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The Unibrain Theory –

An Unified Functional Architecture of the Brain which Explains how the Brain Encodes, Stores & Processes Information, Explains Consciousness and the Function of Sleep and Dreams

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Abstract: The Unibrain Theory presents the counterpart of The Unimind Metamodel. It gives an unified functional computer-science based neuroscientific architecture of the brain as an electro-chemical infinite-state automata. It explains how the brain encodes, stores and processes information, how it performs its functions / faculties, explains the phenomenon of consciousness and the function of sleep and dreams.
The Unibrain Theory is also a functional architecture for developing Artificial Intelligence.

I. INTRODUCTORY NOTE

This research paper (The Unibrain Theory) is closely interconnected & interrelated with The Unimind Metamodel and the former contains many references to the concepts mentioned in the latter - therefore an understanding of The Unimind Metamodel is required to understand The Unibrain Theory.

The details of the research paper in which The Unimind Metamodel is presented are as follows :

1) *Title:* "The Unimind Metamodel & Therapy - An Unified Functional Framework of Mind that Explains all its Faculties and provides a Novel Treatment Methodology for Mental Disorders"
2) *Author:* Nitnem Singh Sodhi
3) *Published In:* Volume 8, Issue IV, International Journal for Research in Applied Science and Engineering Technology (IJRASET) Page No: 399-405, ISSN : 2321-9653
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A. *Few Other Important Things To Note*

The "brain" as mentioned everywhere in this research paper (The Unibrain Theory) refers to the physical brain (i.e. large network of neurons / connected network of neural tissues), rather than the abstract brain (i.e. mind / psyche) as mentioned in The Unimind Metamodel.

The "brain" as referred to in this research paper not only includes the brain inside the skull, but also includes the spinal cord and connected neural tissues (i.e. the central nervous system) and also includes the enteric nervous system. The connected system of sum total network of neural tissues (neurons) all over the body constitutes the brain.

II. ESSENCE OF THE UNIBRAIN THEORY

The Unibrain Theory states that the brain is an electro-chemical infinite-state automata, in which synergistically working network of neurons in different areas of the brain acts as different electro-chemical combinational logic circuits which performs different functions, and each of them is built up of large number of neurons which individually acts as elctro-chemical universal logic gates.

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III. INDIVIDUAL NEURONS AS ELECTRO-CHEMICAL UNIVERSAL LOGIC GATES

Logic gates are the building blocks (fundamental components) that performs individual boolean calculations/functions/operations and when combines collectively they constitute a combinational logic circuit. Examples of logic gates include AND, OR, NOT, etc.
An universal logic gate is a type of logic gate that can perform all types of boolean calculations/functions/operations by combining with similar universal logic gates themselves, without any need of any other type of logic gate. Examples include NAND and NOR.
A functional combinational logic circuit to perform any specific task/operation can be created by using combinations of only a single type of universal logic gate. Neurons, as we already know, communicate via electro-chemical signals. An individual neuron receives electro-chemical input from its dendrites and outputs electro-chemical signals via its axonal terminals/synapses. According to The Unibrain Theory, the individual neuron is a type of universal logic gate, which in different combinations can perform all possible boolean operations and form electro-chemical combinational logic circuits.
As we already know that different parts/areas of brain perform different functions, The Unibrain Theory states that these different parts/areas of the brain are the different electro-chemical combinational logic circuits that performs different tasks, each of them built up of large number of neurons as stated above.

IV. DIFFERENT AREAS OF THE BRAIN AS DIFFERENT ELECTRO-CHEMICAL COMBINATIONAL LOGIC CIRCUITS : THE DATABASE OF ALGORITHMS

Combinational logic circuits are a type of circuit that gives a specific determined output in response to a specific information input. These circuits are a combination of logic gates - and the specific combination of logic gates in a circuit determines the unique input-output combinations of that given circuit.
As we understood above that neurons are electro-chemical universal logic gates, The Unibrain Theory states that in different parts/areas of brain, neurons group together to form different electro-chemical combinational logic circuits which perform different functions. Such combinational logic circuits in brain can inter-connect to form larger combinational circuits to perform complicated tasks (faculties).
These electro-chemical combinational logic circuits are the "algorithms" as described in The Unimind Metamodel.
The algorithms as told in The Unimind Metamodel manifest in the brain as these electro-chemical combinational logic circuits.
The unique input-output combinations of each combinational logic circuit (individual algorithm) enables it to perform a specific task/operation - trigerred/initiated/started either by another circuit (another algorithm), or by information input from sensory organs, or automatically based upon the internal clock of the body (known as the "circadian rhythm" which is in itself a combinational logic circuit) - depending upon that circuit (individual algorithm).
Complex algorithms are made up of a group of smaller algorithms - i.e. small combinational logic circuits in brain inter-connects / combines to form larger complex combinational logic circuits.

V. HOW THESE COMBINATIONAL LOGIC CIRCUITS ARE FORMED AND CHANGED/UPDATED : THE LAW OF ALGORITHMIC EVOLUTION

As stated in The Law of Algorithmic Evolution given in The Unimind Metamodel, The brain/mind is inherently programmed for the formation and alteration/updation of algorithms as an automatic and dynamic process guided by the sole aim of survival and reproduction of the body in which it is operating - same applies on the formation and alteration/updation of the combinational logic circuits in the brain, as we learned above that they are verily the "algorithms" of The Unimind Metamodel.
An important thing to note, is that, in reference to The Unimind Metamodel, each mind/brain has its subjective meaning of survival and reproduction, depending upon the subject's circumstances/environment/scenario and past memories/experiences, and its overall "map of reality". Therefore all the individual members of any species or society/culture (as explained in The Unimind Metamodel) although having many algorithms in common, also possess few unique algorithms (i.e. combinational logic circuits) in the brain.
The exact technical process of the formation/updation of electro-chemical combinational logic circuits in the brain is through the process of "dynamic permutation" - i.e. the brain automatically and dynamically arranges or re-arranges its neurons to create the required combinational logic circuits to perform any specific task/operation. It also includes combining / inter-connecting smaller combinational logic circuits to form larger combinational logic circuits that performs complex mental/physical/biological functions.
In the reference to the Law of Algorithmic Evolution, it can be said that the brain is inherently programmed to arrange or re-arrange its neurons to create such electro-chemical combinational logic circuits (algorithms) which supposedly fulfils the aim of survival and reproduction of its body as per its own subjective definitions.
This process is the foundational principle / concept behind the "neural networks".

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VI. MEMORY - HOW THE "OBJECTS/ENTITIES" ARE STORED IN THE BRAIN

The "objects/entities" as per The Unimind Metamodel, which includes language as well as memories, that can be referred to as the overall "memory" part of brain, and such is stored in the brain in form of electro-chemical combinational logic circuits only.

Individual objects/memories in the brain are just a specific integrated combination of sensory information, and each individual object/memory is stored in the brain in form of a unique combinational logic circuit that fuctions to verify/match/compare that information of a specific object/memory with the input information, and outputs how much the input information is identical with the object that circuit represents.

Therefore we can say that the objects/memories are stored in the brain in forms of algorithms only; each individual objects/memories is represented by a unique combinational logic circuit that outputs quantitative value about how much the input information is identical to the sensory information of the object/memory which that circuit represents.

In reference to The Unimind Metamodel, the sensory information input to these combinational logic circuits can be either from the sensory organs or from other algorithms (other combinational logic circuits).

VII. DATA STRUCTURE OF THE BRAIN : THE DATABASE OF ASSOCIATIONS

The "database of associations" as per The Unimind Metamodel is the data structure of the brain - it does not exist independently but it is rather the structure of the brain itself - the "associations" are the connections among one circuit in the brain with other circuits.

As we have learned that these electro-chemical combinational logic circuits can be either algorithms including objects/memories, the physical connectivity of such group of neurons (circuit) with another group of neurons (circuits) is the manifestation of "associations" of The Unimind Metamodel.

In short, the inter-connections among the different combinational logic circuits in the brain are the "associations" - and these associations form the data structure of the brain which a hybrid combination of graph data structure and tree data structure.

VIII. BRAIN AS AN ELECTRO-CHEMICAL INFINITE-STATE AUTOMATA : THE SUBJECTIVE REPRESENTATIONAL MODEL OF REALITY

An automata as we know is a type of computer/machine which operates automatically and independently without any external control. Automata are also considered synonymous with Artificial Intelligence.

As we learned, the brain is a collection of a large number of electro-chemical combinational logic circuits which operates synergistically, in which the circuits are created/changed/updated automatically by itself with the aim/object of achieving survival and reproduction of the body it operates in. Therefore it is suitable to define the brain as an electro-chemical infinite-state automata.

The brain in itself is the "subjective representational model of reality" as mentioned in The Unimind Metamodel.

The Unibrain Theory can be considered as the blueprint for the neurobiological hardware / architecture i.e. the brain, and The Unimind Metamodel can be considered as the software / operating system / abstract framework i.e. the mind.

When both of them - The Unibrain Theory and The Unimind Metamodel are combined / integrated - we get a fully functional blueprint of the electro-chemical infinite-state automata, which is the brain-mind complex.

The "source code" or the fundamental foundational algorithm that is the guiding algorithm which inherently neuro-biologically programs the brain to automatically rewire itself to acquire/change/update its circuits/algorithms towards achieving the purpose of survival and reproduction of the body, is contained in the genes (DNA), and the genes (DNA) are also the physical manifestation of The Law of Algorithmic Evolution.

IX. THE CONCEPT/PHENOMENON OF CONSCIOUSNESS : WHAT IS CONSCIOUSNESS

Consciousness is generally defined as the awareness of one's self and it's surrounding environment.

Consciousness, in reference to The Unimind Metamodel as well as The Unibrain Theory, is not a separate phenomenon, but rather is an automatic byproduct of the "algorithm of personal identity" (as defined in The Unimind Metamodel). In other words, consciousness is an automatic byproduct of a separate identity - i.e., when a brain/mind assigns/considers itself an identity separate from it's surrounding environment, the phenomenon of consciousness automatically arises.

It is impossible for the concept/phenomenon of consciousness to exist without a separate identity (separate from it's surrounding environment - i.e. distinction between the self and the surrounding environment).

Therefore consciousness can be said to be merely a concept/phenomenon created by language; no such phenomenon exists in the objective reality.

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X. THE FUNCTION OF SLEEP AND DREAMS - OPTIMIZATION/REDUCTION/SIMPLIFICATION OF THE COMBINATIONAL LOGIC CIRCUITS

Optimization or reduction or simplification of combinational logic circuits refers to the process in which a circuit is redesigned in such a way that it uses comparatively less logic gates to perform the very same original task/operation/function.

The function of sleep is to optimize/reduce/simplify the combinational logic circuits in the brain by re-wiring them so that they become more efficient by performing the same task/operation using comparatively less neurons.

Dreaming is merely a byproduct of this process, whenever a combinational logic circuit which represents an object/memory is accessed/altered during the process of sleep, that re-wiring of sensory information of such objects/memories creates a flow of sensory information which is perceived in form of dreams.

The "source code" or the fundamental foundational algorithm that is the guiding algorithm which tells the brain how to optimize/reduce/simplify the combinational logic circuits during sleep, is also present in the genes (DNA).

XI. PROCLAMATION

The author (Nitnem Singh Sodhi) is currently working on developing further intricacies of The Unibrain Theory.

These will be published by the author in a subsequent research paper on The Unibrain Theory.

You can contact the author directly on the Email address given at the beginning of this research paper for clarifications and collaboration.

XII. ACKNOWLEDGEMENT

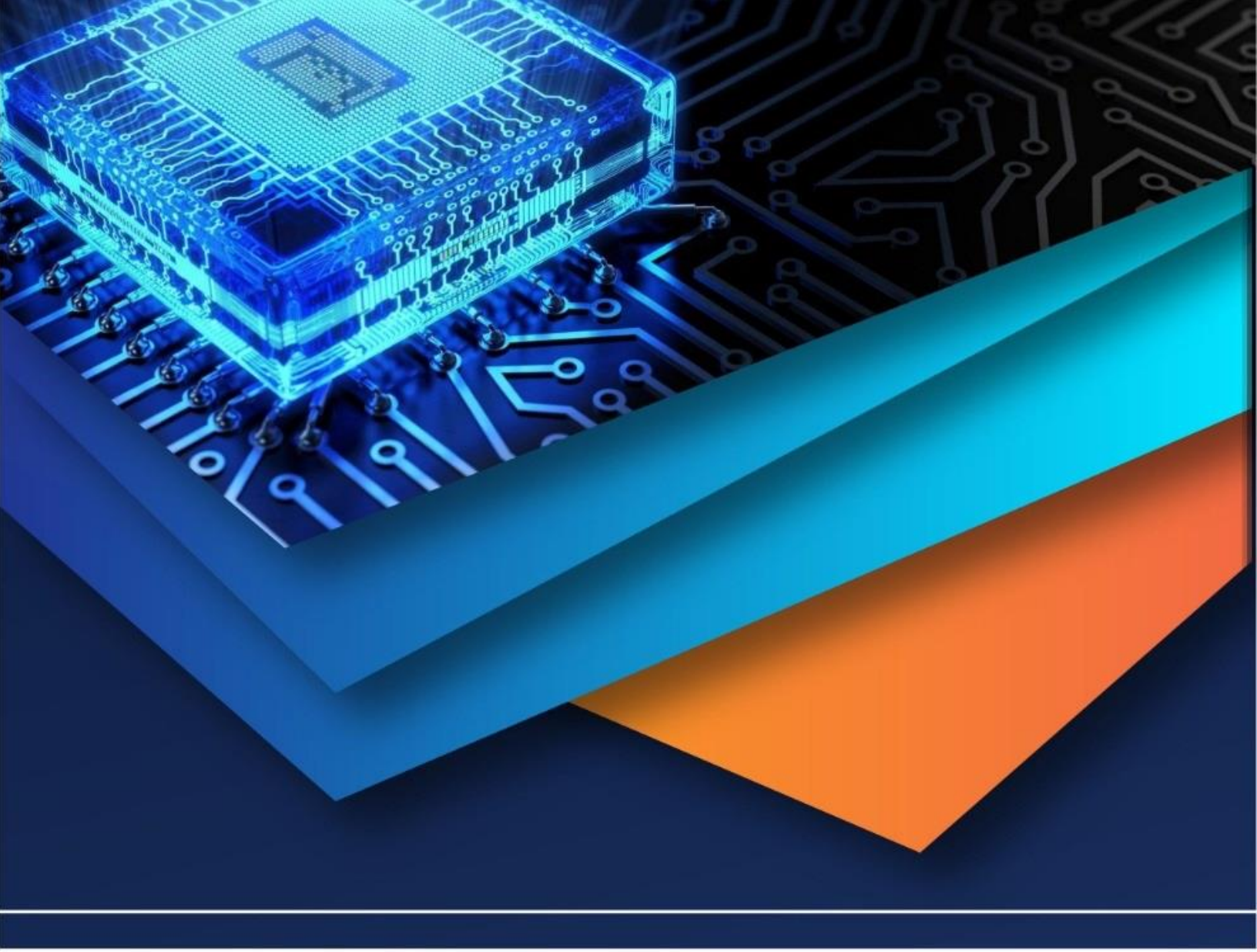
The Unibrain Theory (i.e. all the information in this paper) is the **sole** research work (intellectual creation) of the author (Mr. Nitnem Singh Sodhi).

REFERENCES

[1] Nitnem Singh Sodhi . "The Unimind Metamodel & Therapy - An Unified Functional Framework of Mind that Explains all its Faculties and provides a Novel Treatment Methodology for Mental Disorders", Volume 8, Issue IV, International Journal for Research in Applied Science and Engineering Technology (IJRASET) Page No: 399-405, ISSN : 2321-9653

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