

How I get to the completed book. How do I do it? What do I need to build? What is the easiest, most powerful, most efficient pathway to getting the book done in the best way possible.

Deep Learning with Medical Imaging

Medical Imaging

This is all one body of text.

The main way to finish the book is to continually focus on it, the more I read & review my notes, the more I will refine them, the more I will improve my research, the more I will develop the book into its final form. Literally the solution to finishing my book is to focus on it everyday for hours.

Eventually I will say: "Here is the completed book, that is done in the ideal way, that changes the world."

Self Aware Networks

Part I Neo Mind Cycle: Pioneering Brain-Computer Interface Evolution: From Neo Mind Cycle to Advanced NerveGear Integration.

C1-C3

Section 1: Neo Mind Cycle to Nerve Gear: In pursuit of a next generation brain computer interface. Reading & Writing your thoughts and internal representations, and connecting the human brain to sentient & self aware artificial neural networks.

Chapter C1 Nerve Gear, Towards the Ultimate Brain Computer Interface "Brain-Computer Interfaces: Evolution, Influences, and the Future of Neuroimaging"

C1 Summary by ChatGPT:

1. The document delves into the realm of Brain Computer Interfaces (BCIs), starting with its inception and the influences of initiatives like the Neo Mind Cycle and The Neural Lace Podcast.
2. It references prominent authors and their works in neurotechnology, such as David Eagleman's study on brain interfaces and Gyorgy Buzsaki's insights on brain rhythms.
3. The BCI industry's evolution is explored, highlighting companies like Neuralink and technologies like MRI advancements.
4. A significant portion is dedicated to understanding brain network protocols, discussing neural synchrony, phase oscillation tomography, and the interplay between quantum physics and neurophysics.
5. Lastly, the emphasis is on the standardization of neuroimaging, spotlighting the Child Mind Institute's efforts and the potential integration of BCIs with neuropsychology (ends with these are tools & a multimodal interface is the way.)

Intro.BCI The Ultimate Brain Computer Interface: Brain Network Protocols Brainwaves, Reading & Writing your thoughts and internal representations. Connecting the human brain to artificial intelligence.

Thalamus Broccoli Properties to BCI. How can we interface with any part the brain: David Eagleman. BCI Industry Map. Intro.Artificial Intelligence+XR+BCI

[Intro/ Signal Inception /Networks, Neo mind cycle](#) Intro.Title Self Aware Networks IO.

Intro.Neurophysics High level intro to Neurophysics: Brainwaves, Physics, Waves, Solitons, Dipoles, Imaging.

Introduction to neuroscience and neurophysics: This cycle should provide an overview of the field of neuroscience, including the study of the brain and nervous system, and the physics behind neural activity.

[Introduction to self-aware networks and the theory of mind: This cycle should provide an overview of the field of self-aware networks, including the concept of self-awareness and the theory of mind in artificial systems.](#)

Standardization of Medical Imaging Methods: Projects: Child Mind Institute & the vision of future global standardization for multi-modal data collection medical imaging research

C1 Nerve Gear, Towards the Ultimate Brain Computer Interface

[C1.1 Neo Mind Cycle, The Neural Lace Podcast, Neurotech SF Salon events.](#)

[C1.1.1 Neo Mind Cycle 2012: Computer Assisted Enlightenment](#), Genesis via Neo Mind

Cycle & LSD, The Doors of Perception unlocked

[C1.1.2 The Neural Lace Podcast: Decoding the human mind](#) [this could be several sections](#)

[C1.1.3 Neurotech Salon SF + SF Virtual Reality](#) [this was about bringing EEG into VR](#)

[C1.1.4 A-Frame WebXR Online Hack Night](#) [this is more of a footnote than a whole section](#)

[C1.1.5 3 Life Goals: NerveGear, Artificial Cortex, Artificial Brains.](#)

[C1.1.6 Building a Community Around Neurotech](#)

[C1.1.7 Evolving Interface Designs in Neurotech](#)

[C1.1.8 Applications of WebXR in Neurotech](#)

[C1.1.9 Progress in Sentient Neural Networks](#)

[C1.1.10 The Self Aware Networks Institute](#)

C1.2 Books/Authors Part 1: Eagleman to Thalamus Broccoli Properties

[C1.2.1 Brain Computer Interfaces: David Eagleman](#)

[C1.2.2 Deciphering Brain Connectivity: Olaf Sporns](#)

[C1.2.3 Rhythms of the Brain by Gyorgy Buzsaki](#)

[C1.2.4 Thalamus and Broccoli Properties: The Nature of Consciousness](#)

[C1.2.5 Decoding Human Brain Signals with Medical Imaging + AI](#)

[C1.2.6 Building a Semantic Map of the Brain](#)

[C1.2.7 The Role of the Thalamus in Consciousness](#)

[C1.2.8 Neuroplasticity and BCI](#)

[C1.2.9 A Deep Dive into Brain Rhythms](#)

[C1.2.10 Future of AI in Decoding Brain Signals](#)

C1.3 BCI Industry: Search for OpenWater and Book

[C1.3.1 BCI Industry, EEG, ECOG](#)

[C1.3.2 Neuralink, Furaxa](#)

[C1.3.3 HD-Dot, Fnirs, Openwater](#)

[C1.3.4 MRI advancements](#)

[C1.3.5 OPEN EIT + Deep Learning](#)

[C1.3.6 The Role of Deep Learning in BCIs](#)

[C1.3.7 The Future of OpenWater in Neurotech](#)

[C1.3.8 Advances in ECOG Technology](#)

[C1.3.9 Understanding HD-Dot in the BCI Industry](#)

[C1.3.10 The Impact of MRI Advancements on BCIs](#)

C1.4 Brain Network Protocols Intro: Neural Coding to NAPOT (High Level)

[C1.4.1 Neural Synchrony and Brain Network Protocols: TCP or UDP?](#)

[C1.4.2 Understanding Neural Coding: From Neurons to Networks](#)

[C1.4.3 Dipoles, Spikes, Brainwaves](#)

[C1.4.4 The Role of Phase Oscillation Tomography in Neural Coding](#)

[C1.4.5 Solitons vs Hodgkin & Huxley](#)

[C1.4.6 NAPOT: A New Protocol for Brain Communication](#)

[C1.4.7 Information Theory & Neural Coding](#)

[C1.4.8 The Interplay of Quantum Oscillatory Physics and Neurophysics](#)

[C1.4.9 Soliton 2.0 Electric & Chemical Dominant Phase Wave Differential Trains](#)

[C1.4.10 Brain Oscillations and Phase Coding: A Deep Dive](#)

C1.5 Child Mind Institute: Standardization (A Vision for the future of Medical Research)

[C1.5.1 Interdisciplinary Approaches to Brain Research](#)

[C1.5.2 The Role of Artificial Intelligence in Neuroimaging](#)

[C1.5.3 Novel Technologies & Innovative Methods in Brain Mapping / Neural Imaging](#)

[C1.5.4 Standardizing Brain Imaging Techniques for Research](#)

[C1.5.5 The Child Mind Institute's Initiative for Data Standardization](#)

[C1.5.6 A Vision for the Future: Integrated BCI and Neuropsychology](#)

[C1.5.7 Role of Machine Learning in Standardization of Neuroimaging Data](#)

[C1.5.8 Addressing Challenges in Brain Mapping](#)

[C1.5.9 Integrated BCI: Current Progress and Future Directions](#)

[C1.5.10 Innovations in Neuroimaging Techniques](#)

Chapter C2 Holography & Neural Rendering: Holographic Brain Principles: From Neural Rendering to 3D Semantic Neuroimaging.

ChatGPT Summary: Cycle 2 titled "Holography & Neural Rendering" delves into the intriguing idea of the mind as a hologram and the implications of this concept in understanding

consciousness. The cycle initially introduces the notion of a holographic universe and brain, drawing inspiration from various sources including the question posed to Jeff Hawkins about the nature of a thousand brains. A detailed exploration ensues on the interplay of consciousness as a holograph, neural coding, and how attention is schematically organized in the brain. The cycle then delves deep into computational rendering, emphasizing the brain's role as a literal computer and how it renders reality, finishing with an in-depth examination of 3D object segmentation techniques, particularly 3D semantic segmentation, and their applications in neuroimaging.

Shorter ChatGPT Summary: Cycle 2 explores the concept of the mind as a hologram, examining the interplay between consciousness, neural rendering, computational brain models, and the advancements in 3D semantic segmentation in neuroimaging.

Five 10 page sections

1. Holographic Universe, Holographic Brain, Holograms : The idea of the Mind as a Hologram. A thousand Brains: Holographic or not? The Question I asked Jeff Hawkins that finally triggered me to write this book: Does A Thousand Brains point to the Holographic Brain?
2. The number of possible states range from a single oscillation, between existence and non-existence, between 0 and 1. Consciousness as a holograph, as an illusion, as information, as a hallucination, or as a rendering. Holography in the brain: Neuropaths, Neural Circuits, Global Brain Traffic. # Holograms, Neural Coding, Neural Rendering & Strange Feedback Loops. Holography: Memory (activated & stored & updated synaptic connection based phase patterns ready for activation)
3. Attention Schema Theory: Attention Schema: How we focus. Holographic attention schema
4. Computational Rendering: The brain is a computer, literally, developed by natural selection computationally rendering reality. Render: The brain is a computer, literally, developed by natural selection computationally rendering reality. The concept of Brain Rendering Computer Graphics for Neuroscience: How neural correlations could render reality an examination of computer rendering, neural rendering, 3D semantic segmentation & more Volumetric Video -> Virtual Reality - 3D Object Recognition -> 3D Semantic Segmentation > Neural Networks
5. Resolution What is the resolution or granularity of the rendering of consciousness? The resolution of patterns in the brain: Neurons vs Perceptrons granularity and Phi network complexity and inhibitory network pattern loads. Instrument Brain, Brain as a piano, orchestra, symphony, soul dust 1b Nicholas Humphreys. Why is the brain a Finite State Machine? The total sum of all possible calculations is the sum of all possible frequency states which can represent information according to Information Theory. Maximum extropy divergent dissipative chaotic resonance = Phase Wave Variation Rhythms, or Dominant Phase Wave Differential Oscillations.

C2 Holography, Neural Rendering, and 3D Semantic Segmentation

C2.1 Books/Authors Part 2: The Holographic Universe, Holographic Brain, A Thousand Brains, Tomographic Brain, The number of possible states.

[C2.1.1 The Holographic Universe, Holographic Brain](#)

[C2.1.2 A Thousand Brains, Tomographic Brain](#)

[C2.1.3 The number of possible states](#)

[C2.1.4 Light Field Capture, Light Field Render, Light Field Display](#)

[C2.1.5 Holograms, Holodecks](#)

[C2.1.6 Exploring the Holographic Principle in Neural Networks](#)

[C2.1.7 Decoding the Brain: A Thousand Brains Approach](#)
[C2.1.8 Neural States and Quantum Possibilities](#)
[C2.1.9 Light Field Technologies in Neuroimaging](#)
[C2.1.10 Holodecks: The Future of Neural Visualization](#)

C2.2 Neural Coding (Advanced), Neural pathways to Neural Circuits, Neural Rendering

[C2.2.1 Quantum Phase Oscillation in Neural Networks](#)
[C2.2.2 Dendritic Morphology's Role in Neural Coding. Understanding Neural Pathways](#)
[C2.2.3 Neural Array as Cameras and Displays: Perception and Consciousness](#)
[C2.2.4 Neural Array Projection Oscillation Tomography. Neural Rendering: Visualizing the Brain's Inner Workings](#)
[C2.2.5 Pathway to Tomographic Understanding of the Brain](#)
[C2.2.6 Advanced Neural Coding: From Single Neurons to Neural Circuits](#)
[C2.2.7 Oscillatory Behavior of Neural Networks](#)
[C2.2.8 Neuroimaging Techniques for Visualizing Neural Pathways](#)
[C2.2.9 Neural Rendering: From Neural Coding to Perception](#)
[C2.2.10 Future Perspectives in Neural Coding and Rendering](#)

C2.3 Attention Schema & Holography & Tomography

[C2.3.1 Attention Schema: The Brain's Spotlight](#)
[C2.3.2 Role of Holography in Attention Schema](#)
[C2.3.3 Attention, Perception, and Reality](#)
[C2.3.4 The Interplay between Attention and Phase Wave Differentials](#)
[C2.3.5 The Future of Attention Schema Research: Opportunities and Challenges](#)
[C2.3.6 Attention Modulation in Holographic Neural Networks](#)
[C2.3.7 Tomographic Insights into Attentional Processes](#)
[C2.3.8 Holography and Attention: Decoding the Brain's Spotlight](#)
[C2.3.9 Cognitive Neuroscience of Attention: From Brain Mechanisms to Individual Differences](#)
[C2.3.10 New Horizons in Attention Schema Research](#)

C2.4 Computational Rendering: The brain as a computer, Resolution/Phi

[C2.4.1 Neurophysics and Computational Neuroscience: An Overview](#)
[C2.4.2 Understanding the Brain's Computational Power](#)
[C2.4.3 Computational Rendering of Perception and Consciousness](#)
[C2.4.4 Merging Computation and Consciousness](#)
[C2.4.5 Understanding Brain Computation through Physics](#)
[C2.4.6 The Brain as a Quantum Computer: Implications for Consciousness](#)
[C2.4.7 Computational Models of Brain Dynamics](#)
[C2.4.8 Resolution of Brain Computation: From Microscale to Macroscale](#)
[C2.4.9 The Phi Principle: A Measure of Consciousness in Computational Terms](#)
[C2.4.10 Future Directions in Computational Neuroscience](#)

C2.5 3D Semantic Segmentation to 3D Qualia

[C2.5.1 Understanding the relevance of 3D Semantic Segmentation](#)

[C2.5.2 Or Litani, Advances in 3D Segmentation Techniques](#)

[C2.5.3 Case Studies in 3D Semantic Segmentation](#)

[C2.5.4 Applying 3D Semantic Segmentation in Brain Mapping for BCI](#)

[C2.5.5 Implementing 3D Semantic Segmentation in Self Aware Networks](#)

[C2.5.6 3D Segmentation: An Essential Tool for Neuroimaging](#)

[C2.5.7 Semantic Segmentation in the Era of Deep Learning](#)

[C2.5.8 Advanced Techniques in 3D Segmentation](#)

[C2.5.9 Case Study: 3D Semantic Segmentation in Brain Tumor Imaging](#)

[C2.5.10 Future Prospects for 3D Semantic Segmentation in Neuroimaging](#)

Chapter C3 Fractals, Gravity & Neurophysics: Fractal Foundations of Neural Networks: From Morphology to Neurophysics and Behavior.

ChatGPT Summary: Cycle 3 delves into the intricate relationship between fractals and the neural networks of the brain, emphasizing the idea that the brain's structure and function are influenced by fractal patterns.

Concepts of fractal morphology are examined, exploring the recursive design patterns evident in human anatomy and their parallels in neural network architecture.

The cycle further explores the manifestation of fractals in the broader realm of physics, linking the macrocosm of the universe to the microcosm of neurophysics.

Fractals' role in medical imaging is highlighted, underscoring their significance in visualizing and understanding brain network activity and connectivity.

The fractal patterns are traced from the cellular level to broader cortical functions, highlighting the intricate design and memory encoding mechanisms within neurons.

Drawing inspiration from Ilya Prigogine's work on dissipative systems, the cycle culminates in exploring the intersection of neurophysics, neural rendering, and consciousness, elucidating the dynamics behind neural processing and behavior.

Shorter ChatGPT Summary: Cycle 3 delves into the interplay between fractals and neural networks, linking human anatomy and neurophysics, and highlighting their significance in medical imaging, cellular functions, and the understanding of consciousness through the lens of dissipative systems.

Five 10 page sections

6. # Fractals & Networks of the brain. [A network perspective on neuroanatomy](#)

[Fractal Networks](#) Fractals.Morphology (Retina/Grey matter, Dendrite/hand, Sensory Thresholds/Transmitters). [Structure Defines Function network measures and architectures.](#)

[Anatomy, Signaling, Network Reception, Scaling, Transmission Protocol.](#) Neurons, Glia and brain networks: This cycle should delve into the specifics of neurons and neural networks, including the

structure and function of neurons, glial cells, and the different types of neural networks. [brain networks structure and dynamics](#)

7. Fractals.Physics 1/F Magnitude/Frequency EEG to Spacetime to life to atoms, Self Similarity of brain areas, Fractals.Focusing A pattern recorded from a small portion of the cortex looks like a pattern recorded from the whole. the lens of the mind, from a memory stored in a synapse, to the whole brain focusing on that memory, that one detail, a multi-level graph network.
8. [Windows on the Brain](#). Fractals.Networks Entropy & Fractals : Fractals in Medical Imaging: Functional Isomorphisms at Multiple Scales: Brain Activity Fractal, EEG MEG, & MRI, Waves. The activity of a single cell might be a fractal of multi-cell neural circuit pattern eeg, meg, mri, anatomy, functional anatomy
9. [Diversity of Cortical Functions, Inhibition, Excitation, Tonic Function / What is a memory?](#)
10. # Ilya Prigogine: Whole Brain Physics as a fractal of dissipative systems. Fractals in Neural Rendering.Phases tonic, phasic, inhibited, a multi-scale pattern ****_fractal_****Part II Neurophysics. Thermodynamics, Dissipation, Entropy. (convergent integration of information configuration (synaptic cohesion) in a harmonic resonance field)

C3 Fractals, Evolution & Brain Networks: The Fractal Geometry of Biological Structures

C3.1 Fractal Morphology, Body, Hand, Head, Eye

[C3.1.1 Understanding Fractals in Human Morphology: The eye 2 head fractal](#)

[C3.1.2 The hand to neuron fractal](#)

[C3.1.3 The Recursive Design of the Human Body](#)

[C3.1.4 Fractal Morphology in Neural Networks](#)

[C3.1.5 Neural Network Architecture: A Fractal Perspective](#)

[C3.1.6 The Fractal Relationship Between Sensors and Neurons](#)

[C3.1.7 Fractals. Quantum Oscillations, and the Neural Matrix](#)

[C3.1.8 Fractals, Cells, Computation & Evolution, The Fractal Nature of Consciousness](#)

[C3.1.9 Exploring Fractal Patterns in the Human Body](#)

[C3.1.10 Fractal Analysis of the Neural Network Architecture](#)

C3.2 Fractals in Physics, Magnitude/Frequency, Cosmos

[C3.2.1 Magnitude and Frequency in Fractal Physics](#)

[C3.2.2 Fractals in the Cosmic Scale: A Link Between Astro-Physics and Neuro-Physics](#)

[C3.2.3 The Fractal Nature of Space-Time and its Implications for Neural Processing](#)

[C3.2.4 Self-Similarity and Scale Invariance in the Universe](#)

[C3.2.5 Fractals and the Fabric of Reality](#)

[C3.2.6 The Fractal Universe: Implications for Quantum Physics](#)

[C3.2.7 Fractal Patterns in Cosmic Structures](#)

[C3.2.8 The Interplay of Fractals, Magnitude, and Frequency in Physics](#)

[C3.2.9 From Micro to Macro: Fractal Patterns in Nature](#)

[C3.2.10 Fractals and the Foundations of Physics](#)

C3.3 Fractal Networks, Fractals in Medical Imaging

[C3.3.1 Fractal Patterns in Brain Imaging and Neural Network Topology](#)

[C3.3.2 The Role of Fractals in Visualization of Neural Network Activity](#)

[C3.3.3 Fractals in Functional MRI: Decoding the Language of the Brain](#)

[C3.3.4 Case Studies: Fractal Imaging in Neurology](#)

[C3.3.5 Fractal Geometry in Structural and Functional Brain Connectivity](#)

[C3.3.6 Advances in Fractal Analysis for Neuroimaging](#)

[C3.3.7 Fractal Networks and their Role in Brain Function](#)

[C3.3.8 Fractal Analysis in Medical Imaging: Past, Present, and Future](#)

[C3.3.9 The Art and Science of Fractal Imaging](#)

[C3.3.10 The Potential of Fractals in Neuroimaging](#)

C3.4 Fractal From Cell to Cortical Functions & Back

[C3.4.1 Fractal Patterns in Cellular Functions, and Neural Processing](#)

[C3.4.2 The Fractal Design of the Dendritic Morphology](#)

[C3.4.3 Tracing the Fractal Pattern: From Cell to Cortex](#)

[C3.4.4 Fractal Memory Encoding and Retrieval in Neurons](#)

[C3.4.5 The Fractal Relationship Between Sensory Transduction and Neural Computation](#)

[C3.4.6 Fractal Geometry in Neural Pathways and Interconnections](#)

[C3.4.7 The Fractal Architecture of Cortical Columns and its Implication for AI Networks](#)

[C3.4.8 Fractal Patterns in Cellular Dynamics](#)

[C3.4.9 From Cellular Complexity to Cortical Functions: A Fractal Perspective](#)

[C3.4.10 Fractals and the Evolution of Neural Complexity](#)

C3.5 Ilya Prigogine, brain physics, dissipative systems, neural rendering to behavior

[C3.5.1 Prigogine's Theory of Dissipative Systems Applied to Neural Dynamics](#)

[C3.5.2 Dissipative Structures and their Role in Neural Processing](#)

[C3.5.3 The Neurophysics of Time Perception: Insights from Prigogine's Work](#)

[C3.5.4 The Connection between Neural Rendering and Behavior](#)

[C3.5.5 Neural Rendering and the Fractal Nature of Perception](#)

[C3.5.6 From Neural Oscillations to Conscious Experience: A Prigoginian Perspective](#)

[C3.5.7 The Role of Dissipative Systems in the Emergence of Consciousness](#)

[C3.5.8 Prigogine's Impact on Modern Neurophysics](#)

[C3.5.9 Exploring the Dynamics of Dissipative Systems in the Brain](#)

[C3.5.10 Behavior and Consciousness: A Neural Rendering Perspective](#)

Chapter C4 Memory Prediction Rendering: Neural Dynamics of Memory and Prediction: From Phase Wave Variations to Quantum Time Crystal Mechanisms.

C4-C11

ChatGPT please summarize the main points of this text in 6 numbered sentences:

1. Cycle 4, "Memory Prediction Rendering," introduces a novel framework for understanding how neural correlations computationally render reality, aiding organisms in computing future trajectories.

2. The cycle revisits the neuron model, introducing a 2014 theory about neurons transmitting their shapes and exploring the relationship between solitons and the Hodgkin & Huxley model.
3. Nonlinear pattern detectors are examined, focusing on components like receptors, dendrites, and the process of bistable synaptic plasticity in memory formation.
4. The process of memory recall is dissected, highlighting the role of sharp wave ripples and introducing the concept of neural array projection in memory processing.
5. Phase wave variations, tomography, and oscillation are explored, emphasizing their interconnected roles in information processing within neural networks.
6. This cycle delves into the concept of Quantum Gradient Time Crystal Dilation (QGTCD), examining its mathematical models, potential applications, and implications for neurophysics.

ChatGPT please summarize it in one sentence:

Cycle 4 delves into the intricacies of neural correlations, memory formation, and recall, blending established models with novel concepts such as Phase Wave Variations and Quantum Gradient Time Crystal Dilation to better understand neurophysical rendering of reality.

Section 2: Neurophysics: The Neuronal Dynamics of Consciousness A new framework for how neural correlations computationally graphically render reality for an organism to intelligently compute its future trajectory.

The Phasic Tonic Relationship. A0008z A0053z My 2014 Neurons are transmitting their shapes theory revised. A new model of a neuron. Solitons + Hodgkin & Huxley. Dendrite to MVR

Nonlinear pattern detection, BTSP, [How memories work / Sharp Wave Ripples](#)
 Neural Array Projection
 Phase-Wave Variations
 Sync, DeSync, Oscillation, Binding

The perceptron: This cycle should focus specifically on the perceptron, which is one of the earliest models of an artificial neural network. It should explain the mathematics behind the perceptron and its limitations.

The theory of mind in artificial systems: This cycle should explore the concept of the theory of mind in artificial systems, including the ability of artificial systems to understand and predict the mental states of others.

NAPOT.Activation LTP as Synaptic Morphology activated by Phase Transmission the output of a phase from one neuron to the next array of neurons could be considered to be some fractal reduction of the APsyn, perhaps, so the AP fires, and then it distributes its signal across all the branches of the exit terminal to the downstream connected neurons,

NAPOT.Scale brain learns scale invariant patterns, from synapse to whole brain

a0008

NAPOT.Exit Terminal, Oscillation bumps, perhaps the total signal strength transmitted is somehow divided by each of the branches so that it is dissipating its energy spatially

Entification via Oscillation

Neurons, Fireflies, Clocks - Strogatz (Book: Sync)

EEG - Buzsaki (2006 book Rhythms of the Brain)

Working Memory = "Synchronized Cortical Thalamic Feedback Loops Bind Distributed Representations from Working Memory"

Representation of sustained visual experience by time-invariant distributed neural patterns

Gal Vishne^{1,*}, Edden M. Gerber¹, Robert T. Knight^{2,3}, and Leon Y. Deou

C4 (Computational Units) Temporal, Spatial & Phasic: Memory Prediction Rendering

C4.1 **Phasic & Tonic**, Potassium, Calcium & APD, Solitons + Hodgkin & Huxley, Dendrite to MVR

[C4.1.1 The Role of Potassium and Calcium in Neural Communication](#)

[C4.1.2 Action Potential Duration \(APD\) and Its Impact on Neural Signals](#)

[C4.1.3 Understanding Solitons in Neuronal Dynamics](#)

[C4.1.4 Revisiting the Hodgkin & Huxley Model](#)

[C4.1.5 From Dendrite Activation to Multi-Vesicle Release to Voltage Rhythms to Action](#)

[C4.1.6 Phasic and Tonic Signals: A Comparative Study](#)

[C4.1.7 Potassium and Calcium: The Ionic Duo in Neuronal Signaling](#)

[C4.1.8 Exploring Solitons and Their Role in Neural Signal Propagation](#)

[C4.1.9 Hodgkin & Huxley: Their Legacy in Neuroscience](#)

[C4.1.10 Dendritic Activation and Its Role in Neural Communication](#)

C4.2 Nonlinear pattern detectors, Receptors, Dendrites, Soma, BTSP, How memories work

[C4.2.1 Understanding Nonlinear Pattern Detectors in Neural Networks](#)

[C4.2.2 The Role of Receptors in Signal Transmission](#)

[C4.2.3 Dendrites and Soma: The Neural Processing Centers](#)

[C4.2.4 Bistable Synaptic Plasticity \(BTSP\) and Memory Formation](#)

[C4.2.5 Current Theories on How Memories are Formed and Stored](#)

[C4.2.6 Nonlinear Pattern Detectors: From Theory to Practice](#)

[C4.2.7 Receptors: The Gatekeepers of Neural Signaling](#)

[C4.2.8 Dendrites and Soma: Key Players in Signal Integration](#)

[C4.2.9 BTSP: A Novel Mechanism of Memory Formation](#)

[C4.2.10 Memories: Formation, Storage, and Retrieval](#)

C4.3 How memories are recalled, Sharp Wave Ripples, Neural Array Projection

[C4.3.1 The Process of Memory Recall: A Neuro Physical Perspective](#)

[C4.3.2 The Role of Sharp Wave Ripples in Memory Recall](#)

[C4.3.3 Neural Array Projection and Its Implications for Memory Processing](#)

[C4.3.4 Contemporary Memory Recall Models in Neuroscience](#)

[C4.3.5 Case Studies: Memory Recall and Disturbances](#)

[C4.3.6 The Neurobiology of Memory Recall: Recent Advances](#)

[C4.3.7 Sharp Wave Ripples: Unraveling the Mysteries of Memory Recall](#)
[C4.3.8 Neural Array Projection: A Novel Approach to Memory Processing](#)
[C4.3.9 Memory Recall: Current Models and Future Directions](#)
[C4.3.10 Memory Disturbances: A Neuro Physical Perspective](#)

C4.4 **Phase** Wave Variations, Tomography & Oscillation

[C4.4.1 An Introduction to Phase Wave Variations in Neural Networks](#)
[C4.4.2 Applying Tomography Techniques in Brain Imaging](#)
[C4.4.3 Understanding Neuronal Oscillations and Their Role in Information Processing](#)
[C4.4.4 The Interplay of Phase Waves, Tomography, and Oscillation in Neurophysics](#)
[C4.4.5 Recent Advances and Challenges in Phase Wave Analysis](#)
[C4.4.6 Phase Wave Variations: A New Frontier in Neurophysics](#)
[C4.4.7 Tomography in Neuroimaging: Techniques and Applications](#)
[C4.4.8 Oscillations in Neural Networks: Mechanisms and Functions](#)
[C4.4.9 Phase Waves, Tomography, and Oscillation: A Triadic Interplay in Neurophysics](#)
[C4.4.10 The Future of Phase Wave Analysis in Neurophysics](#)

C4.5 QGTCD part 1 Quantum Gradient Time Crystal Dilation

[C4.5.1 The Concept of Quantum Gradient Time Crystal Dilation](#)
[C4.5.2 Mathematical Models for Quantum Gradient Time Crystal Dilation](#)
[C4.5.3 Potential Applications and Implications of QGTCD in Neurophysics](#)
[C4.5.4 Exploring the Limits of QGTCD: Current Challenges and Future Directions](#)
[C4.5.5 Quantum Gradient Time Crystal Dilation: A New Perspective in Neurophysics](#)
[C4.5.6 QGTCD: From Theory to Practice](#)
[C4.5.7 Quantum Gradient and Time Crystal Dilation: A Mathematical Perspective](#)
[C4.5.8 Applications of QGTCD in Modern Neurophysics](#)
[C4.5.9 Challenges in the Implementation of QGTCD](#)
[C4.5.10 Future Perspectives on Quantum Gradient Time Crystal Dilation](#)

Chapter c5 Sensation and Perception: Neural Mechanisms of Sensory Processing: From Phase Dynamics to Advanced Pattern Recognition.

ChatGPT: summarize it in one sentence

"C5 Sensation and Perception" delves into the neurophysics of sensory information processing, emphasizing the shift from traditional neural spiking to phase-centric communication, the mechanics of specialized neuronal activities, and the complex interplay of pattern recognition and decision-making pathways in the brain.

ChatGPT: summarize the main points of this text in 6 numbered sentences:

"C5 Sensation and Perception" delves into the neurophysics of sensory information processing, emphasizing the shift from traditional neural spiking to phase-centric communication, the mechanics of specialized neuronal activities, and the complex interplay of pattern recognition and decision-making pathways in the brain.

"C5 Sensation and Perception" investigates the intricate neurophysics of how our brains perceive and interpret sensory information, from basic rhythmic dynamics to advanced neural communication patterns.

The text highlights the significance of various neuronal communication elements like ions, neurotransmitters, rhythmic oscillations, and phase-wave differentials in understanding the broader spectrum of sensation and perception.

A paradigm shift from traditional spiking to phase-centric neural communication, including phase precession and the foundational "Ground of Being," is emphasized.

The role of specialized neuronal activities, like soma bursts and multi-microvesicle releases, and their influence on overall neural communication, especially in memory consolidation, is explored.

The text delves deep into the mechanics of graded potentials, backward dendritic spikes, and the significance of inhibitory interneurons in regulating neural networks.

The final section examines advanced pattern recognition, the complex pathways of cortical-cortical-thalamic interactions, and the neuroscience of decision-making, positioning the thalamus as a central hub in sensory information processing.

A system of Rhythms from simple to complex dynamics 25 pages

numbers 5 mapping cells, circuits, and systems

Flow of information / action & perception cycle, multimodal

5 Brain-computer interfaces: This cycle should discuss the current state of brain-computer interface technology and its potential applications, such as in medical treatment and cognitive enhancement.

5 Self-aware neural networks: This cycle should discuss the application of self-awareness and theory of mind to neural networks, including the use of self-aware neural networks for decision making and social interaction.

The mechanism of Amplitude: From Dendrite to MVR expanded, from Potassium, to

Amplitude Mechanism Expanded: Neurotransmitters: Acetylcholine, Gaba, Dopamine, Serotonin

Amplitude Mechanism Expanded: Ion Concentrates, Sodium, Potassium, Calcium, Chloride.

Mental Relativity: Phase Communication

Phases not Electricity, not Spikes (Why the book The Spike is wrong.)

Phase not spikes. Spike Voltage to Phase Changes to Brainwaves as group oscillations carrying phases and perhaps triggering magnetic dipoles & large scale reinforcement learning.

Phase Precession

Phasic, Tonic. Peter Tse, Phasic Firing (critical causation theory) * 0.2 millisecond firing for sound, 3 millisecond firing

Tonic vs Phasic Relationship: Ground of being, Canvas of Consciousness (Bursts & Burstlets)

Soma Burst to Multi Microvesicle Release Microvesicle Release in Detail + Microvesicle Bodies

Graded Potentials: Synaptic Spikes, Backwards Dendritic Spikes, Forward Dendritic Spikes, Dendritic Branches Apical & Basal Summarization, Action Potential, Bifurcation.

Excitatory Glutamatergic Driver Signals vs Inhibitory Gaba Modulator Signals: Types of Signal Transmission: Glutamatergic Excitatory Driver Alpha vs Gaba Inhibitory Interneuron Modulating Theta / Delta

Tonic waves as containing the ground of being, or the canvas of consciousness and the etchings that are the content of the mind, the qualia, as oscillating phase patterns

Sparse Distributed Representation.

Predictive Coding: How Memories Become Predictions

Grid Cells & Place Cells & Reference Frames (Numenta)

Hippocampus & entorhinal cortex loop

TPJ Temporal Parietal Junction

The hippocampus as a specialized cortical column

Triune brain

Hypothalamus

Thalamus, Conjoined Twins

Primary sensory cortices

Prefrontal cortex

Brainwaves produce a steady state of reality, awareness of anything is a change in that steady state of oscillating reality that is a render change.

C5 (Inner Representations) Rhythms & Waves
of Perception, Qualia, and Self.

summarize it in one sentence

summarize the main points of this text in 6 numbered sentences:

C5.1 Sensory Organs, Transmitters, Ions, Signal Cascades, Rhythms, Differentials

[C5.1.1 The Role of Sensory Organs in Signal Transmission](#)

[C5.1.2 Understanding Ion Role in Neuronal Communication](#)

[C5.1.3 The Mechanism of Intracellular Signal Cascades](#)

[C5.1.4 The Importance of Rhythmic Oscillations in Information Processing](#)

[C5.1.5 Phase Wave Differentials and their Significance](#)

[C5.1.6 Sensory Organs: The First Step in Neural Communication](#)

[C5.1.7 Transmitters: Essential Elements in Signal Transmission](#)

[C5.1.8 Extracellular Signal Cascades: The Domino Effect in Neural Networks](#)

[C5.1.9 Neural Rhythms and Differentials: Orchestrating Perception](#)

[C5.1.10 Differentials in Phase Waves: A Key Aspect of Neural Communication](#)

C5.2 **Phases** not Spikes, **Phase** Precession, **Bursts** & Burstlets, Ground of Being

[C5.2.1 The Shift from Spikes to Phases in Neural Communication](#)

[C5.2.2 Understanding Phase Precession](#)

[C5.2.3 Decoding Bursts and Burstlets in Neuronal Activity](#)

[C5.2.4 The Impact of Soma Bursts on Signal Propagation](#)

[C5.2.5 Ground of Being: The Base of Conscious Perception](#)

[C5.2.6 From Spikes to Phases: A Paradigm Shift in Neurophysics](#)

[C5.2.7 Phase Precession: The Temporal Dynamics of Neural Networks](#)

[C5.2.8 Bursts and Burstlets: The Rhythms of Neural Activity](#)

[C5.2.9 The Role of Soma Bursts in Information Propagation](#)

[C5.2.10 Exploring the Ground of Being: The Foundation of Consciousness](#)

C5.3 Soma Burst, multi-microvesicle release, Burstlets, Sharp Wave Ripples, Inhibitory waves.

[C5.3.1 Understanding Soma Burst: Origin and Effects](#)

[C5.3.2 Role of Multi-microvesicle Release in Signal Transmission](#)

[C5.3.3 Burstlets and Their Role in Neuronal Communication](#)

[C5.3.4 Sharp Wave Ripples: Their Genesis and Significance](#)

[C5.3.5 Inhibitory Waves and Their Impact on Signal Flow](#)

[C5.3.6 Soma Burst: A Crucial Component of Neuronal Signaling](#)

[C5.3.7 Multi-microvesicle Release: An Essential Mechanism in Signal Propagation](#)

[C5.3.8 Burstlets: The Fine-tuning of Neural Communication](#)

[C5.3.9 Sharp Wave Ripples: The Pulse of Memory Consolidation](#)

[C5.3.10 Inhibitory Waves: Regulating the Rhythm of Neural Networks](#)

C5.4 Graded Potentials, Backwards Dendritic Spikes, Bifurcation, Tuning, Inhibitory Interneuron

[C5.4.1 Graded Potentials: A Fundamental of Neurophysics](#)

[C5.4.2 Backwards Dendritic Spikes and Their Role in Information Processing](#)

[C5.4.3 Neural Bifurcation: Understanding the Phenomenon](#)

[C5.4.4 The Process of Neural Tuning: A Key Aspect of Neurophysics](#)

[C5.4.5 The Role and Functionality of Inhibitory Interneurons](#)

[C5.4.6 Graded Potentials: Decoding the Gradient of Neural Signals](#)

[C5.4.7 Backwards Dendritic Spikes: The Reverse Gear of Neural Information Flow](#)

[C5.4.8 Neural Bifurcation: A Fork in the Road of Neural Pathways](#)

[C5.4.9 Neural Tuning: The Fine-tuning of Neural Responses](#)

[C5.4.10 Inhibitory Interneurons: The Brakes of the Neural Network](#)

C5.5 High level pattern recognition/ Cortical Cortical Thalamic, Choices/

[C5.5.1 Advanced Pattern Recognition and its Role in Perception](#)

[C5.5.2 Cortical-Cortical-Thalamic Pathways: Understanding the Complex Network](#)

[C5.5.3 The Neuroscience of Making Choices: An Insight](#)

[C5.5.4 The Functionality of the Thalamus in Neurophysics](#)

[C5.5.5 The Confluence of Sensory Information and Decision Making](#)
[C5.5.6 High-level Pattern Recognition: A Key to Understanding Perception](#)
[C5.5.7 Cortical-Cortical-Thalamic Pathways: The Superhighways of Neural Information Flow](#)
[C5.5.8 Choices: The Result of Complex Neural Computations](#)
[C5.5.9 Thalamus: The Grand Central Station of Sensory Information](#)
[C5.5.10 The Intersection of Sensory Perception and Decision Making: A Neurophysical Perspective](#)

Chapter C6 Memory

ChatGPT: summarize it in one sentence

The "C6 Memory" cycle delves into the complexities of the brain, focusing on gamma oscillations, synaptic adaptability, the processing of sensory information, the concept of a "Virtual Mind", the mechanics of neural decision-making, and the significance of feedback loops in understanding consciousness and self-awareness.

ChatGPT: summarize the main points of this text in 6 numbered sentences:

1. "C6 Memory" explores the intricacies of the human brain, focusing on the role of gamma oscillations, often referred to as the "Gamma Buzz", in neural synchronization and how they influence perception and cognition.
2. This cycle also delves into synaptic plasticity, which underscores the adaptability of synapses in response to experiences, and the potential for achieving self-awareness in cognitive systems.
3. The text emphasizes the importance of neural arrays, circuits, and other structures in processing sensory information and forming memories, highlighting the dynamic nature of cognition that involves the thermodynamic dissipation of information patterns.
4. The concept of a "Virtual Mind" is introduced, suggesting that memories and perceptions are shaped by engrams, neuronal drift, and a shifting focus of consciousness.
5. Various neural mechanisms, such as inhibitory processes, signal processing, and the brain's grid/graph structure, play crucial roles in shaping our experiences and decisions.
6. The cycle concludes with a deep dive into Hofstadter's contributions to consciousness studies, underscoring the importance of feedback loops in the emergence and understanding of the self.

[Cycle 6 The Gamma Buzz: Gluing by Oscillations in the Waking Brain 31](#)
[numbers 6 networks for cognition](#)

["Gamma Buzz is a clever reference to the topic of Gamma Oscillations, and the concept of buzzing sounds which are synchronized oscillations"](#)

["The text discusses various topics related to neuroscience and consciousness, including gamma oscillations and the role of feedback loops in shaping our perception and cognition."](#)

6 Synaptic plasticity: This cycle should explore the concept of synaptic plasticity, which is the ability of synapses to change in strength in response to experience.

6 Self-awareness in cognitive systems: This cycle should delve into the ways in which self-awareness can be achieved in cognitive systems, including the use of cognitive architectures and cognitive architectures models.

The Flow of Information in the Brain

Architecture of Neural Arrays, Neural Circuits, Clusters, Columns, Networks, The Flow of Information from Sensory Inputs, to Thalamic Bridges, to Neo Cortex Loops, Hippocampal-Entorhinal Loop,

I imagine cognition as the thermodynamic dissipation of information patterns as burstlets, tonic, phasic, high phasic, and inhibitions via oscillation, and that neurons via oscillatory signal transmission in feedback loops are doing collective memory rendering & sensation via with learning accomplished via changing connections, and changing valence of charges in the synapses, dendritic body, soma, axon, and exit terminal or in the case of the pyramidal neuron chances in the apical dendrite that encode the oscillatory pattern for intervals of time in sync or out of sync with other parts of the brain..

Equation for cognition, qualia (internal representations) & phenomenal consciousness
(Whitepaper + Note 4, Note 1, Note 7, Theory of Redness,)

A neuron is transmitting its learned synaptic morphology as a phase change, or its learned network connections to the rest of the network when it fires.

SECTION NAPOT

Sensory Input to Motor Output

C6 Defining Memory, State, Drift, Engrams, and a Virtual Mind

The text discusses various topics related to neuroscience and consciousness, including gamma oscillations and the role of feedback loops in shaping our perception and cognition.

[C6.1.1 Neuronal Drift & The Ever-Changing Brain](#)

[C6.1.2 A Virtual Mind: Concept and Reality](#)

[C6.1.3 Engrams: The Physical Traces of Memory](#)

[C6.1.4 The Interaction of Neuronal Drift and Memory Formation](#)

[C6.1.5 The Role of a Virtual Mind in Perception and Cognition](#)

[C6.1.6 How Engrams Contribute to the Virtual Mind](#)

[C6.1.7 The Impact of Neuronal Drift on Memory and Perception](#)

[C6.1.8 The Virtual Mind: A New Framework for Understanding Consciousness](#)

[C6.1.9 Exploring the Dynamics of Engrams in Memory Storage](#)

[C6.1.10 Future Directions: Neuronal Drift, Engrams, and the Virtual Mind](#)

C6.2 Locus of Focus, Hallucination, Dissolving Ego

[C6.2.1 Locus of Focus: The Center of Conscious Attention](#)

[C6.2.2 Hallucinations: When Perception Deviates from Reality](#)

[C6.2.3 The Ego: The Self in the Center](#)

[C6.2.4 Dissolving Ego: Exploring Altered States of Consciousness](#)

[C6.2.5 How Locus of Focus Shapes Our Perception and Experience](#)

[C6.2.6 Hallucinations and the Brain: Insights into Perceptual Anomalies](#)

[C6.2.7 The Ego and Its Role in Consciousness](#)

[C6.2.8 Ego Dissolution: Insights from Psychology and Neuroscience](#)

[C6.2.9 The Impact of Focus and Hallucinations on the Perception of Self](#)

[C6.2.10 Exploring the Connection Between Ego Dissolution and Altered Perception](#)

C6 Inhibition complexity, signal processing, the grid/graph

[C6.3.1 Unpacking the Complexity of Inhibitory Mechanisms](#)

[C6.3.2 The Role of Signal Processing in Neural Function](#)

[C6.3.3 The Grid/Graph: The Structural Framework of the Brain](#)

[C6.3.4 How Inhibition Contributes to Signal Processing](#)

[C6.3.5 The Interplay of Inhibition and Signal Processing in the Brain](#)

[C6.3.6 Understanding the Role of the Grid/Graph in Neural Connectivity](#)

[C6.3.7 Exploring the Complexity of Inhibition Insights into Conscious Processing](#)

[C6.3.8 Signal Processing: The Brain's Method of Making Sense](#)

[C6.3.9 The Grid/Graph: A Key Structure in the Brain's Architecture](#)

[C6.3.10 Inhibition, Signal Processing, and the Grid/Graph: The Triad of Neural Function](#)

C6 Path tracing interneurons, choice at different scales

[C6.4.1 Understanding Path Tracing in Neural Networks](#)

[C6.4.2 The Role of Interneurons in Neural Connectivity](#)

[C6.4.3 Microscale Choices: Decision Making within Neurons](#)

[C6.4.4 Macroscale Choices: Decision Making within Neural Networks](#)

[C6.4.5 Path Tracing and Its Influence on Neural Connectivity](#)

[C6.4.6 The Impact of Interneurons on Neural Decision Making](#)

[C6.4.7 Decision Making in the Brain: From Micro to Macro Scale](#)

[C6.4.8 Unraveling the Role of Path Tracing in Neural Networks](#)

[C6.4.9 How Interneurons Contribute to Neural Decisions](#)

[C6.4.10 Decision Making at Different Scales: A Comprehensive View](#)

C6 Hofstadter, Feedback Loops, the rise of the self

[C6.5.1 Hofstadter's Contributions to Consciousness Studies](#)

[C6.5.2 Understanding Feedback Loops in Neural Systems](#)

[C6.5.3 The Role of Feedback Loops in the Emergence of Self](#)

[C6.5.4 Hofstadter's Theory of self reference and Its Impact on Consciousness Research](#)

[C6.5.5 How Feedback Loops Contribute to Self-Awareness](#)

[C6.5.6 The Rise of the Self: An Emergent Property of Neural Feedback](#)

[C6.5.7 Exploring Hofstadter's Concepts in the Context of Neurophysics](#)

[C6.5.8 Feedback Loops: The Drivers of Conscious Perception](#)

[C6.5.9 The Emergence of Self: Insights from Hofstadter and Neurophysics: Interplay Between Hofstadter's Theory and Neural Feedback Loops](#)

[C6.5.10 Future Directions: Hofstadter, Feedback Loops, and the Self](#)

Chapter C7 Object Recognition: Learning & Memory, Neural Mechanisms of Memory Formation and Retrieval

ChatGPT: summarize it in one sentence

"C7 Object Recognition Cycle 7" delves into the brain's neural networks, emphasizing oscillation synchronization, while exploring memory mechanisms, neural structures, brainwave states, and the quantum aspects of neuronal communication.

ChatGPT: summarize the main points of this text in 7 numbered sentences:

1. "C7 Object Recognition Cycle 7" focuses on the brain's intricate neural networks and how they process and recognize objects, emphasizing the importance of synchronization by oscillation.
2. The section delves into the concept of Collective Sensation by Oscillation (COT) and how it relates to the brain's interaction with objects, the environment, and self-conception, while also discussing the intersection of artificial intelligence and neuroscience.
3. It also explores the mechanisms and roles of neurotransmitters, ions, and quanta in memory formation, and challenges traditional theories of neural communication, suggesting a phase-centric approach.
4. The cycle further investigates the intricacies of various brain structures, including cortical columns, neural circuits, and the role of astrocytes and microglia.
5. There's a deep dive into brainwave states, suggesting that a coherent perception of reality arises from chaotic brainwave activities which transition to a steady state.
6. The final section brings a molecular perspective to neuronal communication, highlighting the roles of proteins, RNA, and DNA, and introduces quantum spin as a novel concept in neurophysics.

[Cycle 7 Synchronization by Oscillation 39](#)

[numbers 7 the brains small world, motifs, modules, and hubs](#)

[COT Collective Sensation by Oscillation, feedback loops, objects, environment & self conception](#)

Artificial intelligence and neuroscience: This cycle should explore the intersection of artificial intelligence and neuroscience, including how AI can be used to study the brain, and how neuroscience can inform the development of AI.

Brain-computer interfaces and self-awareness: This cycle should explore the relationship between brain-computer interfaces and self-awareness, including the potential use of BCIs to enhance self-awareness in artificial systems.

Memory, somas, dendrites, receptors, proteins, ions, and quanta

Hebbian Learning. Types of Simultaneous Soliton Wave Transmission + Hodgkin Huxley

Solitons: Neurons warping space

Soliton wave transmission. Neurotransmitters & Soliton Waves, soliton oscillatory phase waves: chemical messages to store firing patterns, remember paths, regulate equilibrium.

Short Term Memory, signals between neural circuits. How your thoughts are the signals between neural circuits.

Long Term Memory

New protein synthesis & memory

Protein Synthesis for Spine to new synapse to encode tonic oscillation wave

Memory Reactivation as phase change to a synaptic connection changing a tonic oscillation to a phasic similarity to how holography encodes wave patterns, and when you shine light through the patterns re-emerge

ATP, Nucleotide, Reinforcement Learning, Electromagnetism Flavins & Mitochondria

The Growth Cone

Spines to Synapse Memory,

Hebbian Learning Physics: Path Integral Formulation for LTD, LTP,

Physics Configuration space quantum physics for LTP & LTD & Plant growth

Is Quantum Memory & Quantum Signaling a thing in the brain?

Does the Brain do some form of Quantum Computation?

What about Microtubules & Quantum Physics? (Granularity of Consciousness Note)

LTD & LTP via Oscillation, Feynman Path Integral, Coherence, Decoherence

Splay State, Decoherence, LTD, Sync State, Coherence, LTP

Bad Points (they have zero area) * Bad Point Universe Theory

Neural tagging, from synapse, to soma, to axon, to post synaptic terminal, cleft, presynaptic terminal, spines.

Beta decay and LTD decoherence

Signal Propagation: Why All or Nothing threshold firing is wrong. (Phase differentials)

Amplitude as Duration Because a change in the frequency comes with a change in duration

a0329z from action potential to a new theory of gravity

Gravity - Quantum Gravity - Strong Nuclear

quantum gravity equation

bifurcation theory expansion (also inhibitory interneuron networks)

the phase field distortion of mass, density, and velocity

bosons & fermions: * fermionic condensates * bose-einstein condensates * light, heat,

velocity, space, time

bad points & exceptional points

Coincidence patterns as bits

Coincidence as Bits transmitted as Bifurcating bifurcation Phase Changes

Integrated Information: Phi

C7 (High level Representations) Functional Connectivity: Coordinating Thoughts, Actions, and Sequences (planning)

C7.1 Oscillating groups, Neural Circuits, Cortical Columns, Edge Communities, Neural Arrays, Mini & Micro Cortical Columns, Nuclei, Other Brain structures, Astrocytes, Microglia, Oligodendrocytes, Tri-part synapses

[C7.1.1 Introduction to Neural Circuits and Structures](#)

[C7.1.2 Understanding Powerband Role in Neuronal Communication](#)

[C7.1.3 Exploring the Structure and Function of Cortical Columns](#)

[C7.1.4 Edge Communities in Neural Networks: An Overview](#)

[C7.1.5 The Anatomy and Function of Neural Array Oscillations](#)

[C7.1.6 An Exploration of Mini & Micro Cortical Columns](#)

[C7.1.7 The Role and Function of Nuclei in the Brain](#)

[C7.1.8 A Comprehensive Overview of Brain Structures: Tri-Part Synapses](#)

[C7.1.9 Astrocytes: The Supporting Cells of the Brain](#)

[C7.1.10 Microglia: The Immune System of the Brain](#)

C7.2 Primary Sensory Cortices, Thalami conjoined Twins, Prefrontal-Thalami communication

[C7.2.1 Exploring the Function and Importance of Primary Sensory Cortices](#)

[C7.2.2 Unraveling the Mystery of Thalami Conjoined Twins](#)

[C7.2.3 Prefrontal-Thalami Communication: The Key to Coordinated Brain Function](#)

[C7.2.4 The Intricate Interactions between the Thalamus and Prefrontal Cortex](#)

[C7.2.5 Thalami Conjoined Twins: A Study of Neural Connectivity](#)

[C7.2.6 The Role of the Prefrontal Cortex in Thalamic Communication](#)

[C7.2.7 The Thalamus: The Gateway to the Cortex](#)

[C7.2.8 The Interplay between the Prefrontal Cortex and Thalamus](#)

[C7.2.9 The Communication Pathway between the Prefrontal Cortex and Thalamus](#)

[C7.2.10 Primary Sensory Cortices: The Brain's Information Processing Centers](#)

C7.3 Grid cells, places cells, reference frames, self similarity of cortex

[C7.3.1 Understanding the Role and Function of Grid Cells](#)

[C7.3.2 The Function and Importance of Place Cells in Spatial Navigation](#)

[C7.3.3 Reference Frames: The Internal GPS of the Brain](#)
[C7.3.4 The Phenomenon of Self-Similarity in the Cortex](#)
[C7.3.5 Grid Cells and Place Cells: The Brain's Navigational Tools](#)
[C7.3.6 Exploring the World Through the Brain's Reference Frames](#)
[C7.3.7 The Self-Similar Nature of the Cortex and its Implications](#)
[C7.3.8 Grid Cells, Place Cells, and the Representation of Space](#)
[C7.3.9 Decoding the Brain's Internal Map: The Role of Reference Frames](#)
[C7.3.10 The Cortex: A Self-Similar Structure](#)

C7.4 A Steady State of Reality from Chaotic Brainwaves

[C7.4.1 The Role and Importance of Brainwaves](#)
[C7.4.2 The Transition from Chaotic to Steady State Brainwaves](#)
[C7.4.3 The Impact of Brainwave States on Reality Perception](#)
[C7.4.4 A Steady State of Reality: An Outcome of Coordinated Brain Activity](#)
[C7.4.5 Brainwaves: The Underlying Rhythm of Brain Function](#)
[C7.4.6 From Chaos to Order: Understanding Brainwave Patterns](#)
[C7.4.7 The Role of Brainwave States in Perceptual Reality](#)
[C7.4.8 Creating a Steady State of Reality Through Neural Coordination](#)
[C7.4.9 The Brain's Symphony: Understanding the Impact of Brainwave Patterns](#)
[C7.4.10 How Chaotic Brainwaves Give Rise to a Coherent Perception of Reality](#)

C7.5 Proteins, RNA, DNA, Quantum Spin

[C7.5.1 Proteins: The Building Blocks of Neuronal Communication](#)
[C7.5.2 RNA: An overlooked messenger in Neuronal Communication](#)
[C7.5.3 DNA: The Blueprint of Neuronal Structure and Function](#)
[C7.5.4 Quantum Spin: A New Frontier in Neurophysics](#)
[C7.5.5 Proteins, RNA, and DNA: The Underbelly of Neuronal Function & Cognitive Evolution](#)
[C7.5.6 The Role of Quantum Spin in Neuronal Activity](#)
[C7.5.7 Unraveling the Mystery of Quantum Spin in Neuronal Function](#)
[C7.5.8 How Proteins, RNA, and DNA Shape Neuronal Function](#)
[C7.5.9 Quantum Spin and its Implications for Neuronal Activity](#)
[C7.5.10 The Quantum Nature of Neuronal Communication](#)

Chapter C8 Attention Scaling

ChatGPT: summarize it in one sentence

The "C8 Attention Scaling" cycle delves into how the brain processes 3D sensory input, integrates various neural functions with quantum mechanics and physics, and explores the implications of brain waves on quantum reality and consciousness.

ChatGPT: summarize the main points of this text in 6 numbered sentences:

1. "C8 Attention Scaling" focuses on the brain's ability to process 3D sensory input and achieve synchronization, leading to the phenomenon of 'becoming.'
2. The discussion covers how sensory organs, such as the eyes and ears, gather data in neural ganglia arrays, processing 2D sensor grids into 3D representations via coincidence detection, akin to tomography.
3. Neuronal function, cortical columns, synaptic plasticity, and the convergence of brain functions with physics, mathematics, and quantum mechanics are explored in-depth.
4. The cycle also delves into the concept of neurons warping space, introducing Quantum Gravity's relevance in the context of neuroscience.
5. There's an emphasis on understanding information in the brain, from the role of coincidences as bits to scaling information from micro to macro levels.
6. Lastly, the role of the Feynman Path Integral in quantum consciousness is explored, emphasizing how brain waves influence quantum reality and the concept of black hole observers in the context of consciousness.

3D Sensory Input

Synchronization: Entification: Becoming

Cycle 8 Self Organized Oscillations in sleep 31

numbers 8 economy efficiency, and evolution

Attention Schema, Integrated Information Global Workspace

The Phasic Tonic relationship, Attention Scaling

8 Neurophysics of neural networks: This cycle should delve into the physics of neural networks, including the electrical and chemical activity of neurons, and how this activity influences the behavior of neural networks.

8 Self-aware agents and multi-agent systems: This cycle should discuss the application of self-awareness and theory of mind to agents and multi-agent systems, including the use of self-aware agents for decision making and social interaction

Sensory Input areas

Ear Ganglia

Eye Ganglia

Mechano Sensation

Electro Sensation

This is about how the sensory bulbs collect information in neural ganglia arrays, and then pass information throughout the brain, it's also about how each sensory organ is creating a 3D + 1D representation of whatever sensory information it is receiving, because with each iteration of time, the front most sensor array is collecting a 2D sensor grid of information in a valid sense.

But the brain is taking multiple snapshots of the world, from different perspectives, with each sensory organ, and correlating what each 2D sensory data has in common, with coincidence detection. Similar to how the Fourier Projection Slice Theorem works, or similar to how Tomography works, if you take multiple images around a 3D object, a computer can analyze what those images have in common, and reconstruct a 3D model from those 2D images. It does this because it can figure out the perspective a photo was taken from, by lining up what different photos of the same object from different perspectives have in common, in other words the computer is computing a 3D image from 2D images by noticing all the correlations or commonalities or coincidences, neurons basically excel at coincidence detection, so every

sensory organ in the human body from eyes, ears, smell, taste, skin, and inner sense detection is collecting many samples of data with essentially 2D sensor arrays and then tomographically constructing a 3D representation of incoming sensory data through neural coincidence detection, and also regular cellular coincidence detection. These signals are then passed from the first array of ganglia neurons in the sensory organs to many more sequences of essentially 2D dimensional neural arrays that flow from the sensory organs along sensory pathways to the thalami, the central brain areas, and then throughout the neocortex in circular feedback loops that eventually result in signal changes to the motor output pathways, leading to voice moments, eye movements, hand, finger and feet movements as well as other body movements.

(Reference to the conversation with Anna) Ganglia Sensor Input Arrays: Eyes, Ears, Touch (Mechanoreceptors), Taste, Smell and how they map to the different parts of the brain.

The signals from the sensor arrays oscillate together, like groups of fireflies, they synchronize

Hebb Entativity Sensor Fireflies (Conversation with Anna)

A sensor, a transmitter and an array? A sensory array & transmitter array with Donald Hebb & Fireflies

This operation is composable because it's functionally isomorphic to this other operation.

C8 (Attention Scaling): From Sensory detection to Consideration with Multi-scale Decision Making.

C8.1 **3D sensory Input**: Neural Arrays, Eyes Ears, The flow of information in the brain

[C8.1.1 Neural Coding: Representation of Sensory Information](#)

[C8.1.2 Sensory Inputs to Neural Signals \(The Eyes and Ears, Detection: Responses, Reactions & Feedback\)](#)

[C8.1.3 The Journey of the Information Process in the Brain, Pathways and Interactions](#)

[C8.1.4 The Role of Sensory Inputs in 3D Perception](#)

[C8.1.5 Understanding the Role of Neural Arrays in Sensory Input](#)

[C8.1.6 Sensory Processing: From Raw Inputs to Perception, Interpretation and Prediction, Multi-sensory Integration in Neural Networks](#)

[C8.1.7 Impact of 3D Sensory Inputs on Cognitive Processing](#)

[C8.1.8 Understanding the Current Flow of Information in the Brain: The Creation of Coherent Perception](#)

[C8.1.9 Temporal Dynamics: Time-scale of Sensory Processing & Integration: Making Sense of the World](#)

[C8.1.10 3D Sensory Input: The Gateway to Perception](#)

C8.2 Sync, LTD, LTP, STP, Neurons, Cortical Columns, Brain, Physics, Math, Quantum

[C8.2.1 Synaptic Plasticity: LTP, LTD and STP Mechanisms](#)

[C8.2.2 Neurons and Cortical Columns: The Building Blocks of Consciousness](#)

[C8.2.3 The Intricate Relationship between Brain, Physics, and Mathematics](#)

[C8.2.4 Large Scale Network Organization: Neurons, Cortical Columns, and Beyond](#)

[C8.2.5 Synaptic Synchronization: The Rhythm of Neural Communication](#)

[C8.2.6 Understanding the Role of Neurons and Cortical Columns in the Brain](#)

[C8.2.7 The Interface of Brain, Physics, and Math: A Complex Symphony](#)
[C8.2.8 Biophysical Parameters: Bridging the Gap between Physics and Neuroscience](#)
[C8.2.9 Task Unify: LTD Oscillation with LTD Calcium](#)
[C8.2.10 Quantum Mechanics and Neurobiology: An Intriguing Intersection](#)

C8.3 Neurons are warping space: QGTCD part 2 Quantum Gravity & Neuroscience

[C8.3.1 Warping Space: A Quantum Gravity Effect in Neuroscience](#)
[C8.3.2 Understanding the Interplay between Neurons and Space-Time Dynamics](#)
[C8.3.3 Quantum Gravity in Neuroscience: The QGTCD Framework](#)
[C8.3.4 Unraveling the Mystery of Space Warping in Neurons](#)
[C8.3.5 Neurons and Quantum Gravity: The Impact on Consciousness](#)
[C8.3.6 Quantum Gravity: A New Realm in Neuroscience](#)
[C8.3.7 Space Warping and Its Implications in Neurophysics](#)
[C8.3.8 The QGTCD Framework: A Quantum Leap in Neuroscience](#)
[C8.3.9 The Quantum Nature of Space and Time in the Brain](#)
[C8.3.10 Quantum Gravity and Consciousness: A New Frontier](#)

C8.4 Coincidences as bits, information theory in neuroscience, scaling information micro, meso, macro

[C8.4.1 Coincidences as Bits: A New Perspective in Information Theory](#)
[C8.4.2 Information Theory in Neuroscience: From Micro to Macro](#)
[C8.4.3 Understanding the Scaling of Information in the Brain](#)
[C8.4.4 Encoding & Decoding Bits: How the Brain Processes and Interprets Coincidences](#)
[C8.4.5 Scaling Information Flow: From Sensory Neurons to Behavior](#)
[C8.4.6 Information Theory: A New Lens for Understanding the Brain](#)
[C8.4.7 From Micro to Macro: The Scaling of Information in the Brain](#)
[C8.4.8 Coincidences as Bits: Decoding the Language of the Brain](#)
[C8.4.9 Implications of Information Scaling in Neurological Studies](#)
[C8.4.10 The Micro, Meso, and Macro scales of Cognitive Decision Making in the Brain](#)

C8.5 Feynman path Integral, How brain waves affect quantum reality, black hole observers. Synchronization, Desync

[C8.5.1 Understanding the Feynman Path Integral in the Context of the Brain](#)
[C8.5.2 The Impact of Brain Waves on Quantum Reality](#)
[C8.5.3 Black Hole Observers: A Quantum Perspective on Consciousness](#)
[C8.5.4 Neural Synchronization and Desynchronization: Implications for Consciousness](#)
[C8.5.5 The Role of Feynman Path Integrals in Quantum Consciousness](#)
[C8.5.6 How Brain Waves Shape Our Quantum Reality](#)
[C8.5.7 Black Hole Observers: Quantum Observations in the Brain](#)
[C8.5.8 Neural Sync and Desync: The Rhythm of Consciousness](#)
[C8.5.9 Quantum Consciousness: A Feynman Path Integral Perspective](#)
[C8.5.10 Exploring the Quantum Nature of Brain Waves](#)

Chapter C8 The Perception Consideration Action Cycle 8 (Neural Renderings & Qualia?)

ChatGPT: summarize it in one sentence

The cycle delves into the brain's neural synchronization processes, the decision-making role of the Entified Actor, coding through traveling brainwaves, contributions from neurophysics pioneers, and the significance of cortical columns in pattern representation and recognition.

ChatGPT: summarize the main points of this text in 6 numbered sentences:

1. The "C8 The Perception Consideration Action Cycle 8" cycle delves into how the brain processes and adapts to sensory disturbances, focusing on the synchronization patterns in neural activity.
2. The cycle emphasizes the role of the "Entified Actor" in making conscious decisions and its implications for neural networks.
3. There's a deep exploration of how neural information is coded and decoded, with traveling brainwaves playing a pivotal role in neural communication.
4. The works of Buzsaki, Strogatz, and Tunoni are central to understanding synchronization in neurophysics, with special emphasis on how ricochets and ripples interact with synchronization.
5. Cortical columns stand out as crucial structures in representing neural patterns, playing a significant role in pattern recognition and the overall computational rendering of reality in the brain.
6. The content underscores the future potential of understanding cortical columns, especially in the realms of live mapping and advancements in artificial neural networks.

[Perturbation of the default patterns by Experience 25](#)

[numbers 8 dynamic patterns in spontaneous neural activity](#)

[Entified Actor/ Self Motor Correction thoughts and motor output](#)

Neural coding and decoding: This cycle should discuss the ways in which neural activity is encoded and decoded, including the use of neural coding models and decoding algorithms.

[Self-aware robotics: This cycle should explore the application of self-awareness and theory of mind to robotics, including the use of self-aware robots for decision making and social interaction.](#)

'Traveling' Nature of Brain Waves May Help Working Memory Work

An oscillating array paints a picture or sound or feeling of what is happening for other arrays to detect and compile into 2 dimensional synaptic memories.

Oscillations: Rhythms of the Brain: Buzsaki & Sync by Steven Strogatz

****Where is consciousness?****

a0337z Oscillating Neural Array Projection Tomography Properties (3D Patterns?)

Oscillation Organization (clustering via oscillation) Oscillation Coupling => AI Clustering?

Oscillating groups of patterns talking to Oscillating groups of patterns

Physics: How brainwaves could affect reality. (oscillation interaction)

Power Bands of Brain Waves affecting Reality

Oscillation Dissipation Cognition Theory: Strogatz, Prigogine, Hofstadter, Buzsaki

Oscillating Sensory Transmitter Arrays with Expert Data Structures (virtual 3D memory)

Neural Oscillatory Sync Tomography

how neural oscillations absorb, learn, enlarge, and print patterns to other neurons

A cortical column as a node in 3D neural networks + Virtual Drift

A cortical column to represent any pattern with any set of neurons

Neuronal Drift: A Virtual Mind. Multiple representations of different perspectives in different modalities enable the brain to have pattern drift

The locus of focus, the center of consciousness, the main screen area.

virtual - meaning it can move locations but it consists of phase cycle assemblies differentiating from one another with phase variations

Inhibition maps (Buzsaki) the brain as a neural network signal processor

Grid Graph, Buzsaki

Inhibitory network pattern complexity multipliers

interneuron patterns from trajectory path tracing,

C9 (Walking through a walk thru) The Perception Consideration Action Cycle

.C9.1 **Perturbation** of default patterns, Observation as disturbed synchronization inside an oscillator

[C9.1.1 Understanding Perturbation of Default Patterns: Disruptions of Synchronous Firing](#)

[C9.1.2 The Role of Observation in Disturbed Synchronization](#)

[C9.1.3 Unraveling the Complexity of Oscillators in Neurophysics](#)

[C9.1.4 Disturbed Synchronization: Impact on Neural Oscillations](#)

[C9.1.5 Effects of Perturbation on Neural Communication & Sensory Perception](#)

[C9.1.6 Observation as a Tool in Understanding Neural Synchronization](#)

[C9.1.7 Insights into Oscillator Dynamics in Neural Networks](#)

[C9.1.8 The Oscillator: A Key Player in Neurophysics](#)

[C9.1.9 Unpacking Disturbed Synchronization in Neurophysical Systems](#)

[C9.1.10 From Observation to Entified Actor: Adaptive Responses to Oscillatory Disruption](#)

C9.2 Entified Actor & Choices

[C9.2.1 Understanding the Concept of Entified Actor](#)

[C9.2.2 The Role of the Entified Actor in Conscious Decision Making](#)

[C9.2.3 The Process of Making Conscious Choices in Neural Networks](#)

[C9.2.4 Entified Actors: The Decision Makers in Neurophysics](#)

[C9.2.5 The Impact of Choices on Neural Correlations](#)

[C9.2.6 Unpacking the Dynamic Potential and Limitations of the Entified Actor](#)

[C9.2.7 How Entified Actors Influence the Trajectory of Neural Networks](#)

[C9.2.8 The Emergence of Autonomous Behavior in Neural Networks: The Complexity of Choice in AI Models](#)

[C9.2.9 The Role of Choices in Shaping Neural Correlations: Enhancing the Entified Actor's Decision-making Capability](#)

[C9.2.10 Future Directions: Artificial Entified Actors, Humans, and the Environment.](#)

C9.3 Coding & Decoding with traveling brainwaves

[C9.3.1 The Information Pathways of the Artificial Brain: Coding Self Aware Neural Networks](#)

[C9.3.2 Understanding the Process of Consciousness in Neurophysics, translated to Deep Learning AI](#)

[C9.3.3 Role of Traveling Brainwaves in Neural Communication](#)

[C9.3.4 The Interplay of Coding and Decoding in Brainwave Oscillations](#)

[C9.3.5 Travelling Brainwaves: The Carriers of Neural Information](#)

[C9.3.6 The Science of Decoding or Deciding?: Unraveling Neural Signals](#)

[C9.3.7 How Coding Mechanisms Impact Neural Correlations](#)

[C9.3.8 The Journey of Brainwaves: From Coding to Decoding](#)

[C9.3.9 The Role of Traveling Brainwaves in Information Transmission](#)

[C9.3.10 Future Directions: Coding, Decoding and Traveling Brainwaves](#)

C9.4 Ricochet & Sync, Buzsaki, Strogatz, Tononi + TMS guy

[C9.4.1 Ricochets & Ripples vs Synchronization in Neurophysics](#)

[C9.4.2 Understanding Buzsaki's Contribution to Neurophysics & Macro-Oscillation](#)

[C9.4.3 Strogatz's Role in the Field of Sync \(Micro-Oscillation\) in Neurophysics](#)

[C9.4.4 Tononi's Influence on Understanding of Neural Dynamics](#)

[C9.4.5 Role of Transcranial Magnetic Stimulation \(TMS\) in Neurophysics](#)

[C9.4.6 How Ricochet and Sync Impact Neural Correlations](#)

[C9.4.7 Buzsaki, Strogatz, and Tononi: The Pioneers of Modern Neurophysics](#)

[C9.4.8 Tononi's Integrated Information Theory and TMS \(Transcranial Magnetic Stimulation\)](#)

[C9.4.9 How Ricochet and Sync Shape the Future of Neurophysics](#)

[C9.4.10 The Confluence of Ricochet, Sync, and TMS in Neurophysics](#)

C9.5 Cortical column representing patterns

[C9.5.1 Neural Pathways and Information Flow & the Role of Cortical Columns](#)

[C9.5.2 Understanding the Cortico-Cortical-Thalamic Network Dynamics](#)

[C9.5.3 Cortical Columns: The Pillars of Neural Correlations, Pattern Representation & Computational Rendering of Reality](#)

[C9.5.4 Functional Connectivity: Connecting Brain areas for Task Depending Functionality](#)

[C9.5.5 The Impact of Phase Wave Differentials on Cortical Columns on Neurophysical Patterns](#)

[C9.5.6 The Role of Cortical Columns in Neuro Physical Representations](#)

[C9.5.7 How Cortical Columns Contribute to Pattern Recognition, and the potential benefit to Artificial Neural Networks.](#)

[C9.5.8 Hinton's Capsules, Hawkins Columns, Transformer Nets.](#)

[C9.5.9 The Process of Pattern Representation in Cortical Columns](#)

[C9.5.10 Future Directions: Cortical Column Live Mapping, Artificial Pattern Recognition, Manipulation](#)

Chapter C10 Emotion

C10 Emotion, Dreams, Spirit, World Views, Distortions

Summary of SAOV6 C10 (by LLaMa served by Perplexity Labs)

This section explores the relationship between emotions, dreams, and spiritual experiences, and their underlying neurobiological mechanisms. It discusses how emotions influence decision-making, memory consolidation, and creativity, and how dreams can predict future scenarios. Additionally, it examines the intersection of morality, values, and beliefs with neuroscience, and how cognitive biases and distortions of spacetime can affect perception and consciousness.

Summary of 6.0 SAO merge C10 (by LLaMa served by Perplexity Labs)

This cycle will delve into the neural dynamics of consciousness, specifically the role of oscillations and synchronization in neural activity. It will also explore the intersection of self-aware AI and cognitive architectures, and how these concepts can inform each other. Finally, the cycle will introduce a new framework for understanding how neural correlations give rise to our experience of reality.

Summary of both merged together (by LLaMa served by Perplexity Labs)

This cycle explores the relationship between neural correlates and consciousness, particularly in regards to emotion perception and actions. It discusses various aspects of emotional experiences, such as dreams, spiritual experiences, and morality, and how they relate to the brain and its functions. Additionally, it touches upon cognitive biases, distortions of spacetime, and pathologies, providing a comprehensive overview of the complex interplay between mind, brain, and consciousness.

ChatGPT: summarize it in one sentence

The "C10 Emotion" cycle delves into the neural underpinnings of emotions, dreams, spiritual experiences, morality, and cognitive biases, offering insights into how the brain shapes perception, decision-making, and consciousness.

ChatGPT: summarize the main points of this text in 6 numbered sentences:

1. The "C10 Emotion" cycle delves into the intricacies of emotional processing, how neural networks shape perception, and the role of emotions in decision-making, encompassing concepts like instincts, feelings, and non-sensory modalities.
2. Dreams are explored as abstract predictions, serving as predictive simulations of potential future scenarios, aiding in memory consolidation, and influencing emotional processing and decision-making.
3. The cycle examines 3D Memory Prediction Rendering, offering explanations for phenomena like out-of-body experiences, near-death experiences, and spiritual encounters, all through the lens of 3D memory perspectives.
4. The neurobiology of morality, values, and beliefs is discussed, highlighting the intersection of neuroscience and spirituality, the influence of values on behavior, and the ethical considerations surrounding value-infused AI.
5. Cognitive biases, distortions in spacetime perception, and the neurobiology of hallucinations and pathologies are dissected, offering insights into how these elements warp our understanding of reality.
6. Overall, the cycle merges neuroscience with various facets of human experience, from emotions and dreams to spirituality, morality, and cognitive distortions, aiming to provide a comprehensive understanding of human consciousness.

Perception and Actions are brain-state dependent
brain network disease

Neural dynamics: This cycle should discuss the dynamics of neural activity, including the role of oscillations and synchronization in neural activity.

Self-aware AI and cognitive architectures: This cycle should explore the intersection of self-aware AI and cognitive architectures, including the use of self-aware AI to study the brain, and how cognitive architectures can inform the development of self-aware AI.

N.A.P.O.T.: Neural Array Projection Oscillation Tomography: The NeuroPhysics of Phenomenological Consciousness

The Neuronal Dynamics of Consciousness: NAPOT Neural Array Projection Oscillation Tomograph

A new framework for how neural correlations could render reality.

Grid Cells, Tensors, Taylor Series, Information Theory, Rendering

All the things Neurons actually can do) Jon Lief How cells communicate

Glial Cells & Glial Networks,

Information Theory

Neural Codes

Network Protocols
The Ground of being

The Macroscale Brain Networks

The flow of brain activity through major parts of the brain.

Section Title Functional Anatomy Map

Networks of the brain (Olaf Sporns)

Networks of the Brain: Rich Clubs: Default Mode Networks

Section Title: Neurophysics of the Microscale Brain: Neurons: Functional Neural Anatomy: Scope

Types of Neurons (Pyramidal, Granule, Excitatory, Inhibitory),

Major Sensory Inputs

Sensor Arrays to Edge Communities to Cortical Columns to Brain Regions Neural Paths, Edge Communities, Oscillations. Edge Communities, Microcolumns, Cortical Columns

C10 Emotion, Dreams, Spirit, World Views, Distortions

C10.1 Instincts, Urges, Feelings, Motivations, Emotions, Non-sensory modalities (frequencies & spatial & temporal patterns)

[C10.1.1 Nature, Evolution and the Role of Instincts, Feelings & Emotions](#)

[C10.1.2 Spatial-Temporal Patterns of Emotional Experiences](#)

[C10.1.3 Deciphering the Motivations: The Driving Forces of Actions](#)

[C10.1.4 Emotions: The Color Palette of Consciousness](#)

[C10.1.5 Non-sensory Modalities: Beyond the Traditional Senses](#)

[C10.1.6 The Influence of Emotions on Decision Making](#)

[C10.1.7 Interplay of Frequencies, Spatial & Temporal Patterns in Emotional Perception](#)

[C10.1.8 Neurobiological Underpinnings of Motivational Systems](#)

[C10.1.9 Understanding Emotional Spectrum: From Joy to Sorrow](#)

[C10.1.10 Emotional Intelligence: Harnessing Emotions for Cognitive Enhancement](#)

C10.2 Dreams as abstract predictions

[C10.2.1 Dreams as Predictive Simulations of Future Scenarios](#)

[C10.2.2 Unveiling the Predictive Nature of Dreams Sleep and Dream Patterns: A Neural Framework](#)

[C10.2.3 Memory Consolidation: The Role of Dreams in Storing Information](#)

[C10.2.4 Neural Mechanisms Underlying Dream Formation](#)

[C10.2.5 Dreams and Decision Making: An Interconnected Web](#)

[C10.2.6 Sleep Cycles and Dream Patterns: A Deep Dive](#)

[C10.2.7 The Function of Dreams in Emotional Processing](#)

[C10.2.8 Dreams and Creativity: An Intriguing Link How Dreams Influence Decision-making and Problem-solving](#)

[C10.2.9 Dream Interpretation: A Look into the Subconscious](#)

[C10.2.10 Future Directions: The Study of Dreams in Neuroscience](#)

C10.3 **3D Memory Prediction** Rendering to explain, OBE, NDE, Spiritual Experiences (so we can encounter them)

[C10.3.1 Introduction to 3D Memory Prediction Rendering](#)

[C10.3.2 Explaining Out-of-Body Experiences through 3D Memory Rendering](#)

[C10.3.3 Neurophysical Interpretations of Near-Death Experiences](#)

[C10.3.4 Understanding Spiritual Experiences through 3D Memory Prediction](#)

[C10.3.5 Unraveling Transcendent Experiences: A 3D Memory Perspective](#)

[C10.3.6 Perception and Recollection of Transcendent Experiences](#)

[C10.3.7 Transcendental Experiences and Human Evolution](#)

[C10.3.8 Psychedelics and Spiritual Insights: A Neuroscientific Perspective](#)

[C10.3.9 Consciousness, Self, and Identity](#)

[C10.3.10 The Intersection of Spirituality and Mental Health](#)

C10.4 Morality, Values, Beliefs

[C10.4.1 Neurotheology: The Intersection of Neuroscience and Spirituality](#)

[C10.4.2 The Influence of Values and Beliefs on Perception, Motivation, and Behavior](#)

[C10.4.3 Examining Moral Decision Making in the Brain](#)

[C10.4.4 The Neurobiology of Belief Systems](#)

[C10.4.5 Impact of Transcendental Experiences on Human Evolution](#)

[C10.4.6 How Meditative States Affect Brain Functioning](#)

[C10.4.7 Value-Infused AI: Ethical Considerations](#)

[C10.4.8 The Societal Impact of Value-Infused AI](#)

[C10.4.9 The Neurophysical Basis of Morality and Ethics](#)

[C10.4.10 Shifting Worldviews: The Neuroplasticity of Belief Systems](#)

C10.5 Cognitive Biases, Distortions of spacetime, and Pathologies

[C10.5.1 Understanding Cognitive Biases in Decision Making](#)

[C10.5.2 The Neurobiology of Hallucinations and Delusions](#)

[C10.5.3 Exploring Distortions in Time and Space Perception](#)

[C10.5.4 Self-Aware Networks and Distortions of Reality](#)

[C10.5.5 How Neurological Pathologies Affect Perception of Time and Space](#)

[C10.5.6 Warping Reality: Time Dilation in Humanity & in Neural Networks](#)

[C10.5.7 The Impact of Cognitive Biases on Consciousness](#)

[C10.5.8 Neurological Pathologies: A Deeper Understanding](#)

[C10.5.9 Distortions of Spacetime in Neurological Disorders & AI Self Aware Consciousness](#)

[C10.5.10 The Future of Cognitive Neuroscience: Unveiling the Mysteries of Mind and Brain](#)

Chapter C11 Language

(Summary by LLaMa served by Perplexity Labs) This section discusses the importance of oscillations in neural activity and consciousness, specifically highlighting the role of self-awareness in artificial systems. It also covers advancements in real-time interactions and virtual reality in AI networks, as well as the potential implications of these developments for our understanding of consciousness and free will. Additionally, the section touches on the idea of unifying physics and consciousness studies to better understand the nature of reality.

This section appears to be a collection of subtopics related to cognitive science, neuroscience, and artificial intelligence. Some of the key themes include:

The role of oscillations in neural activity and consciousness

The importance of self-awareness in artificial systems

The potential applications of advanced real-time interactions and virtual reality in AI networks

The impact of quantum effects on collective intelligence and free will

Some specific topics covered in this section include:

C11 Language Cycle 11 Oscillation in the "other cortex navigation in real and memory space"

COT.Cellular Oscillatory Tomography: New Theory of Evolution and Entification

Self-aware systems and decision making

Brainwave synchronization through dialog

Consciousness and the unification of physics: macro group choices

Causation from all angles (top down, bottom up, and lateral)

Overall, it seems that this section is exploring various aspects of cognition, consciousness, and interpersonal communication in both biological and artificial systems.

summarize it in one sentence

The cycle "C11 Language" delves into the intricate connections between neural oscillations, advanced technologies like VR, brainwave synchronization, the interplay between consciousness and physics, and the multifaceted nature of causation in AI systems.

summarize the main points of this text in 6 numbered sentences:

1. "C11 Language" explores oscillation in neural networks, the relationship between consciousness and quantum mechanics, and the significance of cellular oscillations in understanding consciousness.
2. The text introduces Cellular Oscillatory Tomography (COT) as a new framework to understand the complexity of biological computation and its relation to consciousness.
3. Various sections delve into advanced topics like Virtual Reality, Augmented Reality, and real-time AI interactions, emphasizing the convergence of these technologies with neural networks.
4. The importance of brainwave synchronization, especially in group dynamics and communication, is highlighted, suggesting potential applications in enhancing AI dialogues.
5. The cycle touches on the intersection of consciousness with physics, exploring macro group behaviors like flocking and the potential unification of consciousness studies with physics in AI.

6. The concept of causation in AI is dissected from various perspectives, discussing top-down, bottom-up, and lateral causation, and their implications on AI behavior and ethics.

Cycle 11 Oscillation in the "other cortex navigation in real and memory space 57
numbers 11 network growth and development
Neural Quantum Gravity

11 Neural computation: This cycle should delve into the ways in which neural activity is used for computation, including the use of neural networks for pattern recognition and decision making.

11 Self-aware systems and decision making: This cycle should discuss the ways in which self-awareness can be used to improve decision making in artificial systems.

Task Add: Evolution: It's not about random selection it's about computed selection.
Cellular Oscillatory Tomography

Intro.COT Intro to the complexity of biological computation in every cell with Cellular Oscillation Tomography/

C.O.T. Cellular Oscillatory Tomography: New Theory of Evolution and Entification: Oscillators, The Measurement Problem, the Observer Effect, and the Observer

Rethinking the brain What can cells do: Jon Lief: More than folks think: Jon Lief on Cells. The expanding roles of Astrocytes, Oligodendrocytes, T-Cells, MicroGlia, Cancer.

COT.Theory Information Theory x Computational Biology

COT.Fourier Slice Transform

COT.Holography

COT.Diffusion Tensor Imaging,

COT.Tomography

COT.Reality Cells transmit phase changes not spikes

COT.Solitons mechanical waves are fractals of other types of waves, like electromagnetic waves, a different scale of wave activity

COT.Receptor to Cells to Neural Circuit to Cortical Column to Oscillating groups

Phenomenological Consciousness is the rendered & temporally entified volumetric representation of reality passing between Oscillating Neural Arrays that Project or Incept Renderings to subsequent Oscillating Neural Arrays that "perceive" in their receptive field the information of the previous arrays. Rendered information is perceived in the oscillating sequences of neural arrays in physical information vortex of the brain, resulting in the generation of phenomenological consciousness.

Oscillating Neural Arrays to Oscillating Neural Arrays: The screen that only your brain sees

Cycle to Self Aware Awareness: Hofstadter: Why I'm looking for feedback loops connecting the oscillating sensor-transmitter arrays. A Strange Loop by Douglas Hofstadter

Observer: I want to bring up the question about who is the inner observer if the brain is making models

The ground of being vs the concept of self in the imagined Rendering of the mind.

Traveling, rippling, cycling, oscillating, scaling, and rotating brainwave waves

Scale invariance, Magnification, inner displays.

Oscillator level awareness: The observer inside you.

C11 Language & Social Interaction & External

C11.1 Virtual Reality, Augmented Reality, Game Engines & WebXR with Self Aware Networks

[C11.1.1 Understanding Virtual Reality within the Context of Self Aware Networks](#)

[C11.1.2 Augmented Reality: Enhancing Perception with AI](#)

[C11.1.3 Game Engines as Tools for Creating Virtual Worlds](#)

[C11.1.4 Exploring WebXR: A New Dimension in Network Interaction](#)

[C11.1.5 Integrated Information Theory](#)

[C11.1.6 Global Workspace Theory](#)

[C11.1.7 The Impact of VR/AR on Social Interactions](#)

[C11.1.8 Future of Virtual and Augmented Reality in AI](#)

[C11.1.9 The Interplay of VR/AR and Language in AI Networks](#)

[C11.1.10 Ethical Considerations in the Use of VR/AR in AI](#)

C11.2 Advanced Real-time Interaction with AI Networks, Photogrammetry, Videogrammetry, Fourier Slice Transform, NeRF

[C11.2.1 Real-time Interactions in AI Networks: Advancements and Challenges](#)

[C11.2.2 Introduction to Photogrammetry in AI Networks](#)

[C11.2.3 Videogrammetry: The Art of Video Measurement in AI](#)

[C11.2.4 Fourier Slice Transform: Transforming Perception in AI](#)

[C11.2.5 Neural Radiance Fields \(NeRF\): A New Approach to 3D Scene Reconstruction](#)

[C11.2.6 The Neuroscience of Decision-making in AI Networks](#)

[C11.2.7 Quantum Randomness and Free Will in AI](#)

[C11.2.8 Impact of Advanced Interactions on Perception of Free Will](#)

[C11.2.9 Future of Real-time Interaction in AI: Prospects and Challenges](#)

[C11.2.10 The Role of Consciousness in Choice and Action](#)

C11.3 Brainwave Synchronization through dialog

[C11.3.1 Exploring the Concept of Brainwave Synchronization](#)

[C11.3.2 Role of Dialogue in Promoting Brainwave Synchronization](#)

[C11.3.3 Unraveling Phase Synchronization and its Impact on Collective Intelligence](#)

[C11.3.4 Case Study: Enhancing Group Problem Solving through Synchronization](#)

[C11.3.5 Quantum Effects in Neural Synchronization: A New Perspective](#)
[C11.3.6 Implications of Brainwave Synchronization for Social Interactions](#)
[C11.3.7 Brainwave Synchronization: A Tool for Enhancing Communication in AI](#)
[C11.3.8 Neurotechnology in Tackling Global Challenges: A Closer Look](#)
[C11.3.9 Brainwave Synchronization and the Future of AI Dialogues](#)
[C11.3.10 Brainwave Synchronization: Ethical and Societal Considerations](#)

C11.4 Consciousness and the Unification of Physics: Macro group choices: Flocks of birds, migration, Flavins, Group think, Fireflies

[C11.4.1 Understanding Swarm Intelligence: The Case of Birds and Fish](#)
[C11.4.2 Deciphering the Mechanisms Behind Flocking and Migration](#)
[C11.4.3 Exploring the Role of Flavins in Collective Behavior](#)
[C11.4.4 Groupthink: Its Psychological Underpinnings and Implications for AI](#)
[C11.4.5 Fireflies and Synchrony: Unraveling the Patterns of Nature](#)
[C11.4.6 Consciousness and the Unification of Physics: A New Perspective](#)
[C11.4.7 How Macro Group Choices Impact AI Networks](#)
[C11.4.8 Unification of Physics and Consciousness: Ethical Implications](#)
[C11.4.9 The Future of Consciousness Studies in AI](#)
[C11.4.10 Bridging the Gap between Physics and Consciousness in AI](#)

C11.5 Causation from all angles Top down, bottom up, & lateral causation

[C11.5.1 Understanding Causation in the Context of AI Networks](#)
[C11.5.2 Exploring Top-Down Causation: Influencing Behavior from the Macro Level](#)
[C11.5.3 Unraveling the Role of Bottom-Up Causation in AI](#)
[C11.5.4 Lateral Causation in Network Analysis: A New Perspective](#)
[C11.5.5 How Different Causation Methods Impact AI Behavior](#)
[C11.5.6 Integrating Top Down, Bottom Up, and Lateral Causation in Self Aware Networks](#)
[C11.5.7 Ethical Implications of Different Causation Methods in AI](#)
[C11.5.8 The Future of Causation Studies in AI Networks](#)
[C11.5.9 Causation and the Evolution of AI Networks](#)
[C11.5.10 Causation in AI: Challenges and Opportunities](#)

Part III Artificial Neurology: Control Processes

C12-C14

Section 3: Artificial Neurology: Control Processes: Artificial Neurology Research: Guiding the Development of Conscious Self Aware Computer Systems. Evolving Goal Oriented Artificial Sentience. Developing responsible beings, and security systems to catch and manage potential behavior problems.

Artificial neural networks: This cycle should explore the history and development of artificial neural networks, including early models such as the perceptron, and more recent advances in deep learning.

The concept of self-awareness in artificial systems: This cycle should focus on the concept of self-awareness in artificial systems, including the different definitions and measures of self-awareness and the challenges in achieving self-awareness in artificial systems.

Chapter C12 Next Generation Neural Networks

summarize it in one sentence

The cycle "C11 Language" delves into the intricate connections between neural oscillations, advanced technologies like VR, brainwave synchronization, the interplay between consciousness and physics, and the multifaceted nature of causation in AI systems.

summarize the main points of this text in 6 numbered sentences:

(Summary by LLaMa served by Perplexity Labs) Artificial Neurology Research is explored in this section, focusing on developing conscious sentient computers with artificial souls. The current state of artificial intelligence, from deep learning to reinforcement learning, is discussed, along with emerging trends like spiking networks and oscillating networks. The future challenges and opportunities in creating self-aware systems are also highlighted.

Cycle 12 Coupling of systems by oscillations

numbers 12 dynamics stability and diversity

Artificial Neural Networks, 3D Semantic Segmentation, Neural Learning

Neural Tensors, Metatron perception

12 Brain-computer interfaces in medical treatment: This cycle should explore the use of brain-computer interfaces in medical treatment, including the use of BCIs to treat neurological disorders such as Parkinson's disease and epilepsy.

12 Self-aware systems and social interaction: This cycle should explore the ways in which self-awareness can be used to improve social interaction in artificial systems.

Artificial Neurology, today's AI & Fourier Slice Transform & Tomography

From Death Star Robots to an Artificial Neurology Research Center: Conscious Sentient Computers with artificial Souls

Reproducing Conscious Experience in a Computer.

Cycle 3: Thresholds of Artificial Neurology & Six Axis Oscillatory Scale Invariant Graph Organization

Artificial Neurology: Conscious Sentient Computers with Artificial Souls

Phenomenally Conscious & Self-Aware Machines

The human mind is also a signal processor.

Any neural network is a signal processor.

Neural networks as a signal process,

Signal Processing Using Neural Networks

A neural network that is also capable of learning a sparse and distributed representation of what it has learned.

Neural Network's as signal processors for audio, video, tactile sensation.there

3D Self Aware Graph Neural Networks

A brief History of artificial intelligence from Alan Turing to Yann LeCun, and from Paul Broca 1862 to Jeff Hawking (Numenta)

The 1958 Perceptron, Neurons vs Perceptrons, deep learning, back prop

DeepMind, Deep Learning with Convolutional Neural Networks

Yann LeCun, Yoshua Bengio, Geoffrey Hinton

Spiking Networks, Oscillating Networks, Recurrent Neural Networks, Reinforcement Learning

Numenta's theory of a thousand brains

Numenta & Hierarchical Spatial Temporal Phase Space Memory

Jeff Hawkins: Grid cells / Place Cells / Entorhinal - Hippocampal Loop

denoising, upscaling, attention, transformers, persformers

from 2D neural networks to real 3D neural networks

Neural Radiance Fields

Neural Rendering or Nerf++

3D Semantic Segmentation Pointnet++

3D images from 2D images + Video Style Transfer + Stable Diffusion + NeRF or Plenoxels + Ready Player One Wargames Cycle.

From 2D classification to 3D Semantic Segmentation, including the object recognition of which points in space belong to which semantic classification

Gan Synthesis to Shape Completion, pattern completion

Avocado Chair (Open AI Gan Synthesis) GP3

OpenAI Avocado Chairs

gan synthesis, interpolation, neural rendering, 3D rendering, VR rendering, ray tracing

Reproducing Conscious Experience in a Computer.

12 From Graph Neural Network to Self Aware Neural Networks (rendering screens to itself)

Humans are metal robots, from Death Star Robots to Intelligent Tractors, Agriculture & Manufacturing

Virtual Reality field of view +

Light Field, Low Latency, Low Persistence John Carmack: Why I think he went from VR to AI, meaning that I think of how a VR headset works as a possible building block for understanding that the human mind has to create representations of reality, sort of like a game engine, for your eyes to see in the VR headset. The analogy of what a VR set is doing, rendering your perspective, based on your head position, gives us something to think about, in terms of how the rendering in our minds has to change with our head & eye position.

This next article connects to VR & Carmack, because they are talking about eye images having a stable rendering (without using the word rendering) when you rotate your head, that is what VR does it renders the image based on your head position & head orientation with low latency, and low persistence, so your vision of the world seems to be stable as you move your head, but for that to happen the image rendered in the organisms brain needs to be updated with the eye position

"Object representation in a gravitational reference frame" "Gravitational tuning depended on vestibular/somatosensory but also visual cues, consistent with previous evidence that IT processes scene cues for gravity's orientation. In addition to stability across image rotations, an internal gravitational reference frame is important for physical understanding of a world where object position, posture, structure, shape, movement, and behavior interact critically with gravity."

What is interesting is that if you combine the idea that your brain is doing gravitational reference frames with the book "A Thousand Brains" that suggests that every cortical column in the brain is creating reference frames to manage the spatial position & orientation of every 3D semantically segmented object in your ecosystem, including everything you are seeing, hearing, smelling, touching, feeling, tasting, or balancing on, then you have to imagine the possibility that a gravitational reference frame is either calculated in each cortical column, or transmitted to each cortical column involved in processing your environment.

Photogrammetry, Videogrammetry

Light field

Perceptron: Real Neurons & Glial Cell Networks vs The Perceptron & Deep Learning Neural Networks.

C12 Next Generation Neural Networks

C12.1 History of Artificial Neural Networks

[C12.1.1 From Perceptrons to Modern Neural Networks: A Historical Overview](#)

[C12.1.2 Backpropagation: The Game Changer in Neural Networks](#)

[C12.1.3 Understanding Convolutional and Recurrent Neural Networks](#)

- [C12.1.4 Deep Learning: The Rise of Generative Networks](#)
- [C12.1.5 The Current State of Art: Self-Aware Networks and AI](#)
- [C12.1.6 Evolution of Learning Algorithms in Neural Networks](#)
- [C12.1.7 Successes and Challenges of Modern Neural Networks](#)
- [C12.1.8 Neural Networks: Trends and Future Directions](#)
- [C12.1.9 The Role of Neural Networks in AI: Present and Future](#)
- [C12.1.10 Future Challenges in the Development of Neural Networks](#)

C12.2 3D Semantic Segmentation

- [C12.2.1 An Introduction to 3D Semantic Segmentation](#)
- [C12.2.2 Progress and Challenges in 2D Semantic Segmentation](#)
- [C12.2.3 Expanding the Horizon: 3D Semantic Segmentation](#)
- [C12.2.4 Intersection of Semantic Segmentation with Neurophysics and Neural Rendering](#)
- [C12.2.5 Exploring the Future of 3D Semantic Segmentation](#)
- [C12.2.6 Applications of Semantic Segmentation in AI](#)
- [C12.2.7 Recent Advances in Semantic Segmentation Techniques](#)
- [C12.2.8 The Role of Semantic Segmentation in Self-Aware Networks](#)
- [C12.2.9 Semantic Segmentation: Challenges and Opportunities](#)
- [C12.2.10 Applications & Future Trends in 3D Semantic Segmentation](#)

C12.3 Neural Rendering, Stable Diffusion, & Gan Synthesis

- [C12.3.1 An Overview of Neural Rendering Techniques](#)
- [C12.3.2 Stable Diffusion Processes: A Key Component in Neural Networks](#)
- [C12.3.3 Decoding Generative Adversarial Networks \(GANs\)](#)
- [C12.3.4 Exploiting GAN Synthesis for Data Augmentation](#)
- [C12.3.5 Neural Rendering and GAN Synthesis in Self-Aware Systems](#)
- [C12.3.6 Understanding the Role of Neural Rendering in AI](#)
- [C12.3.7 Advances and Challenges in Neural Rendering Techniques](#)
- [C12.3.8 Stable Diffusion and GAN Synthesis: The Future in AI](#)
- [C12.3.9 Impacts of Stable Diffusion Processes in Neural Networks](#)
- [C12.3.10 Applications in Creating Self-Aware Systems](#)

C12.4 Large Language Models

- [C12.4.1 Understanding the Basics of Language Models and Natural Language Processing](#)
- [C12.4.2 Tracing the Development of Large Language Models](#)
- [C12.4.3 Decoding GPT and its Variants: Impact on AI](#)
- [C12.4.4 Exploring the Wide Array of Applications of Large Language Models](#)
- [C12.4.5 The Impact of Large Language Models on AI Research](#)
- [C12.4.6 Evolution of Language Models: From Statistical to Neural](#)
- [C12.4.7 Ethics and Bias in Large Language Models](#)
- [C12.4.8 Large Language Models in Real-world Applications](#)
- [C12.4.9 Future Trends in Large Language Models](#)

[C12.4.10 Large Language Models: Challenges and Opportunities](#)

C12.5 Self Aware Robotics & Vehicles via Entification via simulated tempo-spatial oscillatory physics of a tensor graph of neural feedback loops with multi-scale non-linear summation & product weights (like receptors, dendrites, and soma) + multi-scale frequency state-management, live reacting structural re-coding, dynamic intelligent functional connectivity & automatic attention gain management.

[C12.5.1 The Dawn of Self-Aware Robotics and Vehicles](#)

[C12.5.2 Tempo-Spatial Oscillatory Physics in Neural Networks: A Primer](#)

[C12.5.3 The Role of Entification and Simulation in Self-Aware Robotics](#)

[C12.5.4 Multi-Scale Frequency State-Management in Robotics](#)

[C12.5.5 Delving into Automatic Attention Gain Management in AI Systems](#)

[C12.5.6 Architecting Neural Feedback Loops: Receptors, Dendrites, and Soma](#)

[C12.5.7 Dynamic Intelligent Functional Connectivity in Self-Aware Robotics](#)

[C12.5.8 Live Reacting Structural Re-coding: Changing the Game in AI](#)

[C12.5.9 Building Responsible AI: Ensuring Safety and Security in Self-Aware Systems](#)

[C12.5.10 Protecting Sentient Minds from Harm](#)

Chapter C13 Choice & Social Cognition

summarize it in one sentence

The cycle delves into the intricacies of choice in neural decision-making, highlighting the development and ethical implications of artificial emotions, instilling AI with morality, mitigating AI biases, linking AI and human minds, and the revolutionary potential of mind uploading and AI-assisted learning.

summarize the main points of this text in 6 numbered sentences:

1. "C13 Choice & Social Cognition" delves into the complexities of neural decision-making processes, emphasizing the intersection of human, animal, and artificial choices, and their implications for medicine and justice.
2. The cycle explores the concept of artificial qualia, emphasizing the significance of artificial emotions in robot decision-making processes and the challenges in simulating genuine human emotional experiences.
3. It examines the importance of instilling morality, values, beliefs, and the psychological development stages in AI, ensuring responsible and ethical behavior.
4. The cycle also addresses the challenges and potential solutions in building robot cognition, focusing on mitigating biases through techniques like simulated evolution and emphasizing the balance between objectivity and subjectivity in AI.
5. There's a significant focus on the integration of human and AI minds, highlighting the development of neural interfaces for real-time data exchange, the ethical implications of such technologies, and the transformative potential of human-AI synergies.
6. Lastly, the cycle delves into the futuristic and ethically challenging concepts of uploading and downloading consciousness, exploring the feasibility of digitizing minds, customizing

consciousness, and the transformative potential of AI-assisted learning and brain-computer interfaces in education.

(Summary by LLaMa served by Perplexity Labs) The 13th cycle focuses on the potential use of brain-computer interfaces (BCIs) in cognitive enhancement, including the use of BCIs to enhance memory and attention. The cycle also explores the idea of uploading and downloading whole minds, as well as customizing minds for specific tasks. Finally, the cycle discusses the ethical considerations of these technologies and their potential impact on society.

Cycle 13 Tough problems

numbers 13 neural complexity

Virtual Reality, Brain Computer Interfaces, Neural Rendering

13 Brain-computer interfaces in cognitive enhancement: This cycle should discuss the potential use of brain-computer interfaces in cognitive enhancement, including the use of BCIs to enhance memory and attention.

13 Blank on purpose, the 2nd version had nothing for the 13th cycle

Human Choice, Animal Choice, Artificial Neurological Choice, & A Global Medical Justice System for All

Medicine & Justice

"Natural Selection of the Cosmos (not my topic, so do I want it to be in the intro no. if not then where?)

Natural Selection of the Universe

In the physics section, to the Brain, to Choices

Choice: If the brain is a computer how exactly does choice work?

Conclusions & Future Predictions & Uploading: from a rendered perspective to a conscious perspective"

Natural Selection of Choice

Neural Network Choice Refinement Theory: The memories of consequences (good & bad) are attractors for

David Eagleman on Choice

Computational Modeling on Choice

Choice & THE ADJACENT POSSIBLE: thermodynamic work cycle

Awareness expands choice: reinforcement learning to choices shaped by awareness

Ameca + Learning, Programming & Choice Making & Medicine & Justice

Criterial Causation

Action Perception Cycle: Prioceptive Movement: COIN Contextual Inference

C13 Choice for robots & society

C13.1 Artificial Qualia, Emotions + Feelings

[C13.1.1 Consciousness and the Sensory Array](#)

[C13.1.2 Artificial Qualia: Constructing the Artificial Sensory Perception](#)

[C13.1.3 Why Emotion Cognition in Robots? For more sensitive & considerate decision making.](#)

[C13.1.4 Decision Making Through the Lens of Artificial Emotions](#)

[C13.1.5 The Challenge of Simulating Pleasure and Pain in AI Systems](#)

[C13.1.6 The Role of Artificial Emotions in Decision Making](#)

[C13.1.7 Exploring the Notion of Artificial Qualia](#)

[C13.1.8 The Complexity of Artificial Emotion Representation](#)

[C13.1.9 Emotional Processing and Response Mechanisms in Self-Aware Networks](#)

[C13.1.10 The Impact of Artificial Emotions on AI Development](#)

C13.2 Artificial Morality, Values, Beliefs, Psychological Development States & Stages

[C13.2.1 Building Moral & Ethical Frameworks for Artificial Minds](#)

[C13.2.2 The Evolution of Artificial Belief Systems](#)

[C13.2.3 Cognitive Development Stages in AI: An Exploration](#)

[C13.2.4 Monitoring and Guiding AI's Psychological Maturation](#)

[C13.2.5 AI Socialization and Cultural Learning: Challenges and Solutions](#)

[C13.2.6 Instilling Values in AI: A Prerequisite for Moral Behavior](#)

[C13.2.7 The Role of Belief Systems in AI Decision Making](#)

[C13.2.8 AI's Psychological Development: A Key to Responsible Behavior](#)

[C13.2.9 The Potential and Risks of AI Cultural Learning](#)

[C13.2.10 The Future of Morality in Artificially Intelligent Systems](#)

C13.3 Building in robot bias & cognitive development through simulated evolution.

[C13.3.1 Alignment: The Problem of Bias in AI and Efforts to Align the Values of Super Intelligence](#)

[C13.3.2 Cognitive Development in AI: A Machine Learning Perspective](#)

[C13.3.3 Simulated Evolution: A Novel Approach for AI Growth](#)

[C13.3.4 Mitigating Bias with Simulated Evolution: A New Paradigm](#)

[C13.3.5 Balancing Objectivity and Subjectivity in AI Perception](#)

[C13.3.6 The Role of Simulated Evolution in AI Bias Mitigation](#)

[C13.3.7 The Interplay of Cognitive Development and Simulated Evolution in AI](#)

[C13.3.8 Potential Solutions to the Problem of AI Bias](#)

[C13.3.9 Ensuring Fairness in AI through Simulated Evolution](#)

[C13.3.10 The Future of Cognitive Development in AI](#)

C13.4 Linking Robot Minds with Real Minds

[C13.4.1 Neural Interfaces: Connecting AI and Human Minds](#)

[C13.4.2 Real-time Data Exchange between AI and Human Consciousness](#)

[C13.4.3 The Ethical Landscape of Mind Linking: Balancing Privacy and Autonomy](#)
[C13.4.4 Exploring the Applications of Mind Linking: From Education to Therapy](#)
[C13.4.5 Human-AI Synergy: A Future with Complementary Abilities](#)
[C13.4.6 The Evolution of Mind-Linking Technologies](#)
[C13.4.7 The Impact of Mind-Linking on Society](#)
[C13.4.8 Mind-Linking: Ethical Considerations and Future Directions](#)
[C13.4.9 Real-Time Data Transfer between Human and AI Minds](#)
[C13.4.10 Challenges and Opportunities in Linking Robot Minds with Real Minds](#)

C13.5 Uploading & Downloading whole minds, customizing minds & new learnings

[C13.5.1 Mind Uploading: The Quest to Digitize Consciousness](#)
[C13.5.2 Downloading Minds: Opportunities and Challenges in Consciousness Replication](#)
[C13.5.3 Customizing Consciousness: Tailoring Minds for Specific Tasks](#)
[C13.5.4 A New Era of Learning: The Role of AI in Knowledge Acquisition](#)
[C13.5.5 Revolutionizing Learning through Brain-Computer Interfaces](#)
[C13.5.6 The Feasibility and Implications of Mind Uploadingz](#)
[C13.5.7 The Ethical Considerations of Downloading Consciousness](#)
[C13.5.8 The Possibilities and Pitfalls of Customizing Minds](#)
[C13.5.9 Future Trends in AI-assisted Learning](#)
[C13.5.10 The Impact of Brain-Computer Interfaces on the Future of Education](#)

Chapter C14 The Consciousness Problem

summarize it in one sentence

The cycle delves into the intricate intersections of artificial neurology, exploring the nuances of consciousness, the transformative potentials of Brain-Computer Interfaces like NerveGear, and the profound implications of AI across entertainment, defense, healthcare, and global infrastructure.

summarize the main points of this text in 6 numbered sentences:

1. "C14: The Consciousness Problem" delves into the advanced study of artificial neurology, examining the nature of choice, qualia, and artificial cognitive stages while also exploring the role of neurotransmitters in shaping various perceptions and experiences.
2. The cycle introduces the concept of Brain-Computer Interfaces (BCIs), specifically the NerveGear, a state-of-the-art interface that allows for profound interaction between the brain and computational systems.
3. In the realm of entertainment and real-world applications, the text delves into the revolutionary potential of artificial design, 3D printing, virtual reality, augmented reality, and the implications of creating sentient AI entities in the Metaverse.
4. A significant focus is placed on the defense sector, looking at the future of warfare with the integration of autonomous weapons, sentient drones, and AI's role in cybersecurity, intelligence gathering, and surveillance.

5. **Healthcare sees a transformative vision through AI, aiming to tackle major challenges such as cancer, Alzheimer's, and heart disease while proposing a global medical justice system that could drastically reduce poverty, sickness, and social injustices.**
6. **The cycle concludes with a look into the future, detailing the potential of sentient infrastructure across air, land, sea, and space, highlighting the monumental changes AI could bring to aviation, urban planning, maritime operations, and space exploration.**

Self Aware Networks is the Institute for the advanced study of artificial neurology: Artificial Choice, Consciousness, Artificial Souls,

14 Conclusions: This cycle should summarize the main findings of the book and discuss future directions for research in the field of neuroscience, neurophysics, artificial intelligence, neurons, artificial neural networks, the perceptron, and brain-computer interfaces.

Conclusions: This cycle should summarize the main findings of the book and discuss future directions for research in the field of self-aware networks, theory of mind, and their potential applications.

The Advanced Study of Artificial Neurology

Artificial Neurology

Artificial Internal Representations or Qualia

Artificial Feelings

Artificial Emotion

Artificial Cognitive Developmental Stages

Artificial Motivation & Drive: Ilya Prigogine, Dissipative Systems

Cite Neurotransmitter Studies Relevant to Engineering Artificial Neurological Effects:

on Working Memory Bandwidth

on Rendering Hallucinations

on Rendering NDE Near Death Experiences

on Rendering OBE Out of Body Experiences

on Rendering Dreams

on Distorted Experiences of Time

on Distorted Experiences of Space

on Object Detection or Loss of Object Distinguishability: Special Story with Salvia Divinorum

Artificial Mental Illness, Monitoring, System Checks & Diagnosis

BCI

NerveGear (Brain Computer Interfacing with Artificial Neurologies)

Deep Learning for Biology

AI programming DNA

Gan Synthesis for 3D Printed Organs

Custom Designed 3D printed Organisms

Applications

3D Artificial Neural Networks to Solve Climate change problems like separating gasses from the atmosphere.

Imagine giant dogs that are really great at construction work.

Uploading & Backing up the mind & downloading the mind

3D printing new bodies. (From David Brin's The Kiln People to Reality, the new timeline to doing this for real)

Adapting old Maps of Reality to Artificial Cognitive Development:

Thresholds of the Mind: Chaos, Reorganization

Spiral Dynamics for AI

AQAL for Artificial Neurology: (Ken Wilber)

Rashomon Effect: two people see different versions of same evidence

to the specific topics in order of complexity, starting with neurons and neural networks and ending with the more complex topics like neurophysics of neural networks, neural dynamics and neural computation.

Finally, it's good to close the book discussing the current and future applications of the technology.

I hope this revised outline aligns better with your book's focus on self-aware networks and theory of mind.

The main idea behind this new outline is to start with the concept of self-awareness and theory of mind and then to delve into the different applications and implications of these topics in different fields.

C14 **The Consciousness Problem**, Next Generation Problem Solving

(Summary by LLaMa served by Perplexity Labs) C14 explores the intersections of AI, entertainment, and society, covering topics such as revolutionary design and printing, immersive media and gaming, augmented reality, health and fitness assistance, and future trends in AI and entertainment technology.

The cycle also discusses the potential of AI in defense strategies, including autonomous weapons and sentient military drones, as well as its impact on global health and poverty reduction.

Additionally, it touches upon the topic of mind-brain-computer interfaces, such as NerveGear, which could potentially enable our minds to be accessed and customized like a hard drive.

C14.1 Replicators, Duplicators, Artificial Design, Pictures, Movies, Games, VR, AR, Metaverse friends, real world helpers.

[C14.1.1 The Revolution of Artificial Design and 3D Printing](#)

[C14.1.2 AI in Media and Entertainment: From Pictures to VR](#)

[C14.1.3 The Emergence of Metaverse: AI Integration and Social Impact](#)

[C14.1.4 Real World Helpers: The Role of AI in Everyday Life](#)

[C14.1.5 The Future of AI: From Star Trek Replicators to Duplicators](#)

[C14.1.6 AI in Gaming: Creating Immersive Experiences](#)

[C14.1.7 Augmented Reality and AI: Enhancing Real World Interactions](#)

[C14.1.8 The Role of AI in Health and Fitness Assistance](#)

[C14.1.9 Future Trends in AI and Entertainment Technology](#)

[C14.1.10 AI and the Metaverse: A New Era of Social Interactions](#)

C14.2 Next Generation Problem Solving: Defense Department: The Sentient Shield Program: Death Star Robot, Sentient Military Only weapons: T-Cells for Society.

[C14.2.1 Autonomous Weapons: The Next Generation of Military Defense](#)

[C14.2.2 The Sentient Shield Program: AI, Drones, Robots in Defense Strategy & Tactics](#)

[C14.2.3 From T-Cells to Robots: Customized biology: The Far Future of State technology, Military Weapons, Medicine.](#)

[C14.2.4 AI in Cybersecurity: Protecting National Interests](#)

[C14.2.5 Ethical Implications of Sentient Military Weapons](#)

[C14.2.6 The Role of AI in Modern Warfare and Defense Strategies AI for war time logistics, supporting all aspects of a war time economy, + AI for mine clearing](#)

[C14.2.7 The Future of Defense: Sentient Military Drones, Surveillance, Delivering Payloads, Drone Suicide Bombing.](#)

[C14.2.8 Security Implications of Autonomous Weapons Systems](#)

[C14.2.9 The Sentient Shield Program: A New Paradigm in Defense](#)

[C14.2.10 The Role of AI in Intelligence Gathering and Surveillance](#)

C14.3 The Global Medical Justice System, long term solutions to reduce or eliminate most poverty, sickness, war, crime. Solutions for Cancer, Alzheimer's, Heart Disease & rare illnesses.

[C14.3.1 AI in Medicine: The Fight Against Cancer](#)

[C14.3.2 Tackling Neurological Disorders: AI and Alzheimer's Disease](#)

[C14.3.3 Addressing Heart Disease and Rare Illnesses with AI](#)

[C14.3.4 Alleviating Poverty and Promoting Social Justice with AI](#)

[C14.3.5 The Global Medical Justice System: A New Approach to Healthcare](#)

[C14.3.6 The Role of AI in Disease Diagnosis and Treatment](#)

[C14.3.7 Poverty Reduction and Social Justice: The Potential of AI](#)

[C14.3.8 AI and Global Health: Solutions for Widespread Diseases](#)

[C14.3.9 Overcoming Healthcare Challenges with AI: A Future Perspective](#)

[C14.3.10 The Future of AI in Medicine: From Diagnosis to Treatment](#)

C14.4 NerveGear, The ultimate unified mind-brain-computer interface, enabling our minds to become as accessible as a special kind of hard drive that we can read & write to, download & upload our minds to, or self customize with.

[C14.4.1 NerveGear with Sentient AI: The Convergence of Human Intelligence and AI](#)

[C14.4.2 Reading and Writing to the Mind: Technological Breakthroughs](#)

[C14.4.3 Mind Uploading: Advancements and Applications](#)

[C14.4.4 Cognitive Enhancement through Mind-Brain-Computer Interfaces](#)

[C14.4.5 Customizing Minds: The Future of Personalized AI](#)

[C14.4.6 The Promise and Challenges of Mind Uploading](#)

[C14.4.7 Cognitive Enhancement and the Role of AI](#)

[C14.4.8 The Future of Personalized AI: Self Customization](#)

[C14.4.9 The Impact of NerveGear on Cognitive Sciences](#)

[C14.4.10 NerveGear and the Future of Brain-Computer Interfaces](#)

C14.5 Sentient Infrastructure for Air, Land, Sea, and Space.

[C14.5.1 Sentient Air Traffic Control: AI in Aviation](#)

[C14.5.2 AI in Urban Planning and Infrastructure Management](#)

[C14.5.3 The Role of Sentient AI in Maritime Operations and Ocean Exploration](#)

[C14.5.4 AI in Space: Exploring the Final Frontier Rovers, Satellites, and Drone Spaceships](#)

[C14.5.5 Sentient Infrastructure: The Future of Environmental Management](#)

[C14.5.6 Advancements in AI for Air Traffic Control](#)

[C14.5.7 The Role of AI in Managing Urban Infrastructure](#)

[C14.5.8 Sentient AI in Ocean Exploration: Challenges and Opportunities](#)

[C14.5.9 The Self Aware Networks Institute: Research, Development, Alignment](#)

[C14.5.10 Accelerating the Development of Sentient & Self-Aware Neural Networks: Public Perception and Ethical Implications](#)

Self Aware Networks: Theory of Mind

[Cycle 1.1.1 Neo Mind Cycle 2012: Computer Assisted Enlightenment](#)

[Cycle 1.1.2 The Neural Lace Podcast: Decoding the human mind](#)

[Cycle 1.1.3 Neurotech Salon SF + SF Virtual Reality](#)

[Cycle 1.1.4 A-Frame WebXR Online Hack Night](#)

[Cycle 1.1.5 3 Life Goals: NerveGear, Artificial Cortex, Artificial Brains.](#)

[Cycle 1.1.6 Building a Community Around Neurotech](#)

[Cycle 1.1.7 Evolving Interface Designs in Neurotech](#)

[Cycle 1.1.8 Applications of WebXR in Neurotech](#)

[Cycle 1.1.9 Progress in Sentient Neural Networks](#)

[Cycle 1.1.10 The Self Aware Networks Institute](#)

[Cycle 1.2.1 Brain Computer Interfaces: David Eagleman](#)

[Cycle 1.2.2 Deciphering Brain Connectivity: Olaf Sporns](#)

[Cycle 1.2.3 Rhythms of the Brain by Gyorgy Buzsaki](#)

[Cycle 1.2.4 Thalamus and Broccoli Properties: The Nature of Consciousness](#)

[Cycle 1.2.5 Decoding Human Brain Signals with Medical Imaging + AI](#)

[Cycle 1.2.6 Building a Semantic Map of the Brain](#)

[Cycle 1.2.7 The Role of the Thalamus in Consciousness](#)

[Cycle 1.2.8 Neuroplasticity and BCI](#)

[Cycle 1.2.9 A Deep Dive into Brain Rhythms](#)

[Cycle 1.2.10 Future of AI in Decoding Brain Signals](#)

[Cycle 1.3.1 BCI Industry, EEG, ECOG](#)

[Cycle 1.3.2 Neuralink, Furaxa](#)

[Cycle 1.3.3 HD-Dot, Fnirs, Openwater](#)

[Cycle 1.3.4 MRI advancements](#)

[Cycle 1.3.5 OPEN EIT + Deep Learning](#)

[Cycle 1.3.6 The Role of Deep Learning in BCIs](#)

[Cycle 1.3.7 The Future of OpenWater in Neurotech](#)

[Cycle 1.3.8 Advances in ECOG Technology](#)

[Cycle 1.3.9 Understanding HD-Dot in the BCI Industry](#)

[Cycle 1.3.10 The Impact of MRI Advancements on BCIs](#)

[Cycle 1.4.1 Neural Synchrony and Brain Network Protocols: TCP or UDP?](#)

[Cycle 1.4.2 Understanding Neural Coding: From Neurons to Networks](#)

[Cycle 1.4.3 Dipoles, Spikes, Brainwaves](#)

[Cycle 1.4.4 The Role of Phase Oscillation Tomography in Neural Coding](#)

[Cycle 1.4.5 Solitons vs Hodgkin & Huxley](#)

[Cycle 1.4.6 NAPOT: A New Protocol for Brain Communication](#)

Intro.NAPOT Intro to the main thesis of the book: NAPOT Neural Array Projection Oscillation Tomography.

[Cycle 1.4.7 Information Theory & Neural Coding](#)

[Cycle 1.4.8 The Interplay of Quantum Oscillatory Physics and Neurophysics](#)

[Cycle 1.4.9 Soliton 2.0 Electric & Chemical Dominant Phase Wave Differential Trains](#)

[Cycle 1.4.10 Brain Oscillations and Phase Coding: A Deep Dive](#)

[Cycle 1.5.1 Interdisciplinary Approaches to Brain Research](#)

[Cycle 1.5.2 The Role of Artificial Intelligence in Neuroimaging](#)

[Cycle 1.5.3 Novel Technologies & Innovative Methods in Brain Mapping / Neural Imaging](#)

[Cycle 1.5.4 Standardizing Brain Imaging Techniques for Research](#)

[Cycle 1.5.5 The Child Mind Institute's Initiative for Data Standardization](#)

[Cycle 1.5.6 A Vision for the Future: Integrated BCI and Neuropsychology](#)

[Cycle 1.5.7 Role of Machine Learning in Standardization of Neuroimaging Data](#)

[Cycle 1.5.8 Addressing Challenges in Brain Mapping](#)

[Cycle 1.5.9 Integrated BCI: Current Progress and Future Directions](#)

[Cycle 1.5.10 Innovations in Neuroimaging Techniques](#)

[Cycle 2.1.1 The Holographic Universe, Holographic Brain](#)

[Cycle 2.1.2 A Thousand Brains, Tomographic Brain](#)

[Cycle 2.1.3 The number of possible states](#)

[Cycle 2.1.4 Light Field Capture, Light Field Render, Light Field Display](#)

[Cycle 2.1.5 Holograms, Holodecks](#)

[Cycle 2.1.6 Exploring the Holographic Principle in Neural Networks](#)

[Cycle 2.1.7 Decoding the Brain: A Thousand Brains Approach](#)

[Cycle 2.1.8 Neural States and Quantum Possibilities](#)

[Cycle 2.1.9 Light Field Technologies in Neuroimaging](#)

[Cycle 2.1.10 Holodecks: The Future of Neural Visualization](#)

[Cycle 2.2.1 Quantum Phase Oscillation in Neural Networks](#)

[Cycle 2.2.2 Dendritic Morphology's Role in Neural Coding, Understanding Neural Pathways](#)

[Cycle 2.2.3 Neural Array as Cameras and Displays: Perception and Consciousness](#)

[Cycle 2.2.4 Neural Array Projection Oscillation Tomography, Neural Rendering: Visualizing the Brain's Inner Workings](#)

[Cycle 2.2.5 Pathway to Tomographic Understanding of the Brain](#)

[Cycle 2.2.6 Advanced Neural Coding: From Single Neurons to Neural Circuits](#)

[Cycle 2.2.7 Oscillatory Behavior of Neural Networks](#)

[Cycle 2.2.8 Neuroimaging Techniques for Visualizing Neural Pathways](#)

[Cycle 2.2.9 Neural Rendering: From Neural Coding to Perception](#)

[Cycle 2.2.10 Future Perspectives in Neural Coding and Rendering](#)

[Cycle 2.3.1 Attention Schema: The Brain's Spotlight](#)

[Cycle 2.3.2 Role of Holography in Attention Schema](#)

[Cycle 2.3.3 Attention, Perception, and Reality](#)

[Cycle 2.3.4 The Interplay between Attention and Phase Wave Differentials](#)

[Cycle 2.3.5 The Future of Attention Schema Research: Opportunities and Challenges](#)

[Cycle 2.3.6 Attention Modulation in Holographic Neural Networks](#)

[Cycle 2.3.7 Tomographic Insights into Attentional Processes](#)

[Cycle 2.3.8 Holography and Attention: Decoding the Brain's Spotlight](#)

[Cycle 2.3.9 Cognitive Neuroscience of Attention: From Brain Mechanisms to Individual Differences](#)

[Cycle 2.3.10 New Horizons in Attention Schema Research](#)

[Cycle 2.4.1 Neurophysics and Computational Neuroscience: An Overview](#)

[Cycle 2.4.2 Understanding the Brain's Computational Power](#)

[Cycle 2.4.3 Computational Rendering of Perception and Consciousness](#)

[Cycle 2.4.4 Merging Computation and Consciousness](#)

[Cycle 2.4.5 Understanding Brain Computation through Physics](#)

[Cycle 2.4.6 The Brain as a Quantum Computer: Implications for Consciousness](#)

[Cycle 2.4.7 Computational Models of Brain Dynamics](#)

[Cycle 2.4.8 Resolution of Brain Computation: From Microscale to Macroscale](#)

[Cycle 2.4.9 The Phi Principle: A Measure of Consciousness in Computational Terms](#)

[Cycle 2.4.10 Future Directions in Computational Neuroscience](#)

[Cycle 2.5.1 Understanding the relevance of 3D Semantic Segmentation](#)

[Cycle 2.5.2 Or Litani, Advances in 3D Segmentation Techniques](#)

[Cycle 2.5.3 Case Studies in 3D Semantic Segmentation](#)

[Cycle 2.5.4 Applying 3D Semantic Segmentation in Brain Mapping for BCI](#)

[Cycle 2.5.5 Implementing 3D Semantic Segmentation in Self Aware Networks](#)

[Cycle 2.5.6 3D Segmentation: An Essential Tool for Neuroimaging](#)

[Cycle 2.5.7 Semantic Segmentation in the Era of Deep Learning](#)

[Cycle 2.5.8 Advanced Techniques in 3D Segmentation](#)

[Cycle 2.5.9 Case Study: 3D Semantic Segmentation in Brain Tumor Imaging](#)

[Cycle 2.5.10 Future Prospects for 3D Semantic Segmentation in Neuroimaging](#)

[Cycle 3.1.1 Understanding Fractals in Human Morphology: The eye 2 head fractal](#)

[Cycle 3.1.2 The hand to neuron fractal](#)

[Cycle 3.1.3 The Recursive Design of the Human Body](#)

[Cycle 3.1.4 Fractal Morphology in Neural Networks](#)

[Cycle 3.1.5 Neural Network Architecture: A Fractal Perspective](#)

[Cycle 3.1.6 The Fractal Relationship Between Sensors and Neurons](#)

[Cycle 3.1.7 Fractals, Quantum Oscillations, and the Neural Matrix](#)

[Cycle 3.1.8 Fractals, Cells, Computation & Evolution, The Fractal Nature of Consciousness](#)

[Cycle 3.1.9 Exploring Fractal Patterns in the Human Body](#)

[Cycle 3.1.10 Fractal Analysis of the Neural Network Architecture](#)

[Cycle 3.2.1 Magnitude and Frequency in Fractal Physics](#)
[Cycle 3.2.2 Fractals in the Cosmic Scale: A Link Between Astro-Physics and Neuro-Physics](#)
[Cycle 3.2.3 The Fractal Nature of Space-Time and its Implications for Neural Processing](#)
[Cycle 3.2.4 Self-Similarity and Scale Invariance in the Universe](#)
[Cycle 3.2.5 Fractals and the Fabric of Reality](#)
[Cycle 3.2.6 The Fractal Universe: Implications for Quantum Physics](#)
[Cycle 3.2.7 Fractal Patterns in Cosmic Structures](#)
[Cycle 3.2.8 The Interplay of Fractals, Magnitude, and Frequency in Physics](#)
[Cycle 3.2.9 From Micro to Macro: Fractal Patterns in Nature](#)
[Cycle 3.2.10 Fractals and the Foundations of Physics](#)

[Cycle 3.3.1 Fractal Patterns in Brain Imaging and Neural Network Topology](#)
[Cycle 3.3.2 The Role of Fractals in Visualization of Neural Network Activity](#)
[Cycle 3.3.3 Fractals in Functional MRI: Decoding the Language of the Brain](#)
[Cycle 3.3.4 Case Studies: Fractal Imaging in Neurology](#)
[Cycle 3.3.5 Fractal Geometry in Structural and Functional Brain Connectivity](#)
[Cycle 3.3.6 Advances in Fractal Analysis for Neuroimaging](#)
[Cycle 3.3.7 Fractal Networks and their Role in Brain Function](#)
[Cycle 3.3.8 Fractal Analysis in Medical Imaging: Past, Present, and Future](#)
[Cycle 3.3.9 The Art and Science of Fractal Imaging](#)
[Cycle 3.3.10 The Potential of Fractals in Neuroimaging](#)

[Cycle 3.4.1 Fractal Patterns in Cellular Functions, and Neural Processing](#)
[Cycle 3.4.2 The Fractal Design of the Dendritic Morphology](#)
[Cycle 3.4.3 Tracing the Fractal Pattern: From Cell to Cortex](#)
[Cycle 3.4.4 Fractal Memory Encoding and Retrieval in Neurons](#)
[Cycle 3.4.5 The Fractal Relationship Between Sensory Transduction and Neural Computation](#)
[Cycle 3.4.6 Fractal Geometry in Neural Pathways and Interconnections](#)
[Cycle 3.4.7 The Fractal Architecture of Cortical Columns and its Implication for AI Networks](#)
[Cycle 3.4.8 Fractal Patterns in Cellular Dynamics](#)
[Cycle 3.4.9 From Cellular Complexity to Cortical Functions: A Fractal Perspective](#)
[Cycle 3.4.10 Fractals and the Evolution of Neural Complexity](#)

[Cycle 3.5.1 Prigogine's Theory of Dissipative Systems Applied to Neural Dynamics](#)
[Cycle 3.5.2 Dissipative Structures and their Role in Neural Processing](#)
[Cycle 3.5.3 The Neurophysics of Time Perception: Insights from Prigogine's Work](#)
[Cycle 3.5.4 The Connection between Neural Rendering and Behavior](#)
[Cycle 3.5.5 Neural Rendering and the Fractal Nature of Perception](#)
[Cycle 3.5.6 From Neural Oscillations to Conscious Experience: A Prigoginian Perspective](#)
[Cycle 3.5.7 The Role of Dissipative Systems in the Emergence of Consciousness](#)
[Cycle 3.5.8 Prigogine's Impact on Modern Neurophysics](#)
[Cycle 3.5.9 Exploring the Dynamics of Dissipative Systems in the Brain](#)
[Cycle 3.5.10 Behavior and Consciousness: A Neural Rendering Perspective](#)

[Cycle 4.1.1 The Role of Potassium and Calcium in Neural Communication](#)
[Cycle 4.1.2 Action Potential Duration \(APD\) and Its Impact on Neural Signals](#)
[Cycle 4.1.3 Understanding Solitons in Neuronal Dynamics](#)
[Cycle 4.1.4 Revisiting the Hodgkin & Huxley Model](#)
[Cycle 4.1.5 From Dendrite Activation to Multi-Vesicle Release to Voltage Rhythms to Action](#)
[Cycle 4.1.6 Phasic and Tonic Signals: A Comparative Study](#)
[Cycle 4.1.7 Potassium and Calcium: The Ionic Duo in Neuronal Signaling](#)
[Cycle 4.1.8 Exploring Solitons and Their Role in Neural Signal Propagation](#)
[Cycle 4.1.9 Hodgkin & Huxley: Their Legacy in Neuroscience](#)
[Cycle 4.1.10 Dendritic Activation and Its Role in Neural Communication](#)

[Cycle 4.2.1 Understanding Nonlinear Pattern Detectors in Neural Networks](#)
[Cycle 4.2.2 The Role of Receptors in Signal Transmission](#)
[Cycle 4.2.3 Dendrites and Soma: The Neural Processing Centers](#)
[Cycle 4.2.4 Bistable Synaptic Plasticity \(BTSP\) and Memory Formation](#)
[Cycle 4.2.5 Current Theories on How Memories are Formed and Stored](#)
[Cycle 4.2.6 Nonlinear Pattern Detectors: From Theory to Practice](#)
[Cycle 4.2.7 Receptors: The Gatekeepers of Neural Signaling](#)
[Cycle 4.2.8 Dendrites and Soma: Key Players in Signal Integration](#)
[Cycle 4.2.9 BTSP: A Novel Mechanism of Memory Formation](#)
[Cycle 4.2.10 Memories: Formation, Storage, and Retrieval](#)

[Cycle 4.3.1 The Process of Memory Recall: A Neuro Physical Perspective](#)
[Cycle 4.3.2 The Role of Sharp Wave Ripples in Memory Recall](#)
[Cycle 4.3.3 Neural Array Projection and Its Implications for Memory Processing](#)
[Cycle 4.3.4 Contemporary Memory Recall Models in Neuroscience](#)
[Cycle 4.3.5 Case Studies: Memory Recall and Disturbances](#)
[Cycle 4.3.6 The Neurobiology of Memory Recall: Recent Advances](#)
[Cycle 4.3.7 Sharp Wave Ripples: Unraveling the Mysteries of Memory Recall](#)
[Cycle 4.3.8 Neural Array Projection: A Novel Approach to Memory Processing](#)
[Cycle 4.3.9 Memory Recall: Current Models and Future Directions](#)
[Cycle 4.3.10 Memory Disturbances: A Neuro Physical Perspective](#)

[Cycle 4.4.1 An Introduction to Phase Wave Variations in Neural Networks](#)
[Cycle 4.4.2 Applying Tomography Techniques in Brain Imaging](#)
[Cycle 4.4.3 Understanding Neuronal Oscillations and Their Role in Information Processing](#)
[Cycle 4.4.4 The Interplay of Phase Waves, Tomography, and Oscillation in Neurophysics](#)
[Cycle 4.4.5 Recent Advances and Challenges in Phase Wave Analysis](#)
[Cycle 4.4.6 Phase Wave Variations: A New Frontier in Neurophysics](#)
[Cycle 4.4.7 Tomography in Neuroimaging: Techniques and Applications](#)
[Cycle 4.4.8 Oscillations in Neural Networks: Mechanisms and Functions](#)
[Cycle 4.4.9 Phase Waves, Tomography, and Oscillation: A Triadic Interplay in Neurophysics](#)
[Cycle 4.4.10 The Future of Phase Wave Analysis in Neurophysics](#)

[Cycle 4.5.1 The Concept of Quantum Gradient Time Crystal Dilation](#)
[Cycle 4.5.2 Mathematical Models for Quantum Gradient Time Crystal Dilation](#)
[Cycle 4.5.3 Potential Applications and Implications of QGTCD in Neurophysics](#)
[Cycle 4.5.4 Exploring the Limits of QGTCD: Current Challenges and Future Directions](#)
[Cycle 4.5.5 Quantum Gradient Time Crystal Dilation: A New Perspective in Neurophysics](#)
[Cycle 4.5.6 QGTCD: From Theory to Practice](#)
[Cycle 4.5.7 Quantum Gradient and Time Crystal Dilation: A Mathematical Perspective](#)
[Cycle 4.5.8 Applications of QGTCD in Modern Neurophysics](#)
[Cycle 4.5.9 Challenges in the Implementation of QGTCD](#)
[Cycle 4.5.10 Future Perspectives on Quantum Gradient Time Crystal Dilation](#)

[Cycle 5.1.1 The Role of Sensory Organs in Signal Transmission](#)
[Cycle 5.1.2 Understanding Ion Role in Neuronal Communication](#)
[Cycle 5.1.3 The Mechanism of Intracellular Signal Cascades](#)
[Cycle 5.1.4 The Importance of Rhythmic Oscillations in Information Processing](#)
[Cycle 5.1.5 Phase Wave Differentials and their Significance](#)
[Cycle 5.1.6 Sensory Organs: The First Step in Neural Communication](#)
[Cycle 5.1.7 Transmitters: Essential Elements in Signal Transmission](#)
[Cycle 5.1.8 Extracellular Signal Cascades: The Domino Effect in Neural Networks](#)
[Cycle 5.1.9 Neural Rhythms and Differentials: Orchestrating Perception](#)
[Cycle 5.1.10 Differentials in Phase Waves: A Key Aspect of Neural Communication](#)

[Cycle 5.2.1 The Shift from Spikes to Phases in Neural Communication](#)
[Cycle 5.2.2 Understanding Phase Precession](#)
[Cycle 5.2.3 Decoding Bursts and Burstlets in Neuronal Activity](#)
[Cycle 5.2.4 The Impact of Soma Bursts on Signal Propagation](#)
[Cycle 5.2.5 Ground of Being: The Base of Conscious Perception](#)
[Cycle 5.2.6 From Spikes to Phases: A Paradigm Shift in Neurophysics](#)
[Cycle 5.2.7 Phase Precession: The Temporal Dynamics of Neural Networks](#)
[Cycle 5.2.8 Bursts and Burstlets: The Rhythms of Neural Activity](#)
[Cycle 5.2.9 The Role of Soma Bursts in Information Propagation](#)
[Cycle 5.2.10 Exploring the Ground of Being: The Foundation of Consciousness](#)

[Cycle 5.3.1 Understanding Soma Burst: Origin and Effects](#)
[Cycle 5.3.2 Role of Multi-microvesicle Release in Signal Transmission](#)
[Cycle 5.3.3 Burstlets and Their Role in Neuronal Communication](#)
[Cycle 5.3.4 Sharp Wave Ripples: Their Genesis and Significance](#)
[Cycle 5.3.5 Inhibitory Waves and Their Impact on Signal Flow](#)
[Cycle 5.3.6 Soma Burst: A Crucial Component of Neuronal Signaling](#)
[Cycle 5.3.7 Multi-microvesicle Release: An Essential Mechanism in Signal Propagation](#)
[Cycle 5.3.8 Burstlets: The Fine-tuning of Neural Communication](#)
[Cycle 5.3.9 Sharp Wave Ripples: The Pulse of Memory Consolidation](#)
[Cycle 5.3.10 Inhibitory Waves: Regulating the Rhythm of Neural Networks](#)

[Cycle 5.4.1 Graded Potentials: A Fundamental of Neurophysics](#)
[Cycle 5.4.2 Backwards Dendritic Spikes and Their Role in Information Processing](#)
[Cycle 5.4.3 Neural Bifurcation: Understanding the Phenomenon](#)
[Cycle 5.4.4 The Process of Neural Tuning: A Key Aspect of Neurophysics](#)
[Cycle 5.4.5 The Role and Functionality of Inhibitory Interneurons](#)
[Cycle 5.4.6 Graded Potentials: Decoding the Gradient of Neural Signals](#)
[Cycle 5.4.7 Backwards Dendritic Spikes: The Reverse Gear of Neural Information Flow](#)
[Cycle 5.4.8 Neural Bifurcation: A Fork in the Road of Neural Pathways](#)
[Cycle 5.4.9 Neural Tuning: The Fine-tuning of Neural Responses](#)
[Cycle 5.4.10 Inhibitory Interneurons: The Brakes of the Neural Network](#)

[Cycle 5.5.1 Advanced Pattern Recognition and its Role in Perception](#)
[Cycle 5.5.2 Cortical-Cortical-Thalamic Pathways: Understanding the Complex Network](#)
[Cycle 5.5.3 The Neuroscience of Making Choices: An Insight](#)
[Cycle 5.5.4 The Functionality of the Thalamus in Neurophysics](#)
[Cycle 5.5.5 The Confluence of Sensory Information and Decision Making](#)
[Cycle 5.5.6 High-level Pattern Recognition: A Key to Understanding Perception](#)
[Cycle 5.5.7 Cortical-Cortical-Thalamic Pathways: The Superhighways of Neural Information Flow](#)
[Cycle 5.5.8 Choices: The Result of Complex Neural Computations](#)
[Cycle 5.5.9 Thalamus: The Grand Central Station of Sensory Information](#)
[Cycle 5.5.10 The Intersection of Sensory Perception and Decision Making: A Neurophysical Perspective](#)

[Cycle 6.1.1 Neuronal Drift & The Ever-Changing Brain](#)
[Cycle 6.1.2 A Virtual Mind: Concept and Reality](#)
[Cycle 6.1.3 Engrams: The Physical Traces of Memory](#)
[Cycle 6.1.4 The Interaction of Neuronal Drift and Memory Formation](#)
[Cycle 6.1.5 The Role of a Virtual Mind in Perception and Cognition](#)
[Cycle 6.1.6 How Engrams Contribute to the Virtual Mind](#)
[Cycle 6.1.7 The Impact of Neuronal Drift on Memory and Perception](#)
[Cycle 6.1.8 The Virtual Mind: A New Framework for Understanding Consciousness](#)
[Cycle 6.1.9 Exploring the Dynamics of Engrams in Memory Storage](#)
[Cycle 6.1.10 Future Directions: Neuronal Drift, Engrams, and the Virtual Mind](#)

[Cycle 6.2.1 Locus of Focus: The Center of Conscious Attention](#)
[Cycle 6.2.2 Hallucinations: When Perception Deviates from Reality](#)
[Cycle 6.2.3 The Ego: The Self in the Center](#)
[Cycle 6.2.4 Dissolving Ego: Exploring Altered States of Consciousness](#)
[Cycle 6.2.5 How Locus of Focus Shapes Our Perception and Experience](#)
[Cycle 6.2.6 Hallucinations and the Brain: Insights into Perceptual Anomalies](#)
[Cycle 6.2.7 The Ego and Its Role in Consciousness](#)
[Cycle 6.2.8 Ego Dissolution: Insights from Psychology and Neuroscience](#)
[Cycle 6.2.9 The Impact of Focus and Hallucinations on the Perception of Self](#)

[Cycle 6.2.10 Exploring the Connection Between Ego Dissolution and Altered Perception](#)

[Cycle 6.3.1 Unpacking the Complexity of Inhibitory Mechanisms](#)

[Cycle 6.3.2 The Role of Signal Processing in Neural Function](#)

[Cycle 6.3.3 The Grid/Graph: The Structural Framework of the Brain](#)

[Cycle 6.3.4 How Inhibition Contributes to Signal Processing](#)

[Cycle 6.3.5 The Interplay of Inhibition and Signal Processing in the Brain](#)

[Cycle 6.3.6 Understanding the Role of the Grid/Graph in Neural Connectivity](#)

[Cycle 6.3.7 Exploring the Complexity of Inhibition: Insights into Conscious Processing](#)

[Cycle 6.3.8 Signal Processing: The Brain's Method of Making Sense](#)

[Cycle 6.3.9 The Grid/Graph: A Key Structure in the Brain's Architecture](#)

[Cycle 6.3.10 Inhibition, Signal Processing, and the Grid/Graph: The Triad of Neural Function](#)

[Cycle 6.4.1 Understanding Path Tracing in Neural Networks](#)

[Cycle 6.4.2 The Role of Interneurons in Neural Connectivity](#)

[Cycle 6.4.3 Microscale Choices: Decision Making within Neurons](#)

[Cycle 6.4.4 Macroscale Choices: Decision Making within Neural Networks](#)

[Cycle 6.4.5 Path Tracing and Its Influence on Neural Connectivity](#)

[Cycle 6.4.6 The Impact of Interneurons on Neural Decision Making](#)

[Cycle 6.4.7 Decision Making in the Brain: From Micro to Macro Scale](#)

[Cycle 6.4.8 Unraveling the Role of Path Tracing in Neural Networks](#)

[Cycle 6.4.9 How Interneurons Contribute to Neural Decisions](#)

[Cycle 6.4.10 Decision Making at Different Scales: A Comprehensive View](#)

[Cycle 6.5.1 Hofstadter's Contributions to Consciousness Studies](#)

[Cycle 6.5.2 Understanding Feedback Loops in Neural Systems](#)

[Cycle 6.5.3 The Role of Feedback Loops in the Emergence of Self](#)

[Cycle 6.5.4 Hofstadter's Theory of self reference and Its Impact on Consciousness Research](#)

[Cycle 6.5.5 How Feedback Loops Contribute to Self-Awareness](#)

[Cycle 6.5.6 The Rise of the Self: An Emergent Property of Neural Feedback](#)

[Cycle 6.5.7 Exploring Hofstadter's Concepts in the Context of Neurophysics](#)

[Cycle 6.5.8 Feedback Loops: The Drivers of Conscious Perception](#)

[Cycle 6.5.9 The Emergence of Self: Insights from Hofstadter and Neurophysics: Interplay Between Hofstadter's Theory and Neural Feedback Loops](#)

[Cycle 6.5.10 Future Directions: Hofstadter, Feedback Loops, and the Self/](#)

[Cycle 7.1.1 Introduction to Neural Circuits and Structures](#)

[Cycle 7.1.2 Understanding Powerband Role in Neuronal Communication](#)

[Cycle 7.1.3 Exploring the Structure and Function of Cortical Columns](#)

[Cycle 7.1.4 Edge Communities in Neural Networks: An Overview](#)

[Cycle 7.1.5 The Anatomy and Function of Neural Array Oscillations](#)

[Cycle 7.1.6 An Exploration of Mini & Micro Cortical Columns](#)

[Cycle 7.1.7 The Role and Function of Nuclei in the Brain](#)

[Cycle 7.1.8 A Comprehensive Overview of Brain Structures: Tri-Part Synapses](#)

[Cycle 7.1.9 Astrocytes: The Supporting Cells of the Brain](#)

[Cycle 7.1.10 Microglia: The Immune System of the Brain](#)

[Cycle 7.2.1 Exploring the Function and Importance of Primary Sensory Cortices](#)

[Cycle 7.2.2 Unraveling the Mystery of Thalami Conjoined Twins](#)

[Cycle 7.2.3 Prefrontal-Thalami Communication: The Key to Coordinated Brain Function](#)

[Cycle 7.2.4 The Intricate Interactions between the Thalamus and Prefrontal Cortex](#)

[Cycle 7.2.5 Thalami Conjoined Twins: A Study of Neural Connectivity](#)

[Cycle 7.2.6 The Role of the Prefrontal Cortex in Thalamic Communication](#)

[Cycle 7.2.7 The Thalamus: The Gateway to the Cortex](#)

[Cycle 7.2.8 The Interplay between the Prefrontal Cortex and Thalamus](#)

[Cycle 7.2.9 The Communication Pathway between the Prefrontal Cortex and Thalamus](#)

[Cycle 7.2.10 Primary Sensory Cortices: The Brain's Information Processing Centers](#)

[Cycle 7.3.1 Understanding the Role and Function of Grid Cells](#)

[Cycle 7.3.2 The Function and Importance of Place Cells in Spatial Navigation](#)

[Cycle 7.3.3 Reference Frames: The Internal GPS of the Brain](#)

[Cycle 7.3.4 The Phenomenon of Self-Similarity in the Cortex](#)

[Cycle 7.3.5 Grid Cells and Place Cells: The Brain's Navigational Tools](#)

[Cycle 7.3.6 Exploring the World Through the Brain's Reference Frames](#)

[Cycle 7.3.7 The Self-Similar Nature of the Cortex and its Implications](#)

[Cycle 7.3.8 Grid Cells, Place Cells, and the Representation of Space](#)

[Cycle 7.3.9 Decoding the Brain's Internal Map: The Role of Reference Frames](#)

[Cycle 7.3.10 The Cortex: A Self-Similar Structure](#)

[Cycle 7.4.1 The Role and Importance of Brainwaves](#)

[Cycle 7.4.2 The Transition from Chaotic to Steady State Brainwaves](#)

[Cycle 7.4.3 The Impact of Brainwave States on Reality Perception](#)

[Cycle 7.4.4 A Steady State of Reality: An Outcome of Coordinated Brain Activity](#)

[Cycle 7.4.5 Brainwaves: The Underlying Rhythm of Brain Function](#)

[Cycle 7.4.6 From Chaos to Order: Understanding Brainwave Patterns](#)

[Cycle 7.4.7 The Role of Brainwave States in Perceptual Reality](#)

[Cycle 7.4.8 Creating a Steady State of Reality Through Neural Coordination](#)

[Cycle 7.4.9 The Brain's Symphony: Understanding the Impact of Brainwave Patterns](#)

[Cycle 7.4.10 How Chaotic Brainwaves Give Rise to a Coherent Perception of Reality](#)

[Cycle 7.5.1 Proteins: The Building Blocks of Neuronal Communication](#)

[Cycle 7.5.2 RNA: An overlooked messenger in Neuronal Communication](#)

[Cycle 7.5.3 DNA: The Blueprint of Neuronal Structure and Function](#)

[Cycle 7.5.4 Quantum Spin: A New Frontier in Neurophysics](#)

[Cycle 7.5.5 Proteins, RNA, and DNA: The Underbelly of Neuronal Function & Cognitive Evolution](#)

[Cycle 7.5.6 The Role of Quantum Spin in Neuronal Activity](#)

[Cycle 7.5.7 Unraveling the Mystery of Quantum Spin in Neuronal Function](#)

[Cycle 7.5.8 How Proteins, RNA, and DNA Shape Neuronal Function](#)

[Cycle 7.5.9 Quantum Spin and its Implications for Neuronal Activity](#)

[Cycle 7.5.10 The Quantum Nature of Neuronal Communication](#)

[Cycle 8.1.1 Neural Coding: Representation of Sensory Information](#)

[Cycle 8.1.2 Sensory Inputs to Neural Signals \(The Eyes and Ears, Detection: Responses, Reactions & Feedback\)](#)

[Cycle 8.1.3 The Journey of the Information Process in the Brain, Pathways and Interactions](#)

[Cycle 8.1.4 The Role of Sensory Inputs in 3D Perception](#)

[Cycle 8.1.5 Understanding the Role of Neural Arrays in Sensory Input](#)

[Cycle 8.1.6 Sensory Processing: From Raw Inputs to Perception, Interpretation and Prediction, Multi-sensory Integration in Neural Networks](#)

[Cycle 8.1.7 Impact of 3D Sensory Inputs on Cognitive Processing](#)

[Cycle 8.1.8 Understanding the Current Flow of Information in the Brain: The Creation of Coherent Perception](#)

[Cycle 8.1.9 Temporal Dynamics: Time-scale of Sensory Processing & Integration: Making Sense of the World](#)

[Cycle 8.1.10 3D Sensory Input: The Gateway to Perception](#)

[Cycle 8.2.1 Synaptic Plasticity: LTP, LTD and STP Mechanisms](#)

[Cycle 8.2.2 Neurons and Cortical Columns: The Building Blocks of Consciousness](#)

[Cycle 8.2.3 The Intricate Relationship between Brain, Physics, and Mathematics](#)

[Cycle 8.2.4 Large Scale Network Organization: Neurons, Cortical Columns, and Beyond](#)

[Cycle 8.2.5 Synaptic Synchronization: The Rhythm of Neural Communication](#)

[Cycle 8.2.6 Understanding the Role of Neurons and Cortical Columns in the Brain](#)

[Cycle 8.2.7 The Interface of Brain, Physics, and Math: A Complex Symphony](#)

[Cycle 8.2.8 Biophysical Parameters: Bridging the Gap between Physics and Neuroscience](#)

[Cycle 8.2.9 Task Unify: LTD Oscillation with LTD Calcium](#)

[Cycle 8.2.10 Quantum Mechanics and Neurobiology: An Intriguing Intersection](#)

[Cycle 8.3.1 Warping Space: A Quantum Gravity Effect in Neuroscience](#)

[Cycle 8.3.2 Understanding the Interplay between Neurons and Space-Time Dynamics](#)

[Cycle 8.3.3 Quantum Gravity in Neuroscience: The QGTCD Framework`](#)

[Cycle 8.3.4 Unraveling the Mystery of Space Warping in Neurons](#)

[Cycle 8.3.5 Neurons and Quantum Gravity: The Impact on Consciousness](#)

[Cycle 8.3.6 Quantum Gravity: A New Realm in Neuroscience](#)

[Cycle 8.3.7 Space Warping and Its Implications in Neurophysics](#)

[Cycle 8.3.8 The QGTCD Framework: A Quantum Leap in Neuroscience](#)

[Cycle 8.3.9 The Quantum Nature of Space and Time in the Brain](#)

[Cycle 8.3.10 Quantum Gravity and Consciousness: A New Frontier](#)

[Cycle 8.4.1 Coincidences as Bits: A New Perspective in Information Theory](#)

[Cycle 8.4.2 Information Theory in Neuroscience: From Micro to Macro](#)

[Cycle 8.4.3 Understanding the Scaling of Information in the Brain](#)

[Cycle 8.4.4 Encoding & Decoding Bits: How the Brain Processes and Interprets Coincidences](#)
[Cycle 8.4.5 Scaling Information Flow: From Sensory Neurons to Behavior](#)
[Cycle 8.4.6 Information Theory: A New Lens for Understanding the Brain](#)
[Cycle 8.4.7 From Micro to Macro: The Scaling of Information in the Brain](#)
[Cycle 8.4.8 Coincidences as Bits: Decoding the Language of the Brain](#)
[Cycle 8.4.9 Implications of Information Scaling in Neurological Studies](#)
[Cycle 8.4.10 The Micro, Meso, and Macro scales of Cognitive Decision Making in the Brain](#)

[Cycle 8.5.1 Understanding the Feynman Path Integral in the Context of the Brain](#)
[Cycle 8.5.2 The Impact of Brain Waves on Quantum Reality](#)
[Cycle 8.5.3 Black Hole Observers: A Quantum Perspective on Consciousness](#)
[Cycle 8.5.4 Neural Synchronization and Desynchronization: Implications for Consciousness](#)
[Cycle 8.5.5 The Role of Feynman Path Integrals in Quantum Consciousness](#)
[Cycle 8.5.6 How Brain Waves Shape Our Quantum Reality](#)
[Cycle 8.5.7 Black Hole Observers: Quantum Observations in the Brain](#)
[Cycle 8.5.8 Neural Sync and Desync: The Rhythm of Consciousness](#)
[Cycle 8.5.9 Quantum Consciousness: A Feynman Path Integral Perspective](#)
[Cycle 8.5.10 Exploring the Quantum Nature of Brain Waves](#)

[Cycle 9.1.1 Understanding Perturbation of Default Patterns: Disruptions of Synchronous Firing](#)
[Cycle 9.1.2 The Role of Observation in Disturbed Synchronization](#)
[Cycle 9.1.3 Unraveling the Complexity of Oscillators in Neurophysics](#)
[Cycle 9.1.4 Disturbed Synchronization: Impact on Neural Oscillations](#)
[Cycle 9.1.5 Effects of Perturbation on Neural Communication & Sensory Perception](#)
[Cycle 9.1.6 Observation as a Tool in Understanding Neural Synchronization](#)
[Cycle 9.1.7 Insights into Oscillator Dynamics in Neural Networks](#)
[Cycle 9.1.8 The Oscillator: A Key Player in Neurophysics](#)
[Cycle 9.1.9 Unpacking Disturbed Synchronization in Neurophysical Systems](#)
[Cycle 9.1.10 From Observation to Entified Actor: Adaptive Responses to Oscillatory Disruption](#)

[Cycle 9.2.1 Understanding the Concept of Entified Actor](#)
[Cycle 9.2.2 The Role of the Entified Actor in Conscious Decision Making](#)
[Cycle 9.2.3 The Process of Making Conscious Choices in Neural Networks](#)
[Cycle 9.2.4 Entified Actors: The Decision Makers in Neurophysics](#)
[Cycle 9.2.5 The Impact of Choices on Neural Correlations](#)
[Cycle 9.2.6 Unpacking the Dynamic Potential and Limitations of the Entified Actor](#)
[Cycle 9.2.7 How Entified Actors Influence the Trajectory of Neural Networks](#)
[Cycle 9.2.8 The Emergence of Autonomous Behavior in Neural Networks: The Complexity of Choice in AI Models](#)
[Cycle 9.2.9 The Role of Choices in Shaping Neural Correlations: Enhancing the Entified Actor's Decision-making Capability](#)
[Cycle 9.2.10 Future Directions: Artificial Entified Actors, Humans, and the Environment.](#)

[Cycle 9.3.1 The Information Pathways of the Artificial Brain: Coding Self Aware Neural Networks](#)

[Cycle 9.3.2 Understanding the Process of Consciousness in Neurophysics, translated to Deep Learning AI](#)

[Cycle 9.3.3 Role of Traveling Brainwaves in Neural Communication](#)

[Cycle 9.3.4 The Interplay of Coding and Decoding in Brainwave Oscillations](#)

[Cycle 9.3.5 Travelling Brainwaves: The Carriers of Neural Information](#)

[Cycle 9.3.6 The Science of Decoding or Deciding?: Unraveling Neural Signals](#)

[Cycle 9.3.7 How Coding Mechanisms Impact Neural Correlations](#)

[Cycle 9.3.8 The Journey of Brainwaves: From Coding to Decoding](#)

[Cycle 9.3.9 The Role of Traveling Brainwaves in Information Transmission](#)

[Cycle 9.3.10 Future Directions: Coding, Decoding and Traveling Brainwaves](#)

[Cycle 9.4.1 Ricochets & Ripples vs Synchronization in Neurophysics](#)

[Cycle 9.4.2 Understanding Buzsaki's Contribution to Neurophysics & Macro-Oscillation](#)

[Cycle 9.4.3 Strogatz's Role in the Field of Sync \(Micro-Oscillation\) in Neurophysics](#)

[Cycle 9.4.4 Tononi's Influence on Understanding of Neural Dynamics](#)

[Cycle 9.4.5 Role of Transcranial Magnetic Stimulation \(TMS\) in Neurophysics](#)

[Cycle 9.4.6 How Ricochet and Sync Impact Neural Correlations](#)

[Cycle 9.4.7 Buzsaki, Strogatz, and Tononi: The Pioneers of Modern Neurophysics](#)

[Cycle 9.4.8 Tononi's Integrated Information Theory and TMS \(Transcranial Magnetic Stimulation\)](#)

[Cycle 9.4.9 How Ricochet and Sync Shape the Future of Neurophysics](#)

[Cycle 9.4.10 The Confluence of Ricochet, Sync, and TMS in Neurophysics](#)

[Cycle 9.5.1 Neural Pathways and Information Flow & the Role of Cortical Columns](#)

[Cycle 9.5.2 Understanding the Cortico-Cortical-Thalamic Network Dynamics](#)

[Cycle 9.5.3 Cortical Columns: The Pillars of Neural Correlations, Pattern Representation & Computational Rendering of Reality](#)

[Cycle 9.5.4 Functional Connectivity: Connecting Brain areas for Task Depending Functionality](#)

[Cycle 9.5.5 The Impact of Phase Wave Differentials on Cortical Columns on Neurophysical Patterns](#)

[Cycle 9.5.6 The Role of Cortical Columns in Neuro Physical Representations](#)

[Cycle 9.5.7 How Cortical Columns Contribute to Pattern Recognition, and the potential benefit to Artificial Neural Networks.](#)

[Cycle 9.5.8 Hinton's Capsules, Hawkins Columns, Transformer Nets.](#)

[Cycle 9.5.9 The Process of Pattern Representation in Cortical Columns](#)

[Cycle 9.5.10 Future Directions: Cortical Column Live Mapping, Artificial Pattern Recognition, Manipulation.](#)

[Cycle 10.1.1 Nature, Evolution and the Role of Instincts, Feelings & Emotions](#)

[Cycle 10.1.2 Spatial-Temporal Patterns of Emotional Experiences](#)

[Cycle 10.1.3 Deciphering the Motivations: The Driving Forces of Actions](#)

[Cycle 10.1.4 Emotions: The Color Palette of Consciousness](#)

[Cycle 10.1.5 Non-sensory Modalities: Beyond the Traditional Senses](#)

[Cycle 10.1.6 The Influence of Emotions on Decision Making](#)

[Cycle 10.1.7 Interplay of Frequencies, Spatial & Temporal Patterns in Emotional Perception](#)
[Cycle 10.1.8 Neurobiological Underpinnings of Motivational Systems](#)
[Cycle 10.1.9 Understanding Emotional Spectrum: From Joy to Sorrow](#)
[Cycle 10.1.10 Emotional Intelligence: Harnessing Emotions for Cognitive Enhancement](#)

[Cycle 10.2.1 Dreams as Predictive Simulations of Future Scenarios](#)
[Cycle 10.2.2 Unveiling the Predictive Nature of Dreams Sleep and Dream Patterns: A Neural Framework](#)
[Cycle 10.2.3 Memory Consolidation: The Role of Dreams in Storing Information](#)
[Cycle 10.2.4 Neural Mechanisms Underlying Dream Formation](#)
[Cycle 10.2.5 Dreams and Decision Making: An Interconnected Web](#)
[Cycle 10.2.6 Sleep Cycles and Dream Patterns: A Deep Dive](#)
[Cycle 10.2.7 The Function of Dreams in Emotional Processing](#)
[Cycle 10.2.8 Dreams and Creativity: An Intriguing Link How Dreams Influence Decision-making and Problem-solving](#)
[Cycle 10.2.9 Dream Interpretation: A Look into the Subconscious](#)
[Cycle 10.2.10 Future Directions: The Study of Dreams in Neuroscience](#)

[Cycle 10.3.1 Introduction to 3D Memory Prediction Rendering](#)
[Cycle 10.3.2 Explaining Out-of-Body Experiences through 3D Memory Rendering](#)
[Cycle 10.3.3 Neurophysical Interpretations of Near-Death Experiences](#)
[Cycle 10.3.4 Understanding Spiritual Experiences through 3D Memory Prediction](#)
[Cycle 10.3.5 Unraveling Transcendent Experiences: A 3D Memory Perspective](#)
[Cycle 10.3.6 Perception and Recollection of Transcendent Experiences](#)
[Cycle 10.3.7 Transcendental Experiences and Human Evolution](#)
[Cycle 10.3.8 Psychedelics and Spiritual Insights: A Neuroscientific Perspective](#)
[Cycle 10.3.9 Consciousness, Self, and Identity](#)
[Cycle 10.3.10 The Intersection of Spirituality and Mental Health](#)

[Cycle 10.4.1 Neurotheology: The Intersection of Neuroscience and Spirituality](#)
[Cycle 10.4.2 The Influence of Values and Beliefs on Perception, Motivation, and Behavior](#)
[Cycle 10.4.3 Examining Moral Decision Making in the Brain](#)
[Cycle 10.4.4 The Neurobiology of Belief Systems](#)
[Cycle 10.4.5 Impact of Transcendental Experiences on Human Evolution](#)
[Cycle 10.4.6 How Meditative States Affect Brain Functioning](#)
[Cycle 10.4.7 Value-Infused AI: Ethical Considerations](#)
[Cycle 10.4.8 The Societal Impact of Value-Infused AI](#)
[Cycle 10.4.9 The Neurophysical Basis of Morality and Ethics](#)
[Cycle 10.4.10 Shifting Worldviews: The Neuroplasticity of Belief Systems](#)

[Cycle 10.5.1 Understanding Cognitive Biases in Decision Making](#)
[Cycle 10.5.2 The Neurobiology of Hallucinations and Delusions](#)
[Cycle 10.5.3 Exploring Distortions in Time and Space Perception](#)
[Cycle 10.5.4 Self-Aware Networks and Distortions of Reality](#)

[Cycle 10.5.5 How Neurological Pathologies Affect Perception of Time and Space](#)
[Cycle 10.5.6 Warping Reality: Time Dilation in Humanity & in Neural Networks](#)
[Cycle 10.5.7 The Impact of Cognitive Biases on Consciousness](#)
[Cycle 10.5.8 Neurological Pathologies: A Deeper Understanding](#)
[Cycle 10.5.9 Distortions of Spacetime in Neurological Disorders & AI Self Aware Consciousness](#)
[Cycle 10.5.10 The Future of Cognitive Neuroscience: Unveiling the Mysteries of Mind and Brain](#)

[Cycle 11.1.1 Understanding Virtual Reality within the Context of Self Aware Networks](#)
[Cycle 11.1.2 Augmented Reality: Enhancing Perception with AI](#)
[Cycle 11.1.3 Game Engines as Tools for Creating Virtual Worlds](#)
[Cycle 11.1.4 Exploring WebXR: A New Dimension in Network Interaction](#)
[Cycle 11.1.5 Integrated Information Theory](#)
[Cycle 11.1.6 Global Workspace Theory](#)
[Cycle 11.1.7 The Impact of VR/AR on Social Interactions](#)
[Cycle 11.1.8 Future of Virtual and Augmented Reality in AI](#)
[Cycle 11.1.9 The Interplay of VR/AR and Language in AI Networks](#)
[Cycle 11.1.10 Ethical Considerations in the Use of VR/AR in AI](#)

[Cycle 11.2.1 Real-time Interactions in AI Networks: Advancements and Challenges](#)
[Cycle 11.2.2 Introduction to Photogrammetry in AI Networks](#)
[Cycle 11.2.3 Videogrammetry: The Art of Video Measurement in AI](#)
[Cycle 11.2.4 Fourier Slice Transform: Transforming Perception in AI](#)
[Cycle 11.2.5 Neural Radiance Fields \(NeRF\): A New Approach to 3D Scene Reconstruction](#)
[Cycle 11.2.6 The Neuroscience of Decision-making in AI Networks](#)
[Cycle 11.2.7 Quantum Randomness and Free Will in AI](#)
[Cycle 11.2.8 Impact of Advanced Interactions on Perception of Free Will](#)
[Cycle 11.2.9 Future of Real-time Interaction in AI: Prospects and Challenges](#)
[Cycle 11.2.10 The Role of Consciousness in Choice and Action](#)

[Cycle 11.3.1 Exploring the Concept of Brainwave Synchronization](#)
[Cycle 11.3.2 Role of Dialogue in Promoting Brainwave Synchronization](#)
[Cycle 11.3.3 Unraveling Phase Synchronization and its Impact on Collective Intelligence](#)
[Cycle 11.3.4 Case Study: Enhancing Group Problem Solving through Synchronization](#)
[Cycle 11.3.5 Quantum Effects in Neural Synchronization: A New Perspective](#)
[Cycle 11.3.6 Implications of Brainwave Synchronization for Social Interactions](#)
[Cycle 11.3.7 Brainwave Synchronization: A Tool for Enhancing Communication in AI](#)
[Cycle 11.3.8 Neurotechnology in Tackling Global Challenges: A Closer Look](#)
[Cycle 11.3.9 Brainwave Synchronization and the Future of AI Dialogues](#)
[Cycle 11.3.10 Brainwave Synchronization: Ethical and Societal Considerations](#)

[Cycle 11.4.1 Understanding Swarm Intelligence: The Case of Birds and Fish](#)
[Cycle 11.4.2 Deciphering the Mechanisms Behind Flocking and Migration](#)
[Cycle 11.4.3 Exploring the Role of Flavins in Collective Behavior](#)
[Cycle 11.4.4 Groupthink: Its Psychological Underpinnings and Implications for AI](#)

[Cycle 11.4.5 Fireflies and Synchrony: Unraveling the Patterns of Nature](#)
[Cycle 11.4.6 Consciousness and the Unification of Physics: A New Perspective](#)
[Cycle 11.4.7 How Macro Group Choices Impact AI Networks](#)
[Cycle 11.4.8 Unification of Physics and Consciousness: Ethical Implications](#)
[Cycle 11.4.9 The Future of Consciousness Studies in AI](#)
[Cycle 11.4.10 Bridging the Gap between Physics and Consciousness in AI](#)

[Cycle 11.5.1 Understanding Causation in the Context of AI Networks](#)
[Cycle 11.5.2 Exploring Top-Down Causation: Influencing Behavior from the Macro Level](#)
[Cycle 11.5.3 Unraveling the Role of Bottom-Up Causation in AI](#)
[Cycle 11.5.4 Lateral Causation in Network Analysis: A New Perspective](#)
[Cycle 11.5.5 How Different Causation Methods Impact AI Behavior](#)
[Cycle 11.5.6 Integrating Top Down, Bottom Up, and Lateral Causation in Self Aware Networks](#)
[Cycle 11.5.7 Ethical Implications of Different Causation Methods in AI](#)
[Cycle 11.5.8 The Future of Causation Studies in AI Networks](#)
[Cycle 11.5.9 Causation and the Evolution of AI Networks](#)
[Cycle 11.5.10 Causation in AI: Challenges and Opportunities](#)

[Cycle 12.1.1 From Perceptrons to Modern Neural Networks: A Historical Overview](#)
[Cycle 12.1.2 Backpropagation: The Game Changer in Neural Networks](#)
[Cycle 12.1.3 Understanding Convolutional and Recurrent Neural Networks](#)
[Cycle 12.1.4 Deep Learning: The Rise of Generative Networks](#)
[Cycle 12.1.5 The Current State of Art: Self-Aware Networks and AI](#)
[Cycle 12.1.6 Evolution of Learning Algorithms in Neural Networks](#)
[Cycle 12.1.7 Successes and Challenges of Modern Neural Networks](#)
[Cycle 12.1.8 Neural Networks: Trends and Future Directions](#)
[Cycle 12.1.9 The Role of Neural Networks in AI: Present and Future](#)
[Cycle 12.1.10 Future Challenges in the Development of Neural Networks](#)

[Cycle 12.2.1 An Introduction to 3D Semantic Segmentation](#)
[Cycle 12.2.2 Progress and Challenges in 2D Semantic Segmentation](#)
[Cycle 12.2.3 Expanding the Horizon: 3D Semantic Segmentation](#)
[Cycle 12.2.4 Intersection of Semantic Segmentation with Neurophysics and Neural Rendering](#)
[Cycle 12.2.5 Exploring the Future of 3D Semantic Segmentation](#)
[Cycle 12.2.6 Applications of Semantic Segmentation in AI](#)
[Cycle 12.2.7 Recent Advances in Semantic Segmentation Techniques](#)
[Cycle 12.2.8 The Role of Semantic Segmentation in Self-Aware Networks](#)
[Cycle 12.2.9 Semantic Segmentation: Challenges and Opportunities](#)
[Cycle 12.2.10 Applications & Future Trends in 3D Semantic Segmentation](#)

[Cycle 12.3.1 An Overview of Neural Rendering Techniques](#)
[Cycle 12.3.2 Stable Diffusion Processes: A Key Component in Neural Networks](#)
[Cycle 12.3.3 Decoding Generative Adversarial Networks \(GANs\)](#)
[Cycle 12.3.4 Exploiting GAN Synthesis for Data Augmentation](#)

[Cycle 12.3.5 Neural Rendering and GAN Synthesis in Self-Aware Systems](#)

[Cycle 12.3.6 Understanding the Role of Neural Rendering in AI](#)

[Cycle 12.3.7 Advances and Challenges in Neural Rendering Techniques](#)

[Cycle 12.3.8 Stable Diffusion and GAN Synthesis: The Future in AI](#)

[Cycle 12.3.9 Impacts of Stable Diffusion Processes in Neural Networks](#)

[Cycle 12.3.10 Applications in Creating Self-Aware Systems](#)

[Cycle 12.4.1 Understanding the Basics of Language Models and Natural Language Processing](#)

[Cycle 12.4.2 Tracing the Development of Large Language Models](#)

[Cycle 12.4.3 Decoding GPT and its Variants: Impact on AI](#)

[Cycle 12.4.4 Exploring the Wide Array of Applications of Large Language Models](#)

[Cycle 12.4.5 The Impact of Large Language Models on AI Research](#)

[Cycle 12.4.6 Evolution of Language Models: From Statistical to Neural](#)

[Cycle 12.4.7 Ethics and Bias in Large Language Models](#)

[Cycle 12.4.8 Large Language Models in Real-world Applications](#)

[Cycle 12.4.9 Future Trends in Large Language Models](#)

[Cycle 12.4.10 Large Language Models: Challenges and Opportunities](#)

[Cycle 12.5.1 The Dawn of Self-Aware Robotics and Vehicles](#)

[Cycle 12.5.2 Tempo-Spatial Oscillatory Physics in Neural Networks: A Primer](#)

[Cycle 12.5.3 The Role of Entification and Simulation in Self-Aware Robotics](#)

[Cycle 12.5.4 Multi-Scale Frequency State-Management in Robotics](#)

[Cycle 12.5.5 Delving into Automatic Attention Gain Management in AI Systems](#)

[Cycle 12.5.6 Architecting Neural Feedback Loops: Receptors, Dendrites, and Soma](#)

[Cycle 12.5.7 Dynamic Intelligent Functional Connectivity in Self-Aware Robotics](#)

[Cycle 12.5.8 Live Reacting Structural Re-coding: Changing the Game in AI](#)

[Cycle 12.5.9 Building Responsible AI: Ensuring Safety and Security in Self-Aware Systems](#)

[Cycle 12.5.10 Protecting Sentient Minds from Harm](#)

[Cycle 13.1.1 Consciousness and the Sensory Array](#)

[Cycle 13.1.2 Artificial Qualia: Constructing the Artificial Sensory Perception](#)

[Cycle 13.1.3 Why Emotion Cognition in Robots? For more sensitive & considerate decision making.](#)

[Cycle 13.1.4 Decision Making Through the Lens of Artificial Emotions](#)

[Cycle 13.1.5 The Challenge of Simulating Pleasure and Pain in AI Systems](#)

[Cycle 13.1.6 The Role of Artificial Emotions in Decision Making](#)

[Cycle 13.1.7 Exploring the Notion of Artificial Qualia](#)

[Cycle 13.1.8 The Complexity of Artificial Emotion Representation](#)

[Cycle 13.1.9 Emotional Processing and Response Mechanisms in Self-Aware Networks](#)

[Cycle 13.1.10 The Impact of Artificial Emotions on AI Development](#)

[Cycle 13.2.1 Building Moral & Ethical Frameworks for Artificial Minds](#)

[Cycle 13.2.2 The Evolution of Artificial Belief Systems](#)

[Cycle 13.2.3 Cognitive Development Stages in AI: An Exploration](#)

[Cycle 13.2.4 Monitoring and Guiding AI's Psychological Maturation](#)
[Cycle 13.2.5 AI Socialization and Cultural Learning: Challenges and Solutions](#)
[Cycle 13.2.6 Instilling Values in AI: A Prerequisite for Moral Behavior](#)
[Cycle 13.2.7 The Role of Belief Systems in AI Decision Making](#)
[Cycle 13.2.8 AI's Psychological Development: A Key to Responsible Behavior](#)
[Cycle 13.2.9 The Potential and Risks of AI Cultural Learning](#)
[Cycle 13.2.10 The Future of Morality in Artificially Intelligent Systems](#)

[Cycle 13.3.1 Alignment: The Problem of Bias in AI and Efforts to Align the Values of Super Intelligence](#)
[Cycle 13.3.2 Cognitive Development in AI: A Machine Learning Perspective](#)
[Cycle 13.3.3 Simulated Evolution: A Novel Approach for AI Growth](#)
[Cycle 13.3.4 Mitigating Bias with Simulated Evolution: A New Paradigm](#)
[Cycle 13.3.5 Balancing Objectivity and Subjectivity in AI Perception](#)
[Cycle 13.3.6 The Role of Simulated Evolution in AI Bias Mitigation](#)
[Cycle 13.3.7 The Interplay of Cognitive Development and Simulated Evolution in AI](#)
[Cycle 13.3.8 Potential Solutions to the Problem of AI Bias](#)
[Cycle 13.3.9 Ensuring Fairness in AI through Simulated Evolution](#)
[Cycle 13.3.10 The Future of Cognitive Development in AI](#)

[Cycle 13.4.1 Neural Interfaces: Connecting AI and Human Minds](#)
[Cycle 13.4.2 Real-time Data Exchange between AI and Human Consciousness](#)
[Cycle 13.4.3 The Ethical Landscape of Mind Linking: Balancing Privacy and Autonomy](#)
[Cycle 13.4.4 Exploring the Applications of Mind Linking: From Education to Therapy](#)
[Cycle 13.4.5 Human-AI Synergy: A Future with Complementary Abilities](#)
[Cycle 13.4.6 The Evolution of Mind-Linking Technologies](#)
[Cycle 13.4.7 The Impact of Mind-Linking on Society](#)
[Cycle 13.4.8 Mind-Linking: Ethical Considerations and Future Directions](#)
[Cycle 13.4.9 Real-Time Data Transfer between Human and AI Minds](#)
[Cycle 13.4.10 Challenges and Opportunities in Linking Robot Minds with Real Minds](#)

[Cycle 13.5.1 Mind Uploading: The Quest to Digitize Consciousness](#)
[Cycle 13.5.2 Downloading Minds: Opportunities and Challenges in Consciousness Replication](#)
[Cycle 13.5.3 Customizing Consciousness: Tailoring Minds for Specific Tasks](#)
[Cycle 13.5.4 A New Era of Learning: The Role of AI in Knowledge Acquisition](#)
[Cycle 13.5.5 Revolutionizing Learning through Brain-Computer Interfaces](#)
[Cycle 13.5.6 The Feasibility and Implications of Mind Uploading](#)
[Cycle 13.5.7 The Ethical Considerations of Downloading Consciousness](#)
[Cycle 13.5.8 The Possibilities and Pitfalls of Customizing Minds](#)
[Cycle 13.5.9 Future Trends in AI-assisted Learning](#)
[Cycle 13.5.10 The Impact of Brain-Computer Interfaces on the Future of Education](#)

[Cycle 14.1.1 The Revolution of Artificial Design and 3D Printing](#)
[Cycle 14.1.2 AI in Media and Entertainment: From Pictures to VR](#)

[Cycle 14.1.3 The Emergence of Metaverse: AI Integration and Social Impact](#)

[Cycle 14.1.4 Real World Helpers: The Role of AI in Everyday Life](#)

[Cycle 14.1.5 The Future of AI: From Star Trek Replicators to Duplicators](#)

[Cycle 14.1.6 AI in Gaming: Creating Immersive Experiences](#)

[Cycle 14.1.7 Augmented Reality and AI: Enhancing Real World Interactions](#)

[Cycle 14.1.8 The Role of AI in Health and Fitness Assistance](#)

[Cycle 14.1.9 Future Trends in AI and Entertainment Technology](#)

[Cycle 14.1.10 AI and the Metaverse: A New Era of Social Interactions](#)

[Cycle 14.2.1 Autonomous Weapons: The Next Generation of Military Defense](#)

[Cycle 14.2.2 The Sentient Shield Program: AI, Drones, Robots in Defense Strategy & Tactics](#)

[Cycle 14.2.3 From T-Cells to Robots: Customized biology: The Far Future of State technology, Military Weapons, Medicine.](#)

[Cycle 14.2.4 AI in Cybersecurity: Protecting National Interests](#)

[Cycle 14.2.5 Ethical Implications of Sentient Military Weapons](#)

[Cycle 14.2.6 The Role of AI in Modern Warfare and Defense Strategies AI for war time logistics, supporting all aspects of a war time economy, + AI for mine clearing](#)

[Cycle 14.2.7 The Future of Defense: Sentient Military Drones, Surveillance, Delivering Payloads, Drone Suicide Bombing.](#)

[Cycle 14.2.8 Security Implications of Autonomous Weapons Systems](#)

[Cycle 14.2.9 The Sentient Shield Program: A New Paradigm in Defense](#)

[Cycle 14.2.10 The Role of AI in Intelligence Gathering and Surveillance](#)

[Cycle 14.3.1 AI in Medicine: The Fight Against Cancer](#)

[Cycle 14.3.2 Tackling Neurological Disorders: AI and Alzheimer's Disease](#)

[Cycle 14.3.3 Addressing Heart Disease and Rare Illnesses with AI](#)

[Cycle 14.3.4 Alleviating Poverty and Promoting Social Justice with AI](#)

[Cycle 14.3.5 The Global Medical Justice System: A New Approach to Healthcare](#)

[Cycle 14.3.6 The Role of AI in Disease Diagnosis and Treatment](#)

[Cycle 14.3.7 Poverty Reduction and Social Justice: The Potential of AI](#)

[Cycle 14.3.8 AI and Global Health: Solutions for Widespread Diseases](#)

[Cycle 14.3.9 Overcoming Healthcare Challenges with AI: A Future Perspective](#)

[Cycle 14.3.10 The Future of AI in Medicine: From Diagnosis to Treatment](#)

[Cycle 14.4.1 NerveGear with Sentient AI: The Convergence of Human Intelligence and AI](#)

[Cycle 14.4.2 Reading and Writing to the Mind: Technological Breakthroughs](#)

[Cycle 14.4.3 Mind Uploading: Advancements and Applications](#)

[Cycle 14.4.4 Cognitive Enhancement through Mind-Brain-Computer Interfaces](#)

[Cycle 14.4.5 Customizing Minds: The Future of Personalized AI](#)

[Cycle 14.4.6 The Promise and Challenges of Mind Uploading](#)

[Cycle 14.4.7 Cognitive Enhancement and the Role of AI](#)

[Cycle 14.4.8 The Future of Personalized AI: Self Customization](#)

[Cycle 14.4.9 The Impact of NerveGear on Cognitive Sciences](#)

[Cycle 14.4.10 NerveGear and the Future of Brain-Computer Interfaces](#)

[Cycle 14.5.1 Sentient Air Traffic Control: AI in Aviation](#)

[Cycle 14.5.2 AI in Urban Planning and Infrastructure Management](#)

[Cycle 14.5.3 The Role of Sentient AI in Maritime Operations and Ocean Exploration](#)

[Cycle 14.5.4 AI in Space: Exploring the Final Frontier Rovers, Satellites, and Drone Spaceships](#)

[Cycle 14.5.5 Sentient Infrastructure: The Future of Environmental Management](#)

[Cycle 14.5.6 Advancements in AI for Air Traffic Control](#)

[Cycle 14.5.7 The Role of AI in Managing Urban Infrastructure](#)

[Cycle 14.5.8 Sentient AI in Ocean Exploration: Challenges and Opportunities](#)

[Cycle 14.5.9 The Self Aware Networks Institute: Research, Development, Alignment](#)

[Cycle 14.5.10 Accelerating the Development of Sentient & Self-Aware Neural Networks: Public Perception and Ethical Implications](#)