European Journal of Artificial Intelligence and Machine Learning
www.ej-ai.org

The Theory of Natural-Artificial Intelligence

Dev Arastu Panchariya

ABSTRACT

In recent times, mankind is seeking for certain peculiar solutions to multiple facets containing an identically very fundamental philosophy i.e., certainly intend to have indeterminism as a primordial prerequisite; however, that indeterminism is itself like a void filled with determinism as analogous to the quantum computing as qubits and the corresponding complexity. In the meantime, there are algorithms and mathematical frameworks and those in general; yield the required distinctions in the underlying theories constructed upon principles which then give rise to respective objectifications. But, when it comes to the Artificial Intelligence and Machine Learning, then there find some mathematical gaps in order to connect other regimes in relation of one and the other. The proposed discovery in this paper is about quilting some of those gaps as like the whole structure of Artificial Intelligence is yet to be developed in the realm concerning with responsive analysis in betwixt to humans and machines or beyond to such analogy. Hence, the entire introduction & incitement of this theory is to mathematically determine the deep rationality as responsive manifestation of human brain with a designed computing and both with the highest potential degree of attributions or overlaps and both the conditions will be shown mathematically herewith as identifications that make each other separate and clear to persuade.

Keywords: Artificial Intelligence, brain-machine interface, complexity, machine learning, mathematical relations.

Published Online: February 15, 2022
ISSN: 2796-0072
DOI : 10.24018/ejai.2022.1.1.2

D. A. Panchariya*
Center for Theoretical Physics & Mathematics, India.
Department of Physics, IASE-Deemed University, India.

Corresponding Author

I. Introduction

As, the formal introduction of the abstracts representing; the paper is basically expressing a theory of the Mathematical development of “Brain-Machine Interface” or in other words, the theory is about establishing a mathematical linkage or mapping the direction in the frame of human brain and machines like computer or any other constructed on the basis of any artificial algorithmic relations. Clearing more upon the idea, the discovery is made to figure out the mathematical overlap of both responses at peculiar simultaneity of time and this can only be possible if it is presumed that the brain-machine interface is working or generating aftermath originating from an identical timeline which may be defined differently but represents congruency in their results which are assumed as their highest mathematical degree of possible damping. Now, the question rise from this conceptualization that with which abstract theoretical tool and how could the limitation of that degree will be traced then the answer lies in the damping extent, which will be considered for the system of all kinds of neuron with some limits bound to its paths as taking the consideration of the transmission in response which seems to intricate generally; but with the binary boundary conditions to the artificial complexity, there can be some mathematical components to it and then likewise can replicate similar element to the holistic transmission of neurons. This is merely one facet in order to establish the idea. Before, going ahead in the direction, lets’ get one very significant norm cleared here that although bijection can’t necessary be a primordial consideration when the overlapping of constraints in an identical system; however, here the dealing is in between the interface of brain and machine which is corresponding to that of neuron transmission pathways and sort of neural networks respectively, so it that form; its bijection which itself will lead the aftermath on an indistinguishable point of inclination because commonly the intent is to figure out that at what point of degree, the mathematical distinctions collapse between a response or system of a human and a machine as a whole. The Brain-Machine Interface is taken under the rumination of certain transition system and looking at the mathematical edge of the aforementioned statement, it’s very ordinary rife that a transition system as category theoretic formulation is bijective in functional norm of a powerset which can be defined its relatedness as the Game Tree Complexity due to the labelled transition system and thus, will give rise to the binary relations because P – coalgebras are in bijective conformity with sets holding a binary relation and likewise the bijections will sustain the relationships in forms of the pseudofunctor because categorically the Brain-Machine Interface are conditionally traced to originate identical aftermath but they are intrinsically constrained to have distinctions and can never hold the exact extremities.

II. Mathematical Framework

The yielded homomorphisms will devise the definite bisimulations. The bijective groups are thus hereby corresponding to the following relations i.e.,

European Journal of Artificial Intelligence and Machine Learning
www.ej-ai.org

$$f(b_1) := a \cong Hom\ (\Lambda\ ; S \ \rightarrow\ \xi) \tag{1}$$

$$f(b_2) := b \cong Hom\ (\Lambda^{i,j}\ ; S \ \rightarrow\ \xi) \tag{2}$$

Also, the relations will exhibit in the symmetric group where the functional permutations will be expressed as:

$$\Lambda^{i,j}(S_\xi) \ \mapsto\ \left(\xi \left\| \lim_{(a,b)\to\infty} (S_{(a,b)}) \right\| \left\langle \begin{matrix} i \\ j \end{matrix} \right\rangle \right) \tag{3}$$

In the context of the basic mathematical structure, the "S" is clasp as the standard symmetry group in terms of the binary relations exhibiting cross symmetry with "ξ" as a functionally scalar norm and this notion in unison; which in the domination of the component to determine the functional basis of all possible algorithmic combinations "$\Lambda^{i,j}$"; will devise the free monoid of finite rank compact as "(M, γ)" where both exhibit the endomorphism of the corresponding finite strings in "$\Lambda^{i,j}(S_\xi)$". Thus, the system is given as below:

$$(M,\gamma) \ \mapsto\ End\ \left(\Lambda^{i,j}(S_\xi) \ \rightarrow\ \Sigma^*(a,b)\right) \tag{4}$$

Now with all the basics of mathematical elements herewith, the stimulation is now towards the consequence that all the algorithmic terminologies contain an infinite combination but still infinite in terms of transition functions and thus will ultimately take out an asymptotic finite case because of the impositions of finite Strings. Now, let's have the introduction of the game tree complexity here which, by the support of fundamental mathematics for the full widths; the homomorphism of norm will behave as:

$$GTC : \Lambda^{i,j}\ (S_\xi) \ \mapsto\ Hom \parallel (a,b)\ ;\ \xi \parallel \tag{5}$$

And this will generate all the number of inclinations under the domain of automated self powerset. However, considering the non-automated system which is about the human neuron system then the plotting of a mathematical complexity will take place here by summing up the chromatic neuron distinction and corresponding relations of path functions with respect to those interactive dimensions which are "$\chi(G)$" and "$f(n_p)_d$" respectively such that the intensity of interaction "σ" will have the domain even from negative as the functional aftermath which is vice-versa as in the facet of automated systems i.e.,

$$\chi(G) \ \cong End \left(\int \frac{f\left((a,b)\to n_p\right)}{(-\sigma,\sigma)}\ \partial n \right) \tag{6}$$

Now; as the evident abstraction of brain suggest the notion of dimensions in it as the responsive action whose aftermath is due to the interaction in betwixt of those dimensions therefore, here "$\mathcal{B}_d$" is as the transitional functional representation of a required peculiar dimension of brain and in terms of space, there is the convention of "$f(3,3)$" as the notion of ordinary three dimensions along with axes that minutely affect the internal interactivity of dimensions described previously. Analogous to that, for the interaction of brain machine interface, there is "$f(n_p, k_p)$ & $f(n_t, k_t)$" and where the terms correspond to position & the real time as in the simultaneity of responses. However, the separate time hierarchy will also be applicable to that of artificial intelligence response which will come from the language as determined like:

$$L_R \ \mapsto\ \{a\#b\ :\ (a,b)\ \epsilon\ R\}\ \cap\ [\,\textstyle\sum\ \cup \{\#\}\,] \tag{7}$$

Here, the "L_R" programming will be determined by the polynomial reducible time "L'" whose singular element "$\sum$" is mentioned where "#" plays as the functional unity element connecting the binary and transitional relations of algorithm which is decidable by the Deterministic Turing Machine and also includes the uncertainty by determining the undecidable in that polynomial time where the full width monoid norm behaves as:

$$GTC \parallel L\ (M) \parallel\ \cong\ \{\, w\ \in\ \textstyle\sum^*\ :\ M\ accepts\ w \,\} \tag{8}$$

where the "w" is representing the input strings. Apart from that the linear time "$E(T)$" will simultaneously reflect the parallel function to "$f(3,3)$" as aforementioned; while the generation of certain programming, there may be discreteness that takes place in the automated side; hence elucidating the stabilizing of transition relation function as:

$$\parallel Q\ \times\ \textstyle\sum\ \times\ \{-1,0,+1\}\ \parallel\ \longmapsto\ E\ (T)\ \mathcal{L}_{a,b} \tag{9}$$

where "Q" is the element correspond to "$\mathcal{L}_{a,b}$" which is about damping of relation as boundary condition whereas the only brain interface will consist of Boundary "N" as the component of neuron pathways with the module of "n" because the response by brain will be determined by its dimensional interaction as previously mentioned. But up to now there is no such mathematical description to find out the algorithm exercise of machine and by the polynomial time hierarchy for universal Turing Machine "δ", the consideration of the complement in the complexity class of NP will be taken into the account because it holds the propensity to a decision algorithm commensurate to the game tree complexity of transition and binary relations. The functional delineation of that will be "$\overline{X}$" such that:

$$GTC \parallel \delta \parallel\ \longmapsto\ \Lambda^{(i,j)} \left(\int \left\langle \begin{matrix} i \\ j \end{matrix} \right\rangle \frac{L' w}{\partial_Q \sum^* \|\overline{X}\|} \right) \tag{10}$$

All the aforementioned mathematical structures are the prerequisites to effectuate the impetus of the idea. Henceforth, eventually keeping the description brief here; the ultimate proposition of the mathematical framework that substantiate all those previously determined mathematical structures and also vindicating the intersection of the point where the behavior of human and machine overlaps is:

$$\begin{aligned} &\int_0^\infty \int_N \partial^2 f(3,3) \left(f(n_p)\,\chi(G)\right) \left(\sum_{i=0}^{\mathcal{B}_d} \cap \sum_{j=0}^{\mathcal{B}_d} (n_p)_d \left\langle \begin{matrix} i \\ j \end{matrix} \right\rangle \right) \lim_{\sigma\to\infty} \int_{-\sigma}^{\sigma} \int_0^\infty \partial^2 f(n,k)\, f(n_p,k_p) \\ &= \mathcal{L}_{a,b}\, max\, \{\, \Sigma^*\ ;\ |w|\,\}\, L_R\, (L';\ L(M))\, f(w, \overline{X}) \int_0^\infty \int_N \partial^2 f(n_t,k_t)\ f(n_p,k_p)\,(GTC) \\ &\qquad \Sigma \cup \{\#\}\, O\left(\delta\ \left(exp\ \left(\ (E(T)) :\rightarrow\ f(3,3)\right)\right)\right) (Q\ \times\ \Sigma\ \times\ \{-1,0,+1\}) \end{aligned} \tag{11}$$

III. Conclusion

There are variety of pristine mathematical structures are defined in the theory, although all are currently concerning towards the vindication of the phenomena to develop the Brain-Machine Interface or in some sense, integrates the mapping of human-like machines or robots that not only behave likewise but also extend up to the respective thinking & emotive intersections at the highest distinctive degree of extent in term of corresponding properties, propensities and beyond. But still there could be many applications & chronicles to every single of them into distinctive realms like machine learning, robotics, quantum computing, encryptions, complexities etc. and thus the development of multiple theories will arise from it. For now, the discovery concludes the prospect of a highly advanced system collapsing the distinction between human and machines where the intersection of human brain to that of any arbitrary artificial mechanisms takes place. Briefly, the search deals with a forge-ahead system with substantial distinctions of intense cognitive actions and phenomena.

References

[1] Gödel K. Die Vollständigkeit der Axiome des logischen Funktionenkalküls. *Monatshefte für Mathematik*, 1930;37(1):349–360.
[2] Gödel K. Über formal unentscheidbare Sätze der Principia Mathematica und verwandter Systeme I. *Monatsheftc Math. Phys*., 1931; 173-198.
[3] Turing AM. On Computable Numbers, with an Application to the Entscheidungsproblem. *Proceedings of the London Mathematical Society*, 1936-37; 42(1): 230–65.
[4] Turing AM. Computing Machinery and Intelligence. *Mind*, 1950:433-460.