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Artificial Intelligence for disease prediction and monitoring using association Rule Mining for major disease like Corona-Virus in India.

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ABSTRACT:

The health-care sector has long been an early adopter of and benefited gr- patient data and records and thus the treatment of diseases.Typically, AI involves a system that consists of both software and hardware. From a software perspective, AI is particularly concerned with algorithms. An artificial neural network (ANN) is a conceptual framework for executing AI algorithms . It is a mimic of the human brain—an interconnected network of neurons, in which there are weighted communication channels between neurons . One neuron can react to multiple stimuli from neighboring neurons and the whole network can change its state according to different inputs from the environment . As a result, the neural network (NN) can generate outputs as its responses to environmental stimuli—just as the human brain reacts to different environmental changes. NNs are typically layered structures of various configurations. Researchers have devised NNs that can do supervised learning, where the task is to infer a function that maps an input to an output based on example pairs of inputs and outputs; unsupervised learning, where the task is to learn from test data that has not been labeled, classified, or categorized, in order to identify common features in the data and, rather than responding to system feedback, to react based on the existence or inexistence of identified common features in new data; and reinforced learning, where the task is to act within the given surroundings in order to maximize rewards and minimize penalties, both according to some form of accumulative nature . With theadvancement of computation power, NNs have become "deeper," meaning that more layers of neurons are involved in the network to mimic a human brain and carry out learning. In addition, more functions can be incorporated into the NN, such as merging feature extraction and classification functions into a single deep network—hence the technical term "deep learning".

From a hardware perspective, AI is mainly concerned with the implementation of NN algorithms on a physical computation platform. The most straightforward approach is to implement NN algorithm on a general- purpose central processing unit (CPU), in a multithread or multicore configuration. Furthermore, graphical processing units (GPUs), which are good at convolutional computations, have been found to be advantageous over CPUs for large-scale NNs . CPU and GPU co-processing has turned out to be more efficient than CPU alone, especially for spiking NNs . Moreover, some programmable or customizable accelerator hardware platforms, such as field- programmable gate arrays (FPGAs) and application-specific integrated circuits (ASICs), can implement NNs toward a customized application in a more efficient way, in terms of computation capability, power efficiency, and form factor . Compared with GPU and CPU, these platforms can be customized for a

specific application and thus can be more power efficient and compact than GPU and CPU platforms. To deploy AIin edge devices, such as mobile phones in wireless networks or sensor nodes in the Internet of Things (IoT), further improvements in power efficiency and form factor are needed. Researchers have tried to implement AI algorithms using analog integrated circuits, introspection and memristors . Some of these new platforms, such as memristor crossbar circuits, can merge computation with memory and thus avoid the problem of access to the "memory wall" of traditional von Neumann architectures. This access is mandatory in order to update needed parameters. Recently, researchers have tried to improve the efficiency of AI implementation by reducing the number of bits used for data representation. It turns out that the computation accuracy can be maintained when the data representation goes from 32 or 16 bits down to 8 bits. The advantage is faster computation, less power, and smaller form factor. However, the "memory wall" limits remain. On the other hand, the adoption of appropriate training methods (e.g., deep training instead of surface-level training or using pre-training techniques and the use of balanced data-sets, sufficient amounts of data and constant availability of data-sets are important factors to consider in order to achieve satisfactory performance ofANNs.

Keywords: Artificial intelligence, Machine learning, Deep learning, Neural network, Biomedical research Health care applications, Epileptic seizure.

Introduction:-Disease prediction has long been thought to be a critical topic. AI and machine early from technological advances. These days, machine learning (a subset of artificial intelligence) plays a key role in many health-related realms, including the event of latest medical procedures, the handling of learning techniques have already be en developed to resolve this kind of treatment problem. additionally, we use various evaluation criteria to appear at the performance of those classifiers with real-life data-sets. Finally, we also use statistical testing to gauge the importance of the difference in performance among the three classifiers. The statistical testing results indicate that an ensemble classifier performs better than a non-public classifier within an ensemble. However, the solo classifier doesn't perform worse than the ensemble classifier built with the identical size training data set. The ascension within the world of information analysis plays a major role within the health care research. thanks to batch of information growth in biomedical and health-care field providing accurate analysis of medical data that has benefits from early detection, patient care, and community services. Previous system designed to investigate, manage and assimilate data produced by health-care systems. Data analysis has been applied to assist the disease-related information and treatment process. during this paper a choice tree is effectively used for predicting the outbreaks of diseases in society. The paper proposes to experiment with the modified predictive models with medical data which is expounded to the symptoms of the disease.

1) KENSCI

Location: Seattle, Washington How it's using machine learning in health- care: Ken Sci uses machine learning to predict illness and treatment to assist physicians and payers intervene earlier, predict population health risk by identifying patterns and surfacing high risk markers and model disease progression and more.

2) CIOXHEALTH

Location: Alpharetta, Georgia

How it's using machine learning in health- care: Ciox Health uses machine learning to bolster. health information management and exchange of health information," with the goal of modernizing work flows, facilitating access to clinical data and improving the accuracy and flow of health information.

3) PATHAI

Location: Cambridge, Massachusetts

How it's using machine learning in health- care: Path AI's technology employs machine learning to assist pathologists make quicker and more accurate diagnoses yet as identify patients which can show pride in new sorts of treatments or therapies.

4) QUANTITATIVEINSIGHTS

Location: Chicago, Illinois

How it's using machine learning in health- care: Quantitative Insights want to strengthen the speed and accuracy of carcinoma diagnosis with its computer assisted breast MRI workstation Quantx. The goal: better results for patients via improved diagnoses by radiologists.

5) MICROSOFT

Location: Redmond, Washington

How it's using machine learning in health- care: Microsoft's Project Inner Eye employs machine learning to differentiate between tumors and healthy anatomy using 3D radio- logical images that assist doctors in radiotherapy and surgical planning, among other things.

6) PFIZER

Location: manhattan, New York

How it's using machine learning in healthcare: With the assistance of IBM's Watson AI technology, Pfizer uses machine learning for immuno-oncology research about how the body's system can fightcancer.

7) BETABIONICS

Location: Boston, Massachusetts

How it's using machine learning in healthcare: Beta Bionics is developing a wear able "bionic" pancreas it calls the iLet, which manages glucose levels round the record those with Type 1 diabetes."

Industry impact: the corporate was recently awarded an SBOR grant valued at up to $2 million by the NIH-affiliated National Institute of Diabetes and Digestive and Kidney Diseases(NIDDK).

8) PROGNOS

Location: island, New York

How it's using machine learning in health- care: the corporate claims its Prognos Registry contains 19 billion records for 185 million patients. With an assist from machine learning, Prognos's AI platform facilitates early disease detection, pinpoints therapy requirements, highlights opportunities for clinical trials, notes gaps in care and other factors for type ofconditions.

Industry impact: Last year Prognos reportedly raised $20.5 million in an exceedingly Series C funding round. The backing came frominsurance companies, drug manufacturers and venture capitalists.

9) BERG

Location: Framingham, Massachusetts

How it's using machine learning in healthcare: Powered by AI, Berg's Interrogative Biology platform employs machine learning for disease mapping and coverings in oncology,neurology

Noteworthy Contributions:-SELVAS AI, an artificial intelligence (AI) company, has unveiled the world's first AI disease prediction service at CES (Consumer Electronics Show) in 2018 in Las Vegas, Nevada,

SELVAS AI is exhibiting "SelvyCheckup," its AI disease prediction service, through an experience zone where visitors can try the service forthemselves.

"SelvyCheckup" is a deep learning based medical service that predicts the probabilities of incidence within four years for six most common cancers including lung and liver cancers and major adult diseases including cardio-cerebrovascular disease and diabetes. It is provided as part of health checkup.

The service has attracted attention from medical, health-care and wellness industries for the originality of its technology which does not simply diagnose diseases but forecasts the probabilities of disease outbreaks by using artificial intelligence techniques. The innovativeness and originality of "Selvy Checkup" were recognized in November 2017 when it was named winner of the "CES 2018 Innovations Awards" for the first time for an AIcompany.

"Selvy Checkup is an unrivaled AI health- care service that enables users to manage their health proactively. As interest in healthy life is rising, we are convinced we will take market leadership with Selvy Checkup," SELVAS AI CEO James Kimsaid.

SELVAS AI is an artificial intelligence company that conducts AI-related businesses in diverse fields including medical care, finance, automobiles, and assistive technology on the basis of machine learning techniques. It possesses core AI technologies such as voice, handwriting and image intelligences, and AI convergence technology, which combines those core technologies. All the technologies of SELVAS AI are based on machine learning platform.

Proposed methodology of various different diseases:-In this disease prediction using machine learning program we take several basic inputs like name of the patient. Also five symptoms can be taken as an input. Forgetting accurate results we use three algorithms. First one is the decision tree learning algorithm. decision tree algorithm is one of the predictive modelling approaches used in statistics data mining and machine learning it uses a decision tree to go from observations about an item to conclusions about the items target value. decision tree algorithm falls under the category of supervised learning that can be used to solve both regression and classification problems. decision tree uses the tree representation to solve the problem in which each leaf node corresponds to a class label and attributes arerepresented on the internal node of the tree. we can represent any Boolean function on discrete attributes using decision tree. The Other algorithm used is random forest algorithm. Random forest or random decision forest is simple learning method for classification regression and other tasks that operate by constructing a multitude of decision trees at training time and output in the class that is the mode of the classes or Main prediction of the individual trees. The Other algorithm used is Naive Bayes classifier algorithm. in machine learning this classifier is a family of simple probabilistic classified based on applying this theorem with strong Independence assumption between the features. This classifier a collection of classification algorithm based on Baye's Theorem. it is not a single algorithm but a family of algorithms where all of them

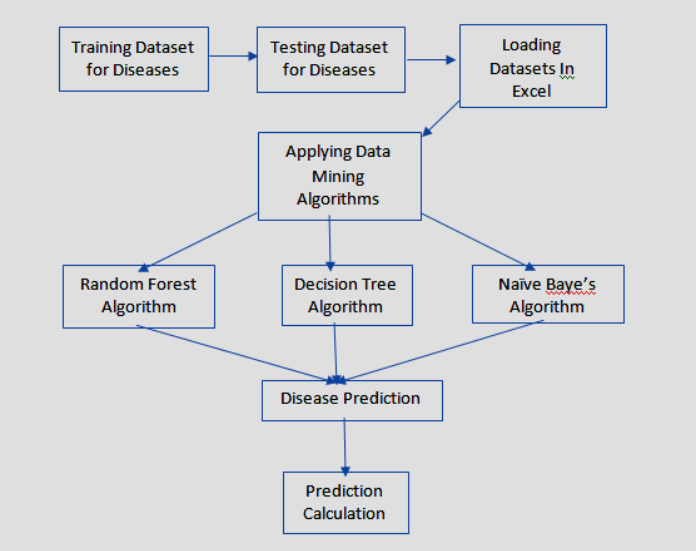
share a common principle that is every pair of features been classified as independent of each other. By using all the three algorithms we get three different predictions which might be the same and which increases the accuracy of our prediction whether the disease predicted is correct ornot.

Proposed methodology of Corona-virus Prediction:-In corona-virus Prediction Program. We take several inputs which includes the name of the patient and following with five symptoms, which the user can give as an input to the program for getting the results. We click on the result button and it gives us a probability that according to the symptoms. What is the percentage that the person is infected with corona-virus or not?

Also, the program automatically detects the location of the patient by using its IP address and according to the location of the patient that it is in Red Zone, orange Zone or green zone. This factor is also considered while giving the probability of corona-virus infection. What the program suggest is if the probability is greater than 40 percent. It is better to consult a doctor nearest to you. If the probability is greater than 40% in the patient's report a helpline number will be mentioned so that the patient can contact the helpline number and associated with the doctors about the current symptoms. The patient is facing. Also, this program gives us an option to gather live reports of India's various major cities example Mumbai Jaipur jodhpur Delhi Etc. This program gives us the exact information about the patient'sinfected. Cured and the death rates in Indianstates.

Expected outcome:-When we uses program began option to give one or at the max 5 symptoms to the program as an Input and all based on the algorithms which we use include in decision tree algorithm random forest algorithm and other algorithm when we use this program we get an option to give five sentence to this program and the Three algorithms used in program including decision tree algorithm random forest algorithm and Naive Baye's algorithm gives us 3 predictions which might be the same. when the predictions are same it increases the accuracy of our results. when out of the three predictions all three are same height increases the accuracy of our results to up to 100%(According to the program). when out of the three predictions two predictions are same the accuracy level according to the mathematics is 66% according to the program.

Block Diagram:-



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