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Human Activity Recognition Using IoT Domain

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ABSTRACT: This task presents a novel framework dependent on the Internet of Things (IOT) to Human Activity Recognition (HAR) by observing fundamental signs distantly. Here it is use raspberry pi, wearable sensors, computational psychiatry. Also have used AI calculations to decide the movement done inside four pre-set up classes (walk, climbing and run). With an increased availability in wearable sensors we explore a better understanding of human needs. Then, it can give input during and after the movement is performed, utilizing a distant checking segment with far off perception and programmable alerts. This framework was effectively executed.

KEYWORDS: Raspberry Pi, Location, Activity Detection, Wearable sensors, Machine learning, Deep learning, Long-Short term memory loss, Conditional random field, Computational psychiatry.

I. INTRODUCTION

The Internet of Things, IOT, is another idea wherein all detecting items can be associated with the web to have far off and steady admittance to its estimations (information). This entrance takes into account making a move in a quicker manner, with better outcomes and considerably more information included. The information that make these sorts out of frameworks can go from temperature ,open air area , indoor area, stockpiling stock, mugginess or other industry related factors. To put it plainly, any sensor that can be associated with the Internet makes part of an IoT. In such a manner, old style uses of unavoidable processing can be moved up to an IoT conspire for an action acknowledgment application: Human Activity Recognition (HAR). These applications, in their traditional methodology, have been investigated, assessed and created to the point that few generally accessible items have HAR frameworks implicit. This can be seen on some wellness tracker, which have HAR frameworks incorporated into the portable utilizations of their producer. These applications normally enlist and dissect day by day and rest action .The HAR framework comprises of detecting the individual's situating and development, playing out a component extraction and an order of those highlights to choose which action was acted in a pre-chosen rundown of exercises. The HAR frameworks have a few techniques. it presents a few disservices for subjects like exactness, inclusion and cost. Another technique that can beat these difficulties are on-body sensors frameworks or wearable helped HAR . This sort of approach depends on wearable sensors present all through the body, which help to play out the acknowledgment . These gadgets could be those inside another gadget like a PDA. In this paper, it present a more itemized and novel rendition of a HAR-IOT framework that utilizes a solitary gadget. This framework is planned to be utilized by patients with ongoing heart sicknesses, patients that have their wellbeing status in a non-basic condition yet at the same time need steady checking. The introduced framework centres around the every day schedule, movement and non-intrusive treatment that every quiet should have as a feature of their recovery cycle. Albeit an IOT approach needs a security investigation, our way to deal with the IOT doesn't depend on a remote sensor organization, the information data isn't touchy to outside audience members and, as already stated, the focal point of the paper is to approve the introduced way to deal with HAR-IoT frameworks. The movement acknowledgment was executed utilizing a classifier that uses the data assembled by this equipment. Two distinct strategies were carried out for the classifiers: Bayes and C4.5. This segment additionally concedes distant admittance to the information and configurable alarms for the action done, if necessary. This paper presents a novel association between a customary HAR framework and an IOT framework with an alternate way to deal with the old style highlight extraction in a HAR framework. This work will be introduced as follows: in Section, the framework engineering is clarified and supplemented with the framework portrayal in Section 3. Area 4 spotlights on clarifying the element extraction technique and the classifier data. The trials and results are introduced.

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II. LITERATURE SURVEY

2.1 Wi-Fi based Human activity recognition using Raspberry Pi

Mix CSI extraction and investigation frameworks utilizing a few wellbeing observing arrangements would address a huge advance forward in this field.
Carried out Human movement acknowledgment framework on the Raspberry and CSI-skilled equipment.[1]

2.2 Human Suspicious Activity Detection using Deep Learning

Chosen 5 dubious exercises shaping 5 classifiers and afterward began the cycle of model choice utilizing ResNet. ResNet-50 works the best to distinguish dubious exercises occurring.[2]

2.3 Human Activity recognition using wearable sensors

Providing accurate and opportune information on people's activities and behaviour is one of the most important tasks in pervasive computing. Innumerable applications can be visualized, for instance, in medical, security, entertainment, and tactical scenarios.[3]

2.4 Human activity recognition

Selected 5 suspicious activities forming 5 classifiers and then started the process of model selection using ResNet. ResNet-50 works the best to detect suspicious activities happening.[4]

2.5 Human activity recognition and behavioural prediction using wearable sensors and deep learning.

Psychiatric measurements and new wearable sensors could increase performance in activity detection with sequential and deep classification algorithm. Detect and classify complex activities and differentiate it from other normal life activities using machine and deep learning.[5]

III. PROPOSED METHODOLOGY AND DISCUSSION

Description: When the individual began with action the raspberry pi B3 model and those specific sensors will get initiated naturally. They will figure the all readings that are distance, rise, speed, pulse, steps and so on.
This information will be consequently get saved money on the worker. Every one of these estimations are relies upon your web speed and network. Contingent upon that it will give results, it won't give 100% exactness for any of the estimations. In the event of lost web association all information will be saved money on the worker no information misfortune will be there.

Algorithm: Dictionary learning algorithm
Dictionary Learning Algorithm plays a main role in signal processesing and in machine learning areas. As Human Activity Recognition needs input from sensor signals, dictionary learning algorithm will be best suited for this case. Creating dictionary from a large set of input signal and using them in analyzing is easier. It involves two stages coding stage and dictionary update stage. The algorithm also works fine in both offline and online stages. Offline stages involves collecting data from sensors and then processing it. Online stage updates the data whenever there is an arrival of a new signal. To extract the time series data, two methods are used: structural and statistical. In structural, it describes the correlation with the data and in statistical, the Fourier and Wavelet transform extract the features by quantitative characteristics . It represents the flexibility processing stages of data compared to MOD, K-SVD. In real time, recognizing the activities is not workable. Due to pre-processing the efficiency and flexibility of models are upgraded. A productive Dictionary learning algorithm is proposed to overcome the problem and to provide a practical solution.

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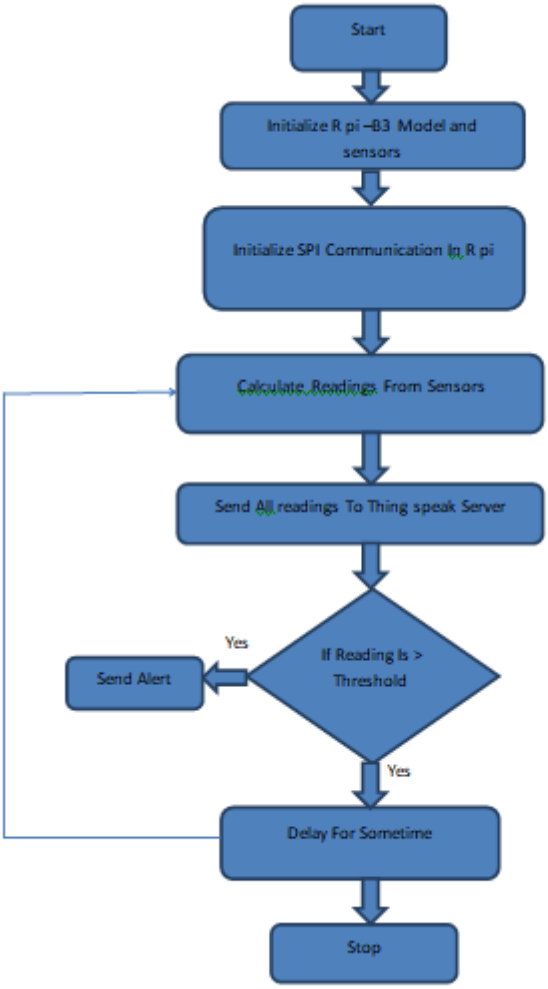

Fig 3.1 Human activity recognition using Raspberry Pi

IV. EXPERIMENTAL RESULTS

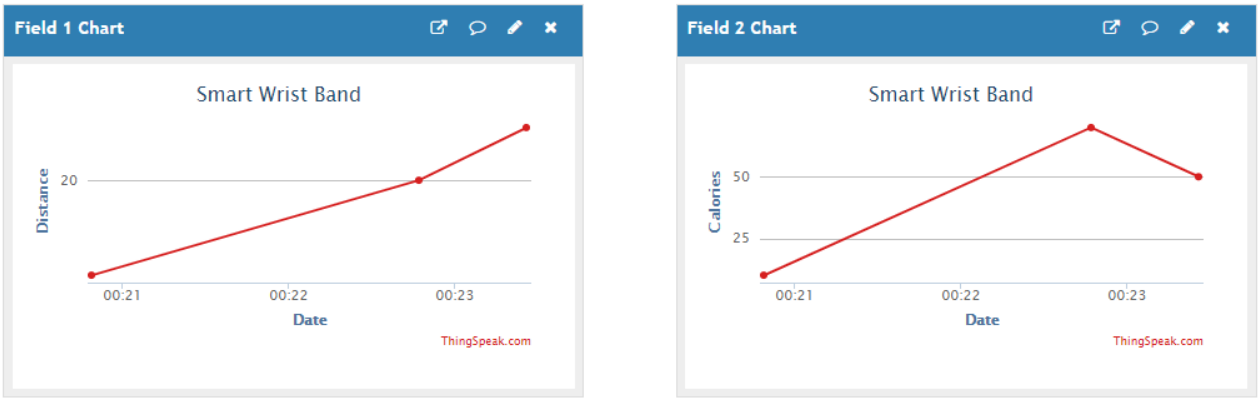

Fig.4.1 Distance and Calories Graph

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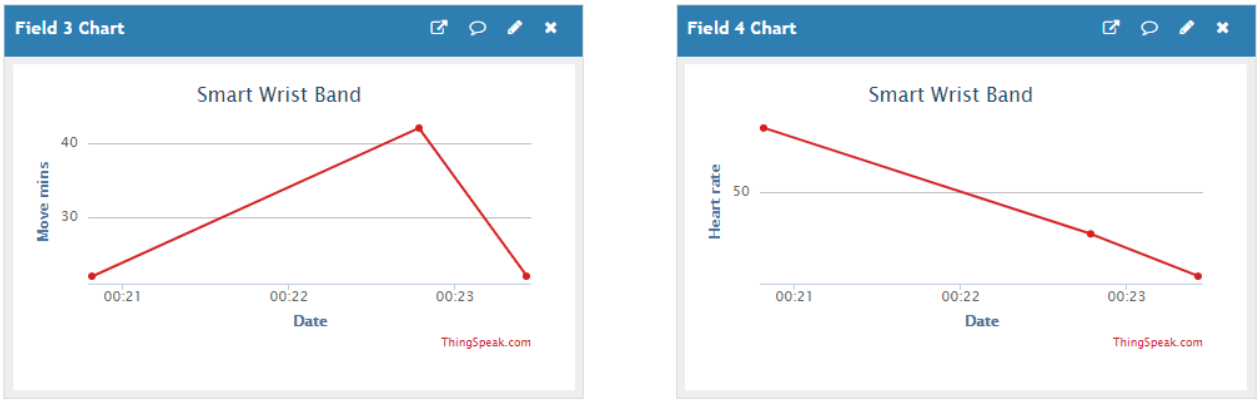

Fig.4.2 Move Mins and Heart Rate Graph

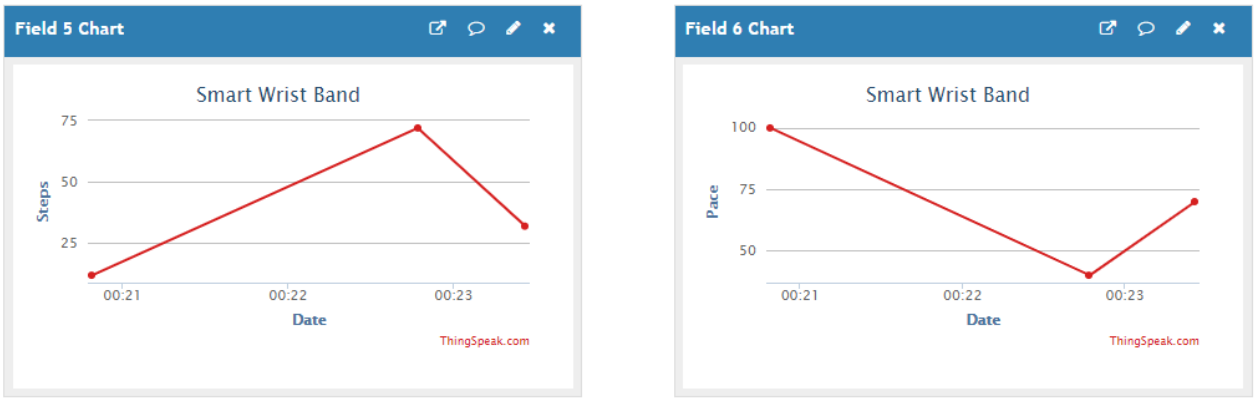

Fig.4.3 Steps and Pace Graph

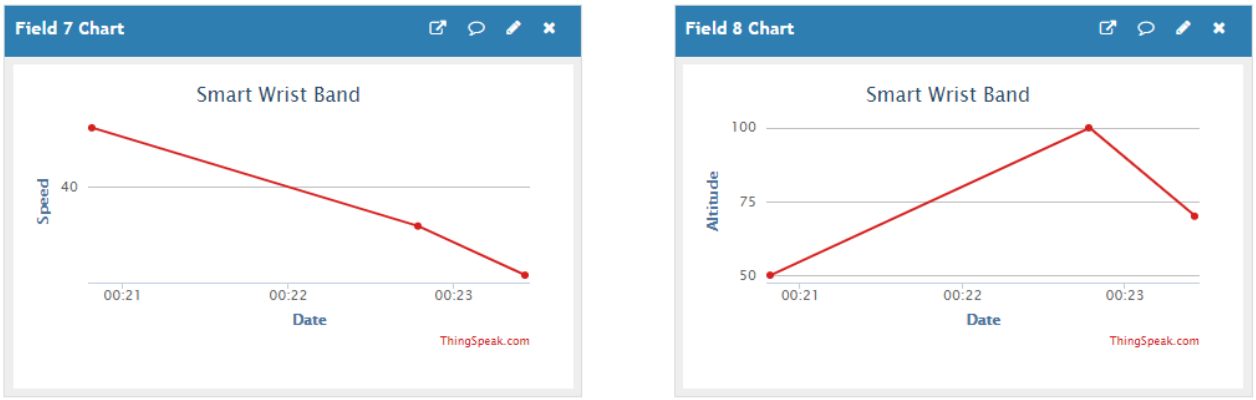

Fig.4.4 Speed and Altitude Graph

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V. CONCLUSION AND FUTURE SCOPE

In this study, it proposed a Human Activity Recognition framework utilizing an accelerometer , beat oximeter and Raspberry Pi regulator. It has additionally showed that the past clinical record data can improve the exhibition of the framework. It is thought about 9 exercises, including both basic exercises and day by day exercises and our trial results showed that different exercises can be grouped with an exactness of 95%. Energy productivity can be improved by utilizing the proposed framework as it can precisely anticipate the client's movement, burn-through just the energy needed for the action, and lessening wastage of energy. In addition, the proposed framework can upgrade comfort. For instance, after the framework predicts the client's movement, it can send an admonition to the client if the tally is uncommon.

The technology can be further developed by using it in the vehicle tracking and sending message in emergency cases and path of the vehicle can also be tracked. It can also be developed by gathering information from many setup and form it as a cluster and send it to the cloud and get access from their.

In future the idea behind the Android app has been derived from having an automated boot to respond to text message responses from the user. It will provide the user with predefined response option at just the click of a button. The user doesn't need to memorize the specific keywords to send. Also, the boot will be preprogrammed to present the user with a set of predefined keyword options such as "location," "snapshot," "SOS," etc. Whereas for the future aspect of this wearable device based on what type sensor is added to it, additional specific keywords could be added such as, "humidity," etc.

In the proposed system, the battery used is a lithium ion battery. But in the future products polymer batteries can be used to make the size of the battery smaller and thereby reducing the size of the system. Furthermore, any other means of safety other than the shock circuit can be added to the product. The product can also be tailored to be water proof to prevent short circuiting due to sweat. The product can also be updated enough to send the changing location of the victim without having to press the emergency button every time the location is changed.

REFERENCES

[1] Glean forbes, Stewart Massi, Susan" Wi-Fi based Human activity recognition using Raspberry Pi"

[2] G.Vallathan, A.John, SK Mohan "Human Suspicious activity detection using deep learning

[3] G.Vallathan, A.John, SK Mohan"Human Activity recognition using wearable sensors"

[4] Charmi Jobanputra, Jatna Bavishi, Nishant Doshi "Human activity recognition"

[5] Sakron Mekruksavanich "Human activity recognition and behavioural prediction using wearable sensors and deep learning."

[6] M. Billinghurst, "New ways to manage information," *The Computer Journal*, vol. 32, no. 1, pp. 57–64, 1999.

[7] J. Gubbi, R. Buyya, S. Marusic, and M. Palaniswami, "Internet of Things (IoT): a vision, architectural elements, and future directions," *Future Generation Computer Systems*, vol. 29, no. 7, pp. 1645–1660, 2013.

[8] L. D. Xu, W. He, and S. Li, "Internet of things in industries: a survey," *IEEE Transactions on Industrial Informatics*, vol. 10, no. 4, pp. 2233–2243, 2014.

[9] O. C. Ann and L. B. Theng, "Human activity recognition: A review," in *Proceedings of the 4th IEEE International Conference on Control System, Computing and Engineering, ICCSCE 2014*, pp. 389–393, mys, November 2014.

[10] Y. LeCun, Y. Bengio, and G. Hinton, "Deep learning," *Nature*, vol. 521, no. 7553, pp. 436–444, 2015.

[11] Cabra, J.; Castro, D.; Colorado, J.; Mendez, D.; Trujillo, L. An IoT approach for Wireless Sensor Networks Applied to E-Health Environmental Monitoring. In Proceedings of the 10th IEEE International Conference on Internet of Things (iThings 2017), Exeter, Devon, UK, 21–23 June 2017; pp. 14–22.Y

[12] Velasquez, N.; Medina, C.; Castro, D.; Acosta, J.C.; Mendez, D. Design and Development of an IoT System Prototype for Outdoor Tracking. In Proceedings of the International Conference on Future Networks and Distributed Systems—ICFNDS '17, Cambridge, UK, 19–20 July 2017; pp. 1–6.

[13] Fitbit. Heart Rate Tracker: Fitbit Charge 2TM. Available online: https://misfit.com/fitness-trackers/ (accessed on 25 November 2017).

[14] Misfit. Misfit: Fitness Trackers & Wearable Technology—Misfit.com. Available online: https://www.fitbit.com/home (accessed on 25 November 2017).

[15] Sikder, F.; Sarkar, D. Log-sum distance measures and its application to human-activity monitoring and recognition using data from motion sensors. IEEE Sens. J. 2017, 17, 4520–4533

[16] Testoni, A.; Di Felice, M. A software architecture for generic human activity recognition from smartphone sensor data. In Proceedings of the 2017 IEEE International Workshop on Measurement and Networking (M&N), Naples, Italy, 27–29 September 2017; pp. 1–6

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[17] Boufama, B. Trajectory-Based Human Activity Recognition from Videos. In Proceedings of the 3rd International Conference on Advanced Technologies for Signal and Image Processing—ATSIP'2017, Fez, Morocco, 22–24 May 2017; pp. 1–5

[18] Rodriguez, C.; Castro, D.M.; Coral, W.; Cabra, J.L.; Velasquez, N.; Colorado, J.; Mendez, D.; Trujillo, L.C. IoT system for Human Activity Recognition using BioHarness 3 and Smartphone. In Proceedings of the International Conference on Future Networks and Distributed Systems—ICFNDS '17, Cambridge, UK, 19–20 July 2017; pp.1-7

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