REMOTE HEALTH MONITORING SYSTEM THROUGH GENERATIVE AI AND SPECULATIVE PARALLELISM

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ABSTRACT:

Remote Health Monitoring of patients using speculative multithreading techniques and parallel multiprocessing. The remote health monitoring system with incentivized wellness. The physical and mental health issues cost a lot to the people, their family. The chronic diseases such as cancer, diabetes, mental illness, physical illness impacts on the work performance, behaviour, human interactions, social behaviour and interaction. The remote monitoring of the patient reduces the time, communication, travel and remotely the patients are monitored effectively. The electronic health record is used in maintaining e-bills, e-notifications. In the rural areas, the patient monitoring and patient surgeries is toughter compared to the urban areas.

Keywords: Remote Health Monitoring, Speculative Parallelism, IOT devices, Smart Healthcare system, Predictive Analytics.

Literature Survey: Remote health monitoring systems would involve reviewing academic papers, journals and conference proceedings related to the topic. Key areas to explore include sensor technologies, data transmission methods, security concerns and the impact of remote monitoring on healthcare outcomes. Recent advancements, challenges and comparative studies to gain a comprehensive understanding of the field[1,2,3,4].

Introduction:

The patients are monitored remotely with the Internet of Things and Artificial Intelligence and Machine Learning techniques. The ways to be done for the remote health monitoring is using the intelligent monitoring, artificial intelligence techniques like regression analysis, remote predictive data analytics and deep learning techniques.

Speculative parallelism is a key area in the data parallelism, instruction parallelism, computer instruction reuse. The integrated IOT devices are used to monitor the healthcare in remotely to reduce the cost, travel and improve with the online services. The sms based monitoring system is developed through the integration of the all the sensors and the remotely monitoring the patients is carried out through the enhanced integrated techniques and technologies.

Speculative execution is a main stream technology which has the capability to accurately predict the events with accuracy, to recover the state to the original when speculation goes wrong, they identify the events to be predicted and to identify the events that are not possible to predict also.

Speculative execution is a technology where a speculative thread spawns threads and each thread is allocated the task for the prediction of the future events based on the profiling and historical data. The architecture of the speculative parallel events are such that if the predicted output is correct, the speculative threads are saved for the events and those events are exempted from execution otherwise the speculative threads are squashed from the execution and the non-speculative thread executes the events as normal.

Proposed Solution:

Early detection of vital signs deterioration is key to the timely invention and avoiding clinical deterioration in acutely ill patients in hospitals. Traditional patient monitoring is to report individual vital signs of patients, which state their current clinical status. vital signs such as temperature, pulse, respiratory rate, and mean arterial pressure are considered continuous predictors for emergency department patients   New patient monitoring algorithms analyze multiple features from physiological signals. This produces a predictive or prognostic index that measures a specific critical health event.

RPM focuses on patients with chronic diseases, post-operative patients, senior patients, and patients from rural areas with limited access to healthcare facilities. The recent studies prove that, when applied to targeted categories, remote monitoring is able to

- reduce readmissions,
- reduce emergency room visits
- improve patient satisfaction
- cut costs of care
- improve medication compliance

Given the potential benefits, it's no surprise that around 88 percent of healthcare providers have already invested or are considering investments in RPM technologies. To serve their goals, these technologies must create an integrated system that covers the entire RPM cycle.

Healthcare monitoring system in hospitals and many other health centers have experienced significant growth, and portable healthcare monitoring systems with emerging technologies are becoming of great concern to many countries world-wide nowadays. The advent of Internet of Things (IoT) technologies facilitates the progress of healthcare from face-to-face consulting to telemedicine. This paper proposes a smart healthcare system in IoT environment that can monitor a patient's basic health signs as well as the room condition where the patients are now in real-time. In this system, five sensors are used to capture the data from hospital environment named heart beat sensor, body temperature sensor, room temperature sensor.

Significance of the study:

The patients are monitored door steps with minimal charges. Hospital visits, consultation fees of doctors, travelling costs, waiting periods for the doctors in the hospitals even after appointments is reduced to the great extent.

The architectural diagram of the RHMS is as follows with the predictive algorithms for the accuracy of the prediction.
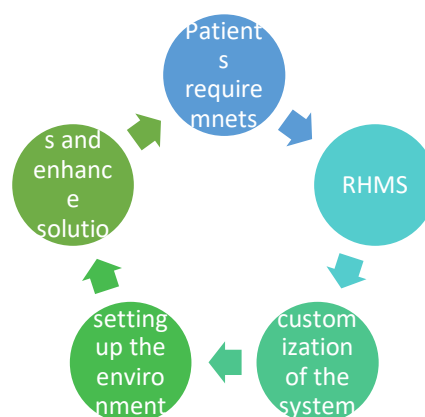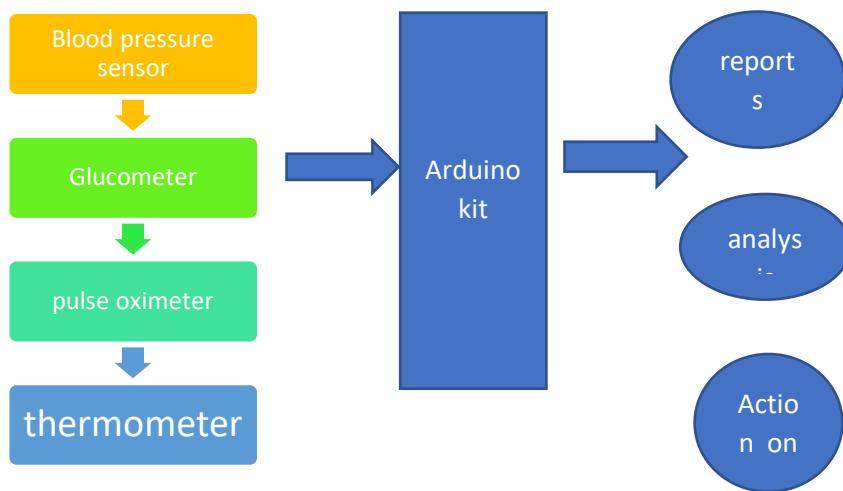
Fig.1 Architectural Diagram for the RHMS

Fig.2 Diagrammatic representation of the RHMS with prediction.

Social Benefits: the project helps the poor and needy who cannot afford to the regular visits to the hospitals for the checkups and monitor regularly the health checkups. Aged people who cannot travel for long distances to big hospitals are benefitted.

Economic Benefits: travelling cost, hospitalization cost, time is reduced as the patients are monitored remotely.

Outcome of the Study:

Most of the rural area patients are benefitted as it is the doorstep service from organizations or the volunteers as it has both social and economic benefits together.

References:

1. Remote_patient_monitoring_a_comprehensive_study.pdf
2. s42979-021-00848-6.pdf
3. https://telehealth.hhs.gov/providers/preparing-patients-for-telehealth/telehealth-and-remote-patient-monitoring
4. https://www.insiderintelligence.com/insights/remote-patient-monitoring-industry-explained/