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A Mini Review on Health Level Prediction for Community-Dwelling

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Abstract

The worldwide fast growth of senior populations is placing a significant strain on the healthcare system. The transition to more pro-active and reasonably priced healthcare could be aided by intelligent methods for ongoing health monitoring. Electrocardiograms, obtained via portable equipment, have been routinely utilised to track a variety of medical disorders since they are noninvasive and economical. However, developing appropriate features and prediction models is a difficult challenge due to the dynamic and varied nature of ECG signals. Using single-lead brief ECG signal data and multiple feature creation, we intend to build an integration projects for one-day-forward wellness prediction in community-dwelling older individuals.

Keywords: Physiological signals • Community-Dwelling • Electrocardiograms • Forecasting • Health monitoring

Introduction

The worldwide accelerated growth of the older population is placing a significant strain on the healthcare system. For instance, it is anticipated that the strain on societal resources and medical costs will rise sharply. Effective healthcare proactive as well as preventative strategies must be developed immediately. The transition to more pro-active and reasonably priced healthcare could be aided by intelligent methods for ongoing health monitoring. Rapid technological breakthroughs in the previous several decades, automated sensor-based data collecting, and sophisticated data analytics techniques have produced an integrated strategy that supports the individual monitoring and control of complex systems to manage their health. Wearable health trackers, for instance, can be used to keep tabs on things like gait speed, sleep duration, heart rate, daily nutrition, and energy intake. The majority of current research focuses on overall wellness, cardiovascular disease decline, and rehabilitation of chronic illnesses. Wellness indices, which are multidimensional notions that include physical, mental, social, emotional, intellectual, and environmental wellness, might indicate the general health status of the elderly.

Literature Review

The health of elderly individuals who live in communities is affected by falls on a global scale. New research reveals that foot issues increase the chance of falling, suggesting that the podiatrist may be essential in identifying fall risk associated with the feet. Nevertheless, there isn't a screening method accessible for use in podiatric practise. Existing tools have poor execution and little predictive value [1]. The creation of risk models for certain clinical populations may improve the precision and efficacy of prediction. In order to anticipate falls in community-dwelling older persons with foot issues, this study's goal was to create and internally evaluate a clinical prediction model that is simply accessible and used in podiatry treatment. Foot assessment should be a regular part of fall prevention because there is growing data about increased risk of falling in community-dwelling older persons who have foot problems. The podiatrist is a medical professional who diagnoses and treats foot issues, thus they are well-suited to contribute to fall-risk assessment. Clinical recommendations advise every healthcare professional to at least inquire about older individuals' falls in the previous year in order to identify individuals who are at risk of falling. The risk of further falls cannot be accurately predicted by this one query, though. Numerous assessment methods, such as questionnaires, physical performance tests, screening models, and algorithms have been created to assist healthcare professionals in fall risk assessment [2]. Despite the recommendations in clinical guidelines and the techniques at hand, fall risk assessment is currently hardly ever used in clinical practise in many parts of the world. A poor evaluation rate is caused by unknown validity, a protracted administration period, limited equipment availability in clinical practise, and the healthcare company's lack of knowledge with the available techniques. Additionally, there are now just a few tools that can accurately forecast if an older person would fall or not in their community. This might be because methodological techniques in development studies, such as not adapting to populations with particular features, fail to account for the multifaceted causes of falling [3].

The prompt and precise prediction of wellness in aged care is crucial for avoiding adverse health effects. Traditional wellness-measuring methods are mostly self-rated questionnaires used in psychology studies as a one-time measurement instrument. Due to the time-consuming nature of data collection and the fact that the results reflect an individual's health condition over an extended period of time, these methods are not appropriate for monitoring wellness on a daily basis. Various health-monitoring methods for geriatric care have been suggested by some research. For instance, a six-layer medical cloud platform was utilised to construct a system that was primarily focused on gathering physiological signals and vital indicators in order to provide a health assessment report. Using data from wearable and smartphone sensors, a real-time health monitoring system for remote cardiac patients was developed. These healthcare platforms often work by processing physiological data and vital signs offline or online on the back end before transferring information about wellness problems to users or healthcare providers in real-time or at a predetermined time [4]. However, rather than forecasting a future trend, the aforementioned systems are primarily concerned with monitoring the health state of the elderly. It is well acknowledged that forecasting health status beforehand could aid greatly in preventing changes that could be life-threatening and could be a useful way to give excellent healthcare services. Developed a customised healthcare monitoring system to forecast senior people's wellness conditions one day in advance. A wearable health tracker and an all-in-one station-based device's vital sign data were combined, and

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machine learning techniques were used to forecast senior people's personal wellness situations [5].

Discussion

Electrocardiograms are frequently used to monitor a variety of cardiac health issues due to its noninvasive nature and low cost. Multiple skin electrodes must be connected to the client for traditional ECG acquisition methods like patient monitors. These days, wearable or portable health monitoring gadgets make single-lead ECG signals easily accessible without regard to time or place. Created a one-day-forward wellness forecasting approach for senior residents living in communities using single-lead brief ECG data. The dynamic properties of ECG signals make it difficult to extract several meaningful features from the raw data for wellbeing prediction, despite the encouraging wellness prediction outcomes from these studies. In terms of signal analysis, several feature extraction models offer a variety of benefits. For instance, the time-frequency domain features provide comprehensive signal pattern information. By using the bandwidth of the empirical mode decomposition filter, empirical mode decomposition can decompose the original signal into intrinsic mode functions in the order of frequency from high to low.

An enhanced version of EMD called ensemble empirical mode decomposition uses white noise to address mode mixing problems. Multiscale entropy is frequently used to depict the self-similarity and irregularity under many scales because of its advantages in evaluating signal sequence irregularity. Although these feature extraction algorithms have been effectively and widely used in many engineering disciplines, ECG signal analysis rarely makes use of them. A machine learning-based model for wellness prediction can be created after extracting numerous representative features. Proposed a method employing random forest with ECG signals to forecast adverse health outcomes. Created a method for classifying health state that combines support vector machine and ECG data processing. Additionally, other related research projects used ECG signals to create deep learning models. used a deep belief network, for instance, to predict health status from ECG readings. There isn't a readily accessible, reliable screening method that can be routinely used in podiatrist practises to assess fall risk. Enhancing the ability of podiatrists to recognise high-risk patients in clinical practise may help and inspire podiatry practise. When a patient is identified as being at higher risk, the podiatrist may decide to inform them, consider referring them to an appropriate expert or fall prevention programme, or start the necessary evidence-based interventions.

The two primary contributions of this article are as follows: first, it integrated various feature construction models to extract the hidden pattern of the ECG data, which provided a solid platform for the following wellness prediction. Second, a thorough comparative analysis was carried out to show how well the developed approach performed. More specifically, many prediction models were cross-validated with the actual ECG signals and the features retrieved from various models. The experiment's findings demonstrate that, when compared to the rival approaches particular characteristics is the community-dwelling older adult population who visit the podiatrist. Diabetes and its complications, along with foot issues, are the most common diseases in this population. Despite the older adult population's acknowledged increased risk of falling, the suggested approach using feature development strategies produced the best wellness prediction results.

Conclusion

Through the analysis and modelling of single-lead short ECG signals, we developed a method for a one-day-ahead wellness forecast for elderly people living in the community. We looked at constructing, extracting, and picking pertinent characteristics from the raw signal data to produce crucial personal health indicators correlated with various wellness states. after feature creation and normalisation. We carried out an extensive evaluation of predictive models with and without feature development to show the value of the features in improving prediction power. In actuality, the suggested method might help in the prompt detection of senior persons with elevated health risks and aid in the decision-making process for healthcare professionals to implement the necessary interventions.

References

1. Bandura, Albert. “Social cognitive theory: An agentic perspective.” *Annu Rev Psychol* 2 (1999): 21-41.
2. Abraham, Charles and Susan Michie. “A taxonomy of behavior change techniques used in interventions.” *Health Psychol* 27 (2008): 379.
3. Czaja, Sara J., Joseph Sharit, Raymond Ownby and David L. Roth. “Examining age differences in performance of a complex information search and retrieval task.” *Psychol Aging* 16 (2001): 564.
4. Laganà, Luciana. “Enhancing the attitudes and self-efficacy of older adults toward computers and the internet: Results of a pilot study.” *Educ Gerontol* 34 (2008): 831-843.
5. Golinowska, Stanisława, Wim Groot, Petra Baji and Milena Pavlova, et al. “Health promotion targeting older people.” *BMC Health Serv Res* 16 (2016): 367-369.

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