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Automatic ML-Based Covid19 patient monitoring system with risk determination

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Abstract The worldwide covid19 pandemic got spread drastically over the globe in very short term. People round the globe are detaining to shrivel the spread of COVID-19. Which includes several activities such as self-isolation, work from home concept, increase in hand washing using sanitizer in order to improve basic hygiene, and the developments of personal protective equipment to reduce the prospect of infection. Smart and connected health care applications enabled the Internet of Things (IoT). Networked sensors, either embedded inside our living system or worn on the body, enable us to collect rich information regarding our physical and standing. In a particular readiness of data at previously unimagined scales and spatial longitudes combined with the new generation of smart processing algorithms can expedite an advancement within the medical field, from this post-facto determination and ministration of a reactive framework to an early-stage proactive paradigm for disease prognosis combined with prevention and cure also as overall administration of well-being rather than the ailment. This paper throws some light on the methods accessible within the web of Things (IoT) domain for healthcare applications. The proposed objective is to style and make a healthcare system centred on Mobile-IoT by collecting patient information from different sensors and alerting both the guardian and therefore the doctor by sending emails and SMS according to the need of the situation. It monitors the physiological parameters of the patient and diagnoses the illnesses swiftly from a remote location. As there are the frequent contact comes with the patient in corona ward there might be chances to be corona to health worker so that were proposed a system which will work on the evaluation of such system which automatically whole data from a sensor connected the body of patient and monitor if any up comes or risk occur it will show the alert to doctor.

Keywords —Internet of Things (IoT), Smart Healthcare, Health Monitoring, Machine Learning.

I. INTRODUCTION

An essential part of this world society is that the aging population of the planet. The average life expectancy has substantially increased as the mortality rate has considerably decreased significantly because of the global advancements in the economy, society and healthcare over the past few decades. As a direct outcome, the number of older people across the world has steadily increased, and go on increasing in the future. It is predicted that by the year 2050, 24 percent of the world population of Sweden will be senior citizens, 10 percent of whom will be 80 or more.

IoT-based technology can deliver a substantial amount of information regarding humans, appliances, medical devices, and others. The combination of modern internet technological advancements and IoT provides a lot of innovative products and services based on wireless communication using low-cost sensors. It offers more collection and processing of knowledge and other services. Any object connecting to IoT demands a singular IP address or mode of identification which will be attained using IPv6.There exists still several people round the globe whose health is suffering from the shortage of adequate access to hospitals. Wireless alternatives connected to the Internet of things can enable remote monitoring of patients rather than visiting the hospital due to the latest wearable technology. A wide range of sensors that are attached to a patient's body might be wont to securely obtain patient data, and therefore the data collected are often examined and sent to the most server using various modes of transmission (3G/4G or Wi-Fi) [4]. All doctors have access to the data and can view the data, and decide accordingly on the type of treatment to provide. People concede that health and well-being is the fundamental condition for promoting the economic development with the passing of time and the development of the society. Mostly the current public healthcare system and its support were challenged globally government and therefore the private sector is continuing to take a position billions for the event of IoT devices, a number of which include the Ministry of Industry and IT's National IoT Plan for China, the ecu Research Cluster on IoT (IERC), Japan's u-Strategy, UK's Future Internet Initiatives, and Netergit's National Italian Project. Medical and health care IoT devices would benefit the patients significantly by using the

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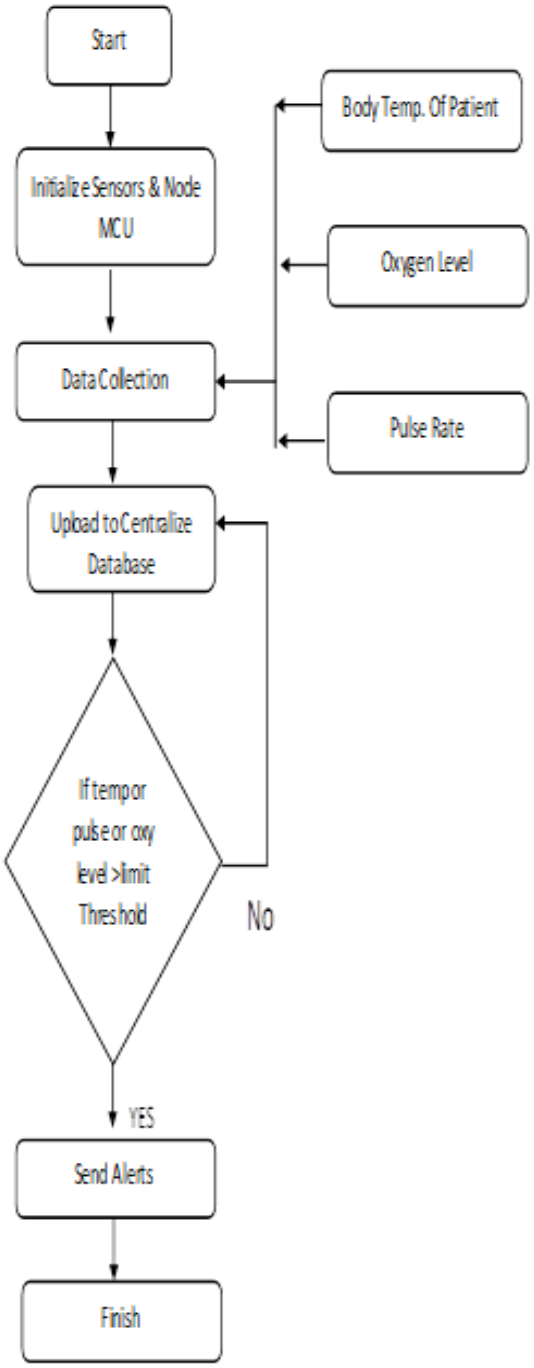
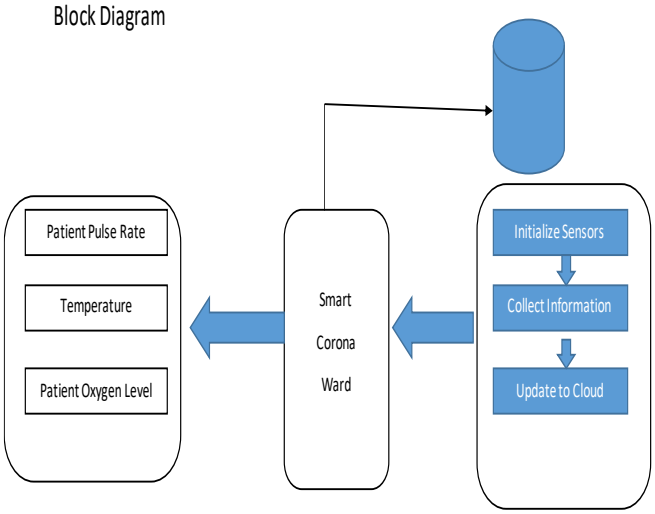
finest medical assistance, the fastest treatment time, the most satisfactory service, and the lowest medical costs.

II. METHODOLOGY

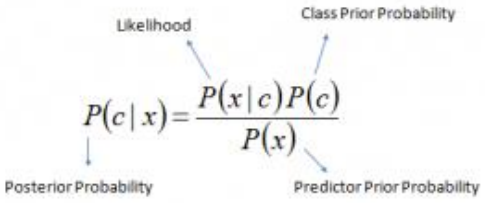
Corona is worldwide pandemic which affecting the doctors and nurses as well as the count going to reach up its very crucial to manage the health care system so that the proposed methodology will help to reduce the in-out contact with corona affected patient as well doctor can monitor the patient health of home quarantine people as well. In this the enhance ML based approach use for the prediction of emergency condition if any raise. The proposed system also configure with alert system which help to inform to the doctors if any issue will be raise. So that the proposed system will help to monitor the things and maintain the alert



Block Diagram



Naive Bayes: Naive Bayes classifiers0T is probabilistic classifiers based on applying Bayes' theorem with strong (naive)Independence assumptions between the features. A Naive Bayesian model is easy to build, with no complicated iterative parameter estimation which makes it particularly useful in the field of medical science for diagnosing heart patients. Despite its simplicity, the Naive Bayesian classifier often does surprisingly well and is widely used because it often outperforms more sophisticated classification methods. Bayes theorem provides a way of calculating the posterior probability, P(c|x), from P(c), P(x), and P(x|c). Naive Bayes classifier assumes that the effect of the value of a predictor (x) on a given class (c) is independent of the values of other predictors. This assumption is called class conditional independence



$$P(c \mid X) = P(x_1 \mid c) \times P(x_2 \mid c) \times \cdots \times P(x_n \mid c) \times P(c)$$

- P(c|x) is the posterior probability of class (target) given predictor (attribute).
- P(c) is the prior probability of class.
- P(x|c) is the likelihood which is the probability of predictor given class.
- P(x) is the prior probability of predictor

Where C and X are two events (e.g. the probability that the train will arrive on time given that the weather is rainy). Such Naïve Bayes classifiers use the probability theory to find the most likely classification of an unseen (unclassified) instance. The algorithm performs positively with categorical data but poorly if we have numerical data in the training set.

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III. CONCLUSION

In this work, we have proposed a unique model for future IoT-based healthcare systems, which can be applied to both general systems and systems that monitor specific conditions. We then presented a thorough and systematic overview of the state-of-the-art works relating to each component of the proposed model. Several wearable, non-intrusive sensors were presented and analyzed, with particular focus on those monitoring vital signs, blood pressure, and blood oxygen levels

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