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NeuralNetworks2.0
Neurogenesis

Polymorphic,oligopoly,dynamicallyadaptive,
NeuralImpulseNetworks

PODANINetworks

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TheProjectontheInternet:

https://github.com/Zoltan-X/Neurogenesis

PODANI Networks - Neural Networks 2.0 - Neurogenesis

Table of Contents

Chapter 1: Introduction

About the Emergence of this Project

This work started on 14 October 2018, with an incredible and gorgeous inspiration that led to this elaboration's first two fundamental theorems. Therefore, the GitHub account "Zoltan-X" was created on 17 October 2018, where the first concepts were published.

What PODANI Networks means:

PODANI Networks means

Polymorph,Oligopoly,DynamicallyAdaptive,NeuralImpulsesNetworks.

- Polymorph: PODANINs are polymorphic, self-evolving neural networks. They have specially designed specifications for neural genesis behavior, defining when, where, and how Axons and neurons are created or degenerated in the network. The network is always mutating and remains in an open learning mode.
- Oligopoly: The neurons are oligopoly Nodes that control the flow of Impulses. Depending on the number of independent types of information they process, they influence the flow of Impulses at the Nodes. Further details follow in Chapter 3.2 Oligopoly Nodes.
- Dynamically adaptive: As open neural networks, they are always in a learning mode, continuously and dynamically adapting to new information. Structural polymorphism works dynamically, with structural changes representing an adaptive learning process of the information flows that form.
- Neural ImpulseNetworks: PODANINs use scalar signals (electrical potentials in the form of Impulses) and dynamic flow control in neurons, among several other aspects that could mimic a real brain.

Characteristics of PODANI Networks:

1. 2 Fundamental Theorems of 4D-Impulse Algebra for Neuro-Genesis.
2. Neural genesis concepts regarding logic and autonomic Nodes and Axons emergence.
3. Super Germ (Super Seeded) Design.
4. Oligopoly Nodes emerge and form.
5. Automatic network maintenance: growth and decay.
6. Self-influencing is the network's "ways of switching, thinking, and acting.".
7. Interaction of Neurons by each other nearby being active.
8. Independent and logical emergence of new Nodes (Neurons) in the network.
9. New Nodes favor forming informational associative content.
10. It works with different types of Neurons, which cause various interactions.
11. The network grows and learns automatically.
12. The network evolves independently and logically in an operating mode without human control or intervention through neuro-genesis.

Chapter 2: The Foundations of the Original Ideas

The 2 Fundamental Theorems of this 4D-Impulse Algebra

Precondition: Impulses in Nodes activate them

When a Node has at least one Impulse, it is considered active. Only they emit the EM field of the Impulses within them.

Neighboring and simultaneously active Nodes generate new Axons that connect them. Furthermore, they interact with each other by mutual influence in choosing the further path through the network. Beyond the spatial dimensions, the 4th dimension in this context is time.

It follows from this that Impulses must be present at the same time, in spatially neighboring neurons, for a mutual interaction to occur in 2 forms:

The 2 Fundamental Theorems from 4D Impulse Algebra

1. (EM near field + brain liquor see: CREB-1 and abstract on magnetic field affinity of CREB-1).

   Nodes connect with new Axons in different expressions.

2. (Receptor and neural transmitter Logic)

   Impulses branch by mutual influence according to different defined cases.

An Example of a minimalistic AI-FoE (Artificially Intelligent - Form of Existence) in the form of an Auto-Actor-Model follows.

An Example of an Auto-Actor-Model

1. A simple Impulse transport along an Axon "Axon 1" from a sensor "Sensor 1" to an action "Action 1" with exactly one Node "Axon 1-Node 1-type A".
2. Impulses are continuously generated by the sensor 'Sensor 1' and transmitted via the 'Axon 1' line and the 'Axon 1 - Node 1 - Type A' Node to 'Axon 1 - Action'.
3. the second Axon appears. "Axon 2" is supplied with Impulses by "Sensor 2". "Axon 2" also has a Node "Axon 2-Node 1-Type B", which is close to "Axon 1-Node 1-Type A". The 'Axon 2' ends in 'Axon 2-Action 2'.
4. 'Sensor 1' and 'Sensor 2' continuously send Impulses via the 'Axon 1' and 'Axon 2' lines to 'Axon 1-Action 1' and 'Axon 2-Action 2'.
5. That repeats until two Impulses are simultaneously present at 'Axon 1 - Node 1 - Type A' and 'Axon 2 - Node 1 - Type B', creating a bridging Axon.
6. Then the behavior changes so that the Impulses in 'Axon 1-Node 1 type A' are conditionally redirected across the newly formed bridge to 'Axon 2-Node 1 type B' and from there to 'Axon 2-action 2'.

This behavior corresponds to the first two fundamental theorems, which accomplish the following behavior:

Legend:

A1= Axon 1
N1= Node 1
A1-N1-A= 'Axon 1' at 'Node 1' with 'type A'
A1-S=SensorasTransmitterSignalgeneratororImpulse generator on Axon 1
A1-A= Action on 'Axon 1'
$I_{i,x}$=(t_j,"A1-S")= Impulse number I on Axon x, here on the Axon at a transmitter point at time tj.

The 1st fundamental theorem leads to the connection of "A1-N1-A" and "A2-N1-B" and thereby with a new Axon. The 2nd fundamental theorem consequently causes a redirection of the Impulse flow from Node type A to B.

In this case, A = B redirects when both Nodes are active, and the Nodes "A1-N1-A" and "A2-N1-B" are diverting the Impulses from the A1 line to the A2 line.

The Impulses of "A1-S"are influenced in such a way that then applies:
from: "A1-S"="A1-A"and "A2-S"="A2-A"
follows: "A1-S"="A2-A"and "A2-S"="A2-A

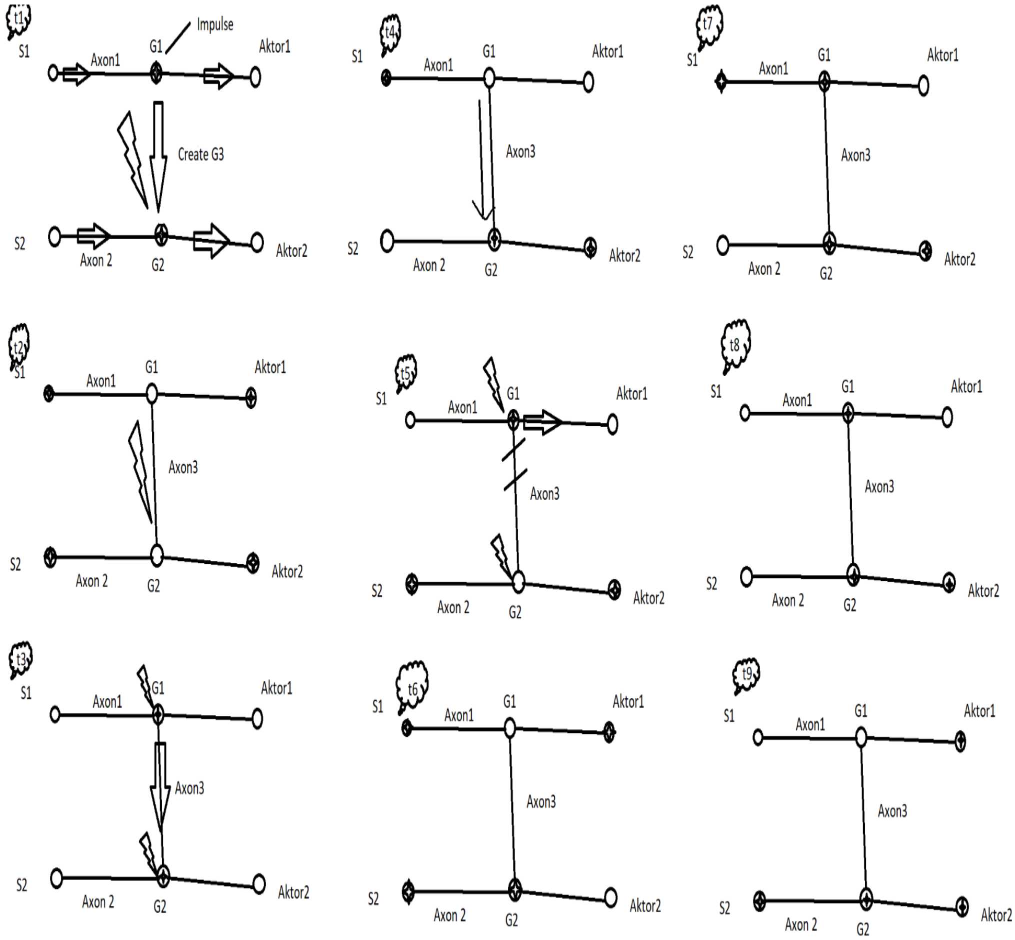
by F(I1,1)(t1,"A1-S")&&F(I1,2)(t1,"A2-S")

with: F(I1,1)(t2,"A1-N1-A")&&F(I1,2)(t2,"A2-N1-B")

follows: Create(A3)with (A1-N1-A=A2-N1-B)

And: F(I1,1)(t3,"A2-N1-B")&&F(I2,1)(t3,"A1-N1-A")&&
F(I1,2)(t3,"A2-A")&&F(I2,2)(t3,"A2-N1-B")&&

In figurative comparison to an auto-actor model, this means
"A1-S"= sends Impulses as a hungry signal.
"A2-S"= sends Impulses as a digestion full signal.
"A1-A"= Food.
"A2-A"= Satisfaction.
"A2-A"= consumes a double Impulse to end the saturation behavior, thus that it stops eating



Super Seed (super germ or primordial germ)

The Super Germ Example has two parallel axons with nodes that interact later. With only two lines, a neural algorithm evolved to eat until satiation. Feeding leads to satiety, not vice versa.

Chapter 3: Elements, Structures, Behaviors

1. Modes of Impulse Interactions

Interaction forms of Impulses with different Node types.

The distinction between Nodes of different types and the resulting Impulse interactions are covered here. Concepts involving Nodes of more than one type follow in 2. Oligopoly Nodes: active versatility of individual Nodes.

Conversion of Impulse Potentials

- Impulse Potential addition
- Impulse Potential subtraction

Enforcement of the transfer through a threshold-based Node

This can depend on:

- the individual Impulse potential
- the number of potentials accumulated in the Node of
  - simultaneous Impulses
  - Impulses Series within a period.

Differentiated Potentials

Explanation of how to create a differential from an Impulse stream on one (or more) Axon(s):

On an Axon A1, in the spatial proximity of two successive Nodes - A1-N1 and A1-N2, the differential is defined by a connection of these two Nodes to another Axon A2, with a Node A2-N1. Nodes A1-N1 and A1-N2 mirror their Impulses to A2-N1 and are transformed into a differential by subtraction. The subsequent Impulses in Axon1 are transforming in A2-N1 and differentiated as a stream of single values. Finally, the result of the subtractive accumulation of the Impulses is a differential with an iteration size of dx=1.

f'(x)=(dy/dx)*(y1-y2)/(x1-x2)

and with the atomic granulation by dx=1 follows

f'(x)=(ImpulseA-ImpulseB)/(x-(x-1))=(ImpulseA-ImpulseB)/1=ImpulseA-ImpulseB

That means a subtractive potential accumulation is a differentiation of two (subsequent) Impulses. It is possible to differentiate without consuming the original Impulses by mirroring them for the given operation. Subtracting needs more than two sources of Impulses (Axons at a Node) with exactly two types of polarised Impulse interpretations involved in this process. The two summed Potentials arise from two distinct Impulsetypes. Subtrahend and Minuend form one or more Impulses from two different types of transmitters (Impulse). The subsequent subtraction process produces the stream of differentiated potentials.

Quantization of Impulses: Summarized potentials.

The aggregated information combines several Impulses into one. The Impulse potential, with the exact position in the network, contains the aggregated information. The network pattern at the merge position is susceptible to recovery by direction reversal. The needed counteract is the quantization of Impulses. The reversal of the condensed Impulses would then be a form of information recovery. The information originated from input (pattern of Impulses in a network) and can be more or less consciously assembled, addressed, and retrieved. The input effect is summarizing, and the reverse effect is quantizing. Initiating retrieval of a summarized set of information - an impulse pattern in a network - results from a single impulse and the quantization process.

Quantizing:From one incoming Impulse at the Node, creating many outgoing.

Reproduced and quantized Impulse potential

- Quantization involves dividing information into atomic pieces (quanta) and distributing them to multiple axons from a single node.
- It is suggested here that mirroring involves accurate transmission of Impulse potentials.

Polarization and common interactions of individual Node types.

Several considered orientations:

- Influencing the Impulse flow according to the EM-Field:
  - As a choice of the outgoing Axon at the dendrite.
  - Increase or decrease of Impulse potentials
  - Increase or decrease of a potential threshold
  - Attraction or rejection of neighboring Impulses
  - Only polarization to influence the surrounding Neurons
  - No effects on individual transmitter types (not susceptible to polarization)
- Influence on Axon formation:
  - Increased field strength and thus the range of Axon formation
  - Change of electromagnetic field lines

It also requires an Impulse potential intensity and a range of interactions that are comparable to the logic of different neurotransmitters in the human brain. And especially the subtypes. The attraction and repulsion of transmitters affect Impulses by EM polarization. Therefore, passband limitations in neurons could make the polarization last longer or reduce the threshold for the signal transmission effect. information is then selectively transmitted to another Axon. Quantization would be an all-in, all-out construct in which all Axons of a given transmitter type pass and mirror the Impulse.

2. Oligopoly Nodes: active versatility of individual Nodes.

Oligopoly Nodes

However, the need to distinguish between Nodes based on different receptors and transmitters, as well as their interconnections, creates the need for Oligopoly Nodes. In these Oligopoly Nodes, oligopolistic logics of Node types emerge under defined conditions. Therefore, the forming of multiple origins by axons is necessary.

Here is a list of Node logics to use:

Differentiation of Node types according to

- additive behavior
- subtractive (differentiating) behavior
- Culvert boundaries
    - temporally summarizing behavior (accumulating potentials)
    - Passage threshold for Impulses
    - muting behavior
- mirroring behavior
- merging and quantizing behavior

The different control logics are defined by various Node types, each with its own set of receptor and transmitter logics. These logics separate the different areas by something protective limiting as the meninges membranes in Human brains. The term "variable receptor and transmitter logic" refers to the behavior inside a Node, where incoming impulses activate specific transmitter types, resulting in a particular response from the Node.

Different ways of branching:

• A = B	Redirection
• A = (A & B)	Mirroring
• C = (A & B & …)	Quantization
• (A + B) = C	Additive behavior
• (A - B) = C	Subtractive behavior
• (A & B) = C	Merge
• (A1 + A2 + …) = A	Threshold

Bridge building according to Impulse interaction rule 1

1. Node type X ⇔ Node type X: A bridge forms between two identical Node types
2. Node type X ⇔ Node type Y: A bridge forms between two distinct Node types

For Impulse Transmission modes with a variety of types

- One Impulse Activates all Node type-specific interactions given in the Node together
- Node input to Node output as Node-specific behavior

Premise:
InputType = OutputType

When a signal enters a Node, it does so through a circular region on the surface of a sphere. That is because the entry point can overlap with other Axon entry points of different neurotransmitter types. All neurotransmitter types within this entry zone will activate by incoming Impulse. The spherical shape of a Node simplifies the processing required, as the Axon entry zone is also circular. The Node surface consists of overlapping areas with different types of neurotransmitters. Different neurotransmitter types within the Node are on the inner surface of the entry points. These areas may overlap with zones of different types. When an incoming Impulse activates an area inside a Node with different transmitter types, the Node sends Impulses of various types along corresponding Axons away from the Node. More on this in Chapter 7: Neural Genesis.

Inner Polarization of an Oligopoly Node

An internal Node polarization generates outward EM fields, which could cause Impulse-flow interactions. These could cause a targeted change in the output Axon. An Example:

When a type 'A' Impulse reaches the Oligopoly Node 'N1', it can be influenced by the nearby active Node 'N2'. The EM field strengths from neighboring active (polarized) Nodes can then interfere and change an Axon. Sometimes, a change in the outgoing Axon can occur when an Impulse bypasses the standard route due to polarized neighboring Nodes. For example, "N1 = N3" may change to "N1 = N4". The transmission path of the Impulse-containing Node can be affected by the EM field. Additionally, there may be a mix of Impulse types, with different types emitted due to overlapping areas in the input zone. By changing receptor types, subtypes of a transmitter, and overlapping types, further variations can emerge.

3. Transitive dependencies: Translation of information

Explicit transitivity and pass-through controlled transitivity

- Explicit transitivity: All kinds of Impulse potential transformations (additive, subtractive, attenuated, amplifying, and possibly more)
- Controlled transitivity: Here, Impulses arriving simultaneously or successively in a short period or accumulating with a time-dependent loss of its potentials are combined to emit an aggregated Impulse when a breakthrough potential, defined by Node strength, is reached. Heavy Nodes could imply high thresholds for Impulse transduction to an outgoing Axon.

Usability of Impulses-controlled passage levels

In various correlations, Impulses with their transported potentials must disappear or be attenuated. A subtractive potential conversion alone could be overwhelming. Also, the derivation into actions might be able to do this only to a limited extent. Enrichment with quantized or amplified Impulse patterns would result in more overdriven and interfering patterns. The transitive reduction with a passband threshold or direct Impulse reduction could normalize this excess. Thus, the solution is to use transitive behavior. The potential scaling can:

A. Selectively reduce or eliminate excessive Impulse potentials
B. Reinforce Impulses to keep information actively stable.

These conditions control the amount of simultaneous Impulse information. The necessary control of the Impulse threshold (transitivity logic) and the Impulse reinforcement describe the behavior above. Thus, transitive control can reduce or amplify output signals in a targeted and precise manner. By accumulating several Impulses and scaling them correctly, output signals are amplified or attenuated.

4. Neural range separation

Demarcation of different dedicated areas

A Demarcation of dedicated areas isolates the chaotic, complex interactions and allows meaningful processing in a demarcated network area. These demarcated areas prevent independent or unrelated information from being associated too early. They could be influenced in a mutually disturbing way by foreign Impulse potentials in the vicinity. Thus, a closed or demarcated processing area offers meaningful processing for information of a given independent context. That includes information processing of all kinds and at all levels.

5. Vitality, strength, degeneration, and renewal

Taking into account a given vitality of Axons and Nodes with specific potentials of Impulses, the effects on Nodes and Axons result in a regenerative, degenerative, or even damaging behavior. Different characteristics are possible:

- Immediate and sustained change in behavior and network due to pain and trauma constructs that result from excessively elevated intensities of Impulse potentials with detrimental effects.
- Forgetfulness due to structural degeneration (caused by lack of structure renewal).
- Reinforcement of information structures by repeated imprinting.
- Increased transitive accumulation and passage threshold in heavy Nodes.

Chapter 4: Breaking the layer logics

1. Levels of Sensors

- Sensors outside the neural network can be considered real-world sensors
- Sensors inside the neural network are part of the information flow control.

2. Levels of Actors

- Actors within the STN can be as Impulse emitters abstracted.
- Actors outside the STN: Possible Actions of the Artificially Intelligent - Form of Existence

3. Layer Concepts

From a given point of view, there are three layers:

1. Sensor Layer
2. Processing Layer
3. Action Layer

These 3 Layers act in the way ofInput -(Processing)-Output, which means:

- Sensors act as input generators
- All handling in between Sensors and Actions has to be assumed as part of the processing layer
- Actions are about how the information is emitted as output.

4. Processing layer (inner layer)

Information processing layers do not exist as specific elements in neural networks but are more likely than the opposite. The outside or inside abstraction makes the inner STN look like a processing layer for the outer STN side. Therefore, any structural abstractions that define a processing layer, where the sensors and actors lie outside a particular processing region, generally conform to this definition.

5. Processing levels of Impulses

The Neuro-Genesis and the spatiotemporal Impulse approach, with patterns of near-field effects of different Node types, cannot be separated.

- Impulse flow direction interactions and type definitions of Impulse flow control in Nodes, considering near-field effects.
- Near-field effects in Nodes generate Axons, Nodes, and interactions through nearby active Nodes.

6. Reconstruction of Impulses

We need to generate Impulses for the reconstruction of information, which is related to the Impulse generation for the quantization from a single Impulse to the whole information. A reconstruction of summarized Information (multiplied Impulses from a single Impulse at a Node) is possible through quantizing or mirroring to generate additional Impulses. On the other hand, transitive accumulating may also be affected, as Impulses are collected there.

Chapter 5: Near field effects

The CREB-1 Dilemma

For the first fundamental theorem, a protein that orients itself towards electromagnetic fields is derived. In this context, isolated CREB-1 proteins are relevant in various studies. Therefore, in the following, this effect is attributed to CREB-1 proteins as a proxy. For reasons of computational complexity, we avoid CREB-1 calculations, except for a possible fictitious growth measurement in the form of distance reached per time.

The Dendrite Theory

The dendrite theory goes along with the approach of a genetic predisposition and slow growth of tree-like branched structures. It doesn't make sense in the context of information formation as a structural mapping in the learning process, but it does in the context of super germ growth.

The magic of concatenating closely spaced Nodes

The chaining of Nodes with Axons among each other defines the structure for information mapping, which then can be reactivated by Impulses. This effect must be limited so that not everything gets hopelessly chained. Luckily, the not-used structure degenerates again and counteracts it. According to the electrical potentials in the individual Nodes, this dynamically determines the range of a possible concatenation. Therefore, proper scaling favors a magical behavior. The "magic" of a well-scaled connection range is the advantage of meaningful complex context that is connected, as thereby an accurate information mapping is managed. With a misdesigned scope for cross-linking of Nodes among themselves, a total cross-linking defines a natural limit. In contradiction to this and based on degeneration for no longer used Axons and Nodes, a releasing effect would take place and counteract reaching this limit, representing the Polymorphic behavior of PODANI Networks. More detail in Chapter 7: Neuro-Genesis.

Limitation of the near-field effect

The spatial limitation of information that can be chained allows the reconstruction and limitation of the patterns that caused said chaining. Thus, only small amounts of information are concatenated at once, which, however, can represent partial complex facts across several different zones. For a targeted information reconstruction across several zones, there is a need for an accurately scaled chaining range on the one hand and an overloading problem through too many associative connection structures on the other. Such overloaded associative connection structures won't chain up meaningfully and could make it even harder or impossible to recover meaningful enough information.

These overcharge problems are defined as follows:

- Too many simultaneous Impulses
- Too wide chaining restrictions

In connection with the algebraic necessities and the near-field effects, they lead to "Noise" - signal noise, which negatively influences finding an adequate solution. Therefore, it requires the possibility of modulating noise by

- Attenuating systems for less signal noise
- Generally regulating systems or logic

Reduced signal noise is necessary to delineate different areas. These should be united using only a subset of the total active information. But they shouldn't be distorted by Impulse and signal noise because their accurate reconstruction might be impossible. This effect is caused in humans by the shielding effect of the meninges but would be negligible in the context of emulated processing. As the separation can be pre-defined in the virtual domain, separate spatial mapping computations with an isolation layer are unnecessary. Still, adaptive transitions are required to make the whole network appear interconnected.

Chapter 6: Retaining, remembering, and reconstructing information

1. Circular flows: Obtain information without changing the network

- Information can remain persistently active through circular Impulse streams.
- By mirroring Impulses from the circulating Impulses stream or parts, Information is kept active, and Impulses diverge to trigger the start of further processes.

A further control effect of these circulating streams requires further interaction rules.

2. Quantified information: Creating and restoring

Impulses that arise from a merged set need a reversal effect for restoration. To restore the information pattern from the merged Impulses, It has to quantize (break down) a single Impulse into many information quants (single Impulses). For more information, see Chapter 3.1 Quantization of Impulse: Combined Potentials.

3. Short-term memory to long-term memory

In terms of human short-term memory and long-term retention, this is a phenomenon that PODANI Networks can take into account. It is a limited set of Impulses that keep the information circulating in short-term memory so that it can appear in long-term memory. The speed of this action depends on the intensity of the perception (size of the Impulse potentials) and the associative diversity; Both aspects increase memorability. Here, long Axon travels are a criterion for why we cannot internalize complex or complicated things immediately and at once. Otherwise, the CREB-1 dilemma applies and can mimic a brain to a limited extent by parameterizing concatenation ranges and growth rates.

Chapter 7: The Neuro-Genesis

1. Neuro-Genesis (formation of neural Nodes and Axons)

Neurogenesis is the independent creation of new neural structures. Thus, new Nodes and Axons are automatically created or degenerated under certain conditions. The aim is to achieve a learning capability of the AI-FoE in free operating mode, which produces meaningful results through intelligent learning without human intervention. Also, the structural polymorphism by created, maintained, and degenerated structures through the Neuro-Genesis behavior is the subject of independent improvements of an AI-FoE.

The Axon Formation

The first of the two Fundamental-Theorems describes the formation of new Axons between two simultaneously activated Nodes. Nodes are active by definition as long as they contain Impulses. Between two neighboring activated Nodes, a connecting Axon, if not present, arises immediately. However, this Axon only arises up to a certain distance, which has to be scaled correctly and based on the intensity of the Node's EM-field. A growth of Axons is in the sense of a slow dendrite formation ignored here. Linking the range of formation of Axon connections to the electrical potentials in the Nodes seems to be sufficiently dynamic and convenient.

The Node Formation

The position for the Origins of new neuronal Nodes must be on an Axon, or they will never receive Impulses. Beyond the Super-Seed at the beginning, where Nodes subdivide long Axons, crossed Axons (Nodes of Axons) are the best place for new neuronal Nodes. Therefore, we define new Nodes at crossed Axons. Because of simplicity, we calculate Axons as a direct connection between 2 Nodes, and we have to define a Node that can not be on direct and straight connections.

Axon grew between Nodes

Directly or according to patterns of electromagnetic fields?

Electromagnetic fields would cause different Axons to cross specifically and form a Node at that point. As a virtualized imitation, this is very complex. In virtualized imitation, limiting the Neuro-Genesis effect to its reach could be a convenient approach. The neural genesis radius is the distance from a Node to any other Nodes within which Axons establish a connection. In a constant neuro genesis radius, everything within this range that is simultaneously active will become connected through missing Axons. Furthermore, an accurately defined range can adapt to differences in dynamic Impulse potential intensities. Just as a new Node should best emerge in the middle between active Nodes, it develops an instant meshing with the other neuronal Nodes.

2. The calculation for an appropriate site for originating a Node

Using a spatial center between EM-Field potentials of the Impulses distorts the space so that **$f(X_{Radius})$= potential/distance** defines a simplified calculated, specific location of a new Node. The Node is in the spatial center of all included Nodes. It can also be defined as spatially offset for better location assignment, according to the potentials.

A short explanation:

By spatially distorting the target position according to the Impulse potentials, these Nodes have better information content. Future connections can advance from the position selected more precisely. This position contains a more precisely tuned information binding for subsequent information entities.

Simple 3D Example calculation for the origin of a new Node:

The Nodes A, B, and C with
A (X, Y, Z) = 0,0,0
B (X, Y, Z) = 3,0,0
C (X, Y, Z) = 3,4,0

3 potentials Au, Bu, and Cu with:
Au = 10V,
Bu = 50V,
Cu = 100V
and r as the distance between two Nodes

AB:	fx(A)=r*(Bu/Au+Bu) = 3* 50/ 60 = 2.5		= 2.5, 0.0, 0.0
BA:	fx(B)=r*(Au/Au+Bu) = 3* 10/ 60 = 0.5		
AC:	fx(A)=r*(Cu/Au+Cu) = 5* 100/110 = 4.545	sin/cos 60°/30°	= 2.7, 3.6, 0.0
CA:	fx(C)=r*(Au/Au+Cu) = 5* 10/110 = 0.454		
BC:	fx(B)=r*(Cu/Bu+Cu) = 4* 100/150 = 2.666		= 3.0, 2.7, 00
CB:	fx(C)=r*(Bu/Bu+Cu) = 4* 50/150 = 1.333		

Now the center point is formed
AB: = 2.5, 0.0, 0
BC: = 3.0, 2.7
AC: = 2.7, 3.6

ABC: = f(x) (2,5+2,7+3,0) /3 = (2.7, ?.?,
f(y) (0,0+3,6+2,7) /3 = (2.7, 2.1, ?)
f(z) (0,0+0,0+0,0) /3 = (2.7, 2.1, 0.0)

Node D is created at the coordinates: f(A, B, C) = (x=2.7, y=2.1, z=0.0)

3. Further clarification of Oligopoly Nodes in Neuro-Genesis

Oligopoly nodes specifically form at processing transmitted information. They emerge by rules of neuro-genesis Concepts when new axons connect with the Node. The selection of receptors and neurotransmitters here may be determined by:

- The neuronal transmitter type equals the receptor type. This results in local dependencies.
- Active Oligopoly Nodes have interactive dependencies, including entry points and mutual Interactions.
- Regulating interactions with other active Nodes

Rules about auto-generating possible Oligopoly behaviors are missing.

Depending on the Impulse potential, areas emerge at the spherical entry points, which create overlapsofthetransmitter-typelogicinthisareaattheentrypoint.

Furthermore, Impulses in the Axons are necessary to cause regeneration or hardening of the Axons and induce Node formation by crossed Axons.

Therefore, the effect of CREB-1 protein should be thought of again in EM field-induced Axon formations and dendrite growth. In this context, it would also lead to long concatenations on electromagnetic field lines.

Chapter 8: Drive of AI-FoE Basics

This chapter covers the Motivation and Driving Principles of an AI-FoE. These principles constantly activate an AI-FoE to make it alive and simultaneously slow it down to avoid over-activation.

1. Activating concepts

Signals are needed to wake the AI-FoE from rest and result in activity. For this, a subset of the AI-FoE must remain active or receptive to detect the waking signals.

Example: A motion sensor activates the AI-FoE.

- Trigger signals
  - On the sensor level, which triggers processes. Here, induced signals start various primary processes.
  - Self-assessment provides signals from processing that generate triggers for actions. That corresponds to the filtering of signals before an activity trigger results in a reflected action.
- Forms of waking signals
  - Motion sensor
  - Acoustic alarm
  - Optical alarm
  - Being that the AI-FoE activated by a switch
  - Signals from preprocessing
  - Time: Activity only at certain times

2. Deactivating concepts

For putting the AI-FoE into an idle state, triggering events are required that signal the AI-FoE to deactivate. In this scenario, the AI-FoE is either partly or entirely inactivated.

- Trigger signals
  - Missing activity triggers: If no tasks are pending, then the AI-FoE should deactivate itself.
  - Time: Activity only at certain times
  - Low electrical: When self-observation of one's electrical reserves reveals a condition that requires treatment, in the sense of a renewing recharging process.
  - Through signals from sensors
  - Through signals from processing

3. Virtualization of pains

The ways of acting and thinking - black pedagogy, change immediately through pain. Pain drives us, and our reflexive actions usually save us from harm. Thus, pain is a driving or nudging factor for becoming active and acting. It is conceptually indispensable to successful AI-FoE design. We emulate pain with exaggerated Impulses, and as a result, Axons and Nodes change. We need a scaling from when it triggers consequences. Regarding the calculation of static scaling, alternatively, the calculation can take place dynamically via the strength of the Axons to Impulse intensities.

- Nodes and Axons change immediately, permanently, and seriously
    - Nodes
        - Transmission of Impulse potentials is jammed.
          (pass barrier or increased threshold passband)
        - Excessive Impulse Potential as a result of it.
    - Axons
        - Provided Axons are temporarily damaged and then avoided.
        - Excessive Impulse-Potentials of transitivity effects with harming surges.
        - Alternative behavior as a result of it.
- Consequences of the surges
    - Causes Strong Signal Noise.
    - Induces further surges and causes possibly expanding harmful changes.
    - Causes heavy polarization in reflexive reactions.
    - Requires rapid spatially propagating attenuating action to keep subsequent damage development low.
        - Comparable to an endorphin flood anesthetizing against neural trauma formation
- Restoration of the healthy state through
    - Neuro-Genesis: renewal and degenerating of an existing structure.
    - Restoring an environment close balance of the Impulse potentials.
    - Derivation of the tensions across the action levels.

Chapter 9: PODANIN in free Operations mode

4D Impulse Algebra and Neuro-Genesis in Free Operation

1. Flow structures in growing networks

- Are determined by a spatial limitation and a super germ flow direction in a specific area
- Different areas mean a mutually independent way of processing and should be connected or crossed with the other areas in time for the unity of the whole.

2. Control of the Impulse flows

- Sensory input
- Preparation levels with refinements of the grown structure
- Processing layer
  - Various preparation levels with refinements of the grown structure
  - Intermediate output levels and tapping of results from processing
- Transition layer between the areas
- Output to the continuing (action) layer

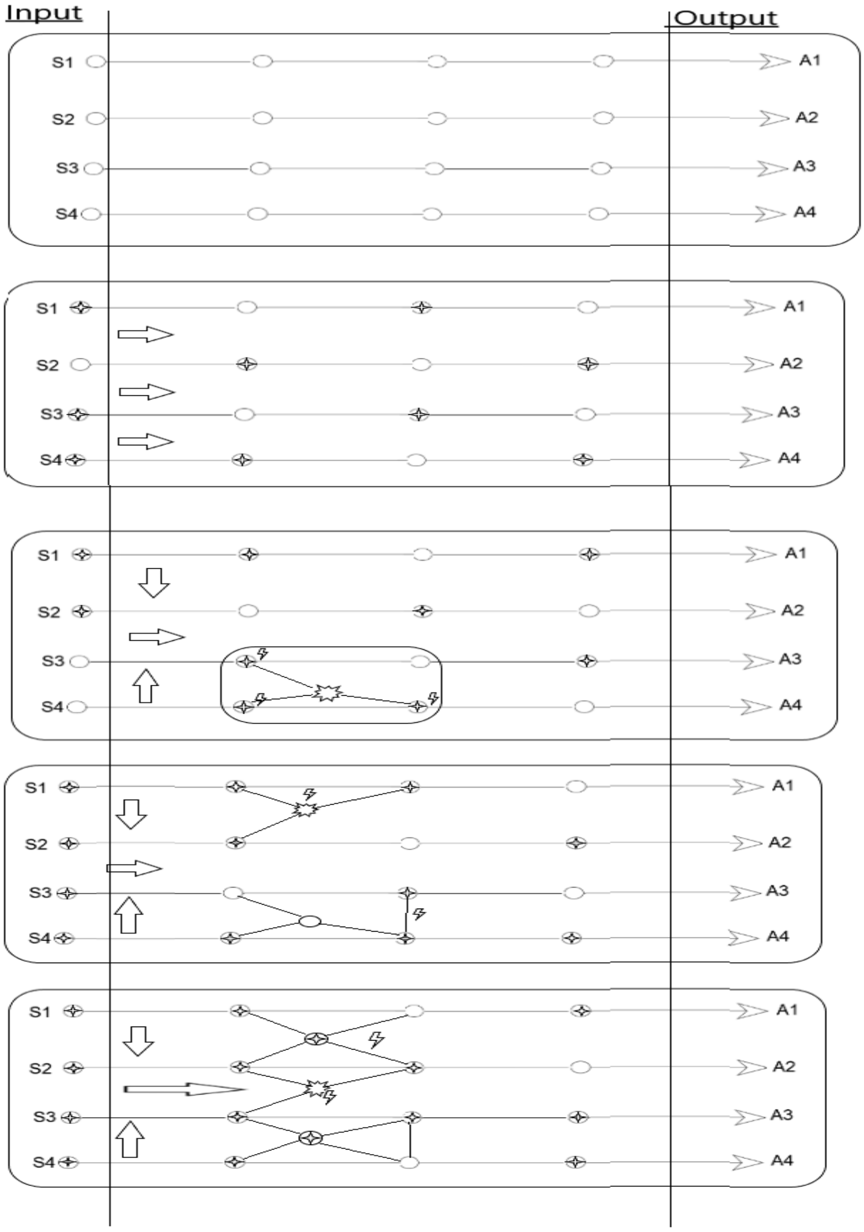
3. Uncontrolled Neuro-Genesis effects

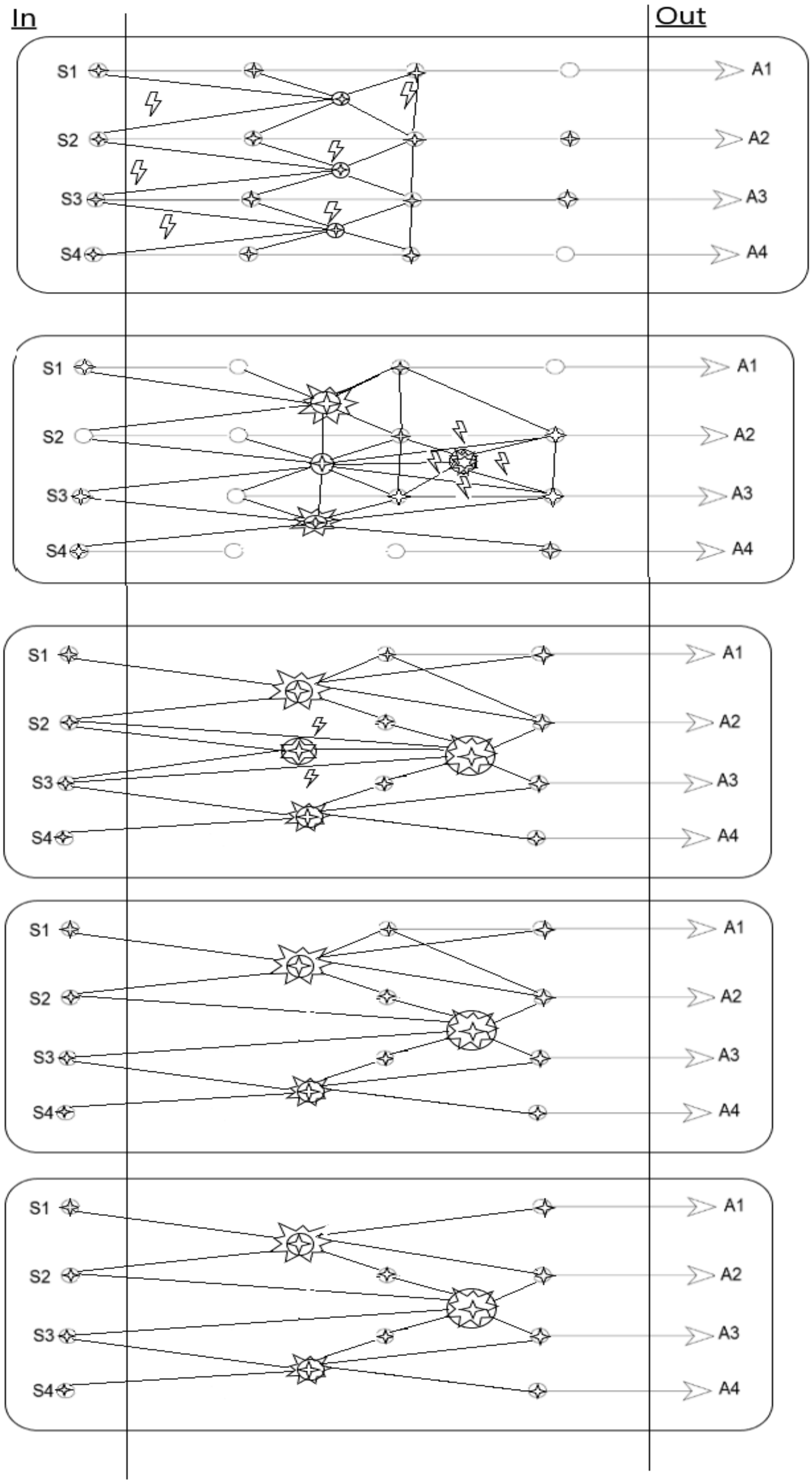
- Axons
  - Through emerging and degenerating Axons, the network mutates constantly. They form connections between Nodes and emerge new Nodes from crossed Axons. Thanks to subtypes - comparable to neural transmitter types, the neuronal flow control is continuously guided to the next level by distinct polarization as designed in the super germ. However, if the super germ infrastructure is already in a structurally changed evolved state, even predetermined flow directions are no longer guaranteed.
- Nodes
  - Multiple active Nodes in an information-mapping area favor the refinement of polarizations and the interconnectedness of closely neighboring Nodes for associative binding and bridging.
- Consequence:
  - This process deforms the structural framework from the super germ and reduces unused and orphaned Axons and neural Nodes.

This section presents a fictive Example of the network transformation that PODANINs create with Neuro-Genesis concepts automatically. The following Example is just for a demonstration of a possible transformation process. This process has various not specified or determined behaviors of the Nodes. This example only aims to showcase automatic Neuro-Genesis effects. It's not a fully functional AI-FoE example, as discussed in Chapter 2 - An example of an Auto Actor Model.

A Fictive Example of an Automatic Network Transformation

This section demonstrates a hypothetical network transformation that PODANINs perform automatically using Neuro-Genesis concepts. Note that this example only showcases automatic Neuro-Genesis effects and is not a fully functional AI FoE example as in Chapter 2 - An example of an Auto Actor Model.




In
Out
S1
S2
S3
S4
A1
A2
A3
A4

t0:
The Super Seed in the first image consists of four independent processes, where each behaves like a neural network. Each process represents a straight axon that connects with other axons between neighboring nodes. The axons are parallel to each other and have three successive ordered nodes.

t1:
The diagram associated with the Super Germ structure shows the first Impulses as 4-sided stars positioned at the center of the Node pictogram. The connections of the Nodes are in the pictogram as straight and continuous lines for the Axons. There is no near-field neurogenesis effect in this image. The initial Impulse pattern prevented the Nodes from activating. There weren't any Nodes containing Impulses, and being sufficiently close to the electrical energy potential of the Impulses entering the Nodes to emerge a neuro-genesis effect up to that point. Bold arrows illustrate the main Impulse flow directions in this graphic.

t2:
The progression of the Impulse streams in the neural network has changed the pattern. Now activated Nodes in sufficient proximity start a neuro-genesis process. Axon formation occurs between active Nodes. Crossed Axons form out as new Nodes. The crossed Axon will immediately or soon become a fully functional Node. The Neuro-Genesis effects are indicated in the pictogram by lightning icons.

t3:
The crossed Axon emerges as the first new Node, and further Neuro-Genesis effects evolve.

t4:
More and more Axons emerge as bridges between Nodes. Some close and active Nodes are producing crossed Axons, so Nodes are also starting to emerge. The amount of change is already huge at this point. A meshing of all related independent processes is developing.

t5:

The high activity causes many new Axons to form, and some of the new centralized Nodes become stronger as part of another Neuro-Genesis effect.

t6:

Unused Axons start to degenerate and vanish. The missing structural renewal from missing Impulse transports causes this. New and significantly bigger Nodes appear, caused by the upcoming traffic amount. The Impulse potentials cause enriched EM-Field effects.

t7:

A clear network transformation process is depicted, already well advanced, but not yet in its final structure pattern.

t8:

The structural network continued to develop as the transformation progressed, with strong knots forming and unused Axons degenerating completely. Subsequently, some Nodes lost all Axons and were eliminated immediately from the network. It is superfluous to simulate the process of Node degeneration because a lost Node can never receive Impulses to interact with again. So they can never connect to a network again. Nodes are eliminated as useless or dead parts of the transformation by immediate deletion when they reach a state where all Axon connections are lost.

t9:

In the final image, a seriously changed neural network remains. It has evolved automatically through the Neuro-Genesis concepts. The original structure of the Super Germ has become unrecognizable here, as it has undergone several changes that evolved. The number of neural elements changed from t0, with 16 partial Axons and 12 Nodes, to 18 partial Axons and nine Nodes in t9. Also, the independent processes are now meshed together. At this point, the network looks unoptimized. Two single nodes only split their axon and don't connect to other nodes. These nodes could be active information points in the future but have no further use.

Chapter 10: AI-FoE Design Concepts

1. Structural recommendations

- To outer delineation areas
  - Separation of independent information types
  - For closed areas of distinct information topics, this would make concatenation only through Associative features within this information type to similarities available.
- Merging regions
  - Unification of different types of information
  - Transitions in the information
  - Unification of partial information
- Controlling regions
  - Processing according to the EVA principle
  - Evaluation
  - Influenced action from polarization in closer proximity to the process itself
- Circular structures
  - Short-term memory
  - Circular Process Flow of closed topic areas in the whole network system
- Dissipating structures
  - Actions
  - Muting logic
    - Loops for reducing the noise of Impulse Potentials
    - Spatially spread of attenuation for throttling the Node's functions
  - Dissipation of Impulse streams
    - Into grounding
    - To accumulate charge

2. Paradigms of a self-assessment

- Implicit control behavior
- Super Seeded evaluation logics; see Auto-Actor-Model
- Ambivalent polarization for self-assessment
- Mutual interactions of active Nodes with in consequence:
  - Impulse redirection
  - Neuro-Genesis: Nodes and Axon formation
- Emotional structure: Automatic, Super Seeded Evaluation Mechanisms.
- Learned assessments should be spatially associative.
- Pedagogy of AI-FoEs to drive
  - Evolve a comparing (differentiate) the quant- and qualities, ability.
  - Aligning the individual AI-FoE drive to needs and desires.
  - Damage prevention; risk assessments
  - Triggering of "pain" must lead to an immediate change in behavior
  - Pain avoidance As a result of pain experiences.

Chapter 11: Oligopoly Nodes - structures, patterns, and designs

1. Type A = B Impulse redirections

Related information processes, independent of each other, can result in the same subsequent actions. They behave like separate networks and are processed accordingly. For instance, consider the example of the auto-actor model discussed earlier in this document, where the Impulse of the eating process got redirected to the network of evaluating a feeling of satiety. That means that without eating, there can be no satiety. The satiety signals indicate that the eating process should stop, and this causes an Impulse redirection.

In summary, information meshes that are related, subsequent, and independent switch between each other redirect in the type:

A=BImpulseredirection

2. Different types of merging and quantizing information.

Multiple Nodes could handle quantization in this way, and this creation and recovery requires a specific neurotransmitter. Thus, various transmitter types from even more Axons could interact independently. We define that the transmitter is equal to the receiver neurotransmitter and that there are logics where one neurotransmitter influences the behavior of the others or does a quantization with only one type of transmitter.

3. Self-optimizing through a circular flow

Circular flows can establish a learning process.

The cyclic flow could be divided into subsequent sections of processing as follows:

…-Sensor-Decision-Action-Evaluation-Repeat-…

Explanation of different sections and their cyclic interacting behavior:

- Sensor: This is where the external input streams into the neural network. This input area initiates all further processing.
- Preprocess Action: The sensor input is analyzed to determine the appropriate action to achieve the desired outcome.
- Action: The Impulses that emanate from this point serve to control and coordinate everything from a single action to a complex set of actions. To maintain the circular flow, we need to separate the Impulses by either mirroring them or generating them through quantization.
- Evaluation: The Evaluation process is the differentiation of given results and comparisons with past experiences. This section then starts sending Impulses into the preprocessing section to thereby possibly influence the selected action.
  This section then induces evaluated Impulses as part of the Sensor and Preprocessing Input to influence this cyclic flow.
  The changed Impulse patterns are part of the self-optimization process through comparing results and self-changing their further acting.
- Repeat: At this point, we start over at the Sensor and Preprocess sections.

Chapter 12: Recapitulation / Formulary

1. Fundamental Theorems of 4D-Impulse Algebra and Neuro-Genesis

The data type of the information - an Impulse - can be described best as a signal representing a dynamic scalar- or boolean blob.

Impulse Interactions Rules

1. Nodes connect with new Axons in different expressions.
2. Impulses branch by mutual influence according to different defined cases.

Neuro-Genesis Rules

1. Axons arise as bridges between nearby neighboring Nodes, which are simultaneously active.
2. The Axon pathways originate on the EM field lines that bring about the Impulses.
3. Axons are not necessarily one-way streets.
4. Nodes subdivide Axons into meaningful lengths.
5. Nodes arise at crossing Axons.
6. Nodes are formed either
   a. immediately,
   b. with a period of formation,
   c. during periods of rest, or
   d. by gating with Impulses
7. Axons between the different Node types define themselves automatically, according to the principle: origin type = target type
8. Depending on the typing in Oligopoly Nodes, type changes of the Impulses in the Nodes occur due to internal polarization, passage limitations, and overlapping of transmitter and receptor types (subtypes)
9. Passage limitations can be reduced or increased by EM sensitivity
10. Depending on the Impulse potential, radial surfaces emerge at the spherical entry points. They scale as potentials related to their radius. These generate superpositions of the transmitter-type logic in the sphere, as a circle, at the entry point.
11. Node type conditional polarization: According to different criteria for joint interaction.
12. The vitality, strength, and conservation influencing Node properties
    a. Pain and trauma: Immediate and sustained changing of the network operations.
    b. Forgetting due to structural degeneration caused by lack of stress in the area.
    c. Strengthening information structures by repeated renewal through Impulse transports.
    d. Transitive behavior, Nodes strength to Impulse potentials

2. Axons, Nodes, Impulses, and EM fields

Axons

- Transport Impulses.
- Arise between 2 active Nodes on electromagnetic field lines.
- Axons become stronger and more resilient through renewal from usage as Impulse cable lines.
- Axons would constantly degenerate in strength and resilience if they don't experience structure renewal through recurring use.
- Nodes form at crossing Axons.
- Axons are not necessarily unidirectional.

Nodes

- Nodes arise on Axons.
- Nodes subdivide Axons into meaningful lengths.
- New Nodes emerge at crossing Axons.
- Oligopoly Nodes harbor different transmitter types in their inner.
- Accumulating, limiting, and scaling Potentials of Impulses.
- The transmitter types are on the inner side of the sphere surface and represent the Node shape.
- They follow the premise: Input- equals Output-Transmitter.
- Additionally, overlaps in input zones always mean that the transmissions of all transmitter types in the input zone of this Axon take place.
- The entry point zone will include the transmitter types of the own and foreign axon entry points that overlap. These specific overlapping areas will trigger all transmitters from this area upon arriving Impulses.
- Nodes are activated when an Impulse arrives.
- Active Nodes influence each other.
- The Impulse paths occur influenced by internal and external EM fields.
- Input Neuro-Transmitter types equal (always) also output Neuro-Transmitter types.

Impulses

- are transporting an electrical potential
- polarize and activate Nodes when they arrive there
- influence and shape the EM field
- affect maintaining, strengthening, and growing Axons and Nodes.

EM fields

- Impulses generate the EM fields
- The meninges shield the individual EM fields from each other and strongly attenuate them.
- EM fields polarize the Nodes so that they control the trajectory of the Impulse.
- EM fields determine the formation of new Axons.
- EM fields influence the neurotransmitter actions in Nodes and change Impulse flows as they attract or repel neurotransmitters.
- The EM field lines establish the spatial formation of Axons away from the shortest connection and allow Axons to cross each other.