Evaluation of Artificial Neural Network using the SPSS Method

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Abstract.

A computer system known as an artificially created neural network (ANN) typically integrated in layers. These layers contain complex reticulated elements called neurons. Neurons are grouped together in a specific pattern inspired by the brain's biological nervous system. ANN is not designed for a specific task, but can be used to solve more complex and complex problems with the help of detection from observational data. Medical practitioners today have access to a wide range of information, from specifics on clinical symptoms to the results of numerous forms of biological data and image processing devices. Each type of data gives data that may be analysed and categorised in accordance with a specific pathology during the diagnosis process. Machine examinations and neural networks that are artificial in particular are able to speed up routine diagnostic operations and avoid misdiagnosis. These adaptable learning techniques may process a variety of clinical data types and combine them to produce outputs that are categorised. The principles, capabilities, and restrictions of neural network technology in medical assessment are briefly reviewed and discussed in this study using a few instances. Ratio studies are statistical analyses of data from appraisals and property valuations. Nearly all states utilize them to produce quantitative measure of the proportion of current market price about which individually estimated taxable property is appraised as well as to offer assessment performance indicators. The Cronbach's Alpha Reliability result. The overall Cronbach's Alpha value for the model is .658 which indicates 66% reliability. From the literature review, the above 50% Cronbach's Alpha value model can be considered for analysis.Characteristics of sisal fiber the Cronbach's Alpha Reliability result. The overall Cronbach's Alpha value for the model is .658 which indicates 66% reliability. From the

literature review, the above 50% Cronbach's Alpha value model can be considered for analysis.

Keywords: Medical diagnosis; Artificial intelligence; Artificial neural networks; Cancer; Cardiovascular Diseases and Diabetes.

1. INTRODUCTION

A prospective set of data of 1320 photographs from a clinical routine was used to test an artificial neural network and compare it to two different classification techniques. Areas underneath the receiver operation characteristic curves, which evaluate how well the machine learning neural network performed in various cardiac regions and during ischemia, fell between 0.83 and 0.96. These findings point to neural networks' enormous potential for use in clinical decision support systems [1]. Artificial neural networks (ANNs) that use evolution as a fundamental sense of adaptations in addition to learning are known as human evolution artificial neural networks (EANNs). They provide a generic framework for examining numerous aspects of simulated growth and adaptation, including the autonomous design of ANNs. The basic framework makes it clear where autonomous ANN design fits into the overall picture of a generic adaptive system, which may modify its behaviour by changing its "hardware," or weights and shapes, and its "software," or learning rules. We review a broad framework of this kind [2]. In several fields, neural networks based on machine learning (ANNS) have emerged as a well-liked and practical model for categorisation, clustering, pattern recognition, and prediction. ANNs are a sort of model for pattern recognition (ML) and are currently comparatively competitive over conventional regression and regression techniques linked to artificial intelligence (neural network, natural language processing (nlp), pattern recognition, robotics), data protection, big data, cloud computing. With regard to data analysis factors including consistency, processing speed, latency, productivity, effectiveness, low latency, size, scalability, and aggregation, ANNS may assess entire applications. This has increased the necessity for this field of study [3]. Only the simplest system identification has been used to build feedback neural networks, meaning that the outputs are typically directly accessible and The system's primary layer is fed back by the neurons in the top layer. A neural network is said to be feedback if any neuron's output is another neuron's input in the same network. There are various uses for neural networks that are artificial with feedback

components [4]. A neuron processing unit in an artificially neural network can represent a variety of things, including characteristics, characters, concepts, or a meaningful abstract pattern. A network's three types of processing units are input components, output variables, and hidden units. The output unit recognises the outcomes of the computer's computations, whereas the input unit unit takes in signals plus facts from the outside world. The term "hidden unit" refers to a unit that is situated in between input and result units and that is invisible to observers apart from the computer weight matrix between neurons, which represent the degree of cell-to-cell connectivity. The connection relationship between network processing units includes information representation and processing [5]. The human brain has more than 100 billion neurons, whereas neural networks made up of computers rarely have the few hundred and maybe even a few thousands PEs. Artificial networks that are as complex as the nervous system are nevertheless beyond the human brain's ability for creativity. However, despite the complexity of the human brain's cognitive processes, many of them remain poorly understood [6]. Artificial Neural Networks concentrate solely on the information that contains the answers to the previously given queries. A thorough therapy cannot be provided due to the wide range of learning techniques that are available and the requisite space restrictions. Here, we'll concentrate mostly on developing learning processes for feedforward networks. Many of the ideas and problems that are raised in this framework, nevertheless, are also more generalizable to other collaborative classroom paradigms. As we go along, we comment on a few of them [7]. An ANN is a "black box" technique with enormous promise for predictive modelling, which means that all characters defining an unidentified event must be input to a trained ANN, which will subsequently identify the situation and produce a prediction. The study of ANNS has resulted in the creation of many neural network architectures that may be used to solve a variety of issues, including auto-associative memory, generalization, optimization, subsampling, control and prediction tasks in diverse contexts, structures, etc. [8]. A complete list of peer-reviewed papers is provided in artificial intelligence for various challenges, including credit risk assessment, financial analysis, and stock performance prediction, along with a breakdown of the articles by application area. The focus of research is mostly on corporate bonds, credit scoring, decision support, and financial crisis and bankruptcy. However, few studies have examined inflation, cost tracking, and sales analysis. In the chapter 7 bankruptcy prediction problem, for instance, suggested a fuzzy neural network model for sales forecasting as opposed to a traditional back browsing neural network using support

vector machines [10]. The empirical character of ON-based models explains how the neuron generates the necessary input (Jain and always they can provide practically accurate solutions al., 1996). Dendrites collect messages from other cells and send them to that same cell body for neurons and difficulties with accurate or carefully planned dendrites. for phenomena that can only be fully comprehended through experimental evidence and field research. ANNs have been applied to modelling, categorisation, pattern recognition, and multivariable data analysis in the field of microbiology. Model applications include of the following: I data from pyrolysis mass spectrometry, GC, and HPLC; (ii) analytical thinking of DNA, RNA, protein structure, and microfilms; and (iii) food goods. identification of microbes and chemicals, (iv) predictions of microbial growth, biomass, and shelf life, and (v) (see Application paragraph for references) [11]. ANNS have recently attracted a lot of interest, in large part because of their widespread applicability and potential for treating complicated issues. Input collected data and matching target values can be correlated in patterns that ANNS can identify and learn. After training, ANNS can be used to predict the outcomes of new, independent input data. ANNS can analyse issues facing highly linear and complicated data even when the input is inaccurate and noisy since it emulates the animal brain's learning process. Since environmental data are known to be extremely complex and frequently non-linear, they are consequently ideally suited for modelling [12]. The well-known multi-layer intake network is one of the most widely used architectures at the moment. The error backpropagation algorithm was used to train the network (Rummelhardt et al., 1986). According on the determined regression error in between observed and estimated results, this algorithm modifies the link weights. The technique of supervised learning seeks to reduce the difference between expected and desired results [13]. This paper's objectives are to provide an overview of the ON approach, as well as to assess the present state of the science, point out its drawbacks, and make future plans. This essay will specifically review the advancement of ANNS across time. After that, the typical ANN architectures and algorithms will be discussed. Additionally, SVMS will introduce a number of advanced ANN models and identify ANNs' limits. Together with the advancement of SVMS, the research and application of ANNs in the future will be highlighted. The implementations of ANNs will be examined through ideas, network structures, and training techniques, with an emphasis on agricultural as well as biological engineering [14]. A good illustration is a model that combines Artificial neural networks with integrated moving averages with a regressive component. An vector autoregression (AR)

functions that regresses on the previous values of something like the mechanism, a simple moving (MA) functions regressed on a completely dynamical system, and an integral I that distinguishes partial data series are all combined into a dynamically integrated moving averages (ARIMA) process. to attain stability via In such hybrids, while the dynamically integrated simple moving model handles nonlinearity, stationary nonlinear components are handled by the neural network model [15]. Artificial brain networks would have been extinct by 1982, when Hopfield published an article that kickstarted a resurgence in human brain research. Hopfield did this by introducing two crucial ideas that allowed him to get around every restriction outlined by Minsky and Papert: the maximum input started receiving by a neuron and thus the output it produces, and the orators in between possible consequence of feedback linking outputs to supplied. In past years, there's been a greater interest in using human brains as real concern machine learning rather than making them better as depictions of the central nervous of people. This landmark, the emergence of the close (BB) algorithm in 1986 has sparked an increasing fascination with a change in paradigm [16]. A single answer for attaining precise, reliable modelling. What is necessary to use a NN? How is NNS better than traditional techniques? What type of issue function properties should have been evaluated for the ON paradigm? What kind of implementation and architecture should be used while designing for an application? In order to evaluate the manner in which such technique fits into industry sectors, this publication will follow a process that combines these management questions and puts them into a framework. This process involves creating a classification framework through the clustering of concepts and the identification of distinctive characteristics [17]. Hardware neural networks are synthetic neural network (ANN) structures and associated expert systems that specifically use the parallelism that exists in neural processing (HNN). Streaming video compression, for example, requires highly adaptive real-time sorting but rather learning large datasets in a reasonable amount of time using power-efficient ON machinery with truly complementary processing abilities Despite the majority of existing Either an in commercial use being developed in development tools, there are some specific applications that demand this [18]. In an artificially neural network application, these data are referred to as "features". Symptoms, results from biochemical analyses, and/or other pertinent information might all be features that help with diagnosis. As a result, the ultimate diagnosis and professional experience are tightly associated. ANNs can learn from examples, which makes them incredibly adaptable and effective instruments for accelerating clinical

diagnosis. While some neural network forms are better suited to data modelling and function approximation, others are better suited to solving perceptual difficulties [19].

2. MATERIAL AND METHOD

Medical diagnosis: the process of identifying a disease, injury, or diagnosis based on its signs and symptoms. Investigations, imaging exams, and blood testing may be used to help with the diagnosis utilised together with a physical examination and health history. For instance, a pathologist will examine tissue to get a firm diagnosis of malignancy. Main diagnosis. a single diagnosis and management that most closely corresponds to the patient's main complaint or treatment need. Numerous patients have multiple diagnoses. Clinical Diagnosis Types Clinical diagnoses are made using test results, symptoms, and living indicators. Instead of using the patient's symptoms, a laboratory diagnosis is made based on laboratory test findings. The stages of the diagnostic process can be divided into three major groups: the initial diagnostic evaluation, which includes the prescribed drug, physical assessment, evaluation of their principal complaint and symptoms, development of an evaluation of patients, and ordering of diagnostic tests.

Artificial intelligence: The simulation of organic cognition Artificial intelligence is the ability possessed by technologies, particularly computer systems. Some examples of particular AI applications are speech recognition, natural language processing, and computational modelling. Artificial intelligence is the use of computers to carry out tasks that previously needed human intelligence (AI). AI can process large amounts of data in ways that humans cannot. AI is intended to resemble humans' ability to notice patterns, choose, and form conclusions.

Artificial neural networks: with the help of a neural network, a computer can learn to do data analysis in a manner inspired by the human brain. Deep learning is a type of learning algorithms that imitates the human brain by using interconnecting networks or networks in a layered framework. To recreate the in digital form human brain, neural networks that are artificial are being developed. Those networks will be utilised to build the subsequent generations of computers, and they are already being employed for complicated analytics in industries ranging from engineering to medical.

Cancer: Cancer is brought on by cells that divide improperly and spread to nearby tissues. Cancer is mostly brought on by genetic changes. The majority of DNA mutations that result

in cancer occur in regions of DNA gene is a segment. These modifications are also referred to as genetic changes. Smoke, excessive ultraviolet (UV) rays emitted by the sun or light therapy, being overweight or obese, & consuming too much alcohol are the key risk factors for malignancies that can be prevented. Depending on the type as well as stage of the illness, the sort of treatment the patient receives, and other considerations, it is possible to cure someone's cancer. The likelihood of curing various types of cancer varies. But each type of cancer needs to be treated differently. Cancer cannot be healed by only one technique.

Cardiovascular diseases: With 17.9 million deaths per year, chronic problems (CVDs) are still the leading cause of death worldwide. CVDs are illnesses of Coronary artery illness (CAD), pulmonary disease, and rheumatic cardiovascular disease are diseases that affect the blood arteries and the heart and certain other conditions. The most significant behavioural causes of cardiovascular disease and stroke include poor diet, inactivity, use of tobacco products, and alcohol abuse. Some with high levels of blood pressure, elevated blood glucose, elevated blood cholesterol, especially overweight and obesity can experience the impact of behavioural risk factors.

Diabetes: When the stomach does not create enough insulin or if the body is unable to utilise the insulin that is produced, diabetes develops. A hormone called insulin controls blood sugar levels. The specific cause of most kinds of diabetes remains uncertain. Sugar accumulates in the body in each circumstance. This is a result of the pancreas' insufficient insulin production. Both types of diabetes may be brought on by a combination of genetic and environmental factors. Yet, frequent diabetes symptoms that many diabetics have include increased urination, fatigue, and weight loss.

Method: SPSS Statistics is a statistical control Advanced Analytics, Multivariate Analytics, Business enterprise Intelligence and IBM a statistic created by a software program is a package crook research. A set of generated statistics is Crook Research is for a long time SPSS Inc. Produced by, it was acquired by IBM in 2009. Current versions (after 2015) icon Named: IBM SPSS Statistics. The name of the software program is to start with social Became the Statistical Package for Science (SPSS) [3] Reflects the real marketplace, then information SPSS is converted into product and service solutions Widely used for statistical evaluation within the social sciences is an application used. pasted into a syntax statement. Programs are interactive Directed or unsupervised production Through the workflow facility. SPSS Statistics is an internal log Organization, types of information, information processing and on

applicable documents imposes regulations, these jointly programming make it easier. SPSS datasets are two-dimensional Have a tabular structure, in which Queues usually form Events (with individuals or families) and Columns (age, gender or family income with) to form measurements. of records Only categories are described: Miscellaneous and Text content (or "string"). All statistics Processing is also sequential through the statement (dataset) going on Files are one-to-one and one-to-one Many can be matched, although many are not in addition to those case-variables form and by processing, there may be a separate matrix session, there you have matrix and linear algebra on matrices using functions Information may be processed.

3. RESULT AND DISCUSSION

TABLE 1. Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Medical diagnosis	25	4	1	5	2.88	1.236
Artificial intelligence	25	4	1	5	3.08	1.525
Artificial neural networks	25	4	1	5	2.72	1.458
Cancer	25	4	1	5	3.00	1.528
Cardiovascular diseases	25	4	1	5	3.04	1.428
Diabetes	25	4	1	5	2.84	1.491
Valid N (listwise)	25					

Table 1 shows the descriptive statistics values for analysis N, range, minimum, maximum, mean, standard deviation medical diagnosis; artificial intelligence; artificial neural networks; cancer; cardiovascular Diseases and diabetes this also using.

TABLE 2. Frequencies Statistics

		Medical diagnosis	Artificial intelligence	Artificial neural networks	Cancer	Cardiovascular diseases	Diabetes
N	Valid	25	25	25	25	25	25
	Missing	0	0	0	0	0	0
Mean		2.88	3.08	2.72	3.00	3.04	2.84
Median		3.00	3.00	3.00	3.00	3.00	3.00
Mode		3	5	1	5	3	1[a]
Std. Deviation		1.236	1.525	1.458	1.528	1.428	1.491
Sum		72	77	68	75	76	71
Percentiles	25	2.00	2.00	1.00	2.00	2.00	1.00
	50	3.00	3.00	3.00	3.00	3.00	3.00
	75	3.50	5.00	4.00	5.00	5.00	4.00
a. Multiple modes exist. The smallest value is shown							

Table 2 Show the Frequency Statistics in Ammonia Manufacturing Plant medical diagnosis; artificial intelligence; artificial neural networks; cancer; cardiovascular Diseases and diabetes curve values are given.

TABLE 3. Reliability Statistics

Cronbach's Alpha Based on Standardized Items	N of Items
.861	6

Table 3 shows the Cronbach's Alpha Reliability result. The overall Cronbach's Alpha value for the model is. 865 which indicates 86% reliability. From the literature review, the above 50% Cronbach's Alpha value model can be considered for analysis.

TABLE 4. Reliability Statistic individual

	Cronbach's Alpha if Item Deleted
Medical diagnosis	.881
Artificial intelligence	.840
Artificial neural networks	.817
Cancer	.822
Cardiovascular diseases	.831
Diabetes	.851

Table 4 Shows the Reliability Statistic individual parameter Cronbach's Alpha Reliability results. The Cronbach's Alpha value for Medical diagnosis - .881, Artificial intelligence - .840, Artificial neural networks -.817, Cancer - .822, Cardiovascular diseases - .831, Diabetes -.851 This indicates all the parameter can be considered for analysis.
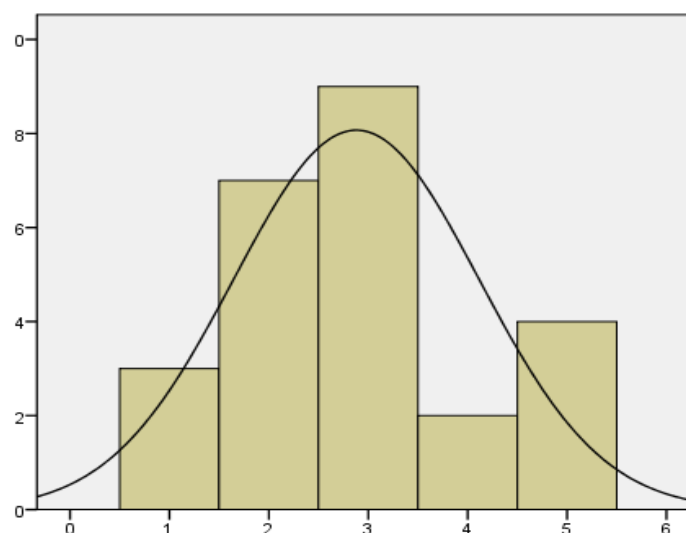
FIGURE 1. Medical diagnosis

Figure 1 shows the histogram plot for Medical diagnosis from the figure it is clearly seen that the data are slightly Right skewed due to more respondent chosen 3 for Medical diagnosis

except the 2 value all other values are under the normal curve shows model is significantly following normal distribution.
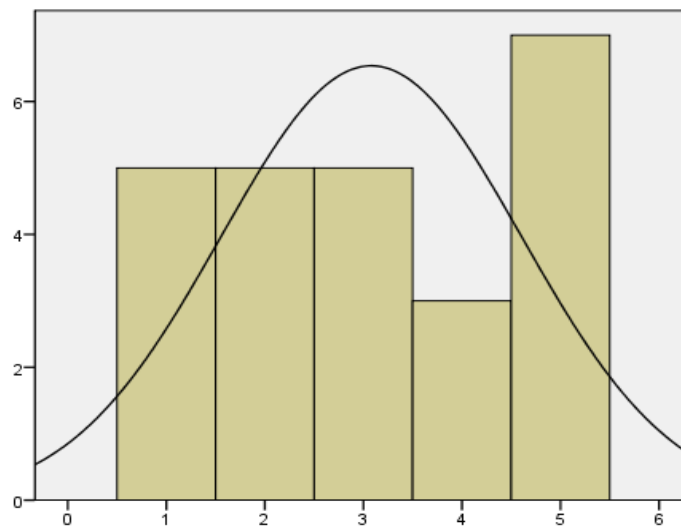

FIGURE 2. Artificial intelligence

Figure 2 shows the histogram plot for Artificial intelligence from the figure it is clearly seen that the data are slightly Right skewed due to more respondent chosen 5 for Artificial intelligence except the 2 value all other values are under the normal curve shows model is significantly following normal distribution.
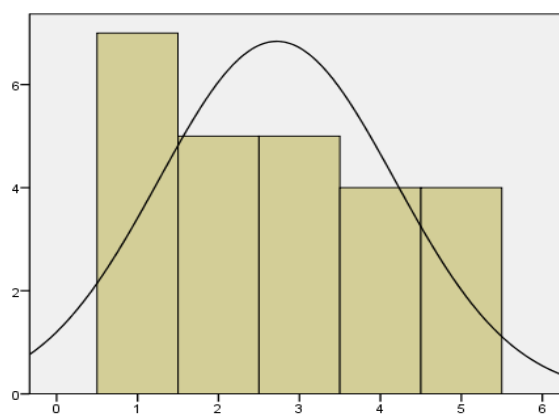

FIGURE 3. Artificial neural networks

Figure 3 shows the histogram plot for Artificial neural networks from the figure it is clearly seen that the data are slightly Left skewed due to more respondent chosen 1 for Artificial

neural networks except the 3 value all other values are under the normal curve shows model is significantly following normal distribution.
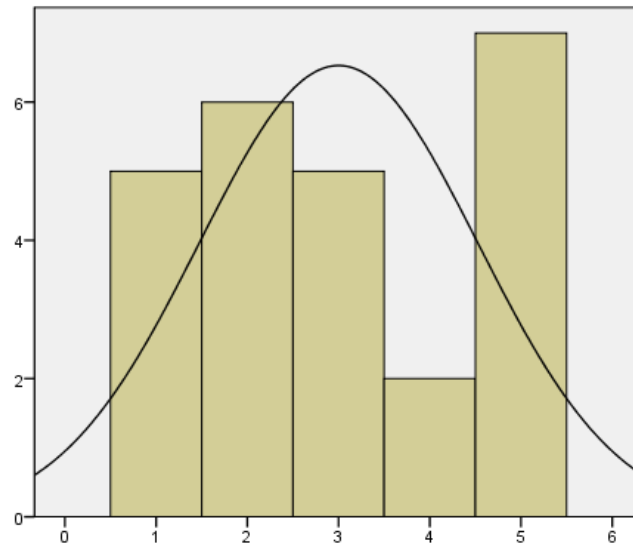

FIGURE 4. Cancer

Figure 4 shows the histogram plot for Cancer use from the figure it is clearly seen that the data are slightly Right skewed due to more respondent chosen 5 for Cancer except the 4 value all other values are under the normal curve shows model is significantly following normal distribution.
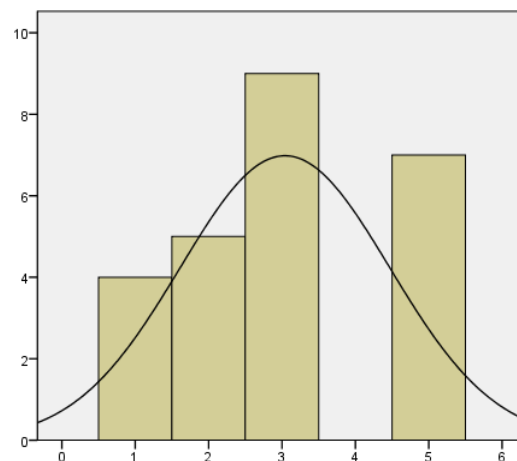

FIGURE 5. Cardiovascular Diseases

Figure 5 shows the histogram plot for Cardiovascular Diseases from the figure it is clearly seen that the data are slightly Right skewed due to more respondent chosen 3 for

Cardiovascular Diseases except the 3 value all other values are under the normal curve shows model is significantly following normal distribution.
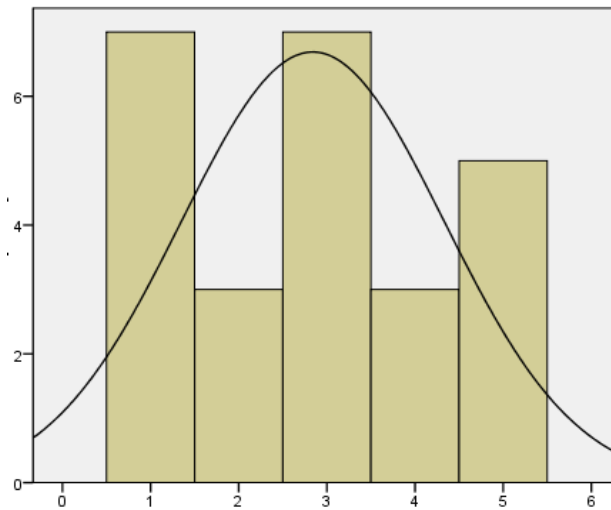

FIGURE 6. diabetes

Figure 6 shows the histogram plot for diabetes from the figure it is clearly seen that the data are slightly Right skewed due to more respondent chosen 1,3 for diabetes except the 2 value all other values are under the normal curve shows model is significantly following normal distribution.

TABLE 5. Correlations

	Coal combustion	Ammonia and fertilizer	factories	Fertilizer use	Sewage	Human sweat
Medical diagnosis	1	.271	.351	.353	.263	.419*
Artificial intelligence	.271	1	.629**	.662**	.553**	.464*
Artificial neural networks	.351	.629**	1	.729**	.726**	.553**
Cancer	.353	.662**	.729**	1	.688**	.457*
Cardiovascular diseases	.263	.553**	.726**	.688**	1	.512**
Diabetes	.419*	.464*	.553**	.457*	.512**	1

Table 5 shows the correlation between motivation parameters for Medical Diagnosis for Diabetes is having highest correlation with Cardiovascular diseases and having lowest correlation. Next correlation between motivation parameters for Artificial Intelligence for Cancer is having highest correlation with Medical diagnosis and having lowest correlation. Next correlation between motivation parameters for Artificial Neural Networks for Cancer is having highest correlation with Medical diagnosis and having lowest correlation. Next correlation between motivation parameters for Cancer for Artificial neural networks is having highest correlation with Medical diagnosis and having lowest correlation. Next correlation between motivation parameters for Cardiovascular Diseases for Artificial neural networks is having highest correlation with Medical diagnosis and having lowest correlation. Next correlation between motivation parameters for Diabetes for Cardiovascular diseases is having highest correlation with Medical diagnosis and having lowest correlation.

4. CONCLUSION

A neural network, a type of artificial intelligence approach, directs computer to analyse information using algorithms structured after the human brain. Deep learning is a particular kind of learning algorithms that imitates the human brain by using coupled synapses or nodes in a multilayer framework. A computer can learn new information and make judgements in a manner By employing artificially generated neural networks, which aim to mimic the network of interconnected neurons that make up the human brain, one can create brains that are comparable to those of humans. ANNs are created by programming regular computers to function like networked brain cells. A computer system known as an artificially created neural network (ANN) typically integrated in layers. These layers contain complex reticulated elements called neurons. Neurons are grouped together in a specific pattern inspired by the brain's biological nervous system. ANN is not designed for a specific task, but can be used to solve more complex and complex problems with the help of detection from observational data. Medical practitioners today have access to a wide range of information, from specifics on clinical symptoms to the results of numerous forms of biological data and image processing devices. A prospective set of data of 1320 photographs from a clinical routine was used to test an artificial neural network and compare it to two different classification techniques. Areas underneath the receiver operation characteristic curves, which evaluate how well the machine learning neural network performed in various cardiac regions and during ischemia, fell the

process of identifying a disease, injury, or diagnosis based on its signs and symptoms. Investigations, imaging exams, and blood testing may be used to help with the diagnosis utilised together with a physical examination and health history. For instance, a pathologist will examine tissue to get a firm diagnosis of malignancy. Main diagnosis. a single diagnosis and management that most closely corresponds to the patient's main complaint or treatment need. Numerous patients have multiple diagnoses. The simulation of organic cognition Artificial intelligence is the ability possessed by technologies, particularly computer systems. Some examples of particular AI applications are speech recognition, natural language processing, and computational modelling. Ratio studies are statistical analyses of data from appraisals and property valuations. Nearly all states utilize them to produce quantitative measure of the proportion of current market price about which individually estimated taxable property is appraised as well as to offer assessment performance indicators. medical diagnosis; artificial intelligence; artificial neural networks; cancer; cardiovascular Diseases and diabetes. The overall Cronbach's Alpha value for the model is .658 which indicates 66% reliability. From the literature review, the above 50% Cronbach's Alpha value model can be considered for analysis.

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