Ai based diabetes prediction system

Name:T.Dhanush

Project Name:Ai based diabetes prediction system

Reg no:723921104013

College Name:Arjun college of technology

## **Abstract**

Diabetes Mellitus (DM) is a condition induced by unregulated diabetes that may lead to multi-organ failure in patients. Thanks to advances in machine learning and artificial intelligence, which enables the early detection and diagnosis of DM through an automated process which is more advantageous than a manual diagnosis. Currently, many articles are published on automatic DM detection, diagnosis, and self-management via machine learning and artificial intelligence techniques. This review delivers an analysis of the detection, diagnosis, and self-management techniques of DM from six different facets viz., datasets of DM, pre-processing methods, feature extraction methods, machine learning-based identification, classification, and diagnosis of DM, artificial intelligence-based intelligent DM assistant and performance measures. It also discusses the conclusions of the previous study and the importance of the results of the study. Also, three current research issues in the field of DM detection and diagnosis and self-management and personalization are listed. After a thorough screening procedure, 107 main publications from the Scopus and PubMed repositories are chosen for this study. This review provides a detailed overview of DM detection and self-management techniques which may prove valuable to the community of scientists employed in the area of automatic DM detection and self-management.

A system is used to predict whether a patient has diabetes based on some of its health-related details such as BMI (Body Mass Index), blood pressure, Insulin, etc. This system is only for females as the dataset used to make this system exclusively belongs to the females

correctly assigned a higher risk for type 2 diabetes 84% of the time, based solely on the frontal X-ray.

Development:

The development of AI-based diabetes prediction systems involves the integration of machine learning algorithms with medical data to identify patterns and predict the likelihood of diabetes in individuals. Here's a simplified overview of the process:

Data Collection: Large datasets of medical records, including information about patients' demographics, lifestyle, genetic factors, and clinical measurements (e.g., blood glucose levels, BMI) are gathered.

Data Preprocessing: This step involves cleaning and preparing the data for analysis. It may include tasks like handling missing values, normalizing or scaling features, and encoding categorical variables.

Feature Selection/Extraction: Relevant features that contribute to diabetes prediction are identified. This step helps reduce noise and improve the model's accuracy.

Model Selection: Different machine learning models (e.g., logistic regression, decision trees, support vector machines, neural networks) are considered. Deep learning models, particularly recurrent neural networks (RNNs) and convolutional neural networks (CNNs), have shown promise in healthcare predictions.

Training the Model: The chosen model is trained using a portion of the dataset. During training, the model learns to recognize patterns and relationships between features and diabetes occurrence.

Validation and Testing: The model's performance is evaluated using a separate portion of the dataset that it has never seen before. This helps assess its ability to generalize to new data.

Evaluation and Fine-tuning: Metrics like accuracy, sensitivity, specificity, and area under the ROC curve (AUC-ROC) are used to evaluate the model's performance. If necessary, the model is fine-tuned or retrained with additional data.

Deployment: Once the model performs satisfactorily, it can be integrated into a user-friendly interface, such as a web application or a mobile app, where it can take input data and provide predictions.

Continuous Monitoring and Improvement: The model should be periodically updated with new data to adapt to changing trends or patient demographics.

It's worth noting that the effectiveness of an AI-based diabetes prediction system depends heavily on the quality and diversity of the data it's trained on. Additionally, privacy and ethical considerations are crucial when dealing with sensitive health information.

Keep in mind that the specifics may vary depending on the exact methodology and technology used by the developers. If you're interested in a specific project or have a particular aspect in mind, feel free to ask for more details!

THANK YOU!