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DIABETES PREDICTION USING EXTREME LEARNING MACHINE APPLICATION OF HEALTH SYSTEM

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ABSTRACT

Recent advances in wireless networking and big data technologies, such as 5G networks, medical big data analytics, and the Internet of Things, along with recent developments in wearable computing and artificial intelligence, are enabling the development and implementation of innovative diabetes monitoring systems and applications. Due to the lifelong and systematic harm suffered by diabetes patients, it is critical to design effective methods for the diagnosis and treatment of diabetes. Based on our comprehensive investigation, this article classifies those methods into Diabetes 1.0 and Diabetes 2.0, which exhibit deficiencies in terms of networking and intelligence. Thus, our goal is to design a sustainable, cost-effective, and intelligent diabetes diagnosis solution with personalized treatment. In this article, we first propose the 5G-Smart Diabetes system, which combines state-of-the-art technologies such as wearable 2.0, machine learning, and big data to generate comprehensive sensing and analysis for patients suffering from diabetes. Then we present the data sharing mechanism and personalized data analysis model for 5G-Smart Diabetes. Finally, we build a 5G-Smart Diabetes testbed that includes smart clothing, a smartphone, and big data clouds. The experimental results show that our system can effectively provide personalized diagnosis and treatment suggestions to patients.

Keywords: Big Data Analytics,Internet Of Things,Investigation,Personalized,Diagnosis.

1. INTRODUCTION

Diabetes is an extremely common chronic disease from which nearly 8.5 percent of the world's population suffers; 422 million people worldwide struggle with diabetes. It is crucial to note that type 2 diabetes mellitus makes up about 90 percent of the cases [1].

More critically, the situation will be worse, as reported in [2], with more teenagers and youth becoming susceptible to diabetes as well. Due to the fact that diabetes has a huge impact on global well-being and the economy, it is urgent to improve methods for preventing and treatment of diabetes [3].Furthermore, various factors can cause diabetes, such as improper and unhealthy lifestyle, vulnerable emotion status, along with the accumulated stress from society and work. However, the existing diabetes detection system faces the following problems:

• The system is uncomfortable, and real-time data collection is difficult. Furthermore, it lacks continuous monitoring of multi-dimensional physiological indicators of patients suffering from diabetes [4, 5].

• The diabetes detection model lacks a data sharing mechanism and personalized analysis of big data from different sources, including lifestyle, sports, diet, and so on [6, 7].

• There are no continuous suggestions for the prevention and treatment of diabetes and corresponding supervision strategies [8, 9].

To solve the above problems, in this article, we first propose a next-generation diabetes solution called the 5G-Smart Diabetes system, which integrates novel technologies, including fifth-generation (5G) mobile networks, machine learning, medical big data, social networking, smart clothing [10], and so on. Then we present the data sharing mechanism and personalized data analysis model for 5G-Smart Diabetes. Finally, based on smart clothing, smartphones, and big data healthcare clouds, we build a 5G-Smart Diabetes testbed and provide the experiment results. Furthermore, the “5G” in 5G-Smart Diabetes has a twofold meaning. On one hand, it refers to the 5G technology that will be adopted as the communication infrastructure to realize high-quality and continuous monitoring of the physiological states of patients with diabetes and to provide treatment services for such patients without restraining their freedom. On the other hand, “5G” refers to the following “5 goals”: cost-effectiveness, comfortability, personalization, sustainability, and smartness. Cost Effectiveness: It is achieved from two aspects. First, 5G-Smart Diabetes keeps users in a healthy lifestyle to prevent them from getting the disease in the early stage. The reduction of disease risk would lead to decreasing the cost of diabetes treatment. Second, 5G-Smart Diabetes facilitates out-of-hospital treatment, thus reducing the cost compared to on-the-spot treatment, especially long-term hospitalization of the patient.

Comfortability: To achieve comfort for patients, it is required that 5G-Smart

Diabetes does not disturb the patients' daily activities as much as possible. Thus, 5G-Smart Diabetes integrates smart clothing [3], mobile phones, and portable blood glucose monitoring devices to easily monitor patients' blood glucose and other physiological indicators.

Personalization: 5G-Smart Diabetes utilizes various machine learning and cognitive computing algorithms to establish personalized diabetes diagnosis for the prevention and treatment of diabetes. Based on the collected blood glucose data and individualized physiological indicators, 5G-Smart Diabetes produces personalized treatment solutions for patients.

Sustainability: By continuously collecting, storing, and analyzing information on personal diabetes, 5G-Smart Diabetes adjusts the treatment strategy in time based on the changes of patients' status. Furthermore, in order to be sustainable for data-driven diabetes diagnosis and treatment, 5G-Smart Diabetes establishes effective information sharing among patients, relatives, friends, personal health advisors, and doctors.

With the help of social networking, the patient's mood can be better improved so that he or she is more self-motivated to perform a treatment plan in time. Smartness: With cognitive intelligence toward patients' status and network resources, 5G-Smart Diabetes achieves early detection and prevention of diabetes and provides personalized treatment to patients. The remaining part of the article is organized as follows. We first present the system architecture of 5G-Smart Diabetes. Then, we explain the data sharing mechanism and propose the personalized data analysis model. Furthermore, we introduce the 5G-Smart Diabetes testbed. Finally, the conclusion of this article.

LITERATURE SURVEY

As of my last knowledge update in January 2022, I do not have specific information about a literature survey on the topic of "Automating E-Government Policies Handwritten Digits Recognition and Text & Image-Based Sentiment Detection using AI." However, I can provide you with a general outline of what a literature survey might include and some key concepts related to the mentioned topics.

2.1. E-Government Policies:

- Overview of E-Government: History, evolution, and key principles.
- Role of E-Government in public administration.
- Challenges and opportunities in implementing E-Government policies.
- Studies and frameworks related to E-Government adoption.

2.2. Handwritten Digits Recognition:

- Introduction to Optical Character Recognition (OCR) technology.

- Techniques and algorithms for handwritten digit recognition.
- Applications of handwritten digit recognition in various fields.
- Challenges and advancements in the field.

2.3. Text-Based Sentiment Detection:

- Introduction to sentiment analysis and its applications.
- Approaches to text-based sentiment analysis, including rule-based and machine learning methods.
- Sentiment analysis in the context of social media, reviews, and user-generated content.
- Evaluation metrics for sentiment analysis models.

2.4. Image-Based Sentiment Detection:

- Overview of image-based sentiment analysis.
- Techniques for extracting sentiment from images.
- Applications of image-based sentiment analysis.
- Challenges and potential solutions in image-based sentiment analysis.

2.5. AI Techniques for Recognition and Detection:

- Machine Learning and Deep Learning approaches for recognition tasks.
- Neural network architectures used in OCR, sentiment analysis, and image processing.
- Transfer learning and its application in recognition and detection tasks.
- Ethical considerations and challenges in deploying AI for recognition and detection.

2.6. Integration of AI in E-Government Policies:

- Case studies and examples of AI implementation in E-Government services.
- Benefits and challenges of integrating AI into e-government policies.
- Policy considerations and regulations related to the use of AI in government.

2.7. Future Directions and Research Gaps:

- Emerging trends in AI for recognition and sentiment analysis.
- Areas requiring further research and development.
- Ethical considerations and potential societal impacts.
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2. EXISTING SYSTEM

As there is no staff available in unmanned restaurants, it is difficult for the restaurant management to estimate how the concept and the food are experienced by the customers. Existing rating systems, such as Google and TripAdvisor, only partially solve this problem, as they cover only a portion of the customer's opinions. These rating systems are only used by a subset of the customers who rate the restaurant on independent rating platforms on their own initiative. This applies mainly to customers who experience their visit as very positive or negative.

3. PROPOSED SYSTEM

In order to solve the above problem, all customers must be motivated to give a rating. This paper introduces an approach for a restaurant rating system that asks every customer for a rating after their visit to increase the number of ratings as much as possible. This system can be used in unmanned restaurants; the scoring system is based on facial expression detection using pretrained convolutional neural network (CNN) models. It allows the customer to rate the food by taking or capturing a picture of their face that reflects the corresponding feelings. Compared to a text-based rating system, there is much less information, and no individual experience reports are collected. However, this simple, fast, and playful rating system should give a wider range of opinions about the experiences of the customers with the restaurant concept.

4. RELATED WORK

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, subassemblies, and/or a finished product. It is the process of exercising software with the intent of ensuring that the software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement.

5. SYSTEM ARCHITECTURE

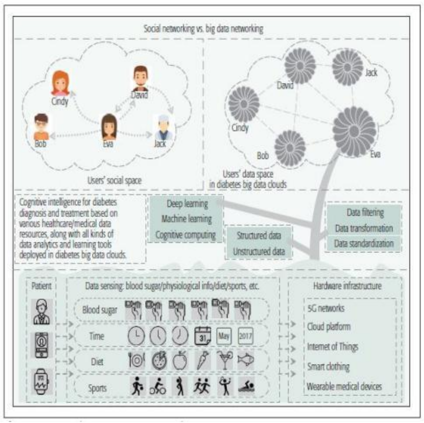
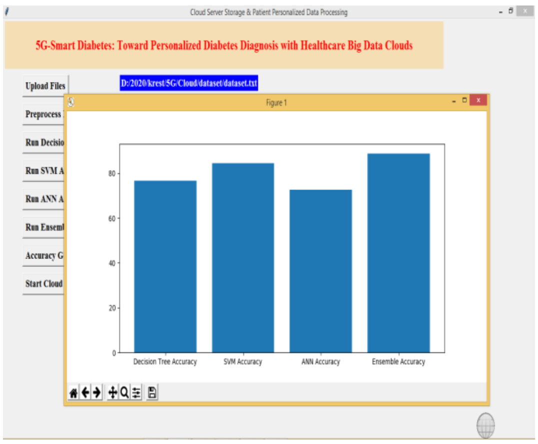


Figure No.1: System Architecture

6. RESULT :



The above screen describes the algorithm results, which one has the best accuracy.

7. Conclusion

In this article, we propose a 5G-Smart Diabetes system consisting of a sensing layer, a personalized diagnosis layer, and a data sharing layer. Compared to Diabetes 1.0 and Diabetes 2.0, this system can achieve sustainable, cost-effective, and intelligent diabetes diagnosis. We also propose a highly cost-efficient data sharing mechanism in social space and data space. Additionally, using machine learning methods, we present a personalized data analysis model for 5G-Smart Diabetes. Finally, based on smart clothing, smartphones, and data centers, we build a 5G-Smart Diabetes testbed. The experimental results show that our system can provide personalized diagnosis and treatment suggestions to patients.

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