

# Artificial Intelligent - Based diabetes prediction system

## Abstract:

Diabetes is one of the most deadly and chronic diseases which cause an increase in blood sugar. If diabetes remains untreated and unidentified many difficulties may arise due to that. The tedious work is in identifying the process which results in visiting the clinic and consulting the doctor. But this tedious work has been solved with the rise in the approaches used by machine learning. Over recent years a plenty of growth has been seen doing over health informatics by focusing on the technology of the presentation, generation and application of clinical information in health care. With the motive of improving outcomes of health for patients and creating efficiency in health professions a Healthcare Informatics or eHealth solutions, has empowered the accessibility of clinical data through computer networks or cloud computing. Its accessibility and understanding have become easier with language technologies. This paper gives a comprehensive prospect of work accomplished to

develop a model that can predict the possibility of diabetes in patients with extreme accuracy. Therefore, various machine learning classification algorithms are used for detecting diabetes. In this paper, the author has studied various machine learning classification algorithms, namely genetic algorithm, decision tree, random forest, Logistic regression, SVM and Naive Bayes. Experiments are carried out on Pima Indians Diabetes Database (PIDD) which is track down from the UCI machine learning repository. Further author has done the comparison among various performances of all the different algorithms. The performances are categories of various measures like Precision, Accuracy, F-Measure and Recall. The paper helps in identifying the algorithm to classify the risk of diabetes. Different techniques were applied to the algorithms for improving the robustness. Additionally, the findings suggest that the best performance of disease risk classification is done with the help of a genetic algorithm.

**Keywords** Random forest · Diabetes prediction · Artificial neural networks · Support vector machine naive bayes · PIDD

## Introduction

Taking care of health or efforts for the betterment of health by way of treatment, diagnosis, salvage from the disease, sickness, injury and other physical and mental deficiencies in people comes under health care. Health specialists provide health care services in different health fields. Doctors, surgeons and their respective associates all are the part of Health experts. Health care includes physical therapy, nursing, pharmacy, Dentistry, athletic training, optometry, etc. All the works come under primary care, tertiary care and secondary care are the part of health care. A well-organized health care plays an important role in the development and progress in a country's economy. Health care proves an important element to maintain the mental and physical health of the people all around the world. In 1980, WHO declares smallpox as the first disease in history which is completely eliminated by deliberate health care was a clear example of efficient health care.

In 2014, 422 million adults all over the world suffering from diabetes mellitus disease. DM enacts a great financial problem on worldwide medical assistance service also the widespread financial situation. The worldwide rate is expected almost 825 billion US dollars in one year, and this cost is arisen because of DM difficulties [2]. For the betterment of the healthiness of the diabetic patient, ailment controlling and taking measures to avoid DM allied problems it is very important and need a deep study about DM. Management of the Glycohemoglobin on the average level is very important for diabetic patient. Glycohemoglobin normal range is less than 7%. For a Diabetic patient to manage this level is difficult and electronic. Digitization [1] and medical assistance had a great effect on all aspects of diabetes. With the help medical facilities information received from the internet and social media and all other allied services related to 'Health' totally transform the scenario of diabetes