International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 04 Issue: 07 | July -2020 ISSN: 2582-3930

Smart Personal Security System for Physically Disabled people using IoT

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***ABSTRACT*- Now-a-days the physically disabled people need more attentions for every movement to be checked for the rehabilitation process and also for their medical diagnosis. The technology were rapidly developed to emergence the information and communication technologies with the giant network areas like IoT (Internet of Things)through connected devices to gather and share data about how the devices are used and the environment in which they are operated with sensors. The sensors continuously emit data about the working state of the devices and it provides the common platform to dump their data from all these data through common languages for all devices to communicate each other. The data get shared with other devices for better user experience automation and improving efficiencies. It will monitor the person's motion and their abrupt moment to avoid falling accident and to recover for rehabilitation process.**

Keywords- Rehabilitation, Internet of Things, Physically Disabled, Sensor, Abrupt moment.

I. INTRODUCTION

In our India, the people with prevalence of disability were in the percentage of 2.2-2.3% in rural places and 2% of urban areas. The prevalence of disability was higher among the males (2.4%) when compared to females (1.9%).finally the survey percentage of disabilities living alone was 3.7%, while 62.1%had care taker. Apart from this there are 21.8% of people had their need through Government and another 1.8% had received through the organization other than government. Though it was the current situation of physically disabled peoples around us, the reason is to be a care taker for all disability with all sufficient situations for a prolong time our miniaturized devices can help which connected to the giant network helps to be a safe guard of that particular during their abrupt moment. While the devices with the connections were take place, it helps by sending data and alert of people fallen through sensors and it also used for diagnosis for that particular to rehabilitate their body to become normal stage by avoiding abrupt accidents.

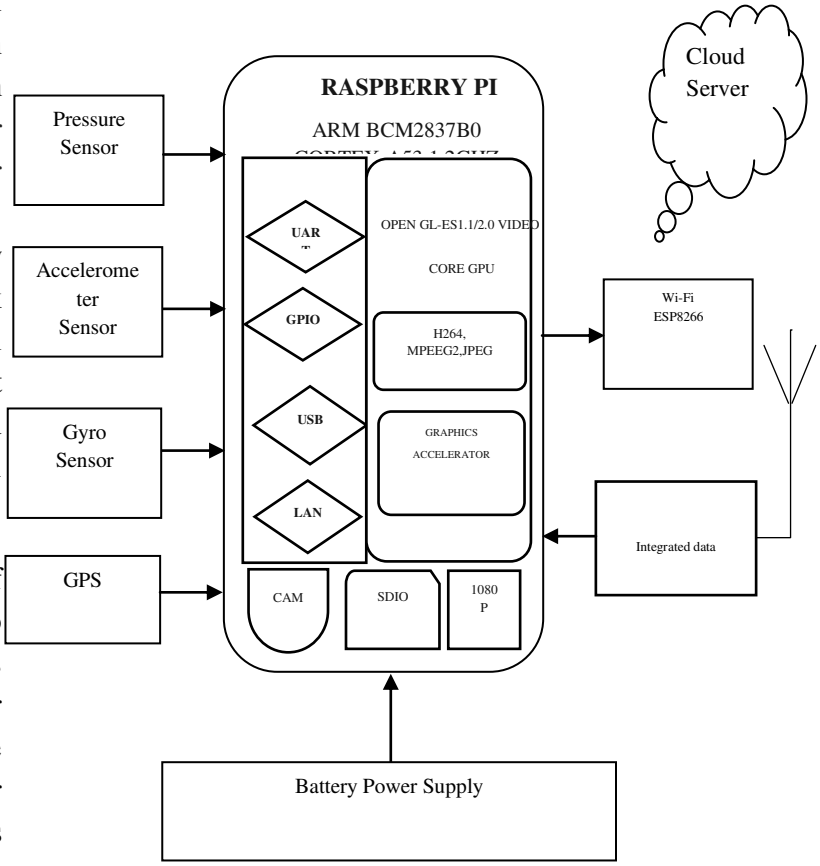
The progress of miniaturization and their decreasing cost make it possible to incorporate them in compact, non-obtrusive continuous monitoring devices easily attachable to the body, empowering the development of Wireless Body Area Networks (WBANs).In particular, these sensors can provide reliable information as well as objective and quantitative measurements when placed on different parts of the body(lumbar region).The multi-modal sensors, hardware devices for tracking systems include sensor/peripheral interconnection cables are flexible, and other components that have not worn easily. Our project has been aimed at developing a WBAN system that is comfortable to wear, easy to use, apply and re-apply, as well as non-limiting for the body movements and acceptable to clinicians.

II. WIRELESS BODY AREA NETWORK

In communication technology, the Bluetooth wireless communication and transmission has become very popular and it is one of the fastest growing fields in the wireless technology. Hence it is important to learn how the GPS interfacing with the microcontroller which is in build with raspberry kit. Now a day the mobile becomes very convenient for all purpose of personal communication with frequent bandwidth with high speed network technology which compatibility for our miniaturization with wireless technology. Most of the devices for physically disabled has the wire connection for supply to devices but here we using the wireless sensors which need less amount of power supply and it transmit through wireless network technologies like "wireless fidelity", which can also used in common local area networks with fast transmission and dump of large data to be stored for a long time purpose for human medical diagnosis.

The way to implement the motion detection of human by Pressure sensors, Accelerometer, Gyro sensors for detecting angle and position of legs and pressure occurs. when the person under abrupt movement the pressure sensor send the data of imbalance of human pressure in sensor and that information is transmitted via wireless networking and the sensors along with pressure sensor also send its data as angle of leg ,location of that person. From the data and information from that person will informed to the concern person immediately with the accurate location and it can be directly recognized for first aid to save the person who get suffer of fallen and the sensors plays an important role of detecting human motion.

The data stored and it send the alert with it get variation among the limited value as like it consider that as abrupt of the person and it alerts the care taker by sending their location using GPS module which data were collected through IoT technology, it is one of the fastest growing fields in the wireless technology. The block diagram were fully explained about the data output and input of the sensors and angle deviations get alerted to the care taker immediately about the person's condition.



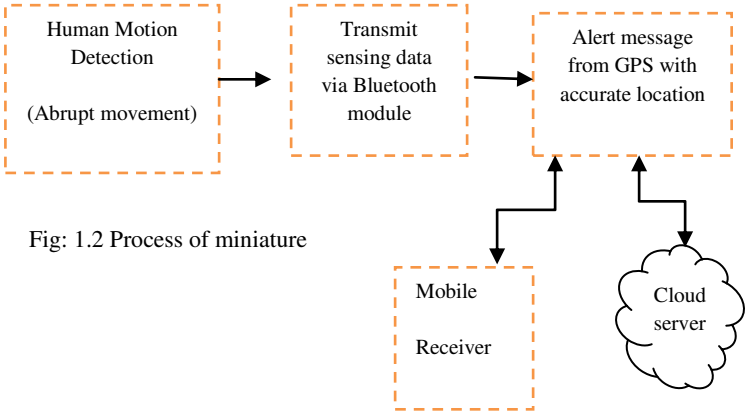


Fig: 1.2 Process of miniature

III Related works

[1] Yamakawa T Taniguchi, Asari K. Kobashi and S.Hata in there paper the explained about the Biometric Personal Identification Based on Gait Pattern using Both Feet Pressure Change. In Proceeding of 2010 World Automation Congress (WAC), Kobe, Japan, 19–23 September 2010. In that paper they propose a hip-based user recognition method which can be suitable for implicit and periodic re-verification of the identity. They used a wearable accelerometer sensor attached to the hip of the person, and then the measured hip motion signal is analyses for identity verification purposes.
The main analyses steps consists of detecting gait cycles in the signal and matching two sets of detected gait cycles. Evaluated the approach on a hip data set consisting of 400 gait sequences (samples) from 100 subjects, it obtained equal error rate (EER) of 7.5% and identification rate at rank 1 was 81.4%. These numbers are improvements by 37.5% and 11.2% respectively of the previous study using the same data set.

[2] Tekscan Tactile Pressure Measurement BPMS measures the pressure distribution of a human body on support surfaces such as seats, mattresses, cushions, and backrests. The thin and conforming sensing mat can measure body pressure distribution with minimal interference of the support surface. The mat has its features as spatial resolution as fine as one sensing element per square centimeter. Thickness enables the user to incorporate into the application without altering the supporting surface. Sensors will not capture pressure artifacts, only the loaded area. Mat design eliminates sensor ham mocking while it conforms to the surface.
The BPMS system is build n a “modular “sensor construction concept. This means the people can acquire a system in many ways from one pressure sensor up to 8 this allows them to grow their BPMS as people’s need expand. Thus it’s protecting initial investment.

[3] Yong, F. Yunjian, G. Quanjun, S established an article in the title of A Human Identification Method Based on Dynamic Plantar Pressure Distribution. In Proceeding of 2011 IEEE International Conference on Information and Automation (ICIA), Shenzhen, China. To detect and predict falls, a hidden Markov model (HMM)-based method using tri-axial accelerations of human body is proposed. A wearable motion detection device using tri-axial accelerometer is designed and realized, which can detect and predict falls based on tri-axial acceleration of human upper trunk. The acceleration time series (ATS) extracted from human motion processes are used to describe human motion features, and the ATS extracted from human fall courses but before the collision are used to train HMM so as to build a random process mathematical model. Thus, the outputs of HMM, which express the marching degrees of input ATS and HMM, can be used to evaluate the risks to fall. The experiment results show that fall events can be predicted 200-400 ms ahead the occurrence of collisions, and distinguished from other daily life activities with an accuracy of 100%.

[4] Lavery, L. Vela, S. Fleishli, J. Armstrong, D. Lavery, D are the authors of Reducing plantar pressure in the neuropathic foot, To compare the effectiveness of therapeutic, comfort, and athletic shoes with and without viscoelastic insoles. We compared pressure reduction at ulcer sites under the hallux, first metatarsal, and lesser metatarsals, using extra-depth, athletic, and comfort shoes

with and without viscoelastic insoles. A rubber-soled canvas oxford was used to establish baseline pressure values When used in conjunction with a viscoelastic insole, all shoe types reduced mean peak plantar pressure better than their non-insoled counterparts ($P < 0.05$). Consistently, comfort shoes reduced pressure significantly better than both the cross trainers and extra-depth shoes for ulcers under the first and lesser metatarsals ($P < 0.05$). For each shoe type, the addition of the viscoelastic insole provided a significant reduction in mean peak pressure ($P < 0.05$). Compared with stock insoles, viscoelastic insoles reduced pressures an additional 5.4-20.1% at ulcer sites. The same trend was also observed at regions of the foot not associated with ulceration. When used in conjunction with a viscoelastic insole, both the comfort and athletic cross-trainer shoes studied were as, if not more, effective than commonly prescribed therapeutic shoes in reducing mean peak first and lesser metatarsal pressures. Furthermore, comfort shoes were as effective as therapeutic shoes in reducing pressure under the great toe. Both of these shoe types may be viable options to prevent the development or recurrence of foot ulcers.

[5] Mohammad Alyami, Yeong-Tae Song were explained about Removing Barriers in Using Personal Health Record Systems" IEEE ICIS 2016, Personal health record (PHR) is considered a crucial part in improving patient outcomes. However the adoption rate by the general public still remains low. To find out the barriers in adopting PHR, they have surveyed articles related to personal health record system (PHRS) from 2008 to 2016 and categorized them into 6 different categories such as motivation, barriers, ownerships, interoperability, privacy, and security and portability. In this paper, they propose a framework that can help lift such barriers and motivate people to adopt PHRS so they can manage their health by monitoring and controlling their clinical data using PHRS. The Healthcare Information Technology Standards Panel (HITSP) to enable integration between systems in order to share informations.

[6] Harsha S. Gardiyawasam Pussewalage and Vladimir A. Oleshchuk, this paper has been explained about Personal Health Record (PHR) has developed because the rising trend within the care technology and by that the patients area unit expeditiously able to produce, manage and share their personal health info. This PHR is currently a day's keep within the clouds for the value reduction purpose and for the straightforward sharing and access mechanism. Cloud storage permits the PHRs to be outsourced to cloud infrastructures rather than storing them regionally. however during this the PHR system, the safety, privacy and health knowledge confidentiality area unit creating challenges to the users once the PHR keep within the third party storage area unit like cloud services. The PHR knowledge ought to be secured from the external attackers and conjointly it ought to be shield from the inner attackers such from the cloud server organization itself.

IV RESULT

The output from all the sensors and data get integrated through raspberry and it get stored in the data base of microprocessor. The signal process of immediate signal transmission is done by wireless network and it operates when it get various deflections of normal values and it beyond the limitation of leg moment deviation and it alerts the care taker to aid that particular person.

V CONCLUSION

The latest research on wearable and wireless sensor systems for gait analysis was focused in this project. The application of wireless sensor

network in healthcare being deployed all over the world with rise of these technology and communication and implementation of healthcare will also rise. We hope that this project will expose for physically disabled peoples.

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