

Conceptual theory on Psychic Tendency in NLP and Artificial Intelligence to predict Human Psychological Problems.

¹Mr. Shubham Shantaram Patil

¹RMD Sinhgad School of Engineering, Pune, University – ¹Savitribai Phule Pune University Pune.

Abstract - As we see in today's era psychic tendency of general peoples is weakening some of the reasons behind it is that the Natural disaster by which we affected recently in 2 years which has created a severe healthcare nuisance amongst world, the Covid pandemic, similarly working in closed environment without being dissolved into our colleagues, friends emotions, these are some things which are constantly resulting in some of the severe human health problems like Anxiety, Depression, Suicidal thoughts, Bipolar manic disorders etc. In USA it is reported that the 47000 youngsters of America are under danger each year through psychological health problems. It is the 10th largest healthcare problem in United States. As we see from 1930 to 1950 when the base of actual human machine correlation established by Georges Artsrouni and Peter Troyanski till date the accuracy between the human emotions and the Computer machine has not been positively increased and somehow still has problems. In this Conceptual theory on psychic tendency in natural language programming and artificial intelligence to predict human psychological problems we have encouraged some of the problems regarding this manner to be solved which should help solve this Human psychological healthcare crisis.

Key Words: Natural Language Processing (NLP), Artificial Intelligence (AI), Natural Language Toolkit (NLTK)

1. INTRODUCTION

Human nervous system is one of the highly complex structures of a body which ingeniously transforms human neural signals to brain behavior, thinking and actions. It is through nervous system only that all other systems of our body work. It passes information from internal system to external. For example, when we put hand in scalding water, it causes pain to us in which the neural system sends immediate signals to brain to move out your hand from that substance. In Artificial intelligence although it is an immensely mature subject still till date scientific disagreements are there regarding whether AI can predict human emotions or not. Some of the artificial intelligence modules are developed to detect spiritual state category like happiness, sad, anger, disgust, surprise, fear, excitement etc. by mapping the facial expressions although it is not successfully worked. This study was the substantial failure towards the emotion based artificial intelligence. Some scientists and enthusiasts criticized regarding the ability of AI in this manner because as we can see faces does not tells

the truth always about what the person is feeling. The person might be miserable from inner side and if a show nothing on the face then the AI module fails to do its work.

So how should we tackle these problems is recognized in this research, basically it is a conceptual theory by understanding Human Nervous System, Human Neural Networks with chemical compositions produced in body and NLP with AI. It is also in correlation with the biological memory that a human being perceives so that a human can understand and remembers the things happened in the past. The poor side of AI is the datasets is not that much able to recall the things for a period of time? This study also includes the working of neurotransmitters and some of them which are linked with psychological intents of human being like serotonin, Melatonin, Dopamine, Glutamate and some of the terms like understanding amygdala, hippocampus and Prefrontal Cortex at the end afterwards we will see how we can combine this study to help tackle psychological health problems with Natural Language Processing and AI.

1.1 HNS & Brain Related AI Studies

Emotions and *Human Neural system* works like concealed manner, pouring millions of different signals to the human brain similarly charging different hormonal balancing and chemical release in our body these signals can be either of different moods, pain, happiness, etc. Humans have wilful or deliberate control over the sensory and motor systems of your central nervous system. The sensory network of your central nervous system receives and transmits information from the outside world through your five senses (sound, sight, smell, taste and touch) to your brain.

As we see in this research context we will go through various terms and will understand what does it mean and how they relates with the study of Natural Language Programming and AI, so starting with how emotional response system works in human body is needed to checked. Limbic structure of the brain which is located in the deep brain network and in that some of the mini parts like **Amygdala** is basically a smaller place of brain located in the base of brain with multiple cells inside each cerebral hemisphere; basically there are two cerebral hemisphere of the brain so responding to the amygdala this is the smallest hub of emotional operations which are directly related to creating sentiments this is straightly related with the Fearful or we can say Stressful responses in humans and also relates with the brain memory. **Hippocampus** is also located with amygdala in the temporal lobe of the brain it is a mini tube like structure

which works correlates with amygdala and it is also important in functioning of the emotions and brain memory. These are also like amygdala locates into both of the cerebral hemisphere of the brain i.e. two hippocampi. After hippocampus the third important part of the brain which is involved in emotions and mood swings is **limbic cortex** this is also called as a part of limbic system of the brain containing two parts in it which are two gyros one is cingulate and another one is parahippocampal gyrus this both helps in recalling specific memory to the brain. The fourth and the last important part are known as **Hypothalamus** it is basically located above the pituitary gland in the base of the brain responsible for mood swings, hormone changes etc.

1.2 Limbic Scores interrelations

As we have gone through all the brain science terms in above theory we now understand that emotions in our body are controlled by our limbic systems which consist of four parts amygdala, hippocampus, hypothalamus and limbic cortex. Amygdala works above hypothalamus in respect to working for example if a person realizes potential physical threat outside the body then he or she can either opt for two decisions by their brain, one is that they can have emotions like fear, anxiety or panic and the other decision can be having a defend position so that they can safeguard their lives. We are not interested what happens outside we are actually concerned with what exact working is carried out in human brain and what chemicals release is happening inside the body so we can relate that with natural language programming and predict that the person is actually in distress position or not. Basically various researchers according the community call this response as Fight-or-Flight response.

When amygdala gives neuron signals to hypothalamus it immediately activates response and further sends signals to adrenaline gland to produce immediate hormones like adrenaline or cortisol these hormones are straight away injected in the blood stream in our body which results in increasing blood pressure, heart rate, breathing rate, sugar levels of the body etc. so this is what we say the limbic system in brain works like with different glands and nervous system.

To measure computational study of all these limbic systems the important aspect also joins to this study which we call it as Neuroimaging Technology. Radiology which evolved two of the world known neuroimaging tests which are qCT Computed Tomography and qMRI Magnetic resonance imaging, "q" is for quantitative radiology. qMRI technique basically certifies special findings about brain and demonstrates the cross sections, boundaries of the cortex and another ones, how intense the signals are and there characteristics, functionality of amygdala, biochemical properties of neural tissues etc. however this study

continues with the intense technologies like SPECT (Single Proton Computed Tomography) and PET (Positron emission tomography).

2. Current AI Studies and improvements needed

Things are not that much easy when it comes to understand precise psychic tendency of human being and convert it into NLP and simply create an AI model. Till date how emotions are being attached with AI vanquished the actual meaning of artificial intelligence. To indulge the intentions and sole sensibility with blending AI the current modules which works are like throwing a ball in a darkest suite, current emotion based AI modules are working on facial recognition, image advancements, preprocessing of taken image, measuring the face values, Facial paths, marks after taking all these values researchers classifies the data into machine learning after that the image is detected and as we know to detect image we simply program by taking 4 coordinates of rectangle let's assume 'x','y','w','h' these coordinates belongs to the faces inside that we add multiple codes like ScaleFactor because some of the faces can be taken in an close up imaging so to recognizing the face we add Scale Factor to code. Some of them use cascade classifier to detect the face by thoroughly importing xml files and use scale functions, ratio, step ratio, min_size, neighbor_number, intersection_score_threshold etc.

This practice can appear as shown below:-

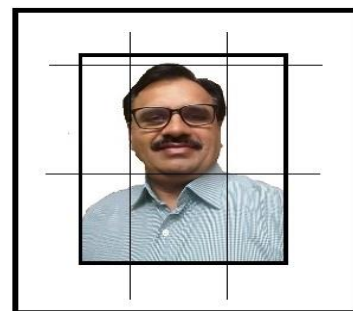


Figure -1: Face Detection Analysis by using Python Programming

Now as you see in above given image by writing this code and taking the x y w h values when machine recognizes this image it appears to be a smiling face after interpretations of output values but we have this belief that these all are unethical and crude practices which again as we said earlier crush the meaning of intelligence. Taking person's photograph and predicting his or her emotion is like pretending to be solved the problems but it is not.

Consider a person who has smile on his face and going through deep miserable phase and AI module is showing that particular human being is Happy. In this kind of phase the artificial intelligence emotion detection module using face detection fails. Even humans can't understand by

looking at the pictures the emotional state of another human being then how do machines will.

2.1 Substitute study to be performed using AI

Although as we know the exercises are made from 19th century till date to favor artificial intelligence and developments on Natural language processing to develop great AI modules but the implementation of the devices that has been made has not succeeded except few cases like siri, alexa and Google’s smart voice assistant etc. As we see the below given graph we can relate the study that has been done on Human Machine Intelligence and the actual implementation in the market.

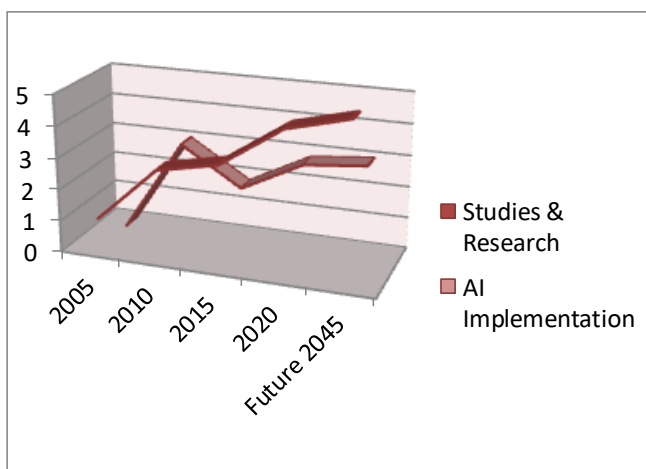


Chart -1: Representation of Studies & Implementation of Emotion based AI Technologies

One of the reasons which is causing hurdle to achieve technological advancements in human machine intelligence is that this field includes a rich diverse fields which should be studied like to predict psychic tendency of humans it should include Neurology, Radiology, Computer science scholars, IT Professionals because the programmers who are working in order to get the result have less knowledge of Neurology and Brain science as compared to that of a particular Neurologist and Radiologist. Machine learning is using software to reproduce biological structures, such as neurons. That aside, An Human neuron can only fire about 200 times a second also having speed of 70-120 m/s i.e. around 150 – 300 miles per hours, a single neuron can be a single piece of data, but many transistors are involved on every single CPU tick. What computers are lacking is parallelism.

There square measure around ninety billion neurons within the human brain however all of them might be active at a similar time. It massively parallel and even the largest mainframe clusters still do not come back anyplace close to the power of process in parallel that out biological brains will do. This can be a part of the matter. Emulating a

hundred billion neurons in software package takes your time, and whereas we tend to have gotten quicker at it with the help of specialised hardware, the computations square measure still terribly slow. The brain is extremely compartmental in some areas that "connections" between areas however in many ways it's not. That leads United States of America to the second issue. Any we are going to discuss concerning however actual abstract theory implementation ought to be one so as to realize emotions based mostly Human Machine intelligence modules.

3. Actual conceptual theory of implementation

As we have previously studied that our central nervous system is connected with brain and in which the limbic architecture consists of 4 important parts which are Amygdala, Hippocampus, Hypothalamus and limbic cortex which is generously evolved in the emotions which a human being perceives. Let us assume that if we gone through the special tests in which we know the functioning of our these 4 parts and if we able to calculate the chemical hormone releases in the human body we can bridge this by programming with artificial intelligence and can make huge difference in predicting Human psychological problems. We will also go through the 4 important brain harmonic chemicals Serotonin, Dopamine, Glutamate and Norepinephrine.

Serotonin helps us in digestion as well as mood swings and depression the fact is most of the serotonin is present in the intestines it is produced by central nervous system. But we do not need what happens in our intestine with serotonin we are interested in the levels which are found in brain. Anti-Depressants used in treatment of extreme depression is actually targets serotonin neurotransmitter in our brain to improve the emotional sensibility of particular human being. A study by Mayo clinic researchers shows that serotonin levels in the brain can be measured by Wireless Instantaneous Neurotransmitter System i.e. (WINCS) this study was published in 2010 issue of Journal of Neurosurgery.

Similarly as Serotonin the Dopamine is also get produced by the Central Nervous System and can be measures in the unit of "ng/ml" this differs for child, adults and old ones. Dopamine in brain is directly related to the cognition and behavior of particular person and situates in the frontal core part of the brain. This is particularly famous for will to take rewards and pleasure type. Basically dopamine present in brain encourages the person to achieve rewards in his or her social life.

Study of our 3rd and important brain chemical which is named as Glutamate this defines the excitement levels within your body and also called as excitatory neurotransmitter. Glutamate is essential for development of human brain as well as increasing its capacity and overall growth. The scientific study shows that glutamate present in the brain can be measured by H-MRS which is called as H-Magnetic Resonance Spectroscopy.

The final important brain chemical is Norepinephrine which is produced itself by brain, adrenal glands and CNS and can the levels can be tested by the test of catecholamine. It is one of the neurotransmitter and stress hormones which are directly linked with the stress management of the human body.

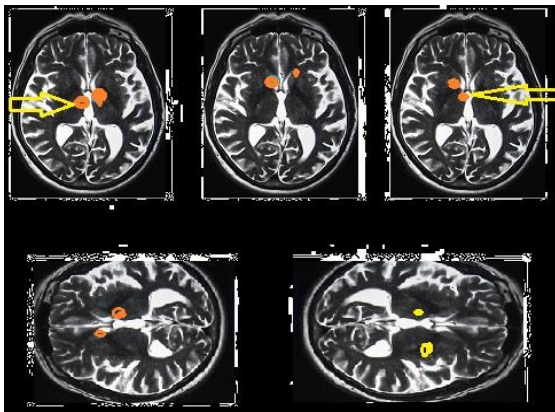


Figure 2: Brain scan through qMRI showing Amygdala of persons in happy and sad emotional state

The whole concept of stating this brain science theory is that we need a joint mechanism to conduct these tests at a point and the test results should be converted into the programming of an AI Module which will define the actual meaning of Emotions based artificial intelligence module if we succeed to achieve this result then we can easily develop an AI Machine. As shown in below diagrams the MRI of brain shows that what state the person is actually going through not accurate as this much by combining the chemical results but recommendable.

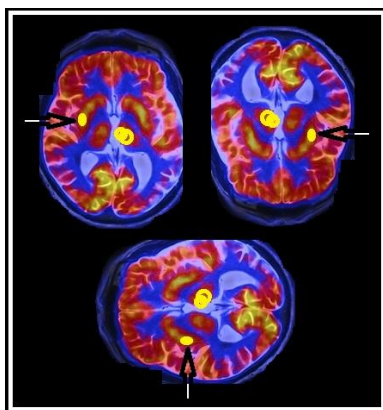


Figure 3: Single proton computed tomography brain scan for Amygdala measurement

3.1 Advantages of study and Problems

ANN or artificial neural networks are scientific discipline systems that are impressed by our biological system, like however our brain processes data. Our human brain has around 100 billion neurons, and each neuron has a

connection point between 1000 to 10,000. Even if one or two cells get corrupted, ANN's capabilities of generating output will not change. This makes it far more the other machine learning technique.

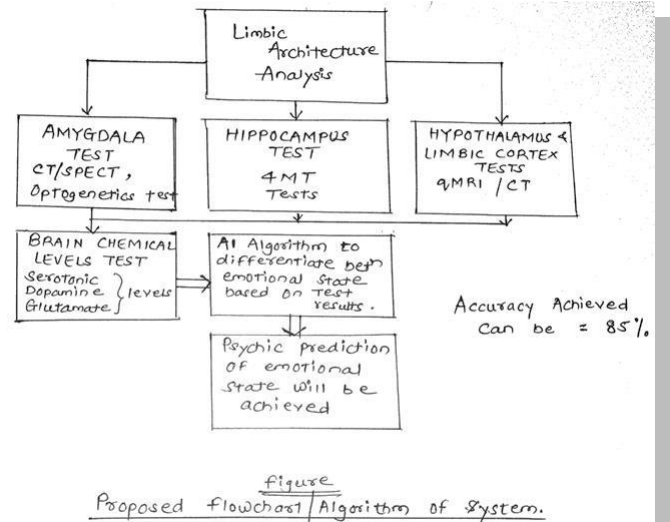


Figure 3: Proposed flowchart of the actual AI System

The problems which can be arose from this exercise can be like to test the brain with so much tests is not easy to do in single stroke similarly there are currently minimum resources are available to conduct these tests like for example serotonin one of the brain chemical it also helps us in digestion procedure so there are not only single brain works are done by these hormones. The other point of it is that its time consuming procedure but as said the human life is more precious than what time it takes what the efforts are made. One of the biggest problem which is there is this is an highly complex structures in which researchers are not able to get what has to be accurately done because as said earlier artificial intelligence for detecting human emotions is very diverse subject and cannot only relate to the computer programmers the knowledge of Neurology should be taken as well as the radiology and brain science knowledge should involve in this research with mass study and proper project funding is also plays an key role.

But unlike by doing research in this subject we have achieved some of the parts which should be focused after getting test result and merging with AI algorithm will result in the actual emotions although not accurate study can be predicted because at last it's a prediction but the accuracy of 85% can be achieved.

Emotions have a huge influence on our behavior. They may additionally and in reality particularly can be seen on the client journey from a selling perspective. Once customers have positive emotional associations with a brand way more probably to be loyal thereto than if the induced associations are detached or maybe negative. Therefore, if brands wish to enhance the client expertise, they have a system that doesn't work on the idea of strictly rational intelligence.

4. CONCLUSIONS

We have seen the limbic architecture and how it is important in emotions forming in human being the main part is the brain chemical formed and testing all the values and combing with AI module we got the psychic tendency prediction of emotional state of particular human being. The main factor is even if the result from AI system and if the prediction goes wrong still we can start counseling of particular person which will definitely help the suicidal attempts now a days.

REFERENCES

- [1] Marsman A, Boer VO, Luijten PR, Hulshoff Pol HE, Klomp DWJ, Mandl RCW. Detection of Glutamate Alterations in the Human Brain Using ¹H-MRS: Comparison of STEAM and sLASER at 7 T. *Front Psychiatry*. 2017;8:60. Published 2017 Apr 21. doi:10.3389/fpsy.2017.00060
- [2] A. G. Ranade, M. Patel and A. Magare, "Emotion Model for Artificial Intelligence and their Applications," 2018 Fifth International Conference on Parallel, Distributed and Grid Computing (PDGC), 2018, pp. 335-339, doi: 10.1109/PDGC.2018.8745840.
- [3] M. Healy, R. Donovan, P. Walsh and H. Zheng, "A Machine Learning Emotion Detection Platform to Support Affective Well Being," 2018 IEEE International Conference on Bioinformatics and Biomedicine (BIBM), 2018, pp. 2694-2700, doi: 10.1109/BIBM.2018.8621562.
- [4] J. G. Rázuri, D. Sundgren, R. Rahmani and A. M. Cardenas, "Automatic Emotion Recognition through Facial Expression Analysis in Merged Images Based on an Artificial Neural Network," 2013 12th Mexican International Conference on Artificial Intelligence, 2013, pp. 85-96, doi: 10.1109/MICAI.2013.16.
- [5] R. Pathar, A. Adivarekar, A. Mishra and A. Deshmukh, "Human Emotion Recognition using Convolutional Neural Network in Real Time," 2019 1st International Conference on Innovations in Information and Communication Technology (ICIICT), 2019, pp. 1-7, doi: 10.1109/ICIICT1.2019.8741491.
- [6] Castro-Sierra E, Chico PLF, Portugal RA. Neurotransmitters of the limbic system. Amygdala. I. Part one.. *Salud Mental*. 2005;28(6):27-32.
- [7] Guex, R., Méndez-Bértolo, C., Moratti, S. *et al*. Temporal dynamics of amygdala response to emotion- and action-relevance. *SciRep* **10**, 11138(2020).
- [8] Salzman, C. Daniel. "Amygdala". *Encyclopedia Britannica*, 27 Feb. 2019, <https://www.britannica.com/science/amygdala>. Accessed 6 June 2021.

BIOGRAPHIES



Author :-

Mr. Shubham Shantaram Patil
Author has vast educational background through his life, currently serving as Chief Executive Officer of Indian Software Company "Lockfisher Software Technologies". He is pursuing his Bachelors of computer engineering honored in cyber security from RMD Sinhgad School of Engineering under Savitribai Phule Pune University, Pune in 2021. He also holds vast knowledge of software development including one of his degrees which is Advance Diploma in Software Technology offered by Softaid Institute of Information Technology in 2016 and General Diploma in Computer Engineering from Maharashtra state board of technical education, Maharashtra, India in 2018. The author's major field of study is Artificial Intelligence, Software Technologies & Cyber Security.