

# Walking the undiscovered road for analysing potential suicides through neural networks

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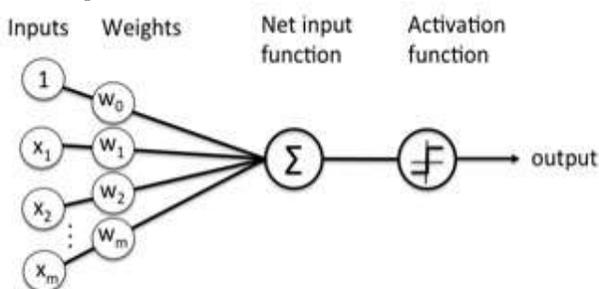
**ABSTRACT:** In this competitive world, people have long working or studying hours with no time to relax or enjoy. Human computer interaction, social media have reduced a great amount of time spent with friends in parks, or speaking to each other and meeting them personally. Maintaining an interesting social life has led to living a miserable real life and due to “fear of missing” out people are glued to their phones and always upset and disappointed. Additionally, when people irrespective of age groups face hardships, they do not have a fall-back person to confide into leading to feeling lonely and shattered. Hence, this project discusses the severe problem across age groups and boundaries due to various factors like loss, rejections, disappointment, stress, anger, peer pressure, loneliness, failures and hardships that push the individual to the extent of ceasing their lives by committing a suicide. There is definitely a trend followed and an increasing number of suicide attempts amongst men, women and the youth and hence some decoding needs to be done here to unveil the reasons, traits and methods of people who are potential to commit a suicide and the ways they might resort to. This project with the help of neural networks, the machine learning algorithm discusses them all in order to inspect, identify and cut it off from the grass root so that no individual would ever be left with only this as a solution and with the help of some of our therapies, our friends and families can lead better and happier lives.

**Key Words:** neural networks, potential suicides, suicide, suicide attempts.

## INTRODUCTION

**NEURAL NETWORKS** –Machine Learning encompasses a lot of applications, one of them being the neural networks. It is cost-effective, efficient and reliable to write training programs rather than hiring someone to write specific codes for a specific program. With the help of training sets and patterns, it gets easier to decode or understand complex situations and get effective results.

- Recognizing patterns; behavioural, spoken or patterns of objects is easier with machine learning.
- Recognizing unusual behaviours- complex situations pertaining to a person or an event.
- prediction – based on the above studies a prediction is made to prepare better for the future. For examples: in this paper to understand the steps a person might take can help us in saving a life. Inspired by biological neural networks and deep networks, neural networks form an important part of machine learning. They are applied to any machine learning problem as they are function approximations. This project is a website aimed at researching, analysing and finding out the major reasons across age groups and genders for committing suicide. This project will help us and the counsellors, doctors or family members to adopt better approach in addressing their very own members of the family. A specific area is being selected for this particular analysis and research to infer for the majority of the population. It also can extend to identifying and suggesting protective factors based on the risks understood and make people strive towards achieving and living their life-goals then put a full stop at them.



Schematic of Rosenblatt's perceptron.

Figure 1: Schematic of Rosenblatt's perceptron.

**OBJECTIVE**

This project aims at finding out reasons and motivations for people across age groups to bring their life to an end. In current scenario the rate is increasing rapidly and it should be addressed by each one of us collectively. There being lot of factors associated with this, it is essential to understand them and observe the existence of these traits in the people we value. This research and website will enable the surrounding people to take a look for these signs and get an analysis done through this site and step-in to stop their loved ones from taking some painful measures. Some of the factors are mentioned below that are used for reference.

**SOME OF THE POTENTIAL FACTORS INVOLVED:**

- Frustration and Anger
- Disappointments
- Rejection
- Stress and Depression
- Dependency
- Loneliness
- Peer Pressure
- Fake Friends and Negativity
- Abuse (Alcohol addict, chain smokers and drug abuse)

The mentioned factors cause the people around us to resort to such difficult, painful and unpleasant means. It is critical to address them at an early stage to avoid such issues.

To understand the reason behind these steps, a survey will be done and studied across age groups to identify actual facts and figures compelling people to commit suicide.

The survey also analyses the means chosen based on the reason, age group and gender. It is an aid to understand, decode and deconstruct the thought process of the mass population and their sufferings. Consequently, it will help us to guide, motivate and encourage them to live a promising and fulfilling life.

**METHODOLOGY**

Inspired by research into the functioning of the human brain, artificial neural networks are able to learn from experience.

These powerful problem solvers are highly effective where traditional, formal analysis would be difficult or impossible. Their strength lies in their ability to make sense out of complex, noisy, or nonlinear data. Neural networks can provide robust solutions to problems in a wide range of disciplines, particularly areas involving classification, prediction, filtering, optimization, pattern recognition, and function approximation. In this project I intend to throw light on the reasons of disappointment and failures which when left unaddressed take deep roots and compel the person to end their lives. Each individual being different may resort to some easier and simpler means to do so. This also is associated with age and gender. This is an attempt to bifurcate and sort out reasons, genders, attempts to what kind of means and what aids can solve this problem better. Based on the mentioned behaviours an analysis will be done and processed by deploying neural networks algorithm and also through social network analysis to understand patterns of behaviour in the person. Hereafter a result will be generated for the particular individual on how prone the person is to commit suicide and attempts at finding and suggesting impactful solutions for the individual will be done.

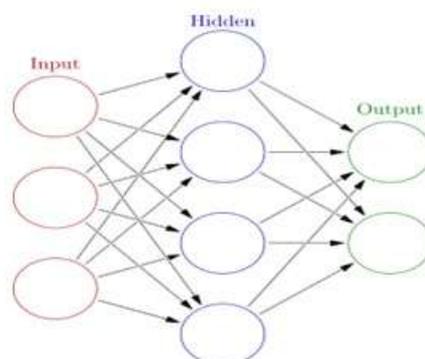


Figure 2 : Neural Network

An artificial neural network is an interconnected group of nodes, akin to the vast network of neurons in a brain. Here, each circular node represents an artificial neuron and an arrow represents a connection from the output of one artificial neuron to the input of another.

**LITERATURE REVIEWS.**

**1)Suicide in India - changing trends and challenges ahead**

Year	Incidence	Rate
1967	38,829	7.8
2006	118,112	10.5
2007	122,637	10.8
2008	125,017	10.8
2009	127,151	10.9
2010	134,599	11.4
2011	135,585	11.2
2012	135,445	11.2
2013	134,799	11.0

Figure 3 : Suicide Statistics.

Discussing the statistics for the increase in suicide rates for over 4 decades, we understand that instead of decreasing they have explicitly increased and this needs serious attention. However, of all the researches done for a country like India have been stating that youths have been dominating this sector than something constructive. The problems related to career, family, friends that stem up in this critical age group between 15 to 25 compels to this solution.

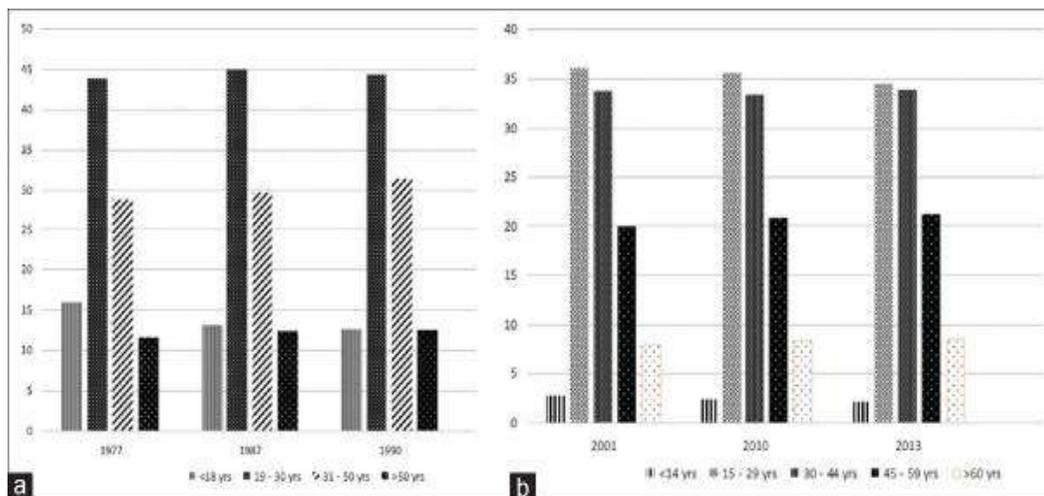


Figure 4 : Graphical representation of percentage of suicide.

This graph clearly shows that since 1977 till 1990 the percentage of suicide in the age group of 19-30 was 45 % and the decades later sighed relief with 10% reduction in the rates yet it was quite high with 35% in 2001 to 2010 and approximately 33-34% in 2013 which is 5 years ago. This paper discusses suicide attempt of farmers, students and armed forces as well.

It discusses problems like substance abuse, issues with parents, in-laws, spouses that eventually lead to suicide attempts. They have statistically stated that intervention of parents, in-laws and spouses have created an increased suicide rate, wherein they should be the reason to their happiness, the arrow has turned to them the other way. Change in trends of suicide attempts like cuts or stabs to hanging, poison, or drowning and burns. Lakes, beaches, sea-links have been blamed to have consumed the emotionally disturbed yet resourceful people of the society and country at large. Internet or the world of technology has also contributed its share in consuming the lives by bringing together people of similar concerns and promoting risky-behaviour.

**2)Suicide: An Indian perspective**

It states that suicide is the third leading cause of death amongst the youths. Suicidal attempts in women is also common and regions and cultures have their contribution too. Every second there's someone thinking of committing suicide and every minute there is someone who loses to life and death wins over. Merely calculation of people surrendering themselves to all the negativity inside or outside them and ceasing their lives isn't a good symbol for any country or state.

Additionally, it also discusses how ceasing one's life is considered to be sacred and holy in some Indic cultures, stating that it's the highest sacrifice that one can give and it attains salvation "moksh". The women have also been committing suicide after or during the death of the husbands, "sati" which has been called off yet quite prevalent in small parts of the country. All this being discussed, it tries to change the lens at viewing suicide and states that it was a way of relieving oneself from the cycle of life and death and safest way to get rid of the problems. Moving ahead, it discusses, the part that it comprises is, the youth, unemployed adults or loneliness. Age group 15-29 is supposed to have made their mark in this no-entry zone by having committed most of the suicides.

Suicide has been associated with gender inequality, physical abuse, mental or physical disorders and inefficiency to cope with them. Men and women have different modes of attempting suicides, lethal and less lethal respectively so as to avoid detection in former and get rescued in the later. Divorce, widows or separated men and women also have been reported with suicide attempts and thus proved marriage also as one of the causes. This paper further goes on to discussing methods resorted to for suicide like poison, burns, hanging, jumping or drowning to name a few. It has also tried to predict suicide and understand attempters versus completers and their behaviours. This paper can foster the project and prediction to safeguard our youth and motivate better lifestyle.

**3)Indian research on suicide**

This paper discusses the reasons and group of suicide attempts a decade ago were below the age group of 44 years. Each one of us is affected by suicide because we either attempt it or witness it. It states that the most vulnerable age group is 18-30 and most common method is poisoning. Females with lower economic background, being married whereas males with less monetary stability, hopelessness, depression. DSH - Deliberate self-harm is also reported as one of the aspects to future suicide attempts. DSH is observed in the younger age groups and less lethal ways but have also observed prevalence of risky behaviour like slitting the wrist, jumping off the cliff or going deep-waters. It also talks about the non-fatal suicidal behaviour that needs to be addressed at the instant stage. Teachers, practitioners, counsellors, paediatricians must all be well equipped and skilled at working on it. This is one way in which we can address the DSH and overcome it thus reducing the fatalities due to suicide.

**4)Suicide in India: a complex public health tragedy in need of a plan**

This paper states that in the year 2015 the suicidal rate marked was 10.6 per 100,000 population. AIDS related and maternal deaths have acquired more attention than the suicidal deaths, I believe it could be more due to the perspective that they ended their lives, why do they need attention. However, that isn't the case, this least-concerned attitude has magnetically attracted and pulled them towards this solution. Youth and older age are key risky periods for women to commit suicide whereas youth, middle age and older age are risky periods for men. It also discusses that each of it can be inter dependent, if the suicidal rates in men decrease and their dependency on alcohol decreases then women committing suicide may decrease. Suicide attempts require our attention as this only helps in attaining the SDG target- sustainable development goal.

**5)Suicide ideation and stresses among the working professionals in India**

This paper talks about the second leading cause of death in the year 2012 discussed by WHO, being suicide. It discusses that National crime record bureau has recorded suicides at a rate of 15 per hour, India being on the first position. Noted the reason as an imbalance between the needs and means to be fulfilled. Weak and feeble in adapting the consistently changing environment makes it stressful and pushes the individual to ceasing the life from this pressure and helplessness. This hopelessness or hopefulness is the bridge between the positive or negative influencer. As the negative influence increases due to increased hopelessness and dependency, the choked feeling causes the person to end his life. This is termed as Cognitive attitude by Aron Beck.

An individual may also commit suicide if he feels left out, unwanted or useless to put it across clearly. If a youth especially feels unrecognized and ineligible to contribute to the society, he or she might opt for these solutions. This is due to the sociological perspective given by Emile Durkheim. Psychological Behavior – Sigmund and Freud have proposed that the person intending to commit suicide may want a reason to do so, for example, taking revenge and then ceasing to life due to guilt, feeling hopeless. People with low serotonin,

dopamine, norepinephrine chemicals in the body are prone to committing suicide. It has done some reliability, KMO and Bartlett's test, hypothesis testing and much more.

**It has discussed various issues that lead to this drastic decision, they are**

- a. Love failure
- b. Cancellation of marriage
- c. Death of the dear person
- d. Barrenness/impotence
- e. Divorce
- f. Unwanted pregnancy
- g. Bankruptcy
- h. Financial crisis
- i. Unemployment due to recession
- j. Professional/career problems
- k. Alcoholism
- l. Illness/sickness
- m. Drug abuse
- n. Physical abuse
- o. Dowry abuse
- p. Family problems
- q. Family health issues

These 17 causes become the driving force to a person committing suicide.

#### **6)Suicide in Youth: Shifting Paradigm**

This paper discusses the various means of causing self-harm like burning, train-run over, suicide and poisoning. It talks about the existence of the term suicide and it being in practice since the existence of humans. It is as if since the day man found out that it could kill himself. Suicidal deaths occur more frequently than the deaths by world's arm conflict or naturally.

It has strived hard to find out the pattern, life events and socio-economical, cultural and psychological status to understand the driving force for the same. Out of the 627 autopsies conducted 227 were termed to be ISH – intentional self-harm. It has discussed in the terms of most reliable or resorted approach for suicide to the least as follows,

- Unknown poisoning (39%)
- Jumping against moving train (25%)
- Hanging (19%)
- Drowning (9%)
- Alcohol (4%)
- Burn (1.8%)

Smart suicide attempts are noted here, as trains are always available during the peak impulse times. Tracks being always occupied with trains and applying brakes being impossible, the depressed yet smart youth tend to take negative advantage of it.

#### **7)The psychology of suicidal behavior**

It accepts that all this while what we have been discussing is only the ways, means or motivations to take such a negative leap, however what we are missing out on is that we hardly know the reason for individuals committing suicides. Whether it is their negative life events like,

- Childhood adversities
- Traumatic life events during adulthood
- Physical illness
- Other interpersonal stressors
- Psychophysiological stress response

These have the potential to contribute to the psychology of an individual and mislead it to something dangerous, if only it could scare them. Social factors equally contribute to the psychology and the thought process of the humans by continuous involvement than required.

- **Social transmission**
- **Modelling**
- **Contagious**
- **Assortative homophily**
- **Exposure to deaths by suicide of others**

- **Social isolation**

Although all these factors do contribute there needs to be some way out of this mess for the valuable youth of our country and precious dear ones in the family. Friends, family and near ones can always be of great support in such scenarios. Optimistic approach and resiliency help in overcoming the fear of losing and also provide motivation and an approach to see to the life with beautiful lens and strive hard to make it true.

- Future thinking
- Goal adjustment
- Reasons for living

These factors do have the potential to bring hopes, desires and aspirations in an individual's life and ignite the desire to live further and achieve the once set goals.

- Thought process.
- Problem solving
- Coping
- Agitation

The above mentioned 4 factors are apparently interlinked as one is able to solve the problems in the lives only if one has a sound thought process and has the ability to cope with negative results or outcomes rather than getting agitated about it for unusually longer duration.

### **8) Suicide and Suicidal Behavior**

This paper states that suicide is an intentional ending of one's life and it is observed across countries and boundaries. This paper also talks about suicide ideation, suicide plan and suicide attempt as three categories of non-fatal suicide thoughts. Suicide ideation is getting convinced with the idea of committing a suicide and nurturing those thoughts. Suicide plan is the means by which one then decides to take an action. Here, the methods come into picture. Suicide attempt is the actual behavior where a person attempts to die with self-harming steps like cutting, poisoning, hanging or drowning. It discusses that the ratio of suicide in India is almost for men and women as per the studies in developing countries. In countries like India, disempowering women and low status has become one of the reasons. It makes a wonderful research stating that the onset of adolescence and early 20's is the period of greatest risk towards committing suicide. Additionally, it talks about preventive and curative measures. Training physicians to recognize and treat suicidal behaviors is the need of the hour, also making access to lethal things difficult is another means of hindering the process.

#### ***Use of software and technologies.***

PHP – HYPER TEXT PREPROCESSING

CSS – CASCADED STYLE SHEETS

JAVASCRIPT

These three when used together help design a website, PHP takes care of the backend for database to store all the details of the users and the symptoms that can help in comparisons and improvements or deteriorations over time and CSS and JavaScript shall take care of the frontend. CSS also provides content accessibility, more flexibility and control in the specification of presentation characteristics, enable multiple web pages. The site may be developed on WordPress platform. Hypertext Pre-processor is a widely-used open source general-purpose scripting language that is especially suited for web development.

### **CONCLUSION**

The approach to life is changing slowly and gradually. Understanding one another better and without judgements or pre-set notions one is able to help others better. If we are able to gauge what an individual around us is going through, we can make a difference in their lives and the society as a whole. Each individual's life and battles are different hence it's essential to have a tailored approach for each individual. The studies show that neural networks work amazingly well on such kinds of problems in order to understand behavioral patterns and predict the outcomes. The therapy can be suggested well only if the root cause or a proper illness diagnosis is done. Eventually a better consultation and an environment can be created to gift an enriched life to our dear ones.

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