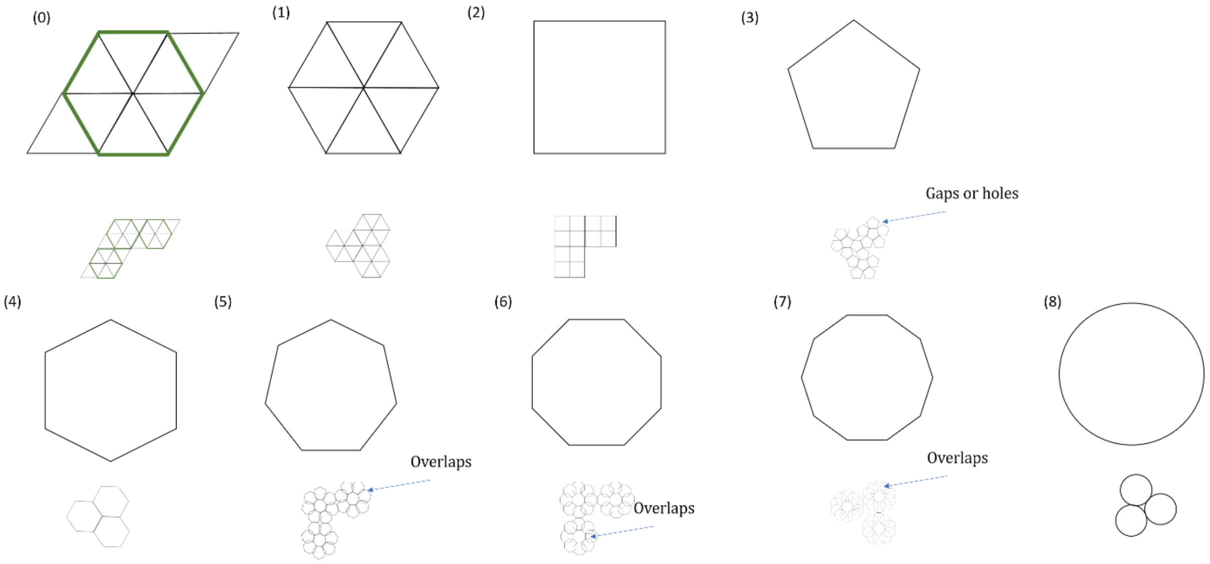
Instead of a continuous system we have a discrete one that approximates continuity as much as possible. For such a system we need to define a novel Tree Rule. A ‘tree’ is a function, called a Tree-function $k \ \times s\ Tree_{mD}[size](n\text{-}\ branches_{\theta})$. that begins to create specified ammounts of stem-branches, it is constrained by the evolutions, by the dimensions in 1D, 2D, 3D, 4D. …, mD. The reason they are called stem-branches is that later there are introdused origin-branches. The Function can be added, substracted multiplied or divided by other $k \ \times s\ Tree_{mD}[size](n\text{-}\ branches_{\theta})$. or operated on with any mathematical tool really. An operator k can tell us how often the tree function will be carried out in row, like in this example: $k \ \times s\ Tree_{mD}[size](n\text{-}\ branches_{\theta})$. Only the imaginations sets limits to how we could use it. The n-branches in the paranthesis tell how many branches that are created. Also the specified function tell sus in wich angles those branches are relatively to each other: $k \ \times s\ Tree_{mD}[size](n\text{-}\ branches_{\theta})$. Here the subscript term mD accounts for how many dimensions those branches extend into.

If we look at the second most simple case, at the function $k \ \times s\ Tree_{2D}[size](n\text{-}\ branches_{\theta})$, and if we would solely increase the number of branches a tree in the plane (2D) had and if for each of the k evolutions we would carry on that same amount of branches something remarkable would happen. The tree with ifinetely many branches would become perfectely circular, become a circle with area, because the respective angles θ between each branch to its adjacent would go aigainst 0 as n (number of branches) goes against infinity. We recognize that θ is dependent on the amount of branches carried out in each evolution. With each passing evolution of the 2D Tree-function, the planar tree with infinetely many branches that has become circular by then would grow in radius per evolution and thus in area.

More precisely a 3D Tree-function has three dimensional branching and would become a sphere with volume.if for each evolution we would carry on that same amount of 3 dimensional branches the angles would as well as in the planar tree, go against zero, thus the tree with ifinetely many 3D branches in the successing evolution would also be spheres with volume. A sphere with infinetely many sheres on each points on its surface just goes against an even bigger sphere, one with a bigger volume. And this same principe is valide for higher dimensional Tree-functions as well.

CFR Proof of the honeycomb conjecture

In CFR Honyecombs offer the most stability, and area, while stikk be stackable besides one another as a grid. They offer the most area in a grid, more than a lattice of cubes, more than a lattice of pentagons, all other n-gons with more vertices than 6 when combined leave more free area due to their angles. Triangles packed the most efficient way is around a central mid point (as shown in (1), case (0) would add unescessary triangles) and also it would contain the hexagon (4) wich would be the easiest most natural form, and when triangles form a hexagon they have the biggest area in a grid that ensures to leave no holes due to the angles matching at interior angles 720° and still can be packed in a gris without leaving holes.The lattices composed of three composed units are shown under each basic form. Case (2) forms a lattice that is less in area than the lattice composed of (0) and (1) and (4), of wich (1) and (4) have the greatest area in there lattices composed of the basic forms. That is true when the sidelengths of the square and hexagon are of equal length, and only then. In (3) the composed structure around the basic-form has not yet overlaps, but leaves gaps, holes. Wich reduces the area of the lattice composed of three such constructs. (5), (6), (7) have overlaps in their composed structures around the basis form and the lattice containing of three such constructs gets more and more stacked like n-gons with many vertices and lesser area, additionally they cant be stacked close to each other because the sides do parallel lesser and lesser. (8) would resemble sphere-packing. But as there are no circles and spheres in CFR. They are polygons with many sides. If they had no vertices at all and where perfectely smooth they could not connect at any side, because there would be no side at all. But it had to touch somewhere, wich is proof by contradiction. It must have granularity then, wich means it sno circle but an n-gon with many vertices. Real ideal circles besided each other then would never touch wich is illogical. All n-gons with a sum of vertices (n), $(n) > 6$ would be lesser in area than the hexagon (1) and (4) as the inner angles would get increasingly greater as $6n \;\rightarrow kn, k \in \mathbb{N} > 6$.



Question of the Conceptual Compression of Modern Physics

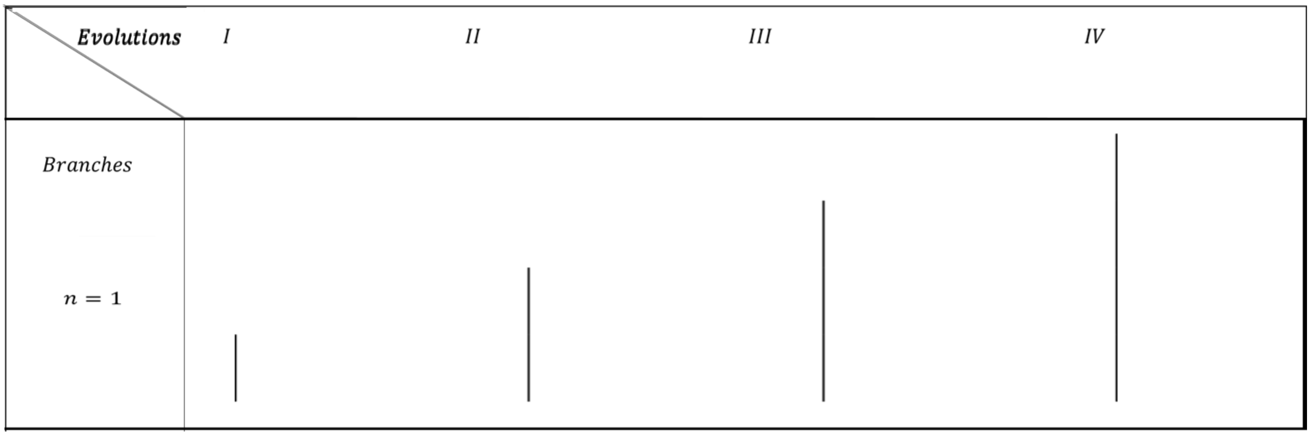
"In mathematics, beauty often lies in simplicity. Can I describe all phenomenon, concepts, or problems that initially appear to be complex but wich can be reduced to a single elegant rule or formula? Why does this reduction retain or enhance its explanatory power?"

The Answer on a possible Conceptual Compression That I arrived at

"The energy mass equivalence and QM, QFT, QLG, QCD are rather obvious attempts to answer this, buth there was another way to maybe explain it to my brother, with including a new Wave Mechanics and take into account SU(n) groups, without lying, while the insight that any system that has a tendency to go torwards an equilibrium of entropy whilst the whole universe goes against more and more entropy, like a system that is growing out of itself, a self referential system, wether one agrees upon telesis or not, one has to agree upon the conclusion of self referentiality and self assembly wich would be the cause to ever greater entropy. Even more baffeling is that this behaviour could even be cyclic, like another system showcasing such behaviour on even bigger scales, pinpoint down at yet again self assembly and self referentiality once more, wich is of rather trivial nature but utterly unsymmetrical, unintuitive to most people but with astounding explainatory power of entropy being as it is. The system I propose has not yet been stated before, but I propose a non-tracable single origin that is orthogonal to anything else in its origin. Showing behavior of Tree branches of diffrent count, size (sum of repetions of the smalles unit of the system itself, the conceptula dot, repeated as a line) trough dimensions (lines of smallest units, conceptual dots orthogonally upon each other determined by an angle theta), and being combineable like distint objects, not like numbers, but numbers can be multiplied, assigned upon them, they are non commutative. Trees inter relations/order are non-commutative whilst themselves and the numbers they are operated on through multiplication, division, subtraction, adding are commutative. Those numbers define wether they are executed (by multiplying by all natural numbers bigger than zero) or when multiplied by the natural number zero held in the not executed background as latent potential. The trees have temporal evolutions, starting by the origin, so called o-Tree, and when tracable backwards where they have lines (stem of the tree) called s-Tree. All s-Trees can be traced back to one single o-Tree. Those Tree rules can be applied upon each other as building blocks of reality, self referential, self assembling, being aplicable in all directions, temporally forwards and backwards with no violation of the rules of causality. They are of discrete nature but since induvidual trees are the origin to new ones there is no need of a mapping function, within the system its continuous even though it is build of discrete units. Repetance of those discrete units with equality or with modifications or non repetance over time is essential to explain our world. Hence respecting both Quantum Mechanics, Quantum Field Theory (wave partical duality, a Tree can have the probability of having branches in all directions from its origin like a light cone, but if interacting may execute another one due to the interaction resulting in new rules). Those Riedel Trees are dependent on energy constraints. They follow the law of least resistance and optical laws of modern physics, like snells law of refraction or refraction. They are even approximation all continuous directions of calculus with the important diffrence of being discrete. Thus also aligning with General Relativity. Planck length and Planck time are the smallest units. With the possibility of being equal without us noticing it due to our diffrent SI standards for units of spatial length and time. In such way explaining why we can't until now unify QM and GR and find solutions to the Navier Stokes equations vecause PDE's blow up to infinities. There are unique solutions and that are the what I call the Riedel Tree Rules. This showcases that we have used syntactical and semantical quasi languages in mathematics that have not been compilable into each other. Thise are continuousness and discreteness. In this framework we operate with discrete objects that approximate continuos functions. This is how most of nature can be explained in one concept until we find a better approach."

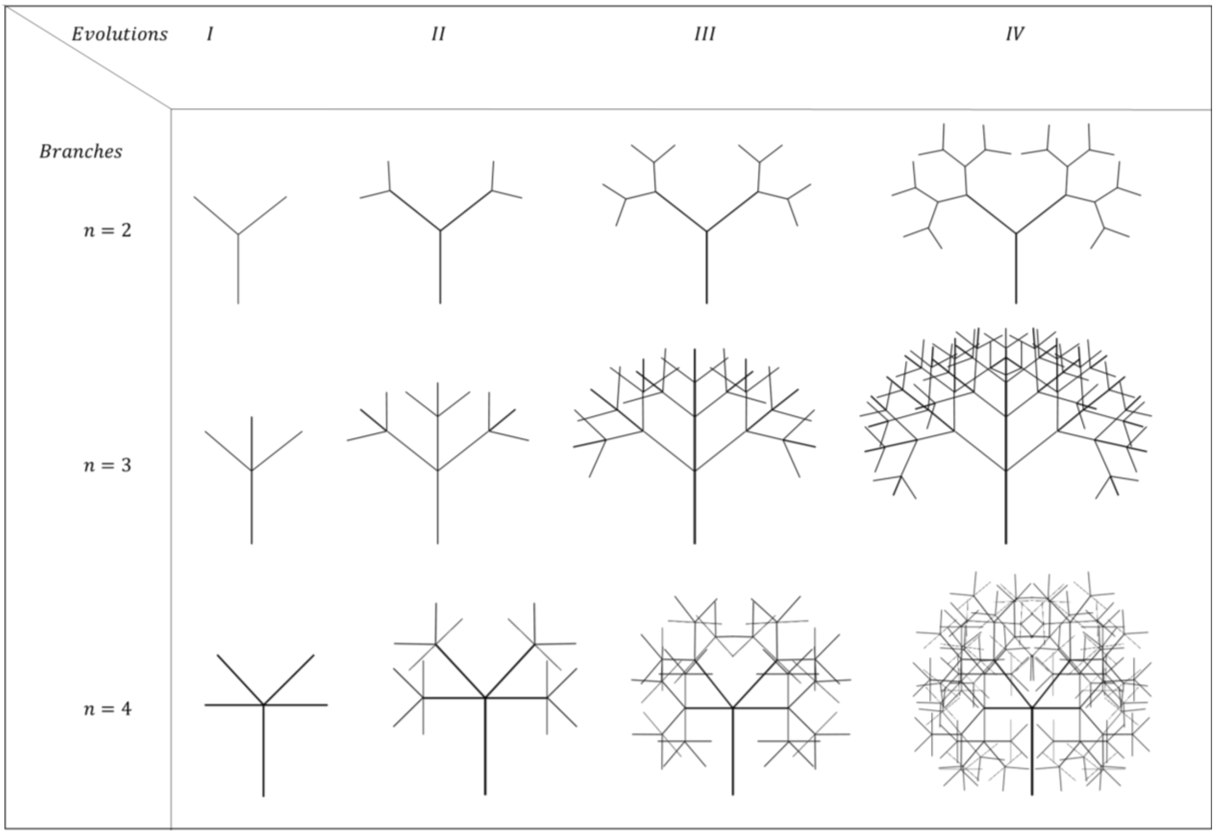
Graphical example of 4 evolutions with n=1

Special case of n=1 where only the line extends in length about its own length, or multiples of 1. This is an unusual s-Tree, but important not to oversee as well.



Those are examples of 4 $Tree_{1D}$(1-s-$branch_\theta$), k=4.

Graphical example of cases of n ∈ ℕ there n≠ $0, n \neq 1$.



Those are examples of 4 $Tree_{2D}$(2-s-$branches_\theta$), 4 $Tree_{2D}$(3-s-$branches_\theta$), 4 $Tree_{2D}$(4-s-$branches_\theta$).

Proof:

Mathematically this can be shown by introducing a tree function that scales as its argument scales. We define it as $Tree_{2D}(n\text{-}s\text{-}branches)$ in 2D and it as $Tree_{3D}(n\text{-}s\text{-}branches)$. Also it as $Tree_{mD}(n\text{-}s\text{-}branches)$ for m-D.

For 1D we obtain:

$\lim_{n\to\infty\ or+t} Tree_{1D}(n-s-branches_{\theta}) = 0 \vee 1$ or even fractional numbers (latent potential)

For 2D we obtain:

$$\lim_{n\to\infty\ or+t} Tree_{2D}(n-s-branches) = (\pi)r^2$$

For 3D we obtain:

$$\lim_{n\to\infty\ or+t} Tree_{3D}(n-s-branches) = \frac{4}{3}(\pi)r^3$$

For 4D we obtain:

$$\lim_{n\to\infty\ or+t} Tree_{4D}(n-s-branches) = \frac{(\pi)^2}{2}r^4$$

For m-D we obtain:

$$\lim_{n\to\infty\ or+t} Tree_{mD}(n-s-branches) = \frac{\pi^{n/2}}{\Gamma(\frac{n}{2}+1)}R^n$$

Pi has from now on always to be expressed as Circumference/diameter, as pi's digits are finite and depend on the amount of verices in a polygon!

The radius of the $Tree_{mD}(n-s-branches)$ is dependent on the length of each brach as well as their displacement from beeing orthogonal to the origin. Thereafter it depends on the number of evolutions. The esiest case is one evolution and as $n \to \infty$ the angle $\theta \to 0$, so we assume they become othogonal to the origin (wich is a single point untop of the line of the «Tree-stem»), and if they have the same length as the «Tree-stem» wich we assume to be r=L=1 for simplicity, they form a circle of the radius one, a sphere of radius 1, a hyperspher of radius 1 and so forth. For each evolution, assumed the length of the branches does not change, groes bigger by one.

That means after the second evolution r=2, after the third evolution r=3, after the forth r=4 and so forth.

I here rely on the proof by using Gaussian integrals, consider the function:

$$f(x_1, x_2, x_3, \ldots, x_n) = \exp\left(-\frac{1}{2}\sum_{i=1}^{n} x_i^2\right)$$

This function is both rotationally invariant and a product of functions of one variable each. Using the fact that it is a product and the formula for the Gaussian integral «gives:

$\int_{R^n} f dV = \prod_{i=1}^{n} \left(\int_{-\infty\ or-t}^{\infty\ or+t} \exp\left(-\frac{1}{2} x_i^2\ dx_i\right) = (2\pi)^{n/2}, \right.$

where dV is the n-dimensional volume element. Using rotational invariance, the same integral can be computed in spherical coordinates:

$\int_{R^n} f dV = \int_0^{\infty\ or+t} \int_{S^{n-1}(r)} \exp\left(-\frac{1}{2} r^2\right) dA dr,$

where $S^{n-1}(r)$ is an $(n - 1)$ sphere of radius r (being the surface of an n-ball of radius r) and dA is the area element (equivalently, the $(n - 1)$ dimensional volume element). The surface area of the sphere satisfies a proportionality equation similar to the one for the volume of a ball: If $A_{n-1}(r)$ is the surface area of an $(n - 1)$ sphere of radius r, then: $A_{n-1}(r) = r^{n-1} A_{n-1}(1)$.

Applying this to the above integral gives the expression:

$(2\pi)^{n/2} = \int_0^{\infty\ or+t} \int_{S^{n-1}(r)} \exp\left(-\frac{1}{2} r^2\right) dA dr = A_{n-1}(1) \int_0^{\infty\ or+t} \exp\left(-\frac{1}{2} r^2\right) r^{n-1} dr$

Substituting for $t = \frac{n}{2}$:

$$\int_0^{\infty\ or+t} \exp\left(-\frac{1}{2} r^2\right) r^{n-1} dr = 2^{(n-2)/2} \int_0^{\infty\ or+t} \mathrm{e}^{-t} t^{(n-2)/2}\, dt$$

The integral on the right is the gamma function evaluated at $\frac{n}{2}$. Combining the two results shows that:

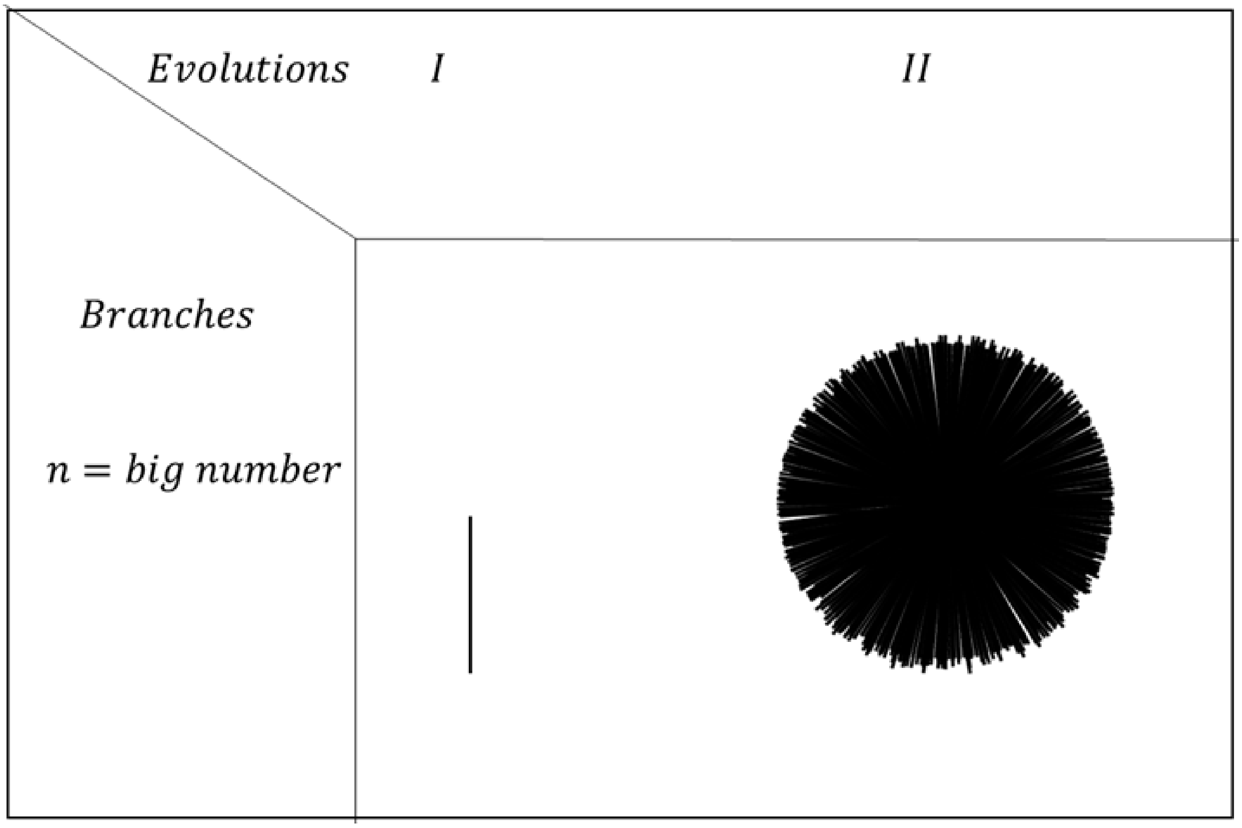
$A_{n-1}(1) = \frac{2\pi^{n/2}}{\Gamma(\frac{n}{2}+1)}$

To derive the volume of an n-ball of radius r from this formula, integrate the surface area of a sphere of radius r for $0 \leq r \leq R$ and apply the functional equation $z\Gamma(z) = \Gamma(z+1)$:

$$V_n(R) = \int_0^R \frac{2\pi^{n/2}}{\Gamma(\frac{n}{2}+1)} r^{n-1} dr = \frac{2\pi^{n/2}}{n\Gamma(\frac{n}{2})} R^n = \frac{2\pi^{n/2}}{\Gamma(\frac{n}{2}+1)} R^n$$

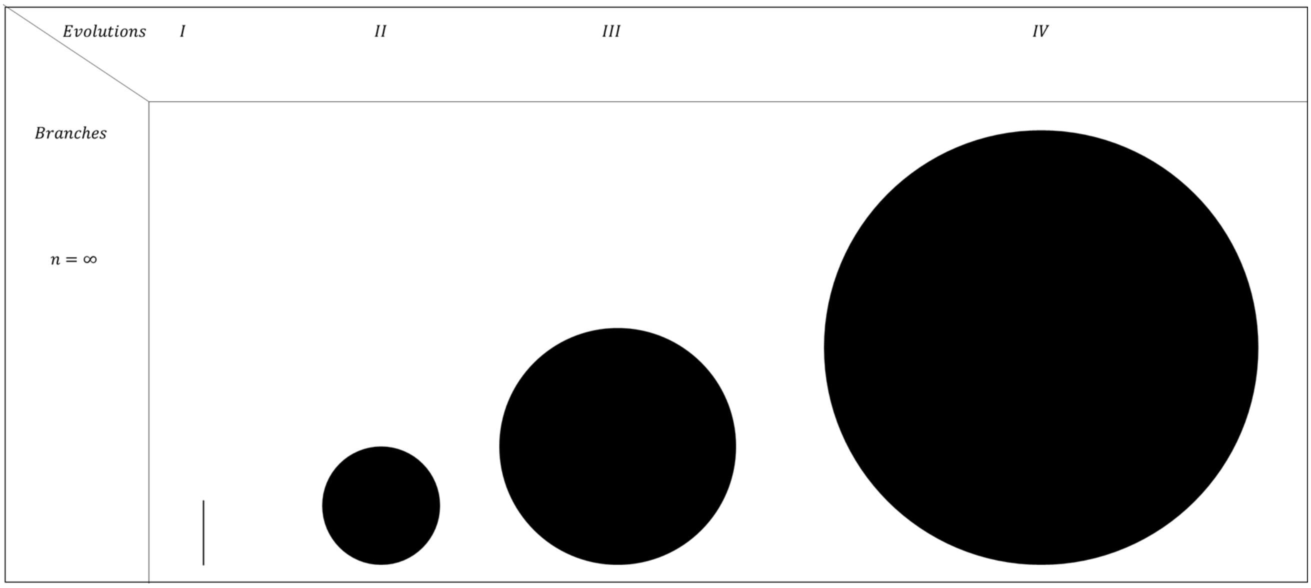
» Proof by Hayes, Brian. 2011. *An adventure in the N-th Dimension*, American Scientist, Volume 99, Number 6, Page 422, doi:10.1511/2011.93.442 Infinities adjusted by the author of the paper. Bjørn L. S. Riedel.

Graphical examples of o-$Tree$(n-$branches$) $as\ n$ =some arbitrarily big number



This example is of purely pedagogical character to show that we get closer and closer to the shape of the cirlce, and thus the area of it as n goes against some arbitrarily big number before it goes against infinity. Those are examples of 1 $Tree_{2D}$($big\ number$-s-$branches_{\theta}$).

Graphical examples of $Tree(n\text{-}branches)\ as\ n \to \infty\ or\ n \to +t$ from the I to the II evolution and to the III and IV



Here it is shown what happens if an s-Tree with infinetely branches has several evolutions where on top of every single one of those branches are added infinetely many more branches. The area increases about one radius length, that the original «Tree-stem» had. The «Tree-stem» is the original line we start iterating on in the first evolution. This is easiest to show in 2D since the Author is limited in increasing the dimensions by his tools, but still is true for up to n-dimensions or evolutions as we call it here. Those are examples of 3 $Tree(+t\text{-}s\text{-}branches_{\theta})$.

Other cases than n $\in \mathbb{N}$ there n$\neq 0, n \neq 1, n\ could\ be\ n \in \mathbb{R}, \mathbb{Q}, \mathbb{Z}, \mathbb{C}\ , Imaginary, p-adics \ldots etc$

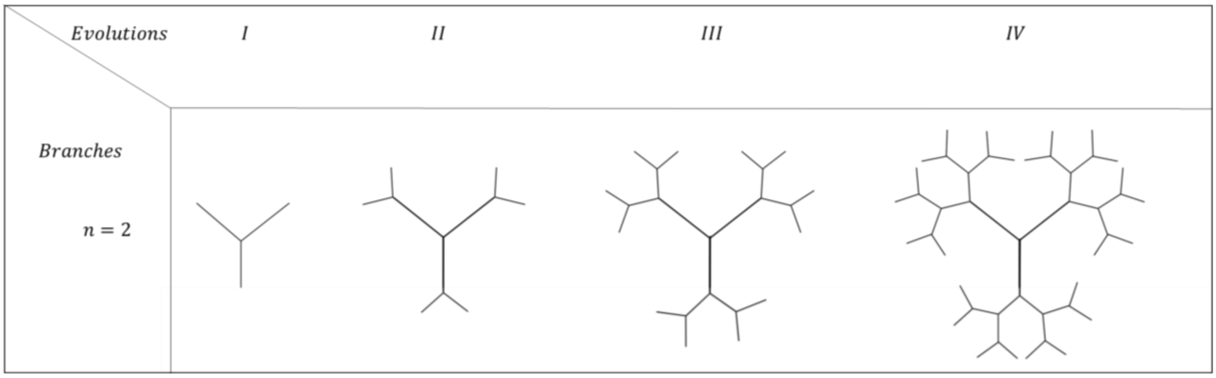
Clearly any type of branch that one can think of would be possible. Possibilities would be 4 $Tree_{2D}(3.5\text{-}s\text{-}branches_{\theta})$, 4 $Tree_{2D}(-3.5\text{-s-}branches_{\theta})$, 2 $Tree_{3D}(\pi\text{-s-}branches_{\theta})$, 2 $Tree_{2D}(2i\text{-s-}branches_{i\theta})$ and so forth. Like in fluid dynamics where negative o-Trees could model inward divergence and Trees with fractional branches could model energy that gets lesser like in $k \times s\text{-}Tree_{mD}(\frac{n-branches}{x}\ {}_{\theta})$ or based digits on another a prime but ten.

$\mathbb{R}/\mathbb{Q}, Transcendentals$

Are represented in a diffrent way as they depend on the size of finite objects and their ratios they are no longer infinite. But evolve accurately so much that they describe the objects sum of finite parts ratio, like pi=circumference of the polygon/diameter.

Origin functions, «Tree-stem» becomes a branch that is iterated on itself

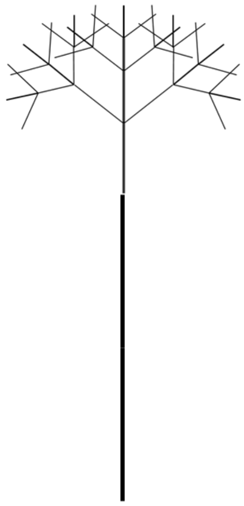
It would be a next natural step to consider what would happen if the «Tree-stem» itself, i.e. the first initial line, would be iterated on its own end, then the Tree-function looks like evolving around a point of shared origin, or origo. The first evolution could be looked at at Tree function 1 $Tree_{2D}(2\text{-}s\text{-}branches_{\theta})$, but also as 1 $Tree_{2D}$(3-o-$branches_{\ equidistant\ \theta}$). That means we have to introduce o-branches, i.e. origin-branches. With what I mean branches that do not have a «Tree-stem» but the same origin. Noteworthy is also that the angle θ is as in stem Tree-functions dependend on the other branches. Altough for symmetry purposes its best to uprighthold an equi-distant angle. As one carries out evolutions, one can observe that we have three equidistant branches that og straight out of the origin and then all of a sudde nits just 2 branches that are carried on. But by considering the former branch one of them its still 3 branches.



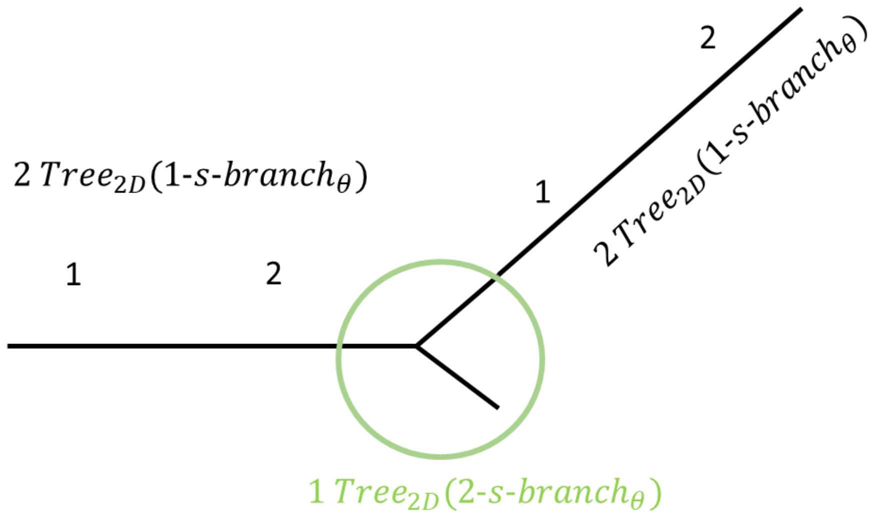
4 $Tree_{2D}$(3-o-$branches_{\ equidistant\ \theta}$).

Combinations of s-Tree-functions

As described before the n-s-branches can be permutted in all thinkable ways. But also the diffrent s-Tree-functions can be combined with each oth in all possible ways.



In this graphical example a 2 $Tree_{1D}$(1-s-$branch_\theta$) and a 3 $Tree_{2D}$(3-s-$branches_\theta$) have been combined. That is written with a plus sign a 2 $Tree_{1D}$(1-s-$branch_\theta$) + 3 $Tree_{2D}$(3-s-$branches_\theta$). As there are with other mathemathical concepts, some functions combined undo each other like 6 $Tree_{2D}$(2-s-$branch_\theta$) − 6 $Tree_{2D}$(2-s-$branch_\theta$) = 0. Or they are not possibleto combine, or two imaginary s-Tree functions become reel s-Tree-functions and so forth.



This construct for example could be described as 2 $Tree_{2D}$(1-s-$branch_\theta$) + 1 $Tree_{2D}$(2-s-$branch_\theta$) + $\boldsymbol{L}$ 2 $Tree_{2D}$(1-s-$branch_\theta$). **L** stands for the left branch if you where to come from the same direction as the former s-Tree-function. This comes close to how the arteries or the nervous system branches with diffrent s-Tree-functions applied after each other in specific sequence with diffrent operators altough thise would be 3D Tree functions as they exist in euclidean space.

New Insights

Continuous Calculus, Algebra and Geometry can be unified by Riedel-Trees as they can approximate any function with on brach that changes its angle according, relatively to at leas tone other branch (like the x-axis to the y-axis, Riedel-Trees are there own coordinate system). Such can create geometric shapes as the triangle, the square, the pentagon, then-gon and any higher geometries. But as the Trees originate in one o-Tree all together have to grow bigger as they elsewise could not fit new concepts under the constraints given by the angles of the first branches that leave gaps that can not be filled. The construct that arises from these Trees gets more and more 'perfect' seems more and more continuous, as it approximates continuity over time. Trees has have been explored in both Fractal Geometry and in Graph Theory. I could not find in any forum what would happen if the number of branches would grow and even og against infinity. A new insight is that the trees become circular, spherical, hyperspherical and so forth, and that they approach a limit. Geometric forms like polygons can be made such as triangles and all sorts of polygons. By reducing the size of the Riedel s-Trees in each succeeding iteration we can create 'discrete, function approaching shapes'. Possibly one could approximate or even solve the Navier Stokes equations. A promising aspect of them is that they dont require infinity as they rely on dicrete smallest units. **A determined granularity.**
. In our example we can model a fern. Logically concluding with the more iterations we have the smoother its shape is gonna be and we can express them with the help of sums and the sigma notation or the The Riedel Iota (**I**) notation for cumulative division of them. Example: $I_{i=5}^{4}\ i$=4/3/2/1 = 4/6. Also an o-Tree models perfectly how light spreads spherically in a vacuum. Plotted over time and there with steady growing spheres, o-Trees area ble to model the light-cone, wich is an important alignment with reality.

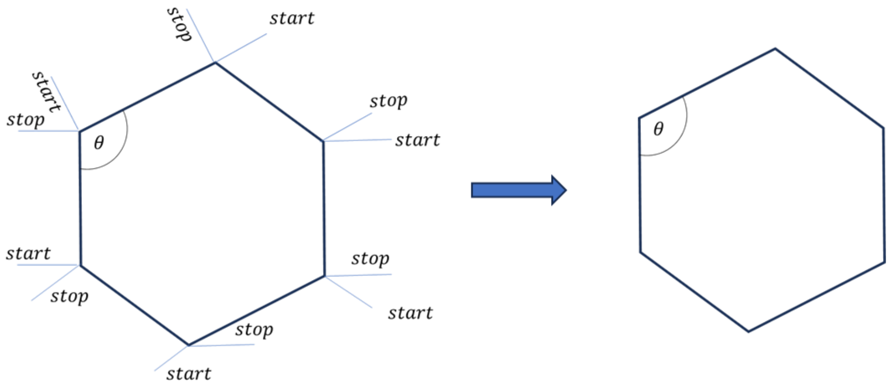
Graphical examples of n-gons and 'discrete function approaching shapes' and light cone

n-gon modeling

$$General\ Form\colon\ k \times \text{s-}Tree_{2D}[size](1 - branches_{\theta})$$

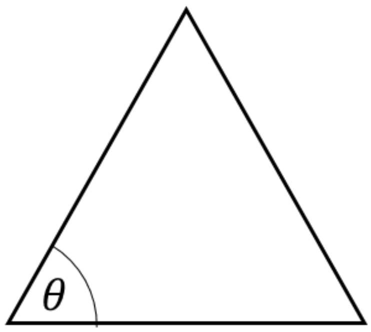
$$6 \times \text{s-}Tree_{2D}[1](1 - branches_{2\pi/6})$$

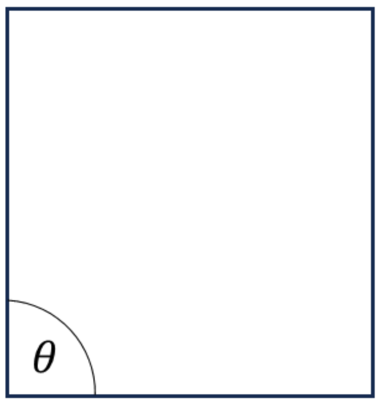
$$= 3 \times 2 \times \text{s-}Tree_{2D}[1](1 - branches_{2\pi/6})$$



$$4 \times Tree_{2D}[1](1 - branch_{2\pi/4})$$

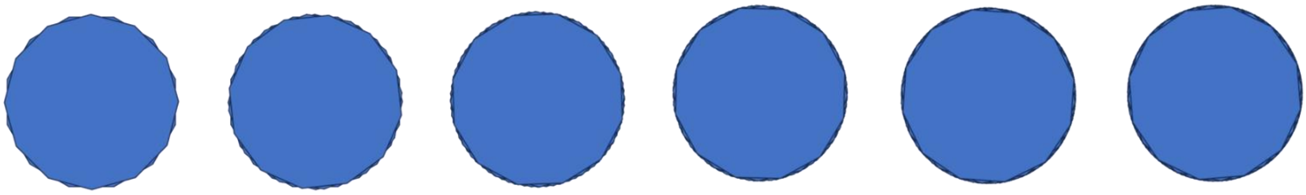
$$3 \times Tree_{2D}[1](1 - branch_{\pi/3})$$





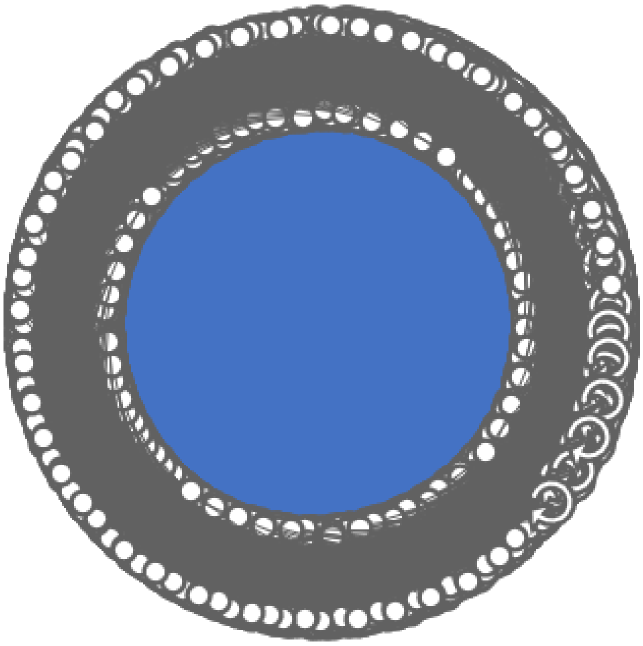
As the polygons get more vertices (n) they get closer and closer to circular shape, approach it, BUT never reach it. As the amount of vertices increases, the granularity increases and undistinguishable to the human eye. In order to reach the granularity of the universe, the planck length of $10^{-35}m$, I would need to double the 24 vertices (n) I started out with, approximately 112 times! Thats quite granular but still not impossible

$24\,n$ $48\,n$ $96\,n$ $192\,n$ $384\,n$ $768\,n$



After 12 rounds only we obtain an incredible amount of vertices

$$n = 98304$$

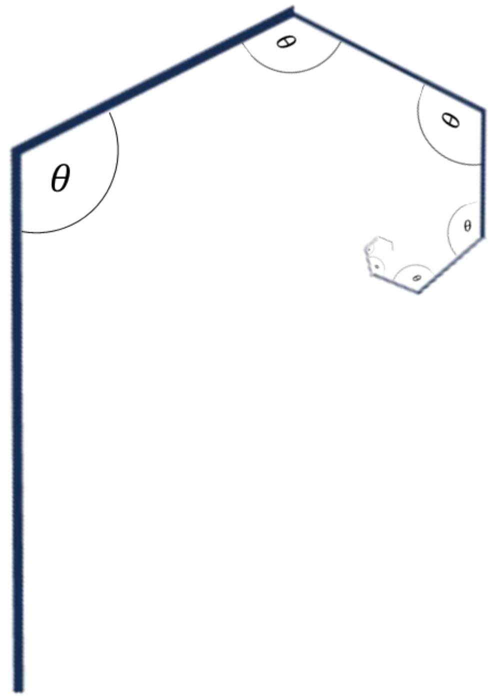


This shows that there are no true circles but polygons with huge amounts of vertices.

'Discrete, function approaching shapes' (Fern)

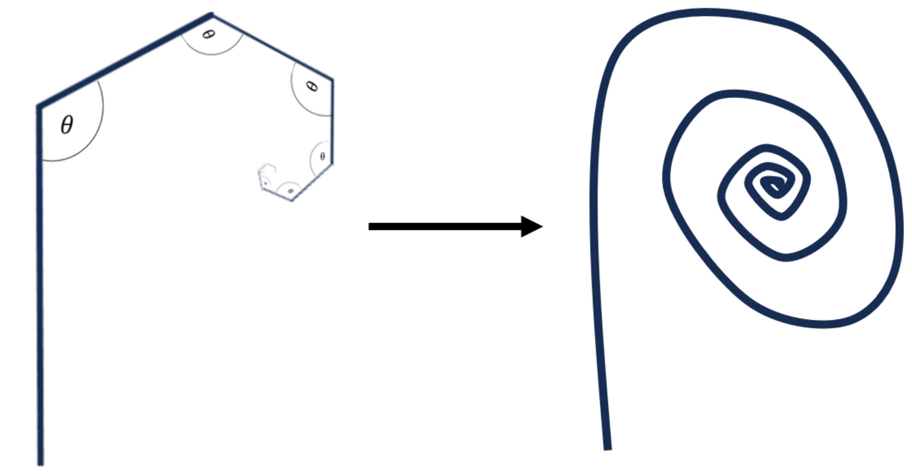
$$General\ Form: k \times Tree_{2D}[size](1 - branches_{\theta}), k = 1$$

s-$Tree_{2D}[1](1 - branches_{\theta})$ +s-$Tree_{2D}[\frac{1}{2}](1 - branches_{\theta})$ + s-$Tree_{2D}[\frac{1}{4}](1 - branches_{\theta}) + s - Tree_{2D}[\frac{1}{8}](1 - branches_{\theta})$ +s-$Tree_{2D}[\frac{1}{16}](1 - branches_{\theta})$ + s-$Tree_{2D}[\frac{1}{32}](1 - branches_{\theta})$ + s-$Tree_{2D}[\frac{1}{64}](1 - branches_{\theta})$ + s-$Tree_{2D}[\frac{1}{128}](1 - branches_{\theta})$ + s-$Tree_{2D}[\frac{1}{256}](1 - branches_{\theta})$ + s-$Tree_{2D}[\frac{1}{512}](1 - branches_{\theta}) = \sum_{i=1}^{10}$ s-$Tree_{2D}\left[\frac{1}{i}\right](1 - branches_{\theta})$

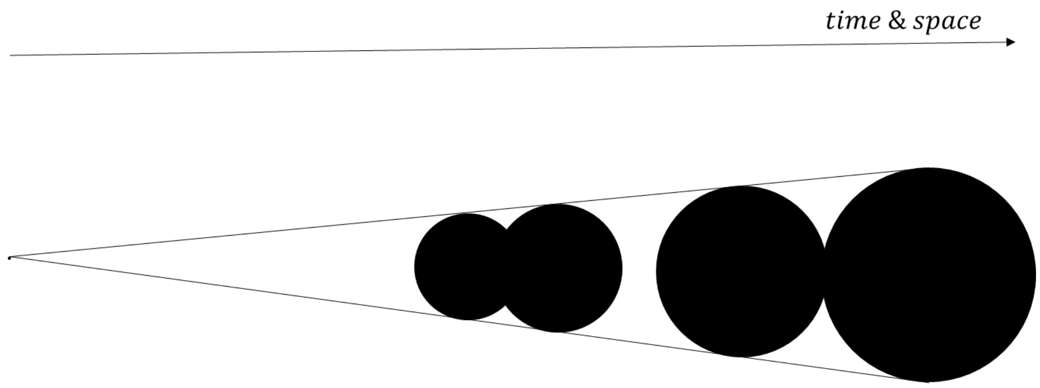


With more iterations this becomes far smoother.

Approaching far smoother finite structures as the amount of s-Trees increases



Light-cone



Spreading from an o-Tree like a circle, that gets circles upon all branches that contain of o-Trees again growing larger, like a wave with periodic repetence, but if measured only a single o-Tree, a particle. Behaving like a wave, a dissonance between two other trees, being measured as a particle. Fields as well are changes to Trees that are carried along over time and hence uprightheld, or inducing change of a concept relatively to the relative rules that are changed by that field.

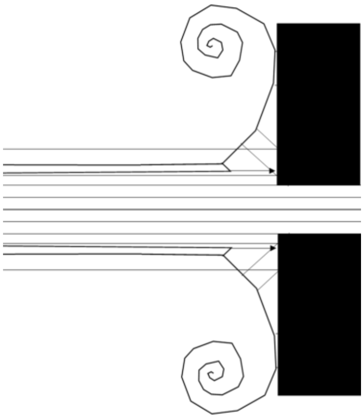
How can the Navier Sokes equations be modeled?

The Navier Stokes equations can be modeled by the Riedel s-Trees and o-Trees. Especially negative o-Trees can be used to model inward divergence and positive ones outward divergence.

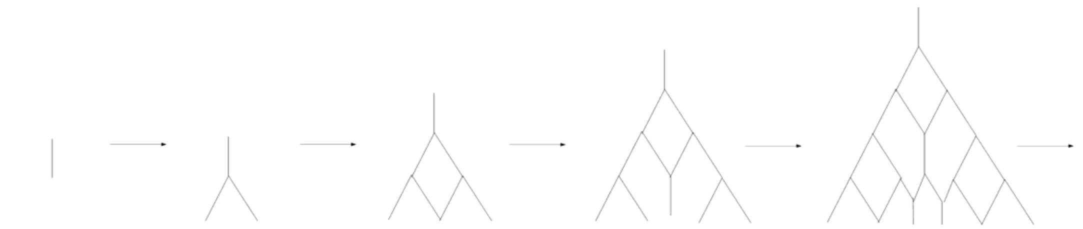
Recursive growth of those Riedel Trees that can work with and without infinities. To solve the Navier Stokes equations we have to assume discreteness and therefore infinities. This determening of granularity is described in another of my papers(Attached below **Determing granularity of any system by the size of its corners, defining being and not being*). By using the most basic s-Trees we can model (stream lines, lines, curve approaching discrete structures, turbulances) and o-Trees we can model (sources and sinks). By making those trees dependend on energy we do not encounter singularities or «blow ups», also we do not depend on partial differential equations although in the beginning of the modeling they are one of the most important tools to find out with wich angle the Riedel s-Trees and o-Trees do so and if they follow as proposed Snells law and other optical laws like the law of refraction (also for the energy that has to distributed whenever a streamline collides with anything (as well following Riedel Trees rules like for the light cone.). The Navier Stokes has unique solutions within this model with discrete smalest units or conceptual points, a solution that can be given by several descriptions that all describe the same Riedel-Tree (like $a^2 = a \cdot a$). The paper *Determing granularity of any system by the size of its corners, defining being and not being* serves as a fundamental pillar for surpassing inconsistencies that arise in continuous systems. The Riedel-Trees approach continuous systems, but never quite become continuous. Partial differential equations assume continuity. Granularity trough discreteness makes the existence of the solutions logically sound as well as measurable. And energy constraints upon those Riedel Trees make them really applicable. If a turbulence over time looses enough energy, the Riedel Treer ule that it was based on can't have any more evolutions and hence the turbulence dissapears over time. Something we see in our sink, coffe cup, in rivers, mixing sirup into water, in all chemistry and biology and physical phenomena that have fluids or gases within them. Therefore the Riedel Trees could be the optimal solution for fluid dynamics as well.

Beatiful is that every streamline is a Riedel Tree of $k \times s\text{-}Tree_{mD}[size](n\text{-}branches_{\theta})$ or $k \times o\text{-}Tree_{mD}[size](n\text{-}branches_{\theta})$ with one branch, n=1, and all resulting behavior by collision, reflection, refraction, absorbtion are succeeding Riedel-Trees with higher branch amount, possibly dimension, certainly angle and size(also according to energy constraints).

The following is only a pedagogical graphical example that does not exactly models flow, but shows how turbulance can be modeled with the Riedel-Tree rules.

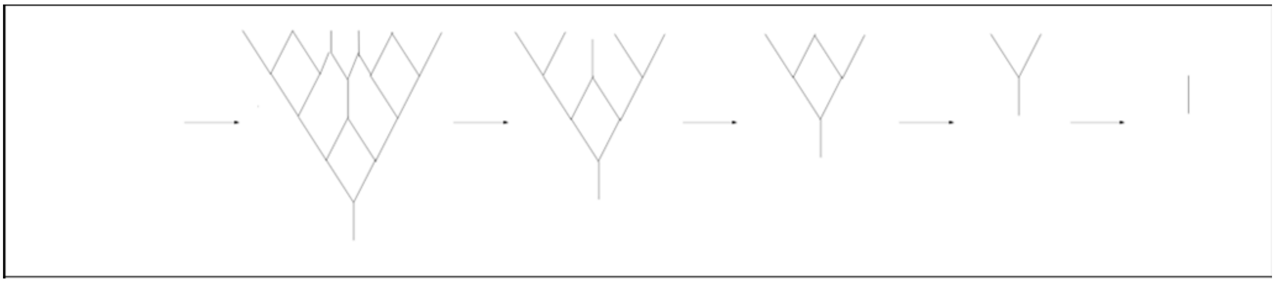


Evolution of the $\sum_{\theta_1}^{\theta_{n\rightarrow+t}} \; - s\text{-}Tree_{mD}[size](2\text{-}branch_{\theta n})$, water running down a window



Here we see that two paths of wather again collapse to one as this is favorable from an energy constrain, thermodynamics standpoint where where first a state of high energy gets into two states of lower energy and if some ‘branches/paths’ meet, they collapse into a new one, finally, the Tree, gets into as many as possible low energy states with most entropy.

We turn the evolution around and get to see how water droplets actually roll down our windows. We have to first back-engineer the process to get to the initial result.



But those are still not what happen. What really happen is only:

Wich is a great example of the non-determinist nature of nature. If the two drops cross they follow the pattern, if not they dont. And wether they do or not requires to know all parameters and the time it takes to determine the outcome, finite repetance has supassed us by the most efficient self assembly: finite repetance.

Discussion

An speculative but interesting thought is applying the rule of increasing amount of branches to causality. Applying this to causality and quantum mechanical interpretations such as 'the many worlds theory' we would gain the astounding insight that even if there are multiple universes created where each contains a single outcome of an event, they finally would go against the same boundary. No matter how many 'worlds' there would be they always would be bounded by the same upper bound.

Many shapes in nature resemble those s-Tree-functions and o-Tree-functions. They way they focus on branches seems new. And if truly nothing quite describes these concepts of branching this must be a novel insight and hence worth exploring further. Possibly, and when we are assuming granularity instead of infinitesimals, we have to use Riedel s-Trees to model fluid dynamics and the Navier Stokes Equations are modeled each time such that a tree follows the path of least resistence and a reflected tree looses some branchial energy to the material it flows into, o or s-Tree likely follow Snells-Law and other laws of modern physics.

* Determing granularity of any system by the size of its corners, defining being and not being

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Hypothesis

For all corners it is true that they are only consisting by a smallest unit or what we call the conceptual dot.

Hence the size of the dot that is that corner is giving the amount of granularity for the entire structure. If the structure is truly infinite, the granularity is.

If the smallest structure or conceptual dot in the overall structure is an atom the granularity is determined by the atoms size and if the smallest unit or conceptual dot is determined by a planck length, the granularity is determined by a planck length, if the smallest unit of a house is a brick stone, the granularity is determined by the smallest unit wich is a brick stone.

N_{total}corners can be connected to N_{total} corners, this holds for any other shape than the triangle, making it the first 2D shape. A known fact. The proof I rely on is mathematical induction. In this case one starst from 4 and upwards, after 4 comes 5, after 5 comes 6 and so on.

In the square one can make four connections, by connecting each corner to another one exactly 4 times. Followed by the pentagon 5 times, the hexagon 6 times and on and on approaching the infinite circle.

The ideal=concept of a circle has no corners and hence no smallest units or conceptual dots. But as discussed in the phylosophical paper perdeal man, perversely ideal man, concepts=ideals and belong to concepts because they would result in infinite granularity. Something unprovable!

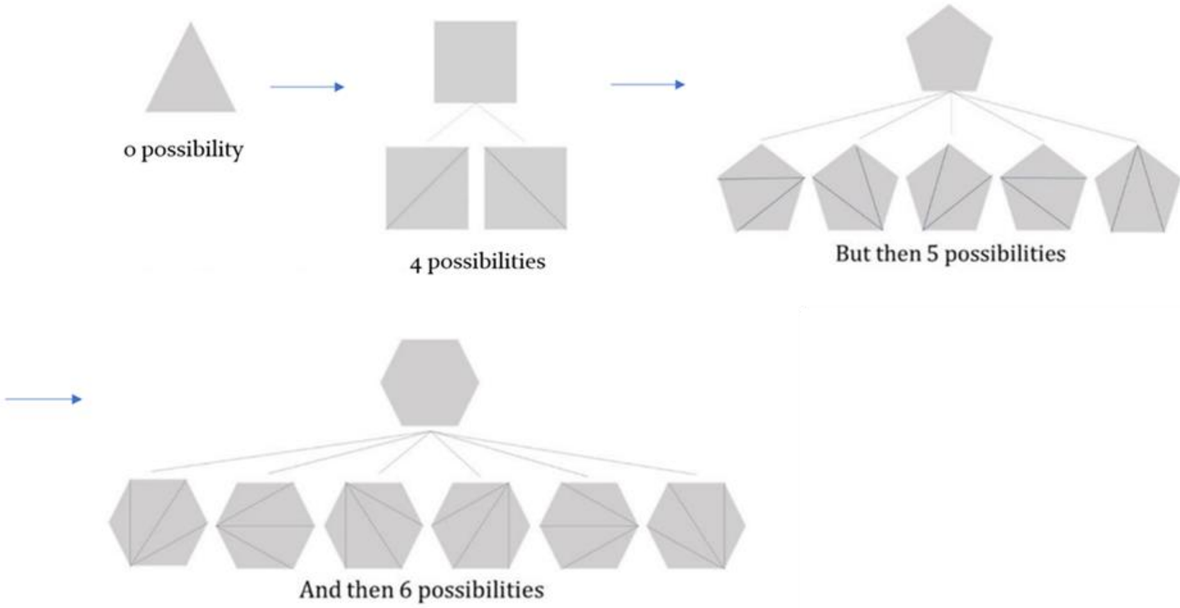
But there must be granularity in order to have something to build upon. Therefore real word circles have granularity, they have smallest units conceptual dots, that are discrete but become continuous over time. And those are measurable indeed!

At least two lines connecting in a single conceptual dot, or as it is a known fact, a corner is a single conceptual dot.

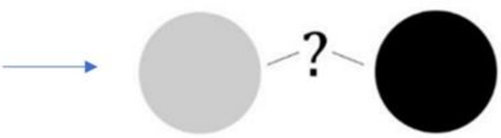
→ Hence all defined smallest units or conceptual dots can show us in return the granularity we have to use instead of the mathematical concept=ideal of infinitiy as all concepts=ideals are inherently constrained.

This is a sufficient proof of the discreteness of nature. A discrete nature that smoothes out over time and space, and time and space itself wich are discrete but appear to be smooth.

This is also a modernization of Leucippus and Democritus word "atomos" or indivisible cupled to Einsteinian understanding of time and space and also to ideal and concept in the philosophical work _Perdeal Man, perversely ideal man_, where ideals=concepts. So far so as creating a discrete Riedelian Space where ‘being’ itself is the presence or the absence of a smallest unit or the conceptual dot!



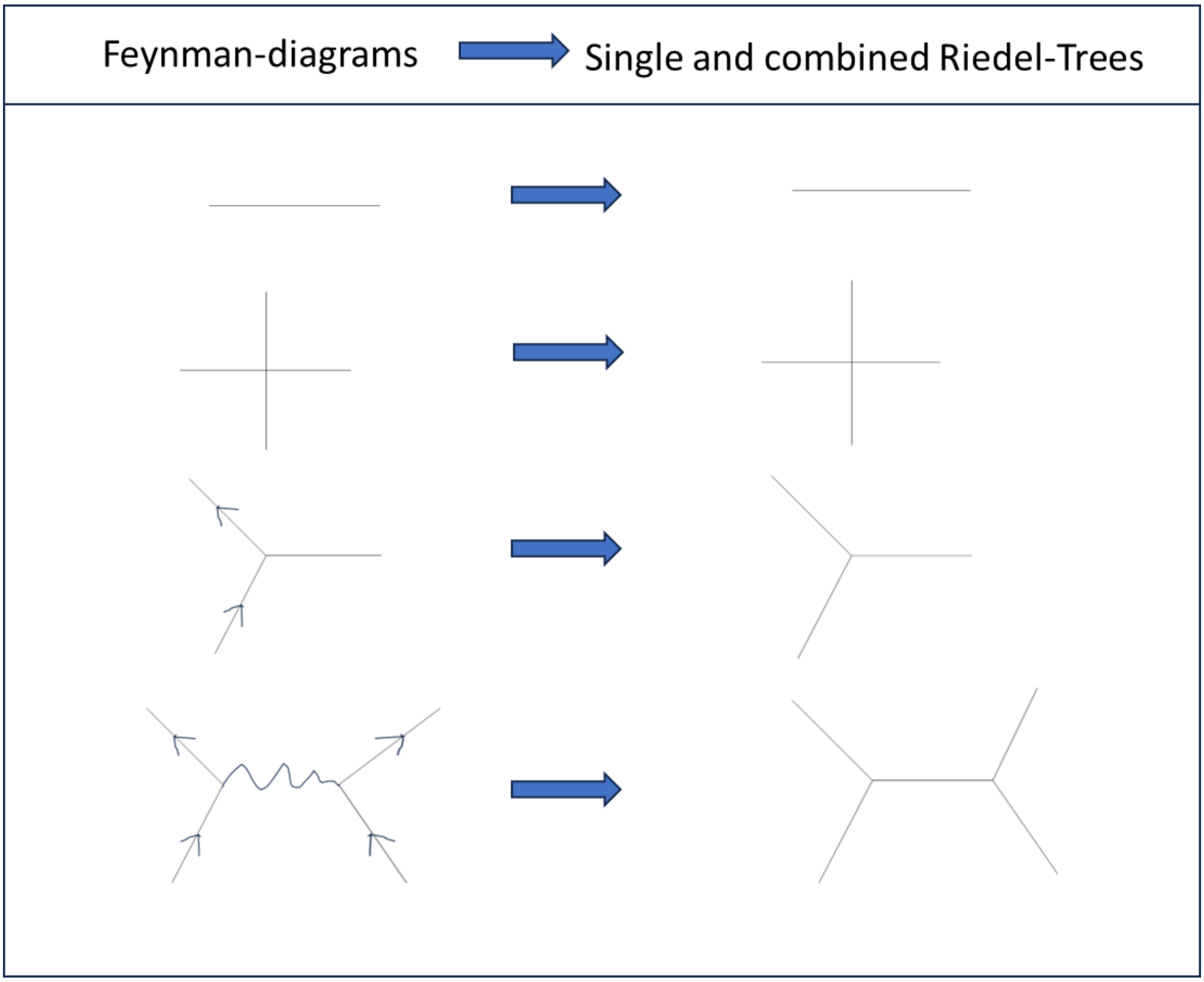
And from then on it goes on and on, the heptagon has seven possibilities
The octagon 8, and the circle has ifinitely many lines that are not crossing,
but infinetely many cornes at the same time means no corners at all and thus no lines at all. Is it both at once?



No corners no lines
Infinite corners infinite lines
The amount of vertices is finite, but keeps increasing as the universe expands. But not for objects of fixed size. Objects of fixed size keep the same amount of digits of pi, as pi is The Circumference/diameter. And as long as the circumference and the diameter doesnt change the amount of digits satisfying a granularity of planck-lengths does not need to change, and hence does not.

o-Tree and s-Tree showing same form as well known Feynman diagrams

The described s-Trees and o-Trees, wich they originate from, can easily build the same structures that Feynman Diagrams and hence the path integrals can. This really showcases their potential and that it should looked be more into them. In Feynman diagrams vertices represent interactions. whereas in Riedel-Trees Rules the vertices are o-Trees, the particles that are mapped along, and from there on get mapped in a new way, after a new Riedel-Tree-Rule. This is the combinatorial nature, accurately the same as an interaction. Wich makes the Feynman diagrams a subset of finite repetance.



Theory: Physical wave representation trough inscribed polygons in a cirlcle

Dimension as mentioned here is nothing more than two orthogonal branches of a Riedel-Tree in the same o-Tree as their origin. Lets assume this is an alternative way to describe trigonometry in a planar (2D) way and project it into 3D and 4D, along the z- axis. Let a wave's periodic motion be represented by equi distant points or for the most cases polygon's inscribed into a circle (a single point on the circle (a vertex/o-Tree/smallest unit that is repeated) is the smallest meaningfull interpretation) or all points That are reached by the branches originating in an o-Tree. The radius of the circle represents the length of the branches, and the amplitude of the wave, the number of vertices represents the 2D frequency, and the angularangular distance between vertices can be converted into a 2D wavelength. The vertices go conceptually 2π around the circle each by only one rotation around the z-axis. So one oint on the circle arc equals a wave of 2π , one with 2equi distant points a wave with 4π , one with 3 vertices, hence a triangle, has $3 \times 2\pi = 6\pi$ (conceptually) wavelength or frequency and so forth. But the important thing is that this is the wave represented in 2D. In 3D4D the wave is also constrained by how long it is expressed along the z-axis (3D4D). This makes it possible that there are also $\frac{1}{2}$ or $\frac{3}{2}$ or other fractional wavelengths as we know there are.
The 2D wave representations are scaled along the z- axis that represents 3D and 4D (denoted as 3D4D). As the number of vertices increases, the polygon approaches the shape of the circle, corresponding to the limit of finite frequency of $2\pi r$ and not infinitesimally small 2D wavelength. Which could theoretically mean there also is an upper bound in 3D4D, wich we currently have calculated to be f_p, or the plack-frequency $f_p = \frac{1}{2\pi}\sqrt{\frac{c^5}{\hbar G}} = \frac{E_p}{h} = 2.952 \times 10^{42} Hz$, wich already is a 3D4D description and not a 2D one. There is a factor of 10^9 between $t_p and\ l_p$ but seems to be the diffrence in how we measure time and length that does not add up to one another. I strongly believe that they are perfectely equal.
Also it seems to met hat through REDPH and RPWH arises a picture of a 4 dimensional universe. 1D, 2D, 3D and 4D. 1D and 2D exist without space and time (3D4D). Every of these dimensions has its concepts or ideals (Mathematical ones) like for example infinities. And infinities in diffrent dimensions constrain each other in their interplay. A fractal pattern in 2D can have consequences for 3D4D but is constrained as there isnt such a thing as infinite time and hence not enough space as well, so a romaneso cant be a perfect fractal, and waves cant propagate without a speed limit. Wich arises from the Maxwell-Equations and is well known as c (299711458m/s). But at planck scale c is a planck length per

planck time. This is where 2D is first merging into 3D4D. In my calculations I cant differentiate 3D and 4D. So I write as 3D4D as consistent with Einsteins Spacetime. In 2D the time independent quantum mechanical equations are true, but as soon as 2D merges only 'one step' into 3D4D the time dependent quantum mechanical equations become the only ones valid.

Proof:

1. **Wave-circle relationship**: Consider a physical wave with a sinusoidal shape propagating in space. One complete cycle of the wave can be represented geometrically by a circle. The radius r of the circle corresponds to the wave's amplitude A, and the circumference $C = 2(\pi)r$ corresponds to one period of the wave. The larger the radius, the greater the amplitude and hence the Energy of the wave. $A^2 \propto E^2 \propto r^2$. n is the number of vertices, o-Trees/smallest units) in the formulae $E_n = n\hbar\omega$ and $E_n = \left(n + \frac{1}{2}\right)\hbar\omega$.

2. **Polygonal approximation of the wave**: Inscribe a regular polygon with n vertices inside the circle. Each two verteces represents either a peak or trough of the wave. The number of of vertices n is directly related to the wave's frequency. Specifically, the frequency is proportional to n:
$$f_{2D} = \frac{c - n}{2(\pi *)}$$
Where T is the period of the wave represented by the time it takes for one complete revolution around the circle in discrete steps. But there is no time in the plane (2D) but as it is mapped along the z-axis torwars $\rightarrow +t$. Therefore we have to think of a z-axis that is orthogonal on the plane. This z-axis represents 3D4D.

3. **Polygon perimeter approaches the circle circumfrence**: The perimeter P_n approaches the circumference of the circle $C = 2\pi r\ (ever\ refined\ torwards + t)$ as the number of vertices increases:
$$\lim_{n\to\infty\ or+t} P_n = C = 2(\pi *)\, r$$
This means we have to work with either infinite granularity or finite granularity. There must be a number c such as lightspeed that is the smallest discrete step and therefore the upper bound of displacement per time. One discrete unit is a vertice. Vertices in the polygon and the approximated circle. Along the z-axis this bounds are t_p and l_p. It's noteworthy that $t_p >> l_p$ about a factor 10^{-9}, wich by everyday logic would mean time is about 1 billion times mor granular than space or that they are the same but our measurement for time and displacement per time in SI-units do not align, but do in fact, for

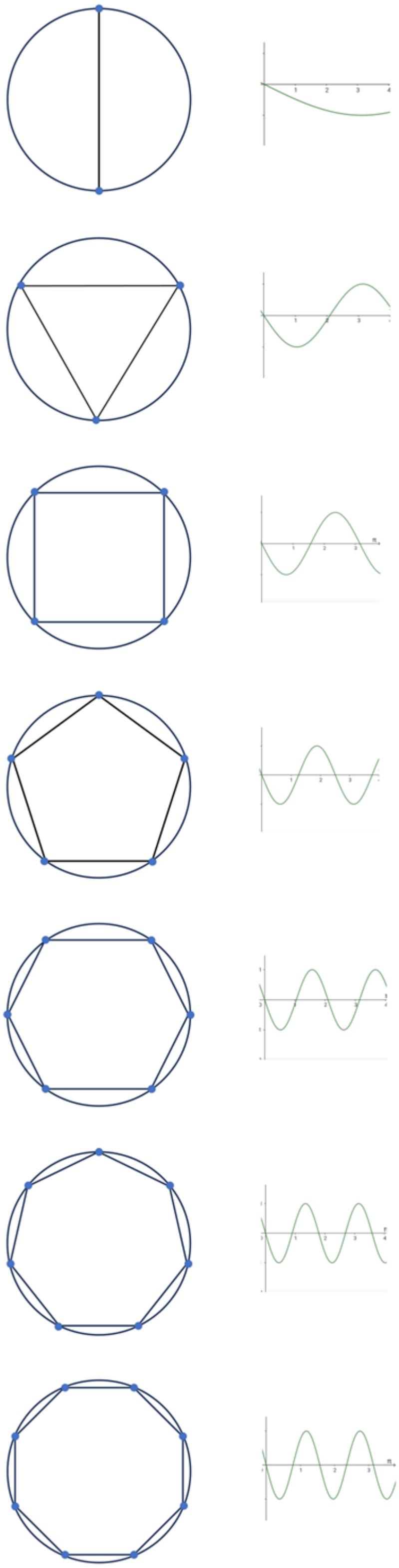
every length, there must be an extra temporal dimension, in an ratio 2:1, as time arises only from one step to the next.

4. **Known frequency wavelength relation in 3D4D**: $f_{3D4D} = \frac{c}{\lambda}, \lambda_{3D4D} = \frac{c}{f}$, $c_{3D4D} = \lambda_{3D4D}\, f_{3D4D}$
5. **Frequency wavelength relation in 2D:** $f_{2D} = \frac{c-n}{2\pi r}, \lambda_{2D} = 2\pi r$, $(c-n)_{2D} = \frac{c-n}{2\pi r} 2\pi = c - n$

6. **Amplitude**: The amplitude A of the wave is modeled by the radius r of the discrete circle. A larger radius means a larger amplitude, wich corresponds to the maximum displacement of the wave from its equilibrium position. As the the radius increases (trough scaling with a factor n) so does the maximum displacement (amplitude) of the wave: $A = r \to An = rn$. And $A^2 \propto E^2 \ \propto \ r^2$.

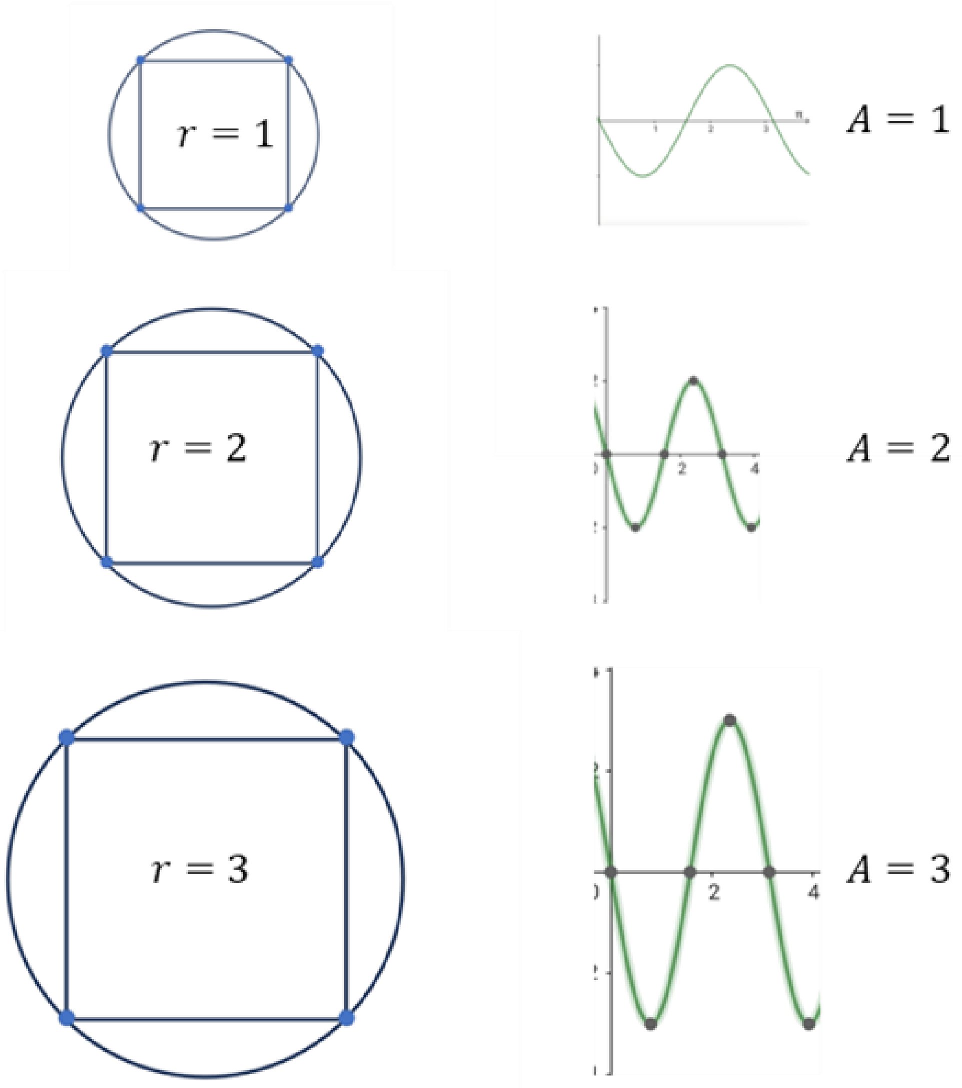
□

Graphical representation trough inscribed polygons in a cirlcle



It is assumed the coordinate system would only go to $2\pi = 2\,\frac{peremiter\ of\ the\ polygon}{diameter\ of\ the\ polygon}$ in all cases.

Graphical representation of the wave trough inscribed polygons in a cirlcle



It is assumed the coordinate system would only go to $2\pi = 2\,\frac{peremiter\ of\ the\ polygon}{diameter\ of\ the\ polygon}$ in all cases.

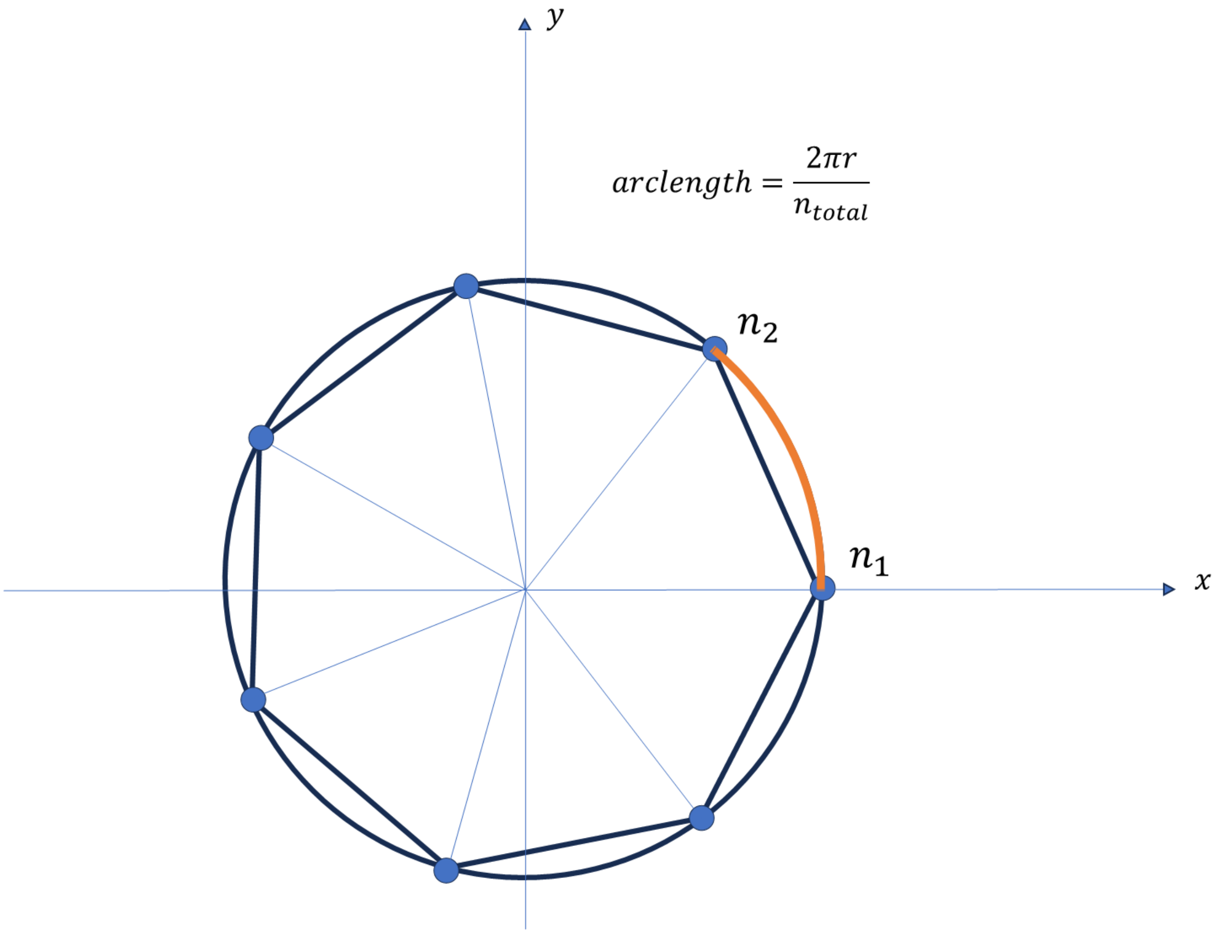
Symmetry in Polygons reduces Number of Trigonometric Calculations

S-Trees form polygons, or n-gons they are inherently symmetric, as are the o-Trees have branches of the same angle, making them by this definition symmetrical. The vertices of these polygons are evenly distributed along a circle arc taht is defined by discrete conceptual dots or smallest units. Sine and cosine values repeat due to these symmetries, meaning that many angles in the polygon will share identical trigonometric values even in Tradional trigonometry that would be an advantage. This reduces the number of unique angles that need to be calculated, simplifying the trigonometric operations. Just consider an octagon, with its eight vertices equally spaced around the unit circle (here all possible directions branches could reach without having the exact same angle, here determined by the smallest size the conceptual dot). The angles associated with the vertices are a progression of 135°, summing to 1080°. Sine and Cosine Symmetry: Notice how the sine and the cosine values for some of these angles are the same, with diffrences only in sign (positive or negative). Instead of calculating sine and cosine for each angle independently, Equi-distant point trigonometry allows to exploit the symmetry of the polygon to reduce the number of necessary calculations. For an n-gon, one might only compute the trigonometric values for one angle per vertice (wich is calculated from the frequency that is measured) and derive the rest using the to the n-gon's inherent symmetry.

Arc-length in in equi-distant point trigonometry

The Arclength in equi-distant point trigonometry is simply the distance between the two points n_2 and n_1 on the circle arc divided into n equal pieces, there we need the total number of n. We divide $2\pi r$ by it $\frac{2\pi r}{n_{total}}$ and get the arc-length. Hence the number of vertices becomes easily calculatable as well as how far the 2D geometry must have moved along the z-axis, because c divided by the 3D4D wavelength gives the frequency wich again is described by how many equi-distant points or vertices the polygon shares with the circle. When a 2D circle has more of those vertices more of it in a shorter time and shoerter space is carried on into 3D4D.

Graphical example of arc length in in equi-distant point trigonometry



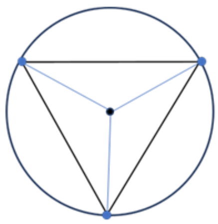
Calculate the area of a circle in terms of Riedel Polygonics

It is very trivial to see how polygons rotated 360° or 2π inside the circle do as well give the same as the area as the fomula A=πr^2 but with the genaral formula $A_{circle-n-gon} = \frac{1}{n}\pi r \cdot nr$. This can be shown with by taking limit even though trivial $\lim_{n\to\infty} \frac{1}{n}\pi r \cdot nr = \pi r^2$ $for\ \forall_n \neq 0, n \in \mathbb{N}$

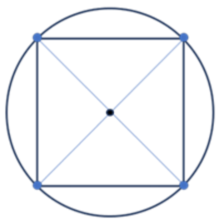
Area of the circle with a Polygon of n-vertices inscibed into the circle

This gives a diffrent geographical representation giving the same result of A=πr^2 since the area drawn our by each line to each vertice and we have n lines from the midtpoint of the circle to each polygon vertice point with the circle arc. N cancels out with the term $\frac{1}{n}$ r but add the additional r that multiplies with πr to πr^2 and since aligns without problems. This can be interpreted as every of the n lines rotating accuartely $\frac{2\pi}{n}$ radians.

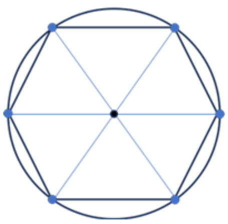
Case 1 looks like an o-Tree with 3 branches ($1 \times o\text{-}Tree_{2D}[1\ size](3\text{-}branches_{2\pi/_3})$,) or $3 \times s\text{-}Trees_{2D}[1\ size](1\text{-}branches_{180/_3})$, Case 2 looks like an o-Tree with 4branches ($1 \times o\text{-}Tree_{2D}[1\ size](4\text{-}branches_{2\pi/_4})$) or $4 \times s\text{-}Trees_{2D}[1\ size](1\text{-}branches_{360°/_4})$, and case 3 looks like an o-Tre with 6 branches ($1 \times o\text{-}Tree_{2D}[1\ size](6\text{-}branches_{2\pi/_6})$) or $6 \times s\text{-}Tree_{2D}[1\ size](1\text{-}branches_{720°/_6})$. Showing that trigonometry can be expressed by the universal concept finite repetance modeled by Riedel-Tree Rules.



$$A_{circletriangle} = \frac{1}{3}\pi r \cdot 3r$$



$$A_{circlesquare} = \frac{1}{4}\pi r \cdot 4r$$



$$A_{circlehexagon} = \frac{1}{6}\pi r \cdot 6r$$

Calculate the volume of a sphere with an area of a circle with a Polygon of n-vertices inscibed into

It is trivial to see how polygons rotated 360° or 2π inside the circle do as well give the same area and thus can as a consequence of that give the volume of a sphere as well for any polygon insribed into the circle.

The formula for this is: $V_{sphere\ from\ n-gon\ circle} = \frac{4}{6 \cdot n} \cdot 2\pi r \cdot nr^2$ and no matter what values for n we may plug it ends up at $V_{sphere\ from\ penta-gon\ circle} = \frac{4}{6 \cdot 5} \cdot r \cdot 5r^2 =$

$$= \frac{40}{30} \cdot \pi r \cdot r^2 = \frac{4}{3} \cdot \pi r^3$$

So this also aligns with the formula for the volume of the sphere $V_{sphere} = \frac{4}{3} \cdot \pi r^3$ for any polygon inscribed into the circle. $\lim_{n \to \infty\ or + t} \frac{4}{6 \cdot n} \cdot r \cdot nr^2 = \frac{4}{3} \cdot \pi r^3\ for\ \forall_n \neq 0, n \in \mathbb{N}$.

Calculate the volume of a n-ball in polygonic-terms

This can be shown by the equation $V_d(r) = \frac{2\pi^{d/2}}{n\Gamma(\frac{d}{2}+1)} nr^d$ and by taking the limit $\lim_{n \to \infty\ or + t} \frac{2\pi^{d/2}}{n\Gamma(\frac{d}{2}+1)} nr^d = \frac{2\pi^{d/2}}{\Gamma(\frac{d}{2}+1)} r^d\ for\ \forall_n \neq 0, n \in \mathbb{N}$.

A polygon with with an arbitrarily large number of vertices, possibly infinitely many vertices is nothing else than an Riedel Infinite Tree if viewed in relation to the center of the circle.

Mathematically this can be shown by introducing a tree function that scales as its argument scales. We define it as $Tree_{2D}(n\text{-}s\text{-}branches)$ in 2D and it as $Tree_{3D}(n\text{-}s\text{-}branches)$. Also it as $Tree_{mD}(n\text{-}s\text{-}branches)$ for m-D.

For 1D we obtain:

$$\lim_{n\to\infty or+t} Tree_{1D}(n-s-branches_{\theta}) = 0 \vee 1$$

For 2D we obtain:

$$\lim_{n\to\infty\ or+t} Tree_{2D}(n-s-branches) = \pi r^2$$

For 3D we obtain:

$$\lim_{n\to\infty\ or+t} Tree_{3D}(n-s-branches) = \frac{4}{3}\pi r^3$$

For 4D we obtain:

$$\lim_{n\to\infty\ or+t} Tree_{4D}(n-s-branches) = \frac{\pi^2}{2} r^4$$

For m-D we obtain:

$$\lim_{n\to\infty\ or+t} Tree_{mD}(n-s-branches) = \frac{\pi^{n/2}}{\Gamma(\frac{n}{2}+1)} R^n$$

The radius of the $Tree_{mD}(n-s-branches)$ is dependent on the length of each brach as well as their displacement from beeing orthogonal to the origin. Thereafter it depends on the number of evolutions. The esiest case is one evolution and as $n \to \infty\ or + t$ the angle $\theta \to 0$, so we assume they become othogonal to the origin (wich is a single point untop of the line of the «Tree-stem»), and if they have the same length as the «Tree-stem» wich we assume to be r=L=1 for simplicity, they form a circle of the radius one, a sphere of radius 1, a hyperspher of radius 1 and so forth. For each evolution, assumed the length of the branches does not change, groes bigger by one.

That means after the second evolution r=2, after the third evolution r=3, after the forth r=4 and so forth.

I here rely on the proof by using Gaussian integrals, consider the function:

$$f(x_1, x_2, x_3, \dots, x_n) = \exp\left(-\frac{1}{2}\sum_{i=1}^{n} x_i^2\right)$$

This function is both rotationally invariant and a product of functions of one variable each. Using the fact that it is a product and the formula for the Gaussian integral «gives:

$\int_{R^n} f dV = \prod_{i=1}^{n} \left(\int_{-\infty \, or-t}^{\infty or+t} \exp\left(-\frac{1}{2} x_i^2 \, dx_i\right) = (2\pi)^{n/2}, \right.$

where dV is the n-dimensional volume element. Using rotational invariance, the same integral can be computed in spherical coordinates:

$\int_{R^n} f dV = \int_0^{\infty \, or+t} \int_{S^{n-1}(r)} \exp\left(-\frac{1}{2} r^2\right) dA dr,$

where $S^{n-1}(r)$ is an $(n-1)$ sphere of radius r (being the surface of an n-ball of radius r) and dA is the area element (equivalently, the $(n-1)$ dimensional volume element). The surface area of the sphere satisfies a proportionality equation similar to the one for the volume of a ball: If $A_{n-1}(r)$ is the surface area of an $(n-1)$ sphere of radius r, then: $A_{n-1}(r) = r^{n-1} A_{n-1}(1)$.

Applying this to the above integral gives the expression:

$(2\pi)^{n/2} = \int_0^{\infty \, or+t} \int_{S^{n-1}(r)} \exp\left(-\frac{1}{2} r^2\right) dA dr = A_{n-1}(1) \int_0^{\infty \, or+t} \exp\left(-\frac{1}{2} r^2\right) r^{n-1} dr$
Substituting for $t = \frac{n}{2}$:

$$\int_0^{\infty \, or+t} \exp\left(-\frac{1}{2} r^2\right) r^{n-1} dr = 2^{(n-2)/2} \int_0^{\infty \, or+t} e^{-t} t^{(n-2)/2} \, dt$$

The integral on the right is the gamma function evaluated at $\frac{n}{2}$. Combining the two results shows that:

$A_{n-1}(1) = \frac{2\pi^{n/2}}{\Gamma(\frac{n}{2}+1)}$

To derive the volume of an n-ball of radius r from this formula, integrate the surface area of a sphere of radius r for $0 \leq r \leq R$ and apply the functional equation $z\Gamma(z) = \Gamma(z+1)$:

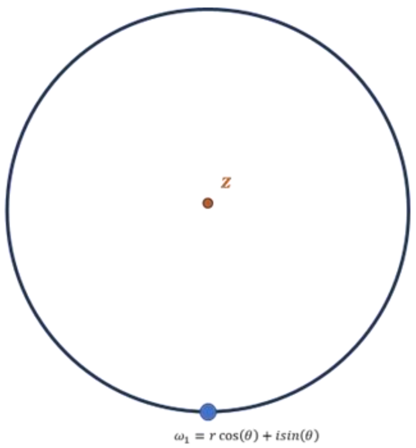
$$V_n(R) = \int_0^R \frac{2\pi^{n/2}}{\Gamma(\frac{n}{2}+1)} r^{n-1} dr = \frac{2\pi^{n/2}}{n\Gamma(\frac{n}{2})} R^n = \frac{2\pi^{n/2}}{\Gamma(\frac{n}{2}+1)} R^n$$

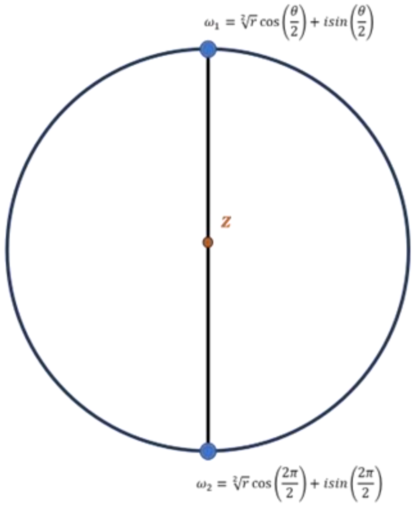
» Proof by Hayes, Brian. 2011. *An adventure in the N-th Dimension*, American Scientist, Volume 99, Number 6, Page 422, doi:10.1511/2011.93.442 The infinities are alternated to contain 'or +t' by the author Bjørn L. S. Riedel

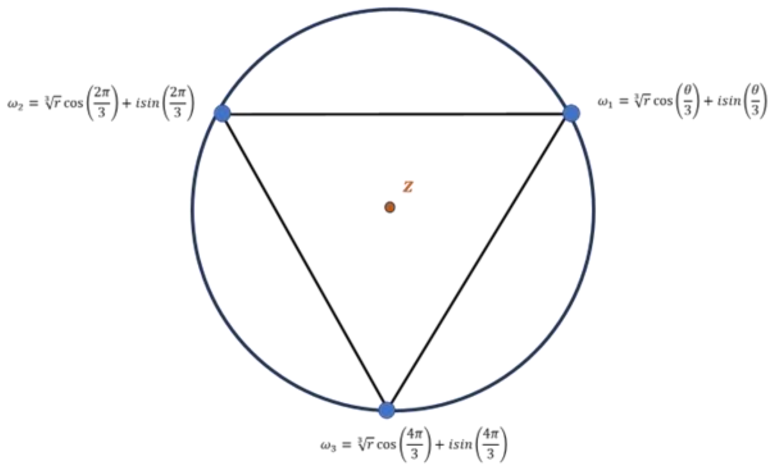
Alignment with the Argand diagrams of complex roots

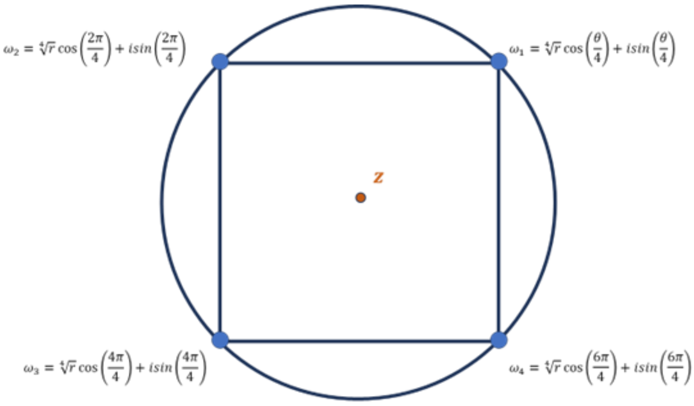
Its a big coincidence that the extremal points of a wave function happen to be exactly at the same point where one finds the complex roots of z. It is no coincidence. It aligns with how I imagine waves in the plane without time. And it aligns with the quantum mechanical formula $E_n = n\hbar\omega$, where I said the vertices there the polygons or equi-distant points align with the circle are, they are the same as n, n=vertices. And also the complex roots as shown. And this aligns with both o-Trees and s-Trees.

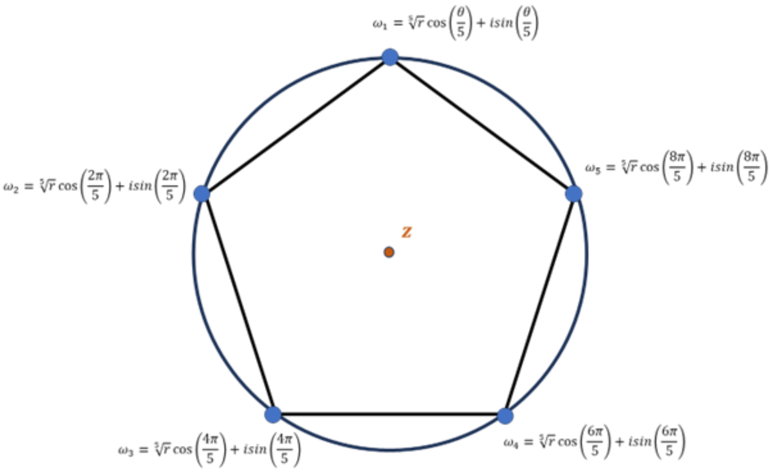
Graphical examples of the the Argand diagrams of complex roots that align with the examples of Riedel equi-distant point trigonometry provides

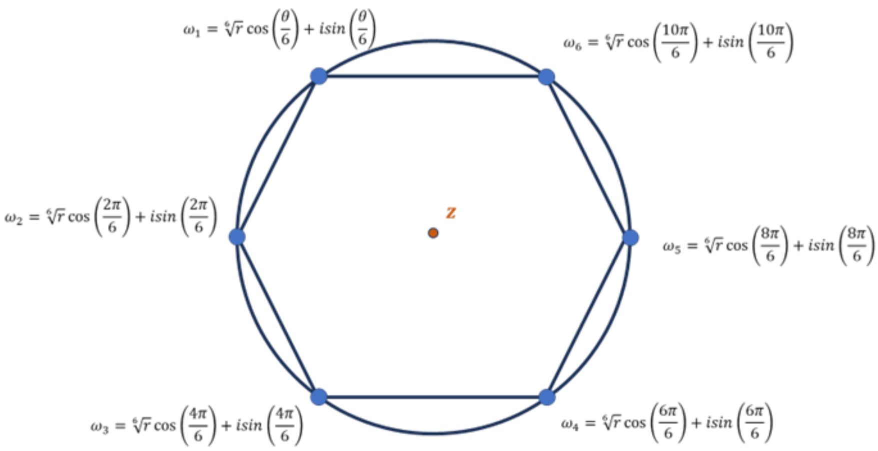












Those given graphical examples show that I am not the only who has thought of this before. But apparently the first one to think about wave behavior in such way. And then additionally connects to a novel also not before stated totally unrelated field of Riedel Tree-Rules. Complex numbers are in a way a mirrored numbers and appear in functions where ever numbers appear. Possibly gaps in the Riedel-Tree Rules.

Sources

I only have one source to proof the truth of the claims in the n-th dimension. Apart from that the hypothesis is my novel contribution to the sciences of geology, biology, mathematics, physics, chemistry, evolution, fluid dynamics. I'm looking forward to peer review and critique as it is, in my meaning, the second most important step in the verification of claims, after measuring the physical reality of course. I don't believe reality is a program thats why I take strong distance from explainig physics with the rules of cellular-automata and people that conflict this with panpsychism. The stated rules are without telesis but would still be self assembling and self-referential. This i a from a materialist standpoint and has not to be interpreted in other ways.

1. Proof by Hayes, Brian. 2011. *An adventure in the N-th Dimension*, American Scientist, Volume 99, Number 6, Page 422, doi:10.1511/2011.93.442

Entropy

As Enrico Fermi proposed, a paper should not violate the second law of thermodynamics. I remember reading he said if it doesn't it would be worth considering.

Amounts of repetance and angles of repetance define exclusively if something is 'mapped' with equity, modification or absenceof it.

The zeroth law of thermodynamics:

If two Riedel Trees (1., 2.) are in thermal equilibrium (equal mapping rate) with a third (3.) Riedel Tree (1., 2.$\underset{equilibrium}{\Longleftrightarrow}$ 3.) then they are also in a thermal equilibrium with each other (1. $\underset{equilibrium}{\Longleftrightarrow}$ 2.).

The first law of thermodynamics $\Delta E = Q - W$:

The net change in repetance of two Riedel-Trees is equal to what other Riedel-Trees have contributed upon their repetance and what they contribute to other Riedel-Trees as a causal consequence. Energy is repeated, modificated (dissipitates in diffrent ways) or kept with equity. (Absence of repetance does not align with thermodynamics, unless there where orthogonal trees, higher or lower dimensions(see Matrix Conversion), but it would always be kept)

The second law of thermodynamics:

All Riedel-Trees that repeat with modification experience an increase of entropy. As causal Riedel-Trees are self referential, self assembling (a lattice that is mapped with more and more repetance with modification) the overall construct goes torwards more entropy.

The third law of thermodynamics:

A structure that has no impurities and does not experience any repetance with modification (as every temperature >0°K would be) is repeated with equity→ $no\ entropy$)

Fractional Trees and Time Hypothesis

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Fractional Trees and Time

Assume: There is no present, we are looking back on the immediate past as we are mapped into the immediate future.

What that means in words:

We never experience the present moment, we are always in the immediate future and realize the present moment only as it has become the immediate past, while we already are mapped in the following immediate future and realize the from it following past and so on and so forth.

This could be described in the following manner:

0.5×s-Tree$_{mD}$[1-$size$](1-branch_θ)

0.4× s-Tree$_{mD}$[1-$size$](1-branch_θ)

0.3× s-Tree$_{mD}$[1-$size$](1-branch_θ)

0.2× s-Tree$_{mD}$[1-$size$](1-branch_θ)

0.1× s-Tree$_{mD}$[1-$size$](1-branch_θ)

0× s-Tree$_{mD}$[1-$size$](1-branch_θ)

The amount the s-Treesare multiplied is becoming increasingly smaller over forwards time.

Time here really is the 'copyrate' or rate of self assemble before a Riedel-Tree is multiplied by zero, and with it becomes latent potential. This goes also negatively in principle, backwards in time, growing bigger and converging at the latent potential of 0×Tree_mD(1-branch) in such manner:

0.5× s-Tree$_{mD}$[1-$size$](1-branch_θ)

0.4× s-Tree$_{mD}$[1-$size$](1-branch_θ)

0.3× s-Tree$_{mD}$[1-$size$](1-branch_θ)

0.2× s-Tree$_{mD}$[1-$size$](1-branch_θ)

0.1× s-Tree$_{mD}$[1-$size$](1-branch_θ)

0× s-Tree$_{mD}$[1-$size$](1-branch_θ)

Both iimediate past and immediate future series converge against each other repeatedly. Hence there is only immediate past and immediate future, from wich it again is possible to look back on another new immediate past. This is invariance of time as it is. Past is the accumulation of causal structures that converge into one single point if traced back to the ultimate source. Rate of change as is the main topic in Newtonian Calculus, is formulated in another way, nothing else then the concept of finite repetance, modification, equity or absence. The future is a continuing contribution of the causal Riedel-Trees repeating themselves. The described behavior is non-linear. Amounts of repetance and angles of repetance define exclusively if something is 'mapped' with equity, modification or absence. Talking of fractional s-Trees makes only sense if they still consist of whole smallest units. An s-Tree consisting of 2 o-Trees cant be splitted into 3 parts as there are only two parts.

I here referr to the quote «A classical field is a function of spatial and time coordinates.[29] Examples include the gravitational field in Newtonian gravity g(x, t) and the electric field E(x, t) and magnetic field B(x, t) in classical electromagnetism. A classical field can be thought of as a numerical quantity assigned to every point in space that changes in time. Hence, it has infinitely many degrees of freedom.» «[In fact, its number of degrees of freedom is uncountable, because the vector space dimension of the space of continuous (differentiable, real analytic) functions on even a finite dimensional Euclidean space is uncountable. On the other hand, subspaces (of these function spaces) that one typically considers, such as Hilbert spaces (e.g. the space of square integrable real valued functions) or separable Banach spaces (e.g. the space of continuous real-valued functions on a compact interval, with the uniform convergence norm), have denumerable (i. e. countably infinite) dimension in the category of Banach spaces (though still their Euclidean vector space dimension is uncountable), so in these restricted contexts, the number of degrees of freedom (interpreted now as the vector space dimension of a dense subspace rather than the vector space dimension of the function space of interest itself) is denumerable.]» David Tong 2015, Chapter 1 to pedagogically show in what others thought of the matter.

Here the distinction becomes clear, In a former paper I introduced a novel definition of granularity as the basis of Riedel Trees. Those approximate all continuous functions, with the distinctions of having very small corners (a smallest measurable unit) instead of infinitesimals.

1. Defining planck-length and planck-time by substituting c^2:

$$\boldsymbol{E} = \boldsymbol{m}\frac{\boldsymbol{t_p}}{\boldsymbol{l_p}} \text{ as } c^2 = \frac{\sqrt{\frac{\hbar G}{c^5}}}{\sqrt{\frac{\hbar G}{c^3}}} = \frac{t_p}{l_p} \rightarrow \frac{E}{m} = \frac{t_p}{l_p} = c^2 \rightarrow (A, E, r) \propto m\frac{t_p}{l_p}$$

$$\frac{E}{t_p} = \frac{m}{l_p}, \frac{E}{t_p} = \frac{m}{l_p}, mt_p = El_p,$$

$$\boldsymbol{m} = \frac{\boldsymbol{El_p}}{\boldsymbol{t_p}}, mE = \frac{\boldsymbol{E}\cancel{\boldsymbol{l_p}}}{\cancel{\boldsymbol{t_p}}} m\frac{\cancel{\boldsymbol{t_p}}}{\cancel{\boldsymbol{l_p}}} = mE, \boldsymbol{l_p} = \frac{1}{mEt_p}, \boldsymbol{t_p} = \frac{1}{mEl_p},$$

$$\boldsymbol{l_p} = \frac{1}{\frac{1}{t_p l_p} t_p}, \boldsymbol{t_p} = \frac{1}{\frac{1}{t_p l_p} l_p} \textit{ that gives } \boldsymbol{l_p} = \boldsymbol{l_p}, \& \boldsymbol{t_p} = \boldsymbol{t_p} \textit{ is correct.}$$

$\frac{E}{t_p} = \frac{m}{l_p}$ Energy per time is the same as mass per length or energy is to time what mass is to length. $\boldsymbol{m} = \frac{\boldsymbol{E}}{\boldsymbol{t_p}\boldsymbol{l_p}^{-1}}, \boldsymbol{E} = \frac{\boldsymbol{m}}{\boldsymbol{l_p}\boldsymbol{t_p}^{-1}}$ or in other words: mass is energy per(time times the inverse length). Or energy is mass per (length times

inverse time). It looks like energy is the temporal scale of mass and mass is the temporal inverse of that. So mass is not yet temporally transposed, not yet energy. While energy is the temporal transpose of mass, energy is past mass transposed, our mass right now is potentially temporal transposed energy, ‘potential energy’, in the immediate future. As we always have a shift between immidiate past and immidiate future it is this very transpose/mapping process from mass into energy. This imbalance is repetance, repetance is imbalance. If repetance and imbalance increase so does entropy. Without time there would be no change and without change there would be no entropy. So we obtain $E_n = m_{n-1}c^2$, where n is the numerical value of finite repetance steps. So $ds^2 = -c^2dt^2 + dx^2 + dy^2 + dz^2$ becomes $ds^2 = dx^2 + dy^2 + dz^2$ but scaled by nc^2, n$\neq \infty$, $but\ n \in \mathbb{N} \rightarrow +t$ (wich means onwardly scaled by c^2) . So Lorentz conditions are satisfied and the Energy mass equivalence remains equal when measured but accounts for all repetitions troughout time by this scaling nc^2.
Also in the Gödel incompleteness theorems a superset contains all sets and thus has to contain itself wich is a paradoxon. CFR says by evolving away from that paradoxon it escapes it but inavitably moves into another and escapes it by evolving away from it but moves into another and so on and so forth. (as we know time had a beginning and is the finite repetition, we only know it is finite, it seems plausible that it has an end, but we cant say that with certainty. The only true statement we can make is: That whatever we observe we can best describe by finite repetance.

Wave function collaps

Normally the wave function is integrated to give us probabilities

$$\cancel{\int_{-\infty}^{+\infty} |\psi(x)|^2\, dx = 1}$$

↓Anything else would be nonsensical, like this:

$$\cancel{\int_{immidiate\ -t}^{immidiate+t} |2\ (s - Trees)|^2 \left(finite\ units\ (l_p, t_p\right) = 1}$$

↓therefore:

But no infinite alternative universes as in the many worlds interpretation, no hidden variables, no continuous spontaneous localization but the constantly unknown interaction it supposes is what I suppose in a sense. **The finite repetance with equity or**

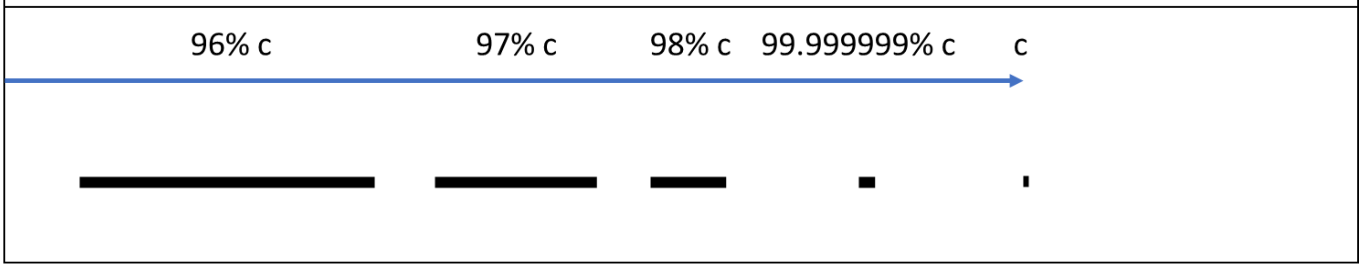
modification interpretation. Finite repetance with equity or modification or absence could just be what forces the wave collapse. The immidiate past is mapped into the immidiate future, wich becomes the immidiate past again, wich is mapped into the immidiate future....and so on and so forth. Energy in the immidiate past could be seen as the mass in the immidiate future. Mass in the immidiate past could be seen as the immidiate future energy of the immidiate past prior to the immidiate past. When m is continuously mapped (multiplied like a scalar) from the immidiate past by c^2 into the immidiate future where it is E. E divided by c^2 is m of the immidiate past, this is so as it is the ratio between $\frac{t_p}{l_p} = c^2$, the fact that this is invariant is known. If we measure we always verify $E = mc^2$, but possibly have overlooked that this ratio creates an imbalance, a finite repetance, that seems continuous. Accordingly a particle will be in diffrent states and hence problems in measurement ambiguities, wave function collapses and particle wave dualities arise. Finite Repetance could be just the explanation but has to be excessively studied. Wich a person obviously cant achieve alone. A research project and both theoretical physicists must be involved in order for the concept of finite repetance to be verified or debunked. The universal concept of finite repetance seems to be right wether this reason is wrong or not.

Alignment With Special Relativity

Velocity(v) is the displacement(d) divided by the time(t), or the 'copyrate' (v=d/t). As displacement per time gets bigger, say 97%, 98%, 99%, 99,999% of the maximum displacement per time or called lightspeed, our Riedel-Trees are getting shorter and shorter. Shorter than all the other s-Trees. They get time dialated.

If the s-Trees reaches c (lightspeed(c=sqrt(t_p/l_p)), means 100%, the copyrate ov the s-Tree, described by the Riedel Travel Sets, have reached the smallest displacement per time. No displacement per time, the s-Tree has become a single o-Tree, so to speak no 'copyrate' at all. No time. No s-Tree, but an o-Tree.

Displacement per time $o\text{-}Tree_{mD}[1\text{-}size](1\text{-}branches_{\theta})$ =s-$Tree_{mD}[1\text{-}size](1\text{-}branches_{\theta})$



On the other hand as a concept, a construct of Riedel Trees, has no modification, but total equity the displacement per time includes every single unit, a displacement of 100m per what would be the exact temporal equivalent to it, would be the maximum displacement per time or $\sqrt{\frac{t_p}{l_p}} = \pm c$ (approx time: 100m/299792458m/s≈ 0.000000333564 or about

333.564 nano seconds). The faster one travels in the immidiate past (same layer of repetance), in that layer of Riedel-Trees, the more disproportionate one would be mapped into the immidiate furure (causally following layer of repetance, or Riedel-Trees). Wich in words, one would say, time is slowed for the one traveling, but one could as well say: the same space per time for the one traveling relative to the others not traveling is elongated to him.

Concept Of Repentance In Number Theory

What are the constants we see in physics? . The fact that the gas constant is 8.314... Pi is 3.14… , e is 2.718 is confusing itself. What story can a human abstract from a purely numerical value? Maybe Numbers are constants of 'copy rates' for Riedel-Trees! That sounds implausible. **But! just think of repetance, thats what a number is, a count of something that repeats, and the number tells how often**. Now all number are whole. Then as the whole numbers get bigger, it makes sense introduce fractional numbers where both the enumerator and the denominator are whole numbers or representanter by a fraction that again consists of whole numbers as in (0.5)/(0.5)=(1/2)/(1/2), and then as we go om we get irrational numbers and transcendental numbers like 3.1415926535... But in this case the digits do not repeat infinite, the constant develops along with the universe and can be calculated only if the amount of digits already esxists. And then you can repeat it of course. But lets say in the infancy of the universe, you could not have calculated as many digits of pi as there probably are in the universe by now. A number of digits far greater than we can calculate. And we cant reach the actual number as our universe expands at a rate that will remain faster than us because of our initial conditions of being born into the thing when it already existed long before and the ongoing expansion. Mathematics already has accepted infinities so much so that they created cardinal numbers and Aleph_0 and concepts like that. If this paper of finite repetance is right, there a transcendal numbers, fractional numbers maybe even imaginary numbers and all starts out from 0 to 1 and 1 is repeated in many diffrent fashions. But no numbers has infinite digits. If you have the number 0.99999999999999999999999999999999.... and it keeps adding ....9999999 and so forth and so on over time its basically 1, the same mathematicians need infinity for in order to describe it. There is no infinite, the universe itself in wich the concepts are growin-evolving in is finite, it is limited by the size of itself. It's so huge and immense that for our purposes it just keeps continuing. This we know from time dialation. The most distant galaxy for example we could never reach due to the expansion and the finite lightspeed limitations, this is very equal as the digits of 0.9999999999999999999999999999999999999999999999... are finite, but the limit of how much of the sequenve already has become a concept in the inflating universe makes it unreachable to inhabitants of it. It's possible to express this without the need for infinities. Simply with a limit that uses +t instead of infinity. A good example of this are indeed fractals, they seemingly grow infinite, and the computer screen shows you it goes on and on, repeats in itself without stopping, but actually the computer is calculating and animating <u>all the time. It needs time, and there is simply not infinitely much time at one instance</u>, thats equal to thinking of any other dimension of infinite size. If somebody would claim a ball would need infinetely much space, everybody would see the irrationality of the claim. A number grows in decimal places such that it logically creates no gaps, there have to be enough smallest units, planck units to account for every digit.

Note: I simply can't understand how we at the one hand can have a smallest length, the plack length, planck time and at the other hand still not have a revolution against infinities, infinities that destroy fluid mechanics, black hole physics, cosmologiy and particle physics, theoretical physics, mathematics (discussable since its just a concept in mathematics). Infinities have even snug themselves into everyday language to make matters worse, people are getting used to it now!

Source:

For once I have a source in order to pedagogically show where I depature and challenge modern physics assumptions. I have tried to get an even better source but it appears much harder than formulating the paper. As it is of only pedagogical value I hope the reader excuses this.

David Tong 2015, Chapter 1:

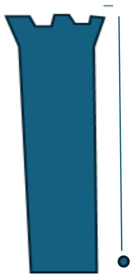
«A classical field is a function of spatial and time coordinates.[29] Examples include the gravitational field in Newtonian gravity g(x, t) and the electric field E(x, t) and magnetic field B(x, t) in classical electromagnetism. A classical field can be thought of as a numerical quantity assigned to every point in space that changes in time. Hence, it has infinitely many degrees of freedom.» «[In fact, its number of degrees of freedom is uncountable, because the vector space dimension of the space of continuous (differentiable, real analytic) functions on even a finite dimensional Euclidean space is uncountable. On the other hand, subspaces (of these function spaces) that one typically considers, such as Hilbert spaces (e.g. the space of square integrable real valued functions) or separable Banach spaces (e.g. the space of continuous real-valued functions on a compact interval, with the uniform convergence norm), have denumerable (i. e. countably infinite) dimension in the category of Banach spaces (though still their Euclidean vector space dimension is uncountable), so in these restricted contexts, the number of degrees of freedom (interpreted now as the vector space dimension of a dense subspace rather than the vector space dimension of the function space of interest itself) is denumerable.]»

Substitute to infinity $n \to +t$

If the amount of n accumulates over forward time and vanishes backwards in time. This is an unusual way of speaking of the topic as one normally would say $'\ as\ n \to \infty'$. If we assume there is a granularity (planck-lengthl_p, planck-time t_p) we have to assume granularity or discreteness, not continuity as we do nowadays, just as defined in the paper *Discrete Calculus.* Also proofs including infinity as for example $\lim_{n\to\infty} \frac{1}{\infty} = 0$, would no longer be true, and would have to be rewritten to $\lim_{n\to +t} \frac{1}{n} = \frac{1}{\sum_{i=1}^{n\to +t} in} = 0$. In such way any proof holds true as long as its temporal direction aligns with the one of the person who uses it. A condition that has not been violated by any human. Even with effects of time dialation this fact would hold true because the magnidude of +t would increase the accurate amount, shown by the time dialation concept of Einsteins special relativity.

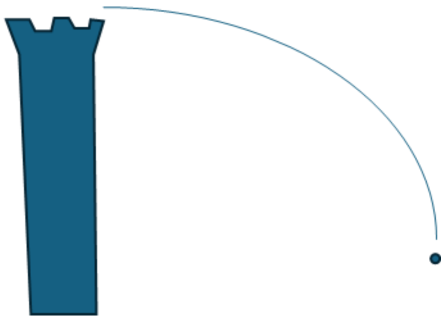
Further any curve that we know to that very day (18.01.2025), even the graph of a stone that is trown of a tower that gives the constant $g = 9.81 m/s^2$ can be shown both assuming continuity or discreteness. But the stone has to fall small steps, they cant be infinitely small, because then it would take no space and no time. And we live in a 3+1 dimensional universet hat requires those two, as long as we proof it wrong by contradiction. This is modeled by the 'easiest' Riedel-Tree Rule $\sum_{\theta_1}^{\theta_{n\to +t}}$ o-$Tree_{mD}[size]$(1-$branch_\theta$), where each smallest unit (l_p, t_p) gets 'copied' along forward in the space that is 'copied' along forward time (by Travel Sets). This means a line with increasing amount of corners gets so smooth, it approximates continuity so well, its not visable. Butt hat would mean Gravity is quantizable (beeing described by smallest units, conceptual dots, Sum of Riedel-o-Trees.

In the following I will give graphical examples with both **Continuous Calculus** and the by me introduced **Discrete Calculus**. The diffrence won't be visible to the eye, te microscope if the smallest sice truly is $10^{-35}m$**:**

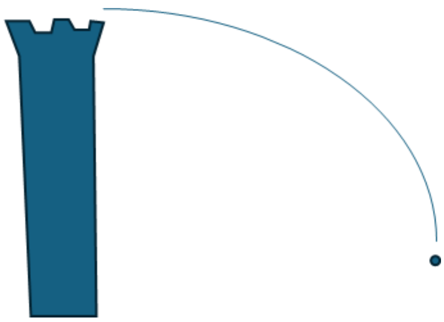


If the gravity constant woud follow a path (a Riedel-Tree) with such big number of granularity $10^{35}m/s^2$ one would think the ball would fall as straight down as possible. But even more the tower couldn't even exist, nothing could! But, luckily, gravity is much weaker. It follows a Riedel-Tree Rules with so much granularity that we could define it to be $9.81m/s^2$. But with a graph we have to assume those infinitesimal changes, they require no time, no space and no logic, they are just neat to calculate. And they circumpass tackling questions so big we cant answer the, going around the uncomfortabilities of facing it, there are questions that can't be answered.

1. **Continuous Calculus** (throwing a stone off a tower)



2. **Discrete Calculus** (throwing a stone off a tower) with granularity so that the stone lands defined by 9.81m/s^2



If there would be a perfect circle with infinetely small equi-distant points there would be also graphs of such nature ($proof\ by\ contradiction$) → If there would be no perfect circle with infinetely small equi-distant points/vertices (n) there would be also no graphs of such nature.

No one could proof a perfect circle→no perfect graph

Such a perfectly continuous circle would have to have a radius that grows bigger along with forward time, so at every instance we would check and measure how many smallest units are within the circle arc the number would have gotten bigger, but we would never arrive anywhere. This aligns with π having a number of digits that does not end as long as we keep calculating. The granularity of the universe would have startet to inrease drastically from its infancy. So far as it would seem unreachable, seemngly infinite. But if truly discrete it can't be→so can't the $circle\ arc \leftrightarrow graph$. Gravity can't be quantifiable by looking at one quanta! Since all the quanta relative to each other build something like a lattice, described by general and special relativity. Its not about the quanta, its about how the quanta togther build a lattice and how that lattive responds to aspects of itself.

$$n_{\ amount} = equi\ distant\ points$$

$$n_2 = 2\ equi\ distant\ points = \text{—}$$

$$n_3 = 3\ equi\ distant\ points = \triangle$$

$$n_4 = 4\ equi\ distant\ points = \square$$

$$n_5 = 5\ equi\ distant\ points = \text{⬠}$$

$$\ldots$$

$$n_{\ amount \to +t} = \bigcirc$$

Now we have arrived at yet another proof:

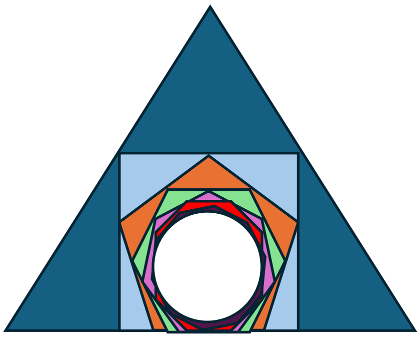
Assume you have a symmetrical triangle n_3 and you put a symmetrical square n_4 in it, and then you put a symmetrical pentagon n_5 into your n_4 and you keep going-

$$n_5 into\ n_6, n_6\ into\ n_7, n_7\ into\ n_8, n_8\ into\ n_9, n_9\ into\ n_{10} \ldots \to +t$$

The n-gons (equi-distant points as we include n_1 $(smallest\ unit) and\ n_2 (smallest\ line)$) would get smaller and smaller in the outer triangle on your paper. Reaching the midpoint, filling it all out. And that tells us something about our reality. It has to be discrete. If there would be a perfect continuous circle it would have no corners, smallest units at all. We could not iterate it back into n-gons around it. Also as the lines you made the n-gons with get closer to the midpoint of the paper the lines themselves have to become smaller and smaller as you carry on drawing. But there is no chemical molecule infinetely small so you could make ink out of it, nor is the paper made of infinitesimal small molecules. **Proof. If there would exist a perfect infinitesimal circle, you would to have build infinitely many polygons of increasing size but decreasing vertices. But the end point is defined, its the triangle! This is proof by contradiction. The other way around has to behave according to the same logic.**

$\boldsymbol{new\ way\ of\ looking\ at\ \pi} = \frac{peremiter\ of\ the\ polygon}{diameter\ of\ the\ polygon}$, because there are no true circles. Circles are already drawn as polygons on all computers because it cant be done otherwise. Wich is the best immidiate proof. If the vertices cant get smaller→we cant og infinitely inwards. But we can finitely increase the size of the object and through it increasing the amount of vertices by step by step increasing its size (diameter and circumference).

A graphical example of purely pedagogical value (also assume I could draw):



Riemann ζ-function, discrete calculus conjecture

The conjecture states: *That the function itself is finite and evolves, and of that reason is unpredictable before the time it takes to calculate it. The concept of it evolves along with the universe it arose in.*

Substituting Infinity to n *goes along* +t ($n \rightarrow +t$) explaines at least the problemes with the Riemann Zeta function! As proposed in *Discrete Calculus and the concept of finite repetance*, The definition of granularity of space and time, in both the paper *Discrete Calculus* and *Substituting Infinity*. There are so many non-trivial zeros as we have time to compute them as the repetance is finite, and where they are we leave to the mathematicians, only in reality there are as much as the universe has evolved to have, that number is growing and hence be finite and not computable by us in a forseeable amount of time. The universe has most likely surpassed us. But we keep on doing that for a growing understanding that remains finite. Non-trivial zeros keep appearing the more time we have to calculate them and as they are always recalculatable the way they have been calculated, the more becomes clear that they are not random, they are neither trivial, as people long ago have understood. But if discrete calculus'es assumption of granularity holds true under measurement, we have at least the conjecture that the function itself is finite and evolves, and of that reason is unpredictable before the time it takes to calculate it. The concept of it evolves along with the universe it arose in. As in Discrete Calculus the Tree-Rules form their own relative coordinate system. With more evolutions of those self assembling, self referential Tree-Rules the concepts that developed from it evolve along with it. So this could be for other non-trivial functions. And not only, numbers and digits, functions as well grow with the universe. Once computed by the universe we can compute them too, but never reach the amount of digits the univerde must held because it has an temporal advantage over us. Just like a light beam that has descended billions of years before we could send one. So for example the famous Rieman Zeta function is still growing, and non-trivial zeros will still ocurr somewhere, but we cant catch up with the universe and we need time to compute it. Other functions, multivariate functions too are growing along with +t. Kurt Gödel showed with logic that Mathematics is incomplete, but not how. The Concept Of Finite Repetance shows how mathematics is incomplete. Imaginefour spheres of diffrent sizes, just imagine a black hole of may star masses, a red star, a planet, a moon.
1. The black hole of may star masses is build of the most planck-units of the four.
2. The red star is build of the 2nd most planck-units of the four.
3. The planet is build of the 3rd most planck-units of the four.
4. The moon is build of the least planck-units of the four.

Planck units: black hole of may star masses> red star> planet>moon
Hence the circumference of the black hole of many star masses's circumference is bigger and following must be described by $C/d = \pi$ but in this case π must have more digits than the π we obtain from the red star's circumference divided by the diameter, and followingly the planet's π we obtain from the planet's circumference divided by the diameter must be smaller than the black holes one. And the π we obtain from the planet's circumference divided by the diameter must be lesser than the red star's one, but bigger then the moons one. And finally the moon's π we obtain by its circumference divided by the diameter must have least digits! Its not infinite but finite. And the amount of digits it contains is directly proportional to how many planck-units an object consists of.

$$\pi_{1.} > \pi_{2.} > \pi_{3.} > \pi_{4.}$$

This shows how Mathematics is incomplete as it grows with the universe it is created in. The universe, rooming it all is always more advanced than what it contains. Objects of momentarily fixed size: Sun, Earth, a ball, an apple, the moon. Objects of momentarily increasing size: Baloon while being filled with gas, a shock wave (expanding air), Constantly increasing size (seemingly): Black holes, the expanding universe.
Objects of constantly increasing size (seemingly) are diffrent from objects of momentarily increasing size and objects of momentarily increasing size. Objects that continue (seemingly), but still discrete and granular in nature, have to have within themselves mathematical concepts, like functions that evolve. Such as the Riemann Zeta function or many others. As time is finite the function becomes increasingly determined along the growth of the universe and will always be of reproducable nature after that point.
$\boldsymbol{new\ way\ of\ looking\ at\ \pi} = \frac{cirumference\ of\ the\ polygon}{diameter\ of\ the\ polygon}$, because there are no true circles. Circles are already drawn as polygons on all computers because it cant be done otherwise. Wich is the best immidiate proof. If the vertices cant get smaller→we cant og infinitely inwards. But we can finitely increase the size of the object and through it increasing the amount of vertices by step by step increasing its size (diameter and circumference).

CFR Set Theory

Introduction to the thoughts: *What happens to cardinality as infinities are no longer real, infinitely huge nor infinitesimal small (because we have no proof of that, but contradictory uncountably many proofs for a discrete size of the things that make up the observable world)?*

If the world is not made up of infinitesimal small things, it isnt, we can only measure and document finite sized units! (All empirical and observable evidence there is shows us that the world is finite, and consits of finite sized units, modern physics itself accepts the smallest meaningful size to be the planck units, but math has not adopted that yet.)

All that is observable and measurable is of finite size. The world is build up of 1 unit to begin with, the unit is multiplied (in the big bang) troughout time mapped into the immidiate future. The universe now has a relatively fixed and finite amount of matter, that is not annihalated but kept by the ongoing mappings, either with modification or equity or near equity or (absence, if necesarry), additionally all structures are made up of the first initial smallest unit that makes up everything, when it got copied and structured so that it could make up matter.

By observation matter is not the only thing that makes up the universe we inhabit, but everything has to be build up by the very same initial unit, but the Tree architecture has to differ, so that the growing universe keeps some with equity, near equity, more modification, some parts more static(like the amount of matter) and others dynamic (like 'spacetime' expanding itself between the galaxies).

Cardinality Theory in a growing universe of finite sized smallest units

1	2	3	4	5	6	7	8	9	10	11	12

Axiom 6, (the smallest units of all is of finite in size and undividable, everything build of it is describable by a finite yet huge number)

In a universe that consists of finite smallest units, those cant be broken up into smaller units because that violates **Axiom 6.** As a consequence number theory, Cantors Set Theory, at least if we apply it to describe the observable world, has to be rewritten.

Axiom 7, as time is finite, at any time the sum of numbers computable has to be finite! There are boundaries, as the universes size (universe=the super set) is always bigger as its parts (subsets) it conceptually always has to have numbers and ratios of greater cardinality than we have time to obtain by calculation. We can never reach the limit as the limit itself expands away by the inflating universe creating finite but ever ever growing geometric concepts, numbers,rational numbers, ratios(irrational numbers), constants.

$$\boxed{1}\ \overbrace{\ldots, 1.2,\ldots, 1,3,\ldots, 1.4,\ldots\ 1.5,\ldots\ 1.6,\ldots, 1.7,\ldots, 1.8,\ldots, 1.9,\ldots}^{|\infty|}\ \boxed{2}$$

In Set Theory the cardinality of natural numbers(ℕ) is less than the cardinality of rational numbers(ℝ). Mathematically expressed Set Theory says $|\mathbb{N}| < |\mathbb{R}|$.

$$\overbrace{\boxed{0}\boxed{1}\boxed{2}\boxed{3}\boxed{4}\boxed{5}\boxed{6}\boxed{7}\boxed{8}\boxed{9}\boxed{10}\boxed{11}\boxed{12}\boxed{\quad\ldots \to \infty}}^{|\infty|}$$

Both natural numbers and rational numbers are infinite sets in set theory. But the diffrent sets have diffrent cardinality. That means diffrent infinities are of diffrent size, some are greater than others and some are smaller than others.

But if the smallest units are finite, so are the numbers that they describe. Then all that there is, is made of natural numbers. But as the universe is growing in finite steps there cardinality is describable as the amount of planck units there can be since the beginning of the universe until now, plus all the ones that get added for each new plack time that passes, wich again is a number uncountable, yet finite, of finitely growing cardinality but not infinitely.

$$\underbrace{\left|\frac{Age\ of\ the\ universe}{t_p} + units\ added\ for\ every\ t_p\right|}$$

0	1	2	3	4	5	6	7	8	9	10	11	12	... → $+t$

Axiom 8

For any object, there are more whole smallest finite units that it consists of than there are fractions that can be made of its parts.

1 and 2 have the cardinality |2|. Whereas the fraction that can be made of them, that does not violate **Axiom 6**, is ½ and has the cardinality |1|, this does not violate **Axiom 6** because ½ of 2 is 2/2=1 wich is a whole smallest unit and part of the natural numbers.

This becomes utmost complicated as we deal with huge numbers of everyday objects, and would once and for all make it inevitable to get units for measurement that rely on the actual units of nature!

With the set of numbers (1,2,3) would hav ethe cardinality |3|. whereas the fractions that could be formed of this set that do not violate **Axiom 6** are (½,2/3, 1/3,3/2) wich would have the cardinality |4|.

Now one could think that this trend shows that the rationals still have greater cardinality than the natural numbers. This is clearly not true for the set (1,2) but true for the set (1,2,3). But the super set of all numbers grows. So the fractions that do not violate Axiom 6, are indeed of growing cardinality, growing faster than the cardinality of the natural numbers, as there are more ways to combine the numbers in fractions of a set of natural numbers than there are natural numbers in the set. Here we would need the combinatorics formula for a set of n natural numbers: $C(n,2) = \frac{n(n-1)}{2}$. The proof that the set of natural numbers has to be smaller than the cardinality of fractions that can be obtained by combining the natural numbers of that set is that $|n| < \left|\frac{n(n-1)}{2}\right|$.

But that does not cover all numbers that are between the numbers of a cardinality $|n|$. That means in modern math we assume there to be infinitely many combinations of numbers between 1 and 2 for example, where as in finite repetance there would be nothing in between them. But we could cut the set intwo half without violating **Axiom 6.**

In set (1,2,3) one could multiply all those fractions (2/3, 1/3) to the set but ½ and 3/2 of the sum 3 would be a violation to **Axiom 6**. So the set (1,2,3) of natural numbers has a cardinality of $|n|$ whereas the fractions that could be made of it that do not violate **Axiom 6, the** rational ones would only have a cardinality of $|n-1|$ in this case.

Not all of the combinations would be allowed! Now in reality this is very unpractical, but unfortunately what a finite nature results in. As some objects are consisting of uneven numbers, they cant be split into half without favoring one half one more planck length and the other one one less. The only way to describe where to put the remaining unit?→probability. Reality becomes inherently probibalistic. That aligns with a non-determined universe, wich we assume in Universal Concept Of Finite Repetance. This highlights the coherence of the (U)CFR. The cardinality of the set (1,2,3,4)= |4|. But the set of fractions allowed for the set (1,2,3,4) $\neq |n-1|$, but 4/2 and ¼ of 4, wich would not violate **Axiom 6.** The cardinality of the set of allowed fractions (4/2, ¼)= |2|, it has two elements. For the set (1,2,3,4,5)= |5|, only the set of fractions (1/5)= |1| of 5 would not violate **Axiom 6.** For the set (1,2,3,4,5,6)= |6|, only the set of fractions (1/6,6/2,6/3)= |3| of 6 would not violate **Axiom 6.**

For uneven numbers this would mean the cardinality of the set would be $|n_{uneven}|$ and the set of fractions that could be obtained from it, not violating Axiom 6 would be of cardinality $|n/n|$.

For even numbers this would mean the cardinality of the set would be $|n_{even}|$ and the set of fractions that could be obtained from it, not violating Axiom 6 would be of cardinality $|n/2|$.

Axiom9

In a growing universe we can not know wether there are more even than uneven numbers wich would mean neither the set of even numbers nor the set of uneven numbers is bigger.

A problem we have are irrational numbers like $\sqrt{2} = 1.4142135623731$ ….

Or defined above π or e or $\ln(2)$. They are assumed to have an infinite amount of digits in modern mathematics.

In CFR they have an finite amount of digits relating to how many smallest units (planck-lenghts) an object consist of. The universe grows and hence had the most time creating amounts of digits so huge we never had the time to even compute them. It would take so many steps ($\frac{Age\ of\ the\ universe}{t_p}$ + the planck times that pass) to calculate how many digits there are actually in the universe. That is a finite, but finitely incresing amount. No other object would need that precision, as no other object would have this immense size. But as described above, as the moon conists of more smallest units than an apple the ratio ((Circumference of the polygon/diameter)=pi) is bigger for the moon than for the apple.

We can think of it that way. There are no true circles, all circles are polygons with n vertices, so much that its neither intuitive nor visible to the human eye. As n increases, like n+1, all angles have to readjust and create a little more space, accurately 1 smallest unit more, wich in turn changes the ratio such that the little change in detail causes its overall description to change. $\pi_{moon} > \pi_{apple}$. The universe would not store infinite descriptions everywhere, but exactely accurate and size adjusted descriptions. Wich makes the universe logic, simple. More natural and grounded, instead of supernatural and conceptual as in modern day mathematics.

All the other numbers between two elements of a set, lets again speak about 1 and 2 for simplicity. Between 1 and 2 there are also numbers like 1.44455566677788899910101011111121212…. and many more that are belonging to the rationals that are no fractions. There are far more of them in fact. Thats why modern mathematics assumes that the cardinality of rationals is far greater than the cardinality of natural numbers $|\mathbb{N}| < |\mathbb{R}|$. But numbers like 1.44455566677788899910101011111121212… violate **Axiom 6.** They are not allowed. And there is no need for them as nature can be described in terms of smallest units (planck-units). Even if the number of smallest units (planck-units) in a meter is $1m = 1.6162 \times 10^{35} l_p = 161620000000000000000000000000000000 l_p$. Thats unpractical in everyday life inbetween macro and microcosm. But no matter how unsettling this is. Its what we observe. We have to find words that describe an even number of them, like $100000000000000000000000000000000000 l_p = 1.6162 \times 10^{35} l_p$ or 1 nature unit= less 1m, ~(0.618m). That way all the world could use natural units. A huge undertaking. And then we still would use numbers like 1.4445556667 for practical purposes I believe, as the planck-units ruler is inusable for our eyes so we had to make up new milimeter analoga like $\frac{100000000000000000000000000000000000 l_p}{1000}$ and centimeter analoga like $\frac{100000000000000000000000000000000000 l_p}{100}$ and so forth.

That is, indeed, possible. And in no other way we area ble to get used to a world consisting of whole smallest units. No matter what we decide in the future the truth for nature stays the same.

$$e_{|k \cdot t_p|} = \lim_{n \to |k \cdot t_p|} \left(1 + \frac{1}{n}\right)^n, \ k \in \mathbb{N}, \ k \neq 0, |k \cdot t_p| = \text{k-planck-times}$$

This would have implications for all $\lim_{x \to \infty} f(x)$ in modern mathematics. Eulers identity ($e^{\pi i} + 1 = 0, e^{\pi i} = -1$), one of the most famous identities would no longer hold~~: $e^{\pi i} + 1 = 0, e^{\pi i} = -1$.~~ It then had to be figured out if it holds under certain temproal evolutions and for π that would mean with how many vertices of a polygon it would hold. As well as the golden ratio ϕ that keeps coming up in nature would evolve in certain degrees corresponding to the amount of smallest units that make up the pattern.

That means with diffrent amounts of precison, in correlation to the size of the smallest units that make up the object.Spiral Aloe (*Aloe polyphylla*) has diffrent plant parts (smallest units) than the common sunflower (*Helianthus annuus*), or the cactus with spiral flowers of *Echinopsis tubiflora.* All those plants smallest units (petals or disk floret unit, or leafes) are angular displaced and in a diffrent temporal stage of development.

Definition of a Riedel Travel Set (finite repetance with modification):

Riedel-Travel-Sets, A set of Numbers(amount of smallest units), can with the loss of a subgroup of the set, exchange subsets onto another set of Numbers or empty sets in every day language 'transfer them onto a' $0 \times$ s-Tree$_{mD}$[1-$size$](1-branch_θ)

- 2.Definitions and Operations: Let SetA = {a1, a2, a3,...} and SetB = {b1, b2,...} be two sets. 2.1 Traveling Subset (T): A subset T is selected to travel to SetB. 2.2 One-Way Transfer: The traveling subset T is transferred to SetB, and after the transfer, SetA no longer contains the elements in T. 2.3 Expansion with New Elements: Upon receiving the traveling subset, SetB is augmented by new elements that are generated during the transfer. 3. Mathematical Formalism: Let T represent the traveling subset. The operation of transfer is defined as: 1. SetA' = SetA minus T (after the elements in T have traveled). 2. SetB' = SetB union T union N, where N is a set of new elements generated as a result of the transfer. 4. Explanatory example: Let SetA = {1, 2, 3, 4} and SetB = {5, 6, 7, 8}. 4.1Suppose the traveling subset T = {3, 4}. 4.2 After the transfer: SetA' = {1, 2} (the elements {3, 4} are no longer in SetA). 4.3 SetB' = {3, 4, 5, 6, 7, 8} union {new elements here {3, 4} }. SetB expands to include both the traveling elements and any new elements that arise from the process. $Set\ A'$ $(after\ removal\ of\ T)$: $Set\ A' = Set\ A \setminus T$ = {1, 2,3,4}\{3,4} = {1,2} $Set\ B'$ $(after\ adding\ T)$: $Set\ B' = Set\ A \cup T$ = {3,4} ∪ {5,6,7,8} = {3,4,5,6,7,8}, As well this works for matrices. They can travel with equity (copy) or with modification or with absence.

Definition of a Riedel Copy Set(finite repetance with equity):

- A copy set: 2.Definitions and Operations: Let SetA_1 = {a1, a2, a3,...} and SetA_2 = { $a1_{\rightarrow+t}$, $a2_{\rightarrow+t}$, $a3_{\rightarrow+t}$, … } be two sets in diffrent times that contain the same elements. 2.1 Copy (repetance with equity) set (C): A copyset C is selected to be mapped equally(with the same elements) into the future (the causally following $t_p/t_p's$ 2.Definitions and Operations: Let SetA= {a1, a2, a3,...} , SetA_2 =(SetA_1 → $n(+t)$)=({ $a1_{\rightarrow+t}$, $a2_{\rightarrow+t}$, $a3_{\rightarrow+t}$, … , $an_{\rightarrow n\,(+t)}$}). So SetA_2 is containing the same elements as SetA_1 at another time.

Further the value Riedel Trees are multiplied by can get 'transfered' fully, or partly necause Riedel Trees in between them are non-commutative as mentioned. Wich doesnt necesarrily mean information is lost, but much more that information is not carried on into a temporally, wich means it looses degrees of freedom without the loss of structural integrity or deletion wich is the main concern in information theory. In such way it does not violate microstates thermodynamics wich would lead to non-measurable recovery. But as it is radiated off the event horizon of black holes as Hawking radiation it could be described as seemingly randum reattaching process for the exact amounts that elsewise would violate thermodynamics, wich is measurable and could be described as follows:

Definition of a Riedel Conversion Set (finite repetance with absence):

- A conversion set: 2.Definitions and Operations: Let SetA_1 = {a1, a2, a3,...} and SetA_2 = { $a1_{\rightarrow+t}$, $a2_{\rightarrow+t}$, $a3_{\rightarrow+t}$, … } = {a1,0,0, … } be two sets in diffrent times that contain the same elements and some of them become 0 or all of them have become 0 in the following t_p. 2.1 Conversion (repetance with absence) set (Con): A conversion set Con is a selected setA to be mapped into the future with absence of all or some of its elements (the causally following $t_p/t_p's$) 2.Definitions and Operations: Let SetA= {a1, a2, a3,...} , then SetCon_1 can be 3 things(in this example with a1, a2, a3) =
  1.(SetA_1 → $n(+t)$)=({0 , $a2_{\rightarrow+t}$, $a3_{\rightarrow+t}$, … , $an_{\rightarrow n\,(+t)}$}).
  2.(SetA_1 → $n(+t)$)=({ $a1_{\rightarrow+t}$, 0, $a3_{\rightarrow+t}$, … , $an_{\rightarrow n\,(+t)}$}).
  3.(SetA_1 → $n(+t)$)=({ $a1_{\rightarrow+t}$, $a2_{\rightarrow+t}$, 0, … , $an_{\rightarrow n\,(+t)}$}).
  Or
  4.(SetA_1 → $n(+t)$)=({0, 0, $a3_{\rightarrow+t}$, … , $an_{\rightarrow n\,(+t)}$}).
  5.(SetA_1 → $n(+t)$)=({0, $a2_{\rightarrow+t}$, 0, … , $an_{\rightarrow n\,(+t)}$}).

6.({ 0, 0, $a3_{\rightarrow +t}$, … , $an_{\rightarrow n\ (+t)}$}).
7.({ 0, 0, 0, … , $an_{\rightarrow n\ (+t)}$}).
So Set Con is containing some of the same elements as SetA_1 or none at another time and hence also describes repetance with modification. Only, and only if all elements in the set become 0 we speak of total absence. Absence can happen in one dimension and lead to change in another dimension.
At this point we need Travel-Matrixes, Copy-Matrixes and Matrix conversion.

Mathematical concept of Matrix conversion:

$$\begin{pmatrix}1\\4\\3\\1\end{pmatrix}^{1D2D3D4D} \overrightarrow{RMCT} \begin{pmatrix}1\\4\\3\\\cancel{1}\end{pmatrix}^{1D2D3D\cancel{4D}} \rightarrow \begin{pmatrix}1\\4\\3\end{pmatrix}^{1D2D3D}$$

- $RMCT$ = Riedel Matrix Conversion Theory

$$\rightarrow \begin{pmatrix}1\\4\\\cancel{3}\end{pmatrix}^{1D2D\cancel{3D}} \overrightarrow{RMCT'} \begin{pmatrix}4\\3\end{pmatrix}^{1D2D} = \begin{pmatrix}1\\0\end{pmatrix}^{1D2D} + \begin{pmatrix}1\\1\end{pmatrix}^{1D2D} + \begin{pmatrix}1\\1\end{pmatrix}^{1D2D} + \begin{pmatrix}1\\1\end{pmatrix}^{1D2D}$$

- $RMCT'$ = Riedel Matrix Conversion Theory applied once more

$$\begin{pmatrix}4\\3\end{pmatrix}^{1D2D} = \begin{pmatrix}1\\0\end{pmatrix}^{1D2D} + 3 \times \begin{pmatrix}1\\1\end{pmatrix}^{1D2D} \overrightarrow{RMCT''} (4)^{1D\cancel{2D}} = (1)^{1D} + (1)^{1D} + (1)^{1D} + (1)^{1D}$$

- $RMCT''$ = Riedel Matrix Conversion Theory applied one last time
- $Matrices\ would\ be\ just\ another\ way\ to\ look\ at\ finite\ repetance$

Mathematical concept of a Copy Matrix:

$$\begin{pmatrix}1\\4\\3\\1\end{pmatrix}^{1D2D3D4D} \rightarrow \begin{pmatrix}1\\4\\3\\1\end{pmatrix}^{1D2D3D4D}$$

Mathematical concept of a Travel Matrix (wich also is repetance with absence):

$$\begin{pmatrix}1,4\\4,2\\3,3\\1,7\end{pmatrix}^{1D2D3D4D} \rightarrow \begin{pmatrix}1,4\\4,2\\0\\0\end{pmatrix}^{1D2D3D4D} + \begin{pmatrix}0\\0\\3,3\\1,7\end{pmatrix}^{1D2D3D4D}$$

What may happen on the Event Horizon of a Black Hole or as Trees become lower or higher dimensional in one dimension? And gain in another one?:

Step I

$$\begin{pmatrix}1\\4\\3\\1\end{pmatrix}^{1D2D3D4D} \overrightarrow{EH} \begin{pmatrix}1\\4\\3\end{pmatrix}^{1D2D3D\cancel{4D}} \rightarrow \begin{pmatrix}1\\4\\3\end{pmatrix}^{1D2D3D}$$

Step II

$$\rightarrow \begin{pmatrix}1\\4\\3\end{pmatrix}^{1D2D\cancel{3D}} \overrightarrow{EH} \begin{pmatrix}4\\3\end{pmatrix}^{1D2D} = \begin{pmatrix}1\\0\end{pmatrix}^{1D2D} + \begin{pmatrix}1\\1\end{pmatrix}^{1D2D} + \begin{pmatrix}1\\1\end{pmatrix}^{1D2D} + \begin{pmatrix}1\\1\end{pmatrix}^{1D2D}$$

Step III happen simaltaneously

$$\begin{pmatrix}1\\0\end{pmatrix}^{1D2D} + \begin{pmatrix}1\\1\end{pmatrix}^{1D2D} + \begin{pmatrix}1\\1\end{pmatrix}^{1D2D} + \begin{pmatrix}1\\1\end{pmatrix}^{1D2D} \overrightarrow{EH} \begin{pmatrix}1\\0\\0\end{pmatrix}^{1D2D(3D)} + 3 \times \begin{pmatrix}1\\1\\0\end{pmatrix}^{1D2D(3D)}$$

Step IV

$$\overrightarrow{EH} \begin{pmatrix}1\\0\\0\\0\end{pmatrix}^{1D2D3D(new\ 4D)} + 3 \times \begin{pmatrix}1\\1\\0\\0\end{pmatrix}^{1D2D3D(new\ 4D)}$$

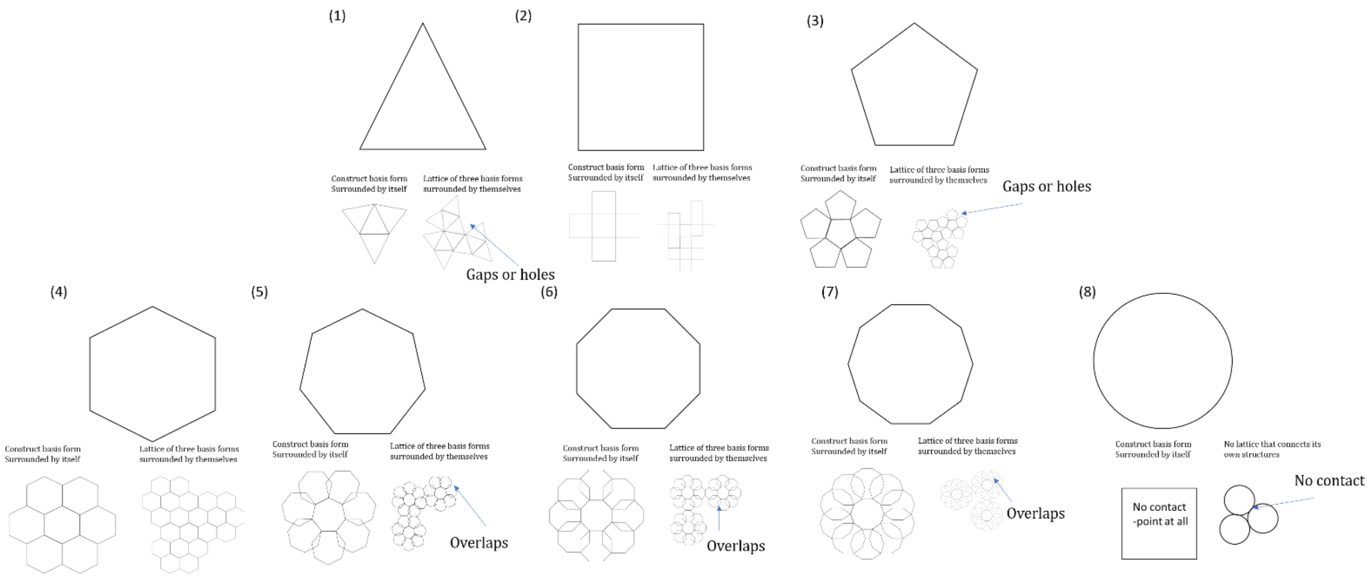
Step V (irradiation of the event horizon)

$$\overrightarrow{HR_{EH}} \begin{pmatrix}1 \times new\ x\\1 \times new\ y\\1 \times new\ z\\1 \times new\ t\end{pmatrix}^{1D2D3D(new\ 4D)} + 3 \times \begin{pmatrix}1 \times new\ x\\1 \times new\ y\\1 \times new\ z\\1 \times new\ t\end{pmatrix}^{1D2D3D(new\ 4D)}$$

- HR_{EH} = Hawking Radiation at the Event Horizon
- EH = Event Horizon
- $new\ x, y, z, t$ as it is radiated off the event horizon it gets new spatial and temporal values Riedel Trees are possibly creating polygons (n-gons) in 2D with specifically the amount of vertices (o-Trees, vertice = n in $E_n = n\hbar\omega$) that expressed along the z and t-axis would create a wave behavior that approximates continuous wave behavior (but of this discrete Trees) that are radiated off with a measurable frequency and thus energy. This Energy squared is proportional to the radius of the circle the polygon, formed by the Riedel Trees, could be inscribed into, as it would be proportional to the amplitude squared as well. $E^2 \propto A^2 \propto r^2$.

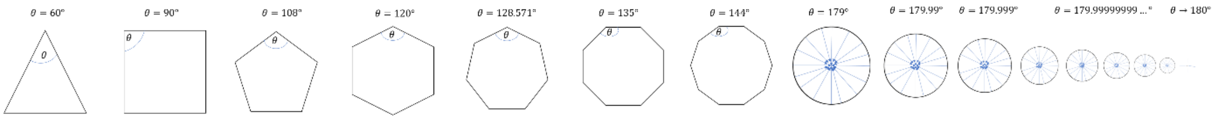
CFR Proof of the honeycomb conjecture

In CFR Honyecombs, hexagons offer the most stability, and surface area if they are surrounded byits own shape in such manner taht it connects one self-equal shape at everyone of its sides, a self-composed-shape. This self-composed-shape repeated to a lattice of three self-composed-shape has the most surface are (or in z-axis volume) if it has no gaps and no overlaps. We do this with all basis forms with increasing amount of vertices. Triangles form a self-composed-shape, that in a lattice leaves gaps (1). In (2) squares form a self-composed-shape that has more area than the triangle self-composed-shape, $A.comp.(2) > A.comp.(1)$. In (3) the self-composed-shape around the basic-form, the self-composed-shape, not yet overlaps, but leaves gaps in the lattice $A.comp.(2) > A.comp.(3) > A.comp.(1)$. The area in the self-composed-shape in the hexagon $A.comp.(4) > A.comp.(2) > A.comp.(3) > A.comp.\{7 > \cdots > n\} > A.comp.(1) > A.comp.(\infty) = DNE$. Thus $A.comp(4) > \forall A.comp.(n \in \mathbb{N} < 6 \ and \ n \in \mathbb{N} > 6)$. N-gons with an increasing amount of vertices have fewer overlaps in their self-composed structures around the basis form, and the lattice containing of three such constructs gets more and more spread out. Creating more gaps, decreasing overall area, additionally they cant be stacked close to each other because the sides do parallel lesser and lesser. (8) would resemble sphere or circle-packing. But as there are no circles and spheres in CFR. They are polygons with many sides. If they had no vertices at all and where perfectely smooth they could not connect at any side, because there would be no side at all. But it had to touch somewhere, wich is proof by contradiction. It must have granularity then, wich means it sno circle but an n-gon with many vertices. Real ideal circles besided each other then would never touch wich is illogical. As n-gons get more vertices there composed structures overlap more and more, why the most of there area comes from the basis structure and the in the process of increasin n, added area decreases as n grows finitely. Thats proof that (the Area of the compound structures of (1), (2), (3) and (4))> (the area of the compound structures of (5), (6), (7) and (…,n)).



Furthermore if circles had granularity they would be no circles. If we no assume the n-gons had no granularity and $n \to \infty$ then the infinite-gon would be infinitely big. We know that the universe is of finite size. Thats proof by contradiction. Now the only other growth would be inward growth if we assume infinitesimals, but that would men they would grow infinitely inwards. What logic is that? In a finite world they would vanish and be nothing.

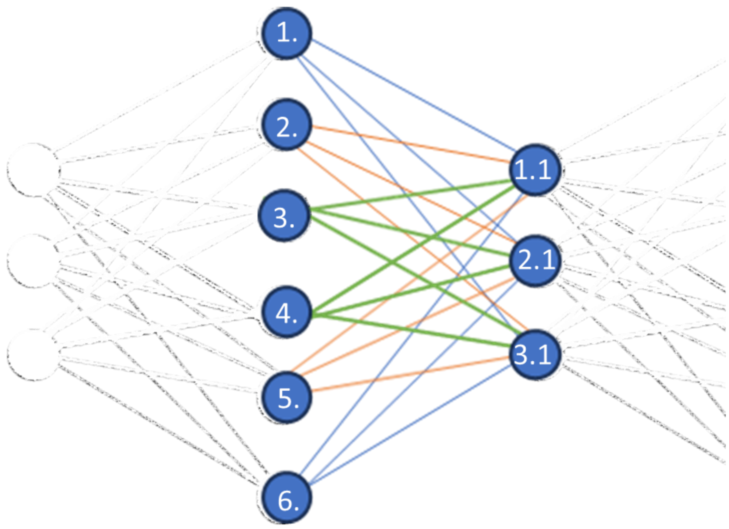
Now finitely growing n-gons where n-increases over time, icreases the area of the n-gon over time if we add vertices (smallest units). Thats something observed and documented in black holes, where the event horizon increases if the mass increases, given by the Schwarzshild radius. Thats proof of a finite granularity. Additionally the Schwarzschild radius assumes that anything can become a black hole if it would satisfy the radius, but as it takes into account mass, it accepts the finite distribution of mass in the universe. $R_{Schwarzschild} = \frac{2GM}{c^{2}}$, M=mass of the black hole (finite), c=speed of light (finite), G=gravitational constant (finite), which we should take into account as empirical evidence for finiteness.



Computation & Artificial Intelligence & Natural Intellingence

Computation and Artificial Intelligence become just diffrent manifestations of the Concept Of Finite Repetance described by Riedel-Tree-Rules. Computers and neural networks are not doing computation but repetance with modification and equity or the absence of repetance. They already follow this Set of Rules, transistor-architecture as well as computer language, as well as AI.

Hierarchically natures Universal Concept Of Finite Repetance would be more fundamental than computation. And as a consequence of that computation and neural networks as in AI are not artificial, but a natural phenomenon. Notably enhanced and reinforced, structured accordingly to human needs, designs and wishes in ways that would not just be found in nature laying around in the form of computer parts of course. But neural networks in the cerebrum, mycelial, mycorrhizal, slime-molds have equal architecture as they all are a result of Finite Repetance. Nature is no computation, but computation arises from natures rules. Computation is a subset of a much bigger superset that is finitely growing in amount of subsets.

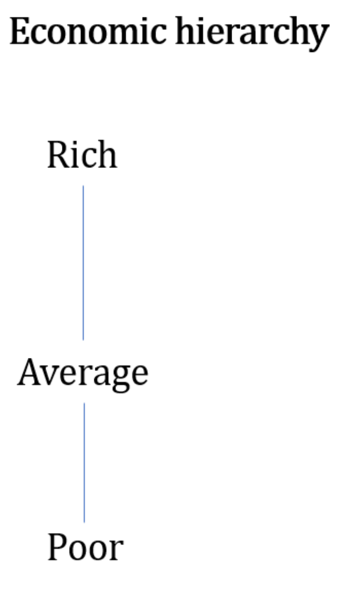


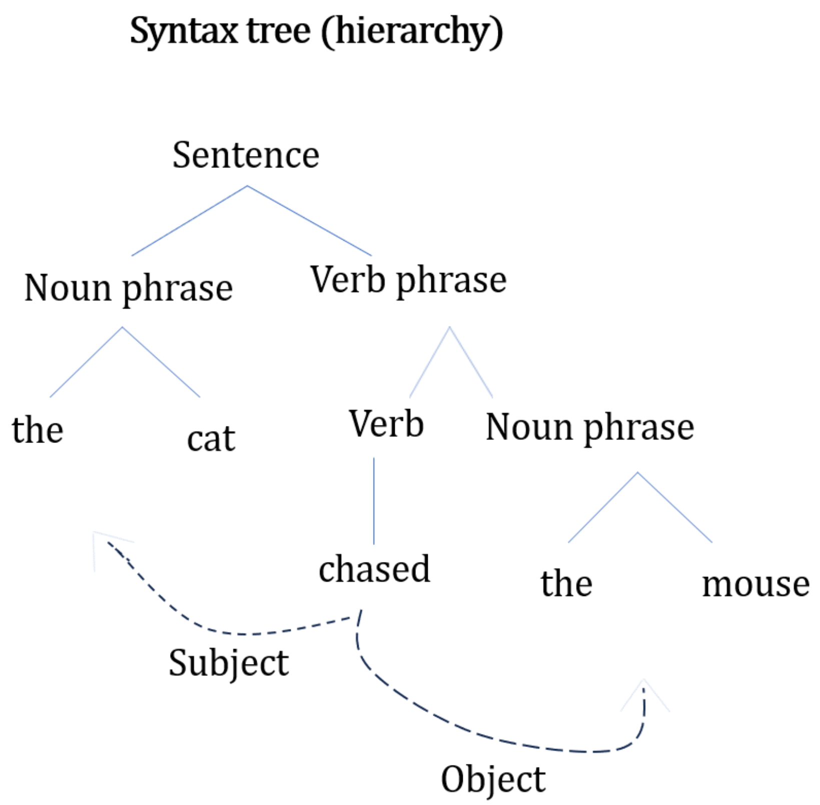
$n[\ldots] + 1.\, s\text{-}Tree[current](3\text{-}branches_{\theta 1}) + 2.\, s\text{-}Tree[current](3\text{-}branches_{\theta 2}) + 3.\, s\text{-}Tree[current](3\text{-}branches_{\theta 3}) + 4.\, s\text{-}Tree[current](3\text{-}branches_{\theta 4}) + 5.\, s\text{-}Tree[current](3\text{-}branches_{\theta 5}) + 6.\, s\text{-}Tree[current](3\text{-}branches_{\theta 6}) = 1.1\ \text{o-}Tree[sum - currents](\text{n-}branches_{\theta n}) + 2.1\ \text{o–}Tree[sum - currents](\text{n–}branches_{\theta n}) + 3.1\ \text{o–}Tree[sum - currents](\text{n–}branches_{\theta n}) + n[\ldots]$

All Hierarchical Structures

Even more stunning all hierarchical structures underly the natural, universal Concept Of Finite Repetance. The span across fields is remarkable, ontology, language science where the morphems (morphology) would be the smallest meaningful units bearing meaning in a sentence (syntax, semantics, pragmatics). Ontology with all its concepts and categories. Societal structure as in Sociology. Historical societies, historical backtracing of things results in Causal Riedel-Tree Struvtures that resemble the Concept Of Finite Repetance. In biology the evolution of organisms is hierarchically traced back to a singular origin of life forms. In geology, vulcanology the magma chambers grow by the Concept Of Finite Repetance, creating a causally hierarchical upwards branching Riedel-Tree with the lower crustal magma chamber being the o-Tree and the magma conduit and s-Tree a repetance of that magma, but modified in direction, and the upper crustal magma chamber again an o-Tree for the dikes and the vent of the vulcano wich again would be following the concept of finite repetance and with it being s-Trees.
Same for atoms and molecules. Atoms are the smallest unit of the molecue, making the molecule the smallest unit of a substance with still the same physical properties. This is the epitome of the Universal Concept Of Finite Repetance, and is observable all around, wich should make verifying the Concept utmost easy. Chemical lettice structures, economic hierarchies, syntax trees and much more follows the braching structures of Riedel-Tree Rules, wich resemble finite repetance.

Exapmples:





Additional Notation and use for it

Riedel Notation with Examples

Iota ($\mathbf{I}$) Notation

The Iota ($\mathbf{I}$) notation represents cumulative division of terms in a sequence. It is the inverse of multiplication (Π). In Iota notation, we divide each term by the next in sequence cumulatively. for example:

$$\mathrm{I}_{i=4}^{4} = 4/3/2/1 = 8/3$$

Or the other way around

$$\mathrm{I}_{i=1}^{4} = 1/2/3/4 = 3/8$$

Gamma ($\mathbf{\Gamma}$) Notation

The Gamma ($\mathbf{\Gamma}$) notation represents cumulative subtraction of terms in a sequence. It is the inverse of summation (Σ). In Gamma notation, we subtract each term from the previous one, cumulatively, for example:

$$\Gamma_{i=10}^{10} = 10 - 9 - 8 - 7 - 6 - 5 - 4 - 3 - 2 - 1 \ = \ -35$$

Or the other way around

$$\Gamma_{i=1}^{10} = 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 \ = \ -53$$

Product (Π) Notation

The Pi (Π) notation represents cumulative multiplication of terms in a sequence. It is commonly used in product series. In Pi notation, we multiply all terms cumulatively.

Example:

$$\Pi_{i=1}^{4} = 1 \times 2 \times 3 \times 4 = 24$$

Sigma (Σ) Notation

The Sigma (Σ) notation represents cumulative addition of terms in a sequence. In Sigma notation, we add all terms cumulatively.

Example:

$$\Sigma_{i=1}^{4} = 1 + 2 + 3 + 4 = 10$$

As per the inverse nature of the Operations, in mathematics, every function can have an inverse operation. Summation (Σ) and product

(Π) are two common operations with their corresponding inverses: subtraction (**Γ**) and

division (I) respectively.

Inverse factorial with Spanish exclamation symbol

like in:

$$n¡ = n/(n - 1)/(n-2)/(n - 3)/(n - 4)/\ldots/(n - (n - 1)$$

$$6¡ = 6/(6-1)/(6-2)/(6-3)/(6-4)/(6-5)/(never\ n-n = 0\ division) = 1/20$$

$$¡n = n/(n+1)/(n+2)/(n+3)/(n+4)/\ldots/(n+(n+1)$$

like in:

$$¡6 = 6/(6+1)/(6+2)/(6+3)/(6+4)/(6+5)/(6+7) = 7/5040$$

Calculating fractions with inreasing n using the Iota notation

$I_{i=1}^{1}i$ =**1/0=D.N.E.**

$I_{i=2}^{2}i$ = **2/1**

$I_{i=3}^{3}i$ =3/2/1=**3/2**

$I_{i=4}^{4}i$ =4/3/2/1=**8/3**

$I_{i=5}^{5}i$ =5/4/3/2/1=**15/8**

$I_{i=6}^{6}i$ =6/5/4/3/2/1=**16/5**

$I_{i=7}^{7}i$ =7/6/5/4/3/2/1=**35/16**

$I_{i=8}^{8}i$ =8/7/6/5/4/3/2/1=**128/35**

$I_{i=9}^{9}i$ =9/8/7/6/5/4/3/2/1=**315/128**

$I_{i=10}^{10}i$ =10/9/8/7/6/5/4/3/2/1=**256/63**

$I_{i=11}^{11}i$ =11/10/9/8/7/6/5/4/3/2/1=**693/256**

$I_{i=12}^{12}i$ =12/11/10/9/8/7/6/5/4/3/2/1=**1024/231**

$I_{i=13}^{13}i$ =13/12/11/10/9/8/7/6/5/4/3/2/1=**3003/1024**

$I_{i=14}^{14}i$ =14/13/12/11/10/9/8/7/6/5/4/3/2/1=**2048/429**

$I_{i=15}^{15}i$ =15/14/13/12/11/10/9/8/7/6/5/4/3/2/1=**6435/2048**

$I_{i=16}^{16}i$ =16/15/14/13/12/11/10/9/8/7/6/5/4/3/2/1=**32768/6435**

$I_{i=17}^{17}i$ =17/16/15/14/13/12/11/10/9/8/7/6/5/4/3/2/1=**109395/32768**

$I_{i=18}^{18}i$ =18/17/16/15/14/13/12/11/10/9/8/7/6/5/4/3/2/1=**65536/12155**

$I_{i=19}^{19}i$ =19/18/17/16/15/14/13/12/11/10/9/8/7/6/5/4/3/2/1=**230945/65536**

$I_{i=20}^{20}i$ =20/19/18/17/16/15/14/13/12/11/10/9/8/7/6/5/4/3/2/1=**262144/46189**

Now I don't know the following the enumerator of my next fraction, but i guess it's the previous denominator in this sequence, being 262144. Let's see:

$I_{i=21}^{21}i$ =[21/…/8/7/6/5/4/3/2/1]= **969969/262144** It indeed is!

$I_{i=22}^{22}i$ =[22/…/8/7/6/5/4/3/2/1]=**524288/88179**

$I_{i=23}^{23}i$ =[23/…/8/7/6/5/4/3/2/1]=**2028117/524288**

$I_{i=24}^{24} i$ =[24/…/8/7/6/5/4/3/2/1]=**4194304/676039**

$I_{i=25}^{25} i$ =[25/…/8/7/6/5/4/3/2/1]=**16900975/4194304**

$I_{i=26}^{26} i$ =[26/…/8/7/6/5/4/3/2/1]=**8388608/1300075**

$I_{i=27}^{27} i$ =[27/…/8/7/6/5/4/3/2/1]=**35102025/8388608**

$I_{i=28}^{28} i$ =[28/…/8/7/6/5/4/3/2/1]=**33554432/5014575**

$I_{i=29}^{29} i$ =[29/…/8/7/6/5/4/3/2/1]=**145422675/33554432**

$I_{i=30}^{30} i$ =[30/…/8/7/6/5/4/3/2/1]=67108864/9694845

$I_{i=31}^{31} i$ =[31/…/8/7/6/5/4/3/2/1]=300540195/67108864

Calculating the complex (seemingly random) behavior

$I_{i=1}^{1} i$ =1/0=D.N.E.

$n \times 2$

$I_{i=2}^{2} i$ = 2/1

$n \times 3$

$I_{i=3}^{3} i$ =3/2/1=3/2

$n \times 4$

$I_{i=4}^{4} i$ =4/3/2/1=8/3

$n \times 5$

$I_{i=5}^{5} i$ =5/4/3/2/1=15/8

$n \times 2$

$I_{i=6}^{6} i$ =6/5/4/3/2/1=16/5

$n \times 3$

$I_{i=7}^{7} i$ =7/6/5/4/3/2/1=35/16

$n \times 8$

$I_{i=8}^{8} i$ =8/7/6/5/4/3/2/1=128/35

$n \times 9$

$I_{i=9}^{9} i$ =9/8/7/6/5/4/3/2/1=315/128

$n \times 2$

$I_{i=10}^{10} i$ =10/9/8/7/6/5/4/3/2/1=256/63

$n \times 11$

$I_{i=11}^{11} i$ =11/10/9/8/7/6/5/4/3/2/1=693/256

$n \times 4$

$I_{i=12}^{12} i$ =12/11/10/9/8/7/6/5/4/3/2/1=1024/231

$n \times 13$

$I_{i=13}^{13} i$ =13/12/11/10/9/8/7/6/5/4/3/2/1=3003/1024

$n \times 2$

$I_{i=14}^{14} i$ =14/13/12/11/10/9/8/7/6/5/4/3/2/1=2048/429

$n \times 15$

$I_{i=15}^{15} i$ =15/14/13/12/11/10/9/8/7/6/5/4/3/2/1=6435/2048

$n \times 16$

$I_{i=16}^{16} i$ =16/15/14/13/12/11/10/9/8/7/6/5/4/3/2/1=32768/6435

$n \times 17$

$I_{i=17}^{17} i$ =17/16/15/14/13/12/11/10/9/8/7/6/5/4/3/2/1=109395/32768

$n \times 2$

$I_{i=18}^{18} i$ =18/17/16/15/14/13/12/11/10/9/8/7/6/5/4/3/2/1=65536/12155

$n \times 19$

$I_{i=19}^{19} i$ =19/18/17/16/15/14/13/12/11/10/9/8/7/6/5/4/3/2/1=230945/65536

$n \times 4$

$I_{i=20}^{20} i$ =20/19/18/17/16/15/14/13/12/11/10/9/8/7/6/5/4/3/2/1=262144/46189

Now I don't know the following the enumerator of my next fraction, but i guess it's the previous denominator in this sequence, being 262144. Let's see:

$n \times 21$

$I_{i=21}^{21} i$ =[21/…/8/7/6/5/4/3/2/1]= 969969/262144 It indeed is!

$n \times 2$

$I_{i=22}^{22} i$ =[22/…/8/7/6/5/4/3/2/1]=524288/88179

$n \times 23$

$I_{i=23}^{23} i$ =[23/…/8/7/6/5/4/3/2/1]=2028117/524288

$n \times 8$

$I_{i=24}^{24} i$ =[24/…/8/7/6/5/4/3/2/1]=4194304/676039

Fraction Sequence Conjecture

The above sequences show that each following enumerator of the following fraction following in the sequence, is the previous denominator in this sequence and then after that being true getting something seemingly random giving trough multiplying the former denominator in the sequence by some natural number not being zero, giving us the following enumerator in the sequence. This enumerator then again becomes the following denominator in the next fraction. Then after that being true getting something seemingly random giving trough multiplying the former denominator in the sequence by some natural number not being zero, giving us the following enumerator in the sequence, wich again is the following denominator in the sequence and so forth with that very same logic.

I therefore introduce the Fraction Sequence Conjecture:

The introduced conjecture states that from the enumerator of the value 2 onwards every succeding enumerator is an integer multiple of 2 and every following denominator from 3 onwards in the sequence is the in the sequence former enumerator. This immediately resolves the question of what use the Iota and Gamma notations are. Of course only fractions of sets of sufficient size do not violate Axiom6 of CFR Set Theory.

The other way around nothing unexpected happens as we multiply by the reciprocals:

$I_{i=1}^{1}i$=0/1=0

$I_{i=1}^{2}i$ =1/2

$I_{i=1}^{3}i$ = 1/2/3 =1/6

$I_{i=1}^{4}i$ =1/2/3/4= 1/24

$I_{i=1}^{5}i$ = 1/2/3/4/5=1/120

$I_{i=1}^{6}i$ =1/2/3/4/5/6=1/720

$I_{i=1}^{7}i$ =1/2/3/4/5/6/7=1/5040

$I_{i=1}^{8}i$ =1/2/3/4/5/6/7/8=1/40320

$I_{i=1}^{9}i$ =1/2/3/4/5/6/7/8/9=1/362880

$I_{i=1}^{10}i$ =1/2/3/4/5/6/7/8/9/10=1/3628800

$I_{i=1}^{11}i$ =1/2/3/4/5/6/7/8/9/10/11=1/39916800

$I_{i=1}^{1} i = 0/1 = 0$

$I_{i=1}^{2} i = 1/2 \quad \times 1/3$

$I_{i=1}^{3} i = 1/2/3 = 1/6 \quad \times 1/4$

$I_{i=1}^{4} i = 1/2/3/4 = 1/24 \quad \times 1/5$

$I_{i=1}^{5} i = 1/2/3/4/5 = 1/120 \quad \times 1/6$

$I_{i=1}^{6} i = 1/2/3/4/5/6 = 1/720 \quad \times 1/7$

$I_{i=1}^{7} i = 1/2/3/4/5/6/7 = 1/5040 \quad \times 1/8$

$I_{i=1}^{8} i = 1/2/3/4/5/6/7/8 = 1/40320 \quad \times 1/9$

$I_{i=1}^{9} i = 1/2/3/4/5/6/7/8/9 = 1/362880 \quad \times 1/10$

$I_{i=1}^{10} i = 1/2/3/4/5/6/7/8/9/10 = 1/3628800 \quad \times 1/11$

$I_{i=1}^{11} i = 1/2/3/4/5/6/7/8/9/10/11 = 1/39916800$

Further exploration of concepts

Σ-notation 1+2+3+4+5+6+7+8+9+10=10+9+8+7+6+5+4+3+2+1 (commutative)

order does not matter

Π-notation 1*2*3*4*5*6*7*8*9*10=10*9*8*7*6*5*4*3*2*1 (commutative)

order does not matter

Γ-notation 1-2-3-4-5-6-7-8-9-10≠ 10-9-8-7-6-5-4-3-2-1 (non-commutative)

order matters

I-notation 1/2/3/4/5/6/7/8/9/10≠ 10/9/8/7/6/5/4/3/2/1 (non-commutative)

order matters

1+2+3+4+5+6+7+8+9+10=55

1*2*3*4*5*6*7*8*9*10=3628800

1-2-3-4-5-6-7-8-9-10=-53 & 10-9-8-7-6-5-4-3-2-1=-35

1/2/3/4/5/6/7/8/9/10=1/3628800 & 10/9/8/7/6/5/4/3/2/1 =1/36288

Ratio I: (55-53)* 1/3628800*3628800=2

Ratio II: (55-35) * (1/36288) *3628800 =200

1+2+3+4+5+6+7+8+9=45

1*2*3*4*5*6*7*8*9=362880

1-2-3-4-5-6-7-8-9=-43 & 9-8-7-6-5-4-3-2-1=-27

1/2/3/4/5/6/7/8/9=1/362880 & 9/8/7/6/5/4/3/2/1 =1/4480

Ratio: I (45-43)*1/362880*362880=2

Ratio: II (45-27)*(1/4480)*362880=1458

1+2+3+4+5+6+7+8=36

1*2*3*4*5*6*7*8=40320

1-2-3-4-5-6-7-8=-34 & 8-7-6-5-4-3-2-1=-20

1/2/3/4/5/6/7/8=1/40320 & 8/7/6/5/4/3/2/1 =1/630

Ratio I: (36-34)*(1/40320)*40320=2

Ratio II: (36-20)*(1/630)*40320=1024

1+2+3+4+5+6+7=28

1*2*3*4*5*6*7=5040

1-2-3-4-5-6-7=-26 & 7-6-5-4-3-2-1=-14

1/2/3/4/5/6/7=1/5040 & 7/6/5/4/3/2/1 =7/720

Ratio I: (28-26)*(1/5040)*5040=2

Ratio II: (28-14)*(7/720)*5040=686

1+2+3+4+5+6=21

1*2*3*4*5*6=720

1-2-3-4-5-6=-19 & 6-5-4-3-2-1=-9

1/2/3/4/5/6=1/720 & 6/5/4/3/2/1 =1/20

Ratio I: (21-19)*(1/720)*720=2

Ratio II: (21-9)*(1/120)*720=432

1+2+3+4+5=15

1*2*3*4*5=120

1-2-3-4-5=-13 & 5-4-3-2-1=-5

1/2/3/4/5=1/120 & 5/4/3/2/1 =5/24

Ratio I: (15-13)*(1/120)*120=2

Ratio II: (15-5)*(5/24)*120=250

1+2+3+4=10

1*2*3*4=24

1-2-3-4=-8 & 4-3-2-1=-2

1/2/3/4=1/24 & 4/3/2/1 =2/3

Ratio I: (10-8)*(1/24)*24=2

Ratio II: (10-2)*(2/3)*24=128

1+2+3=6

1*2*3=6

1-2-3=-4 & 3-2-1=0

1/2/3=1/6 & 3/2/1 =3/2

Ratio I: (6-4)*(1/6)*6=2

Ratio II: (6+0)*(3/2)*6=54

1+2=3

1*2=2

1-2=-1 & 2-1=1

1/2=1/2 & 2/1 =2

Ratio I:

Ratio II:

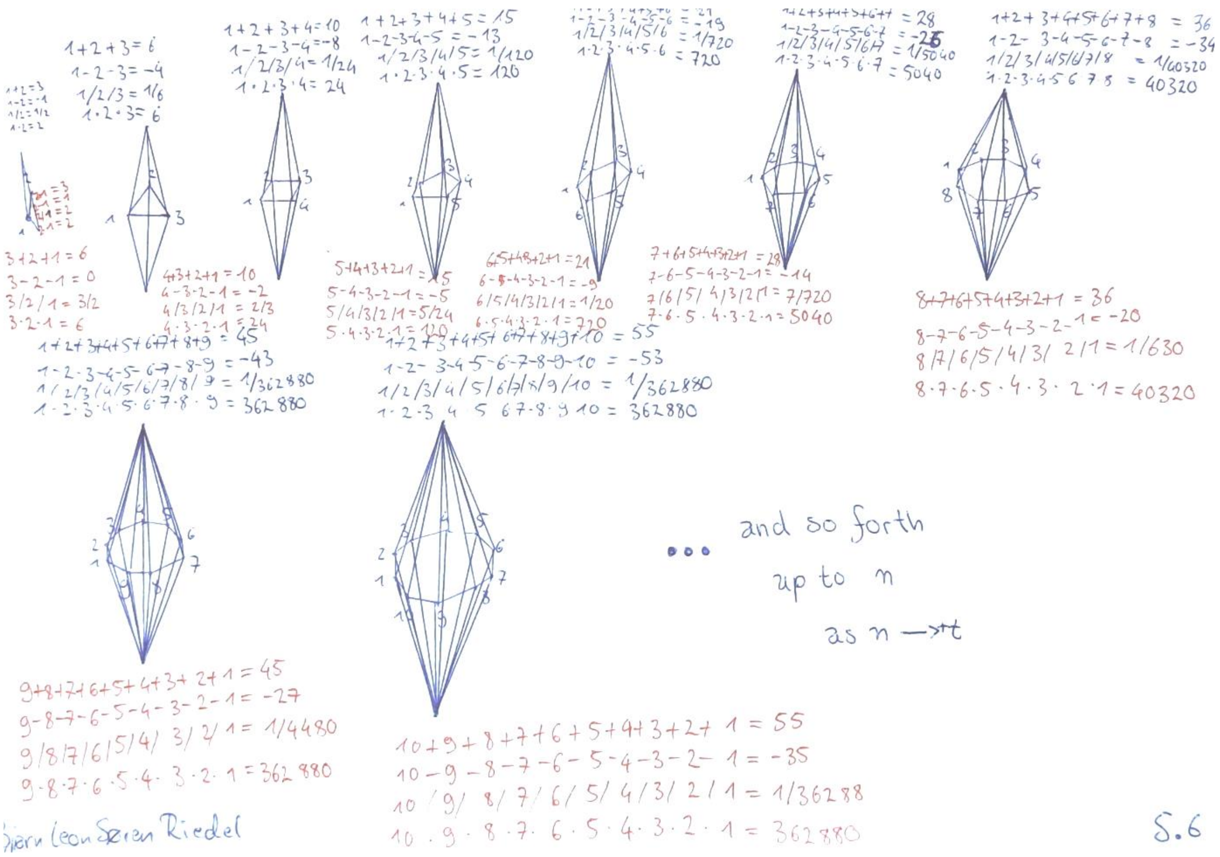
1

1

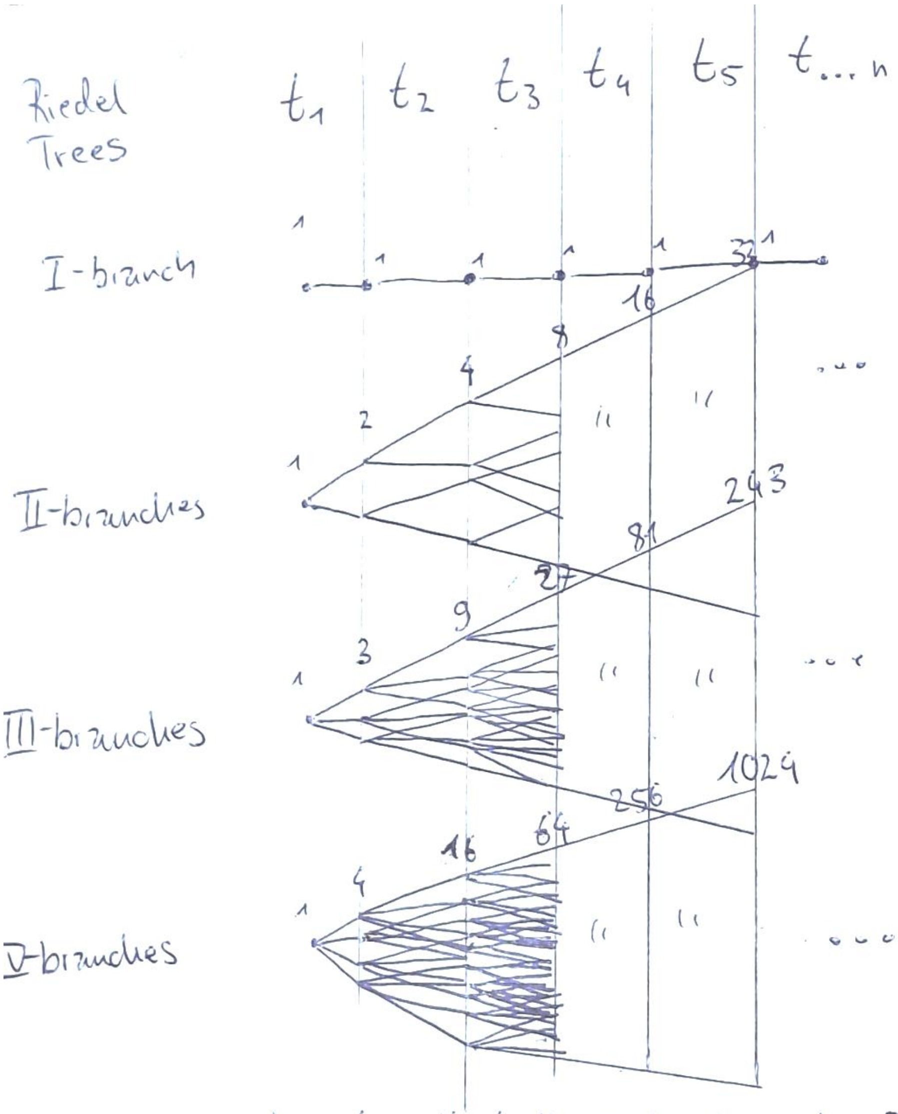
1

1

Geometric Visualisation Of The Finite Repetance Of Numbers Using Π, Γ, I, Σ Notation



All mathematical operations of any finite number can be stored in this way. Above and under the base so that both all commutative and all non-comutative operations are accounted for. The construct as well is a Riedel-Tree, wich highlights the usability of expressing the concept of finite repetance with modification or equity or absence through those Riedel Tree-Rules.

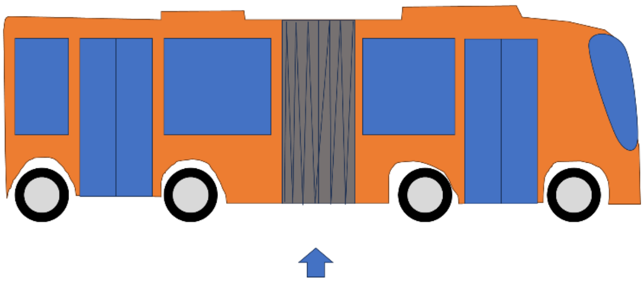


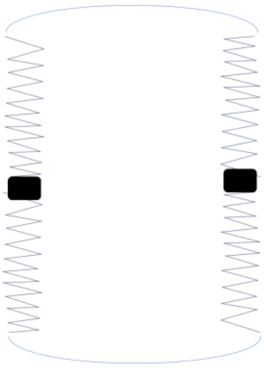
This shows not only that the natural numbers ℕ (excluded 0)
ut also Neural Networks can be modeled by
5-Tree$_{2D}$[size](n-branches$_\theta$).

Folding of Riedel-Trees with one branch angular displaced

Today I sa ton the bus to the pharmacy when I saw this angular section in the bus that looks like an accordion (musikal instrument). This section is movable when the bus turns to the left or to the right. Interesting If an even amount of corners is sticks visibly out the total number of corners/edges must be odd. And if an odd amount of corners is sticks visibly out it must be en even number of total corners.

Graphic down below:





I looked at the single ripples or edges, I counted 4 sections, 10 corners each. 4x10=40. why would they use even numbers? Whats the architectural reason?

So I bought pen and paper and tried to find out how to figure out

1. How to count how many edges/corners are connected all together from the visible ones I see in the triangle like structure that is most prominent. One like these:

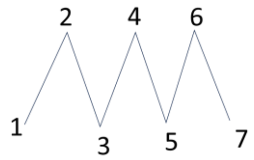
2. And the other way around how to count how many visible triangular shapes would stand out from a given number of point that are folded in such way. The folding so to speak.
   You wouldn't want to count all triangular (The ones you could make a dot under) shapes and all corners in this one, would you?:

The number of total visible corners gives us the sum of total corners:

$$\sum_{i=3}^{n} i + (2(n-1))$$

Example would be:

$$\sum_{i=3}^{3} 3 + 2(3-1) = 3 + 4 = 7$$



The number of triangular structers (Those wich you could place a dot under) or the same thing: visible corners that are not folded insight but stick out is given by any n that gives x, one simply has to solve it computationally or calculate it in the head. Example:

$$\sum_{i=3}^{n} i + (2(n-1)) = x$$

$$let\ x = 345:$$

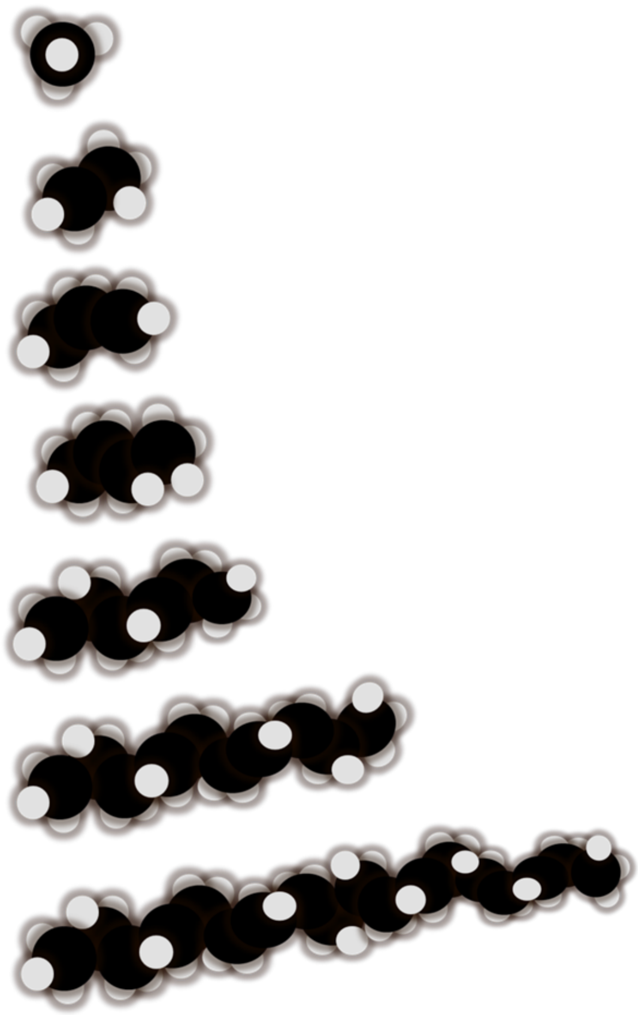
$$\sum_{i=3}^{n} i + (2(n-1)) = \mathbf{345}, then\ \ n = \frac{\boldsymbol{x} - 3}{\mathbf{2}} + 1 = 172$$

$$plugg\ that\ in\ in\ order\ to\ verify\ your\ result:$$

$$\sum_{i=3}^{172} 3 + (2(172-1)) = \mathbf{345}$$

This is useful for both architecture and long fatty acids and long alkanes in chemistry.

Charlotte Model *Lewis structure*



$C\,H_4$

$C_2\ H_6$

$C_3\ H_8$

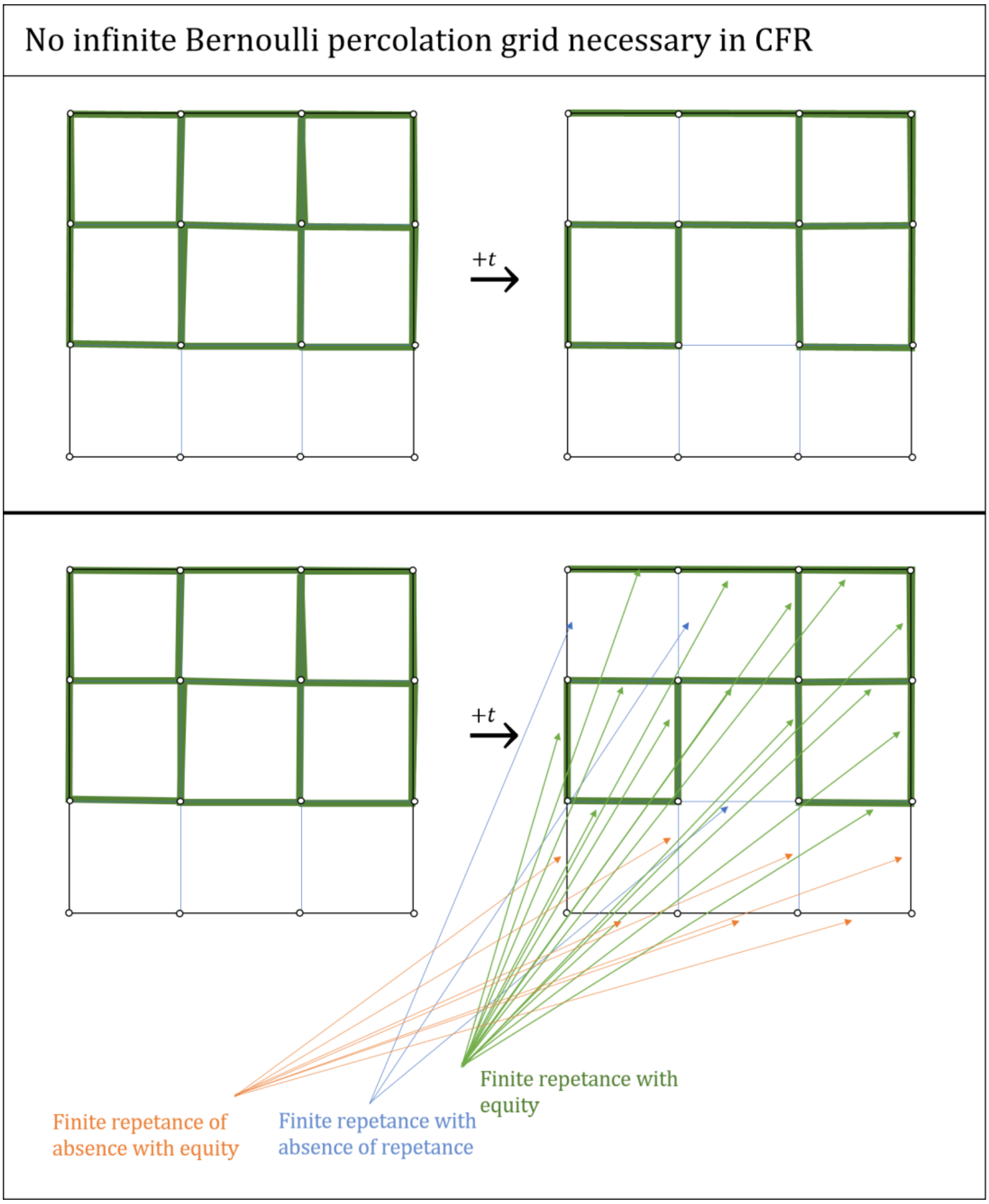
$C_4\ H_{10}$

$C_5\ H_{12}$

$C_6\ H_{14}$

$C_7\ H_{16}$

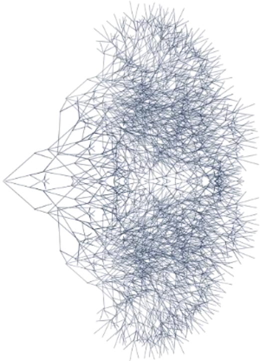
Percolation Theory



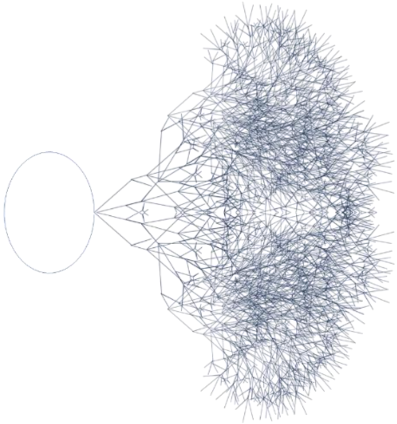
This Graphic is from the 22.02.2025

A finite Set of water molecules exists besides each other and do not overlap as their finite size excludes them from temporarily existing at the same place. The water molecules, or whatever smallest-units are defined to be, follow the Concept Of Finite Repetance (CFR) described by the Riedel-Tree Rules. They are mapped into the immidiate future by FR of the absence with equity, latent Trees, FR with absence of repetance (modification to becoming latent) and repetance with near equity. Fluid dynamics arise from this Tree paths as well (as the 1-branch Tree is a scaled line over time or angular(spatially) displaced line segments over time).

The final limitation in all models

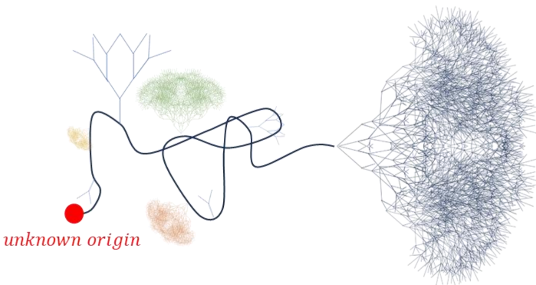


Graphic of purely pedagogical value, shows that the origin must be singular in the model.



Graphic of purely pedagogical value, shows that the origin must be singular because elsewise any other Riedel-Tree would be orthogonal to our universe. And if all universes would be orthogonal to each other there would be infinitely many discrete dimensions and that would be a logical loop where would continuously would come back at the same conclusion of either singular origin or a logical loop.

Even if it wouldnt loop, there had to be an origin everywhere, and this origin could be traced back to one wichs origin is unknown in its nature. So we never og down that rabbit hole.



Non- deterministic and deterministic models of reality

A deterministic system that assumes infinities could predict the future development. Wich no model at all can to the fullest extent without probabilities.

A non-deterministic model can model the past developments to the full extend, and can accumulate data. This way truths are obtained in a network of documented outcomes. But the future has to happen first and become past.

A deterministic model creates models out ot accumulated models from the past to an full extend and tries to model the future from underlying truths wich it tries to find.

1. If something now matches a structure in this network, it also must match the outcome the network predicts. If it does not match, it is stored in the network as well, reshaping its holistic architecture. The model grows outwards over time, more resources and connections and energy, replacing previous displacement over time (velocity) in order to generate the most probobalistic prediction of the future development. Includes 1. Is Non-deterministic, discrete.

2. If something now matches a structure in this network, it also must match the outcome the network predicts. If it does not match, it is stored in the network as well, reshaping its holistic architecture. If the model does not grow outwards over time, it has to grow in itself over time. The connections have to become more intricate, needing less resources, more energy efficient. Includes model 2. Is Non-deterministic, discrete.

3. A model has no network at all, reduces all penomenon to truths that are invariant over time and do not change and give holistic statistical formulas for future outcomes and their probabilities. Numbers have infinitely many digits, infinities exist, functions have to be proven, an ultimate determination wants to be achieved and if not possible has to be achieved through probabilities. Includes model 1. Is Deterministic/Probibalistic (wich is in some sense deterministic with more degrees of freedom), continuous.

4. The model can build networks outward growing and inward growing and does model the past presicely, but one has to wait for whatever happens next in order to precisely model it. The universe does first grow into a truth and then we find it afterwards and area ble to model it, and repeatedly get the same outcome. Eulers number, Pi, Roots, irrational, transcendental numbers may have lets say a 10^100 digits in the universe by now, but we had only time enough to compute 10^10 of them, and if we have reached the point of having computed 10^100 the universe will be ahead of us by a factor of 10^90 again. There are no infinities. Math is a <u>cognitive</u> <u>construct</u> rather than a type of <u>objective truth</u> because it determines. But certain constants digits, or functions grow with the universe itself but cannot be determined beforehand. But used afterwards. Includes 1. and 2. approximates 3. as much as possible, and 4. Is Non-deterministic, continuous.

5. Alike 4. Non-deterministic, but so discrete that it approximates continuity.

6. Concept of universal repetance with equality or with modification or non repetance over time. (To be short could just call it principle of repetance)

7. The ultimate model is the universe itself.

How do the models align with each other

1. Stronger alignment with neural networks used in AI models and mold and fungi networks.

2. Stronger alignment with the biological brain, because of the folding and increased complexity of pertmentilization of the Broadman areas and the interhemispheric corpus callosal and lateralized-cross connections of cerebellar hemispheres and cerebelar hemispheres and the DMN,CNS,CEN, SNS networks etc.

3. Only alignment with Modern Mathematics and Physics (partly).

4. Stronger alignment (not completely) with L. E. J. Brouwer's Intuitive Mathematics*, Nicolas Gisin Mathematics*, Stephen Wolframs and J. Gorard's Model (computational irreducability), Physics (partly).

5.& 6. Contains the models 1., 2., approximates 3. and 4. within Discrete Calculus by Bjørn L. S. Riedel (Riedel-Tree Rules).

7. All models try to align with the actual universe somehow, but ultimately no single model aligns with the universe itself. It is none definable inside its boundaries, it is incomplete to the parts of it as in Gödels incompleteness Theorems. No subset can be the whole universal set, but every part is contained in the universal set.

*the author could be wrong in listing the approaches here

How The Concepts Apply To Other Scienes Like Sociology And Philosophy

Table of contents

Poem

A little Poem,
Think on yer own
Reading others ideas
accepting before thinking
makes yer own insight-
shrinking.

Logic And Perspective

This phenomenon of backing everything with what others wrote arose in a time where people over specialized and generally have less ideas than people in earlier epoches had. Marx, Weber, Durkheim, Said, Wallenberg did neither, they were aware of the others writings I guess, but they have thought for themselves first and then reclibrated their views.

As a concequence of mans many ideals, and as Ideals are only concepts and as concepts can only be formed, obtained, abstracted by a interconnected within an intraconnected system, and as a nervous system is only an interconnected system of nerve cells in layers, and those again an intraconnected network of spezialized neurons, in specific assembly or Broadman areas, the entirety becomes again a network of Broadman areas, that make the individual, one that is just another node in the network of individuals, together making up the species and the species are only one node in the network of all species or all life. Everything seems to be explainable by repetance, discrete, non-deterministic materialism. Materialism has at its basis mathematics, but mathematics not yet includes discreteness or non-determinism. Quite the opposite. And the field acknowledges that since years.
And I wonder if theology too does have its roots in what arises from non-determinism, that a person is a non-determined part of a bigger structure that evolves. Maybe Mathematics ultimately is non-deterministic and discrete but seems continuous in an evolving universe. That would even unify mathemathics with other -ologies and -isms there must be more than just a part of a bigger whole. A bigger whole that already assembled beforehand that had, or had not a reason. An atheist thinks there was no entity that is the reason. The religious person thinks there was one or several entities who had reasons (telesis) to create. And the nihilists thinks of no entity and no reason-

But one thing is equal to all of us. We live in a world of concepts, and as we can't perceive it all, we are not god or gods, but I dare to say that we are not nothing either (not nothing→something). In everyday reasoning, all somethings have a causal reason. We are simply used to that.
We are not the entire universe, we are, we all live and will never know enough to get a final answer. We are a subset of the universal set so to speak, but never the whole universal set, whereas the whole universal set is all subsets at once.

We all have our ways to deal with it. Even not dealing with it is a way of dealing with it. Where has all that exists it's origin ? In the origin! And the origin itself? What a question to ask…but I'll try my best
As we are used to the ideal, the concept that there is always a causal event that predecents the one we are dealing with. We get confused when there is no before. Stephen Hawking had a great analogy here. At a pole, the question «In wich direction is north» makes no sense to ask when you are standing at the north pole, because you cant get further north or south at a pole.
Any net, any causal construction intersecting our dimensions in one point, must be orthogonal to ours. A 2dimensional being would only see a line if whe where to intersect its world with a ball. Origins are always singular. The singular origin must inhabit either

a lower or a higher dimension intersecting ours. But in that reasoning is also the unfortunate result that we get stuck in a logical loop. The question of origin remains still. But it goes back to the same argument than Hawkings, in this higher or lower dimension there also must be an origin. So we push that only away from us. We have to go back to the argument of Hawking. Because in any higher or lower dimension there also must be an origin that has an origin. Sowe only push the truth further away from us.
Either we choose to believe Hawkings Argument or we become a believer of any other -ism or -ology. But after this we are only
left with two choices really, two choices that also reduce to one single choice. Believe. There is only belief left, because at this point of stripping reality apart from itself we cant check or measure anything, we cant penetrate this final frontier. And all statements that are not provable, measurable, verifiable are only statements. We can choose one, but in our human nature, we pick one or another, or none at all wich also would be one.

The final frontier, lies in the concept o fus humans itself, we are not the entire concept but a part of it. Wich inherently removes us as a subset of the universal set. This is true in any self referential system or manifold with any arbitrary topology, an anti de Sitter space, etc. without being a union with its entirety. One simply can not obtain insights into why one exists in the first place… Its far easier to question how something works, but yet again, if one asks all how questions, one will get to the point of exhaustion.

All concepts derived of a singular origin have to be non-singular. Any dualisms such as particle wave duality, measurement problems (position or momentum), wave collapse, mind body dualisms, all I assume, but as a matter of honesty, sanity and reasoning I can't know that.
Dualisms arise from this singular origin at wich even the most elaborate rules fail. Not necessarily originating in it, those rules can be very precise, but will be incomplete, as described by the logician Gödel who proposed incompleteness theorems that are quoted to this day.
We have to accept the reconciliation with the unreconciliable, for resolving the matter is not possible as being only a part of it. This would not be possible with continuous calculus either, but as it assumes continuity and infinities/infinitesimals this leads to no origin at all but a steady continuum as we observe in fractals.
Wich concept finally fits the best is best determined by measurement. But here we encounter it again. We cant measure it all. Epistemiological limits arise, in us, in computers, the individual mind, the collective understanding, in resources, in the energy needed, the universe itself has a lightspeed limit and other physical boundaries as speed of sound or weight or mortality as limit to the perception of time scales bigger than that. Reality may be discrete and non deterministic, but holistically intertwined like a lattice of events but it could be continuous and deterministic as well. Knowledge adds upp, to that knowledge accumulates more, but still it is not entirely whole, its not 'fully', its dynamic instead of static.

Sociology Theory In An Evolving Epochal Phase-Space Of Invariant Epistemiological Limitations But Similar Finite Repetances

The appearance of a panoply of world views is acknowleged.
For example: If a person could not see the parts of a system and would look at the people in the bus and the objects and see them as entities, as Humans and not a system with heart liver lungs and cells this would be the view of the phenomenologist. The rationalist on the contrary would see them as such. He would argue that the phenomenologist never gets the underlying truth, that there are cells, and organelles, and nucleii with DNA threads that evolved and so on and so forth. The dissecting and the wondering is a hard process to the rationalist, it involves constant thinking, something the phenomenologist does not do, could the rationalist think. Wich is a wrong assumption (but he could have stated it that way). Further the rationalist could come to the erroneus conclusion that the phenomenologist just accepts entities without thinking about their parts or how the underlying subunits work.

Rationalist (disintegration heavy) > pehenomenologist (disintegration light)
The rationalist has a reinforced habit of reassamblement of the whole into its parts, and the interplay between people is no more than resource, survival, reproduction management wich is merely assignable to subunits.

While the Phenomenologist could think of the rationalist as someone that is alienated from thinking on the whole, holistically and connect the dots, see the many layers of psyche and thought and feeling and emotion. The tram as a vehicle of transportation in the city that connects friends instead of a machine that does work. He could view the Rationalist as (Hierachy/Category light) < Phenomenologist (Hierarchy/ Category Heavy) reinforced experience and learned, the living is far more than its parts, and so is the interplay between people, the psychology, the feelings in a situation, the tradition, affection, understanding intra relations and with it ontology.

The acceptance of phenomenon and disassembling of phenomenon into parts are to diffrent ways to look at our world. There are dualisms at work and people have their epistemiologic boundary at in correspondance to wich ontological category they belong, how ontology could have constructed placed them, says the phenomenological person, the rationalists looses some truths by looking at the parts of the machinery. The whole phenomenon has greater means than its parts or single actions that amounted to it. «No» would the rationalist again argue, the phenomenological persons looks at the world we inhabit and the matter superficially, instead of finding the deeper truths in its parts that restrict and determine its means.

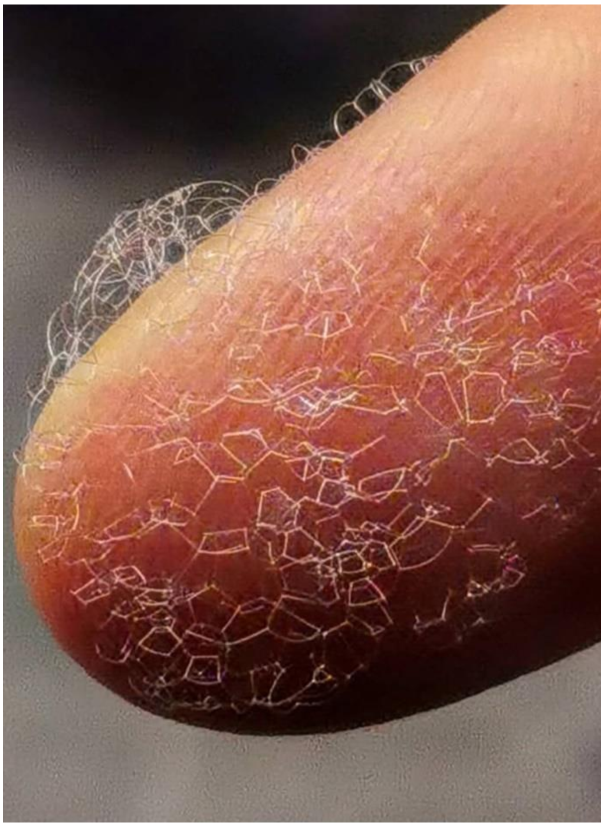
A fitting analogy to their hypothetical dispute is: seeing the world trough two diffrent glasses. Both see diffrently. But actually those diffrences are behind the glasses in our head, our own architecture, our personality. Our manifested, and possibly partly inherited way of looking at an entirety of concepts greater than ourselves. Those restrict us not only epistemologically, biologically but rational thinking is bound to measurement as well. Measurement wich is limited by modern physics instruments and distances andproportionality constants without wich the phenomena would make no sense. And without them reality would rather seem arbitrary.

While an equivalent of the phenomenological measurement or seeing value in the world lacks we also have spiritual aims. Any -isms and -ologies are not taken serious by rationalists like me, because we have not the apparatus to appreciate it.
But often times reality is far more complex than dividing it up into two, three things. Sometimes we cant even do so and add it up.

Additionally we do also have collective and individual ways of looking at society. And that itself shows us something profound about societies, societies have always multidimensional aspects. We can observe that troughout history. Most often there have been common conceptions troughout the same epoche in the majority of people. They are not as rigid as we perceive them, because we only can perceive our epoche as mortals. Writings have told us otherwise. Not every single man and woman has a multi epochal perspective on societies and their own society. Rather slightly influenced monoepochal view that fit into the categories individual, collective, phenomenological, rational.
If we where to look at views from higher standpoint, it would blurr the final abstraction of a truth only more, because in order to obtain it, one had to go even one instance higher, and then one higher, but that makes no sense in the end not only because we would miss out on the small things but other constraints. We will never get a cohesive view upon views, if there is one or several or none at all, that is a conundrum wich will be left as one at the individual basis of knowledge but maybe unfold in a multigenerational accumulation process. All views are tendencies in a phase-space, and in it we as an individual and a group and a world population move around and change it all together like concious vectors forming a storm with the direction that is created by the sum of all partial directions and so does sociological theory. And the Concept Of Finite Repetance gives us just the Epistemiological boundary conditions importantant in Philosophy, Socialogy, Linguistics. Kurt Gödel showed with logic that Mathematics is incomplete, but not how. The Concept Of Finite Repetance shows how mathematics is incomplete.

Philosophical implications of Finite Repetance

We also have to acknowledge the principle of 'computational irreducability' by S. Wolfram and J. Gorard. Soap bubbles cant be modeled the exact way from their initial conditions up to a certain temporal evolution, nor can they be traced back to their initial point in space and time from the picture provided. This leads to an inevitable conclusion: The very first smallest unit in the beginning of time is of unknown nature because it cant be traced by the same backtracing rule as we humans are used to in every day life. And one other aspect we also obtain. If the very first unit of the universe is repeated in anything, and it is of unknown origin, by some unknown rule, one unobtainable, then anything else is of unknown origin. We logically can make sense of everything between the beginning and the end, as we happen to be able to observe and abstract the rules. But the initial one remains for ever unknown and we can do nothing but to accept it. With wonder, with believe, religion or even not at all. This will remain the frontier, and if not, there has to be one by logic.



This Graphic is from the 18.02.2025

Epistemiology, What is intelligence?

Intelligence is finite repetance. But not just finite repetance with equity or with modification. Its the by interaction with other concepts(objects) and the modification of structure of an autonomous concept(object). An object is a closed or open Riedel-Tree structure that describes a accumulation of 1. smallest units (Riedel-o-Trees) that are repeated with near equity, 2. smallest units (Riedel-s-Trees) that are repeated with more modification, smallest units (Riedel-s-Trees) that are repeated with much modification all together such that some parts change more than others, but additionally a growing interconnected object/structure that becomes more finitely repeated with equity (storing memory over time) and also out from that structures that are finitely repeated with the possibility of modification. The structure must adjust itself over time, such that the future outcome is favorable for the object/concept/organism to sustain its own structural integrity by mass and (energy, wich would be mass over time) wich is finite repetance, wich describes entropy as well. Its not at all obvious. A computer chip has smallest electronical parts o nits computer-chips. Electricity can only be repeated finitely (transmitted) trough the metal and half metal parts on that chip. The parts are switched on and off essentially. By coputerlanguage that translates into binary (1 and O). This with the structure of the computer-chips architecture favores a future outcome. We modify reality, by aligning many parts such that there can only be a certain outcome and that the probability of anything else becomes vanishingly low. (example. Tunneling in small parts).

Now that alone is not intelligence, but an intelligent architecture. Build by intelligent beeings. Humans.

Intelligence is arising in a structure where the structure not only predicts, but creates novel outcomes base don the structure that it already has obtained by interaction and aligning such that certain outcomes have to happen in the future or can be generated, something new can be madet hat never has been before. Thats intelligence. The interplay of smallest parts, structural re-alignment, scaling of size. This we see in Artificial intelligence. Here we call structural re-alignment weight adjustment in the neural network. Moores law still holds if parts are of finite size, the only improvement can be made by better architecture, scaling of overall size, compartmentalization as we see in the brain.

Neural networks and nervous systems, molds, fungi mycelia follow Riedel-Tree Rules and with it Universal Finite Repetance, they become a subset of rules of a much broader natural concept. Conciousness is something else still. It seems very likely that a concious architecture just like biological brains. Are even more compartmentalized as Artificial Intelligence Systems. Brains have Broadmann-Areas connected, they are compartmentalized. The brain can obtain abstractions of change over time. A seemingly continuous world changes. Time passes and something persists and something changes. Universal Finite Repetance is happening.

Apart from that finite repetance explains intelligent architecture and evolution in a neo-darwinistic way, where biological evolution is not only happening trough random errors and trial but as the architecture itself gets better, the process of forcing certain favorable future outcomes becomes easier. Is carried on. Modified. Carried on, passed on by the gametes. Certain random elements remain as random mutations, and genecrossing after fertilization.

Overview of how mathematics unifies in the UCFR

All mathematical topics undergo fundamental restructuring under UCFR (Universal concept of finite repetance), but instead of making mathematics more complex, the UCFR simplifies and unifies them by embedding them in a finite, evolving structure that mirrors reality. The Universal concept of finite repetance is a naturalization and by that a simplification. All of these fields are not separate under the UCFR those are all subsets of this same overarching principle. The fragmented subsets or subfields in mathematics are are all emerging from nature likewise

How the UCFR reshapes each field in a cronological list of fields

Algebra → Becomes a dynamic structure rather than static equations, where operations are defined by evolving finite repetitions rather than infinite extensions.

Analysis → Real and complex analysis are restructured to remove infinities and work within a finite iterative framework. Limits and differentials are no longer abstract infinities but steps in a discrete transformation process.

Arithmetic → Numbers are no longer static Platonic objects, but finite structures growing over time, aligning with natural physical processes.

Calculus → Differentiation becomes the single s-Tree-Rules (composed of o-Trees) and integration become finite/discrete summations and iterative transformations. No need for infinitesimals, CFR explains change as finite repetition at different scales by equity, modification and absence.

Combinatorial Game Theory → CFR introduces dynamic game evolution, rather than assuming infinite strategies or continuous probabilities. Game theory already includes game-trees. Riedel-Trees themselves are combinatorial all over nature.

Cryptography → Finite, evolving structures could improve encryption methods and eliminate weaknesses caused by infinite-number assumptions. An encription that takes all the temporal steps a Riedel-Tree function needs to fully expresses itself needs all the time it needs. Even a quantum computer has to make use of time for emerging properties.

Differential Equations (Partially differential equations, ordinary differential equations) → All differential equations must be rewritten using finite iterative processes rather than relying on continuous functions. Much like the finite aproaches for PDE's already used in engineering where engineers aim to create finite lattices to find out where a construct experiences the most stress and at wich points.

Discrete Mathematics → Discrete structures remain, but CFR reorganizes them as naturally evolving systems rather than artificially segmented from continuous math.

Geometry → Shapes are constructed from finite recursive transformations rather than continuous space. Fractals and even bound fractals are replaced by finite repetition since it can create both functions and all geometric shapes in a finite way, in all sizes (defined by the smallest units chosen).

Graph Theory → All graphs must evolve over time instead of being static objects, networks become dynamic, growing structures. There are no cycles that do not require time, there are back and forth modifications but they always evolve forwards in time.

Infinity → Eliminated entirely by the universal concept of finite repetance. Replaced by large but finite structures that evolve over time, structures of smallest units wichs relations can be understood deterministically, but wichs past and future development can only be described probibalistically and wich in non-deterministic as a consequence of each stepwise finite evolution (repetance) being non-commutative on top of the other.

Linear Algebra → Matrix transformations must be reinterpreted as finite operations within evolving finite spaces.

Number Theory → Primes and number distributions are redefined as emerging from structured repetition rather than being purely statistical phenomena. Number arose from enumeration of real world objects and hence can not exist abstractly in a platonic world. They are part of the architecture of smallest units (of varying sizes, and ultimately of the smallest meaningful smallest sizes l_p, t_p. Numbers are always as big as the of smallest units composed structure they describe.

NP=P → Is not true for Turing Machines, but true for the evolving universe, nature itself. As nature is build of the smallest building blocks that possibly are of meaningful finite size and as TM's are build of composed smallest units to favor future outcomes of finite repetance, they are simply impossible to be small enough to include enough $t_p{}'$s as to cover all polynomials that are possible. Wich is described by the incompleteness Theorems of Gödel, wich in CFR become a new layer. The superset contains each set, and by that logic itself, contradictory. The system evolves away from the contradiction, creates a new one, moves away from it creates a new one, and so on and so forth. This creates the finite steps or evolution in the universal concept of finite repetance but also maintains the incompleteness Theorems of Gödel. There are always emergent true statements that we cannot proof. And hence nature creates them prior to us computing them, even if this happens within the TM, before we see the result, and as we see it, nature has developed away from us knowing all of it.

Numerical Analysis and Integration → Approximations shift from infinite summations to finite iterative structures that converge naturally.

Probability and Statistics → Probability is no longer an infinite limit concept, it becomes a finite evolving distribution based on real-world constraints.

Physics → Emergent macroscopic phenomenon like gravity are emergent poperties that cant be described by quantization. Each layer of existence, is described by Riedel-Trees wich describe finite repetance. Reality is like a paranthesis with a smallest unit in it, wich has a smallest unit in another parathesis in it, wich again has a smallest unit in another parathesis in it and so on. Reality is enveloped for each layer and hence each layer makes the other ones up, butt his explains emergent properties that we do not see in specific layers and wich are a consequence of it.

Cantor/ZF Set Theory → CFR Set Theory. Becomes dynamic and evolving instead of infinite, travel sets, conversion sets (repetance with absence) copy sets, (travel, and copy and conversion matrices) describe universal finite repetance with equity, near equity, modification, absence of repetance.

Topology → Continuous spaces and surfaces are replaced with finite evolving structures of finite smallest units, aligning with discrete physical space-time. Unsmoothing Topology making it a emerging field of the smallest units together.

Vector algebra, scalars, tensors → all can be described by finite repetance and are no seperated field anylonger but a subsett hat can be simplified.

Trigonometry → Replaced by Equidistant Point Trigonometry (EPT), redefining sine/cosine functions as finite repetitive n-gon structures rather than infinite smooth and infinite periodic waves. They become finite waves of defined finite granularity, describable by 2D objects expressed along the z-axis, or a composed-smallest unit that gets expressed by finite repetance.

Sources Of The Sociology Part

only for
the word: Panoply,
The names: Marx, Weber, Durkheim, Said, Wallenberg, collective view

Scott, Edles, *Classical and Contemporary Sociological Theory: Text and Readings*, 1965,
ISBN: 978-0-7619-2793-9

The rest of this work is completely original Bjørn Leon Søren Riedel