PHASE-01

AI-BASED DIABETES PREDICTION SYSTEM

INTRODUCTION :

AI-based diabetes prediction systems use machine learning (ML) and deep learning to make advanced inferences based on a large amount of data. Several AI-/ML-based medical devices and prediction models regarding diabetes have already been approved by the US Food and Drug Administration.

Artificial intelligence (AI) can make advanced inferences based on a large amount of data. The mainstream technologies of the AI boom in 2021 are machine learning (ML) and deep learning, which have made significant progress due to the increase in computational resources accompanied by the dramatic improvement in computer performance. In this review, we introduce AI/ML-based medical devices and prediction models regarding diabetes.

PROBLEM DEFINITION:

The problem is to build an AI-powered diabetes prediction system that uses machine learning algorithms to analyze medical data and predict the likelihood of an individual developing diabetes. The system aims to provide early risk assessment and personalized preventive measures, allowing individuals to take proactive actions to manage their health.

PROJECT SCOPE:

The scope of an AI-based diabetes prediction system is to accurately predict diabetic illness from patient data using machine learning algorithms. The system should be able to identify diabetes risk factors and evaluate different machine learning algorithms for diabetes.

OBJECTIVE:

In this project, our objective is to predict whether the patient has diabetes or not based on various features like Glucose level, Insulin, Age, BMI. We will pe

rform all the steps from Data gathering to Model deployment.

DESIGN THINKING:

Data Collection: We need a dataset containing medical features such as glucose levels, blood pressure, BMI, etc., along with information about whether the individual has diabetes or not.

Data Preprocessing: The medical data needs to be cleaned, normalized, and prepared for training machine learning models.

Feature Selection: We will select relevant features that can impact diabetes risk prediction.

Model Selection: We can experiment with various machine learning algorithms like Logistic Regression, Random Forest, and Gradient Boosting.

Evaluation: We will evaluate the model's performance using metrics like accuracy, precision, recall, F1-score, and ROC-AUC.

Iterative Improvement: We will fine-tune the model parameters and explore techniques like feature engineering to enhance prediction accuracy.

IMPLEMENTATION:

Here are some steps that can be followed for implementing an AI-based diabetes prediction system:

* Collect data from various sources.
* Preprocess the data by cleaning, filtering, normalizing, and transforming it.
* Split the data into training, validation, and testing sets.
* Select appropriate features from the data.
* Train different machine learning models on the training set.
* Evaluate the performance of each model on the validation set.
* Select the best-performing model based on evaluation metrics.
* Test the selected model on the testing set.
* Deploy the model in a production environment.

CONCLUSION:

AI aims to make accurate and advanced predictions for a large amount of knowledge data. With patient records, we are able to accurately predict whether or not the patients in the dataset have diabetes with help of Artificial Intelligence.