NOVATEUR PUBLICATIONS
INTERNATIONAL JOURNAL OF INNOVATIONS IN ENGINEERING RESEARCH AND TECHNOLOGY [IJIERT]
ISSN: 2394-3696
VOLUME 2, ISSUE 4, April-2015

WIRELESS BODY AREA SENSOR NETWORK FOR SOLDIER SYSTEM.

Miss.Sonal R Barde
Department of E&TC , Siddhant College of Engg, Sudumbare, Pune.
Dr.S.S.Khot
Ph.D (E&TC), Principal of Siddhant College of Engg , Sudumbare, Pune.

ABSTRACT

The development of wireless body area sensor network (WBASN) is offer many promising new application in the area of remote health monitoring. This paper presents a system consisting of a force measuring device for estimation of the force ability of human muscle groups which means (Arm Strength). It comprises at least one (pressing element) strength sensor which works together with a force measuring microcontroller based electronic unit. This unit can accurately measure the force exerted onto strength sensor placed inside the force measuring unit. According to how the equipment is assorted muscle strength of different muscle group can be measured. The measured value are converted to digital form and stored in memory.

Key words — Arm Strength Sensor, Zig-Bee, Communication tools, Real time estimation, wireless body area sensor networks.

1. INTRODUCTION

This article focus on the WBAN to determine the physiological quantities, it is develop a multimodal system to track an individual level of Arm Strength as well as other vital signs simultaneously. We examined here,

• The need for robustness to highly varying operating environments due to subject induced variability such as mobility or sensor placement.
• Balancing the tension between achieving high fidelity data collection and minimizing network energy consumption.
• Accurate physical activity detection using a modest number of sensors.
• Designing WBANs to determine physiological quantities of interest such as energy expenditure.

In this article, Measurement of isometric muscular strength can be used mainly in athletes, but also in military, fitness centers, orthopedic, rehabilitation and other clinical tests. Isometric testing typically involves a specified joint angle or functional position against an unyielding pad or handle connected to force measuring device. In contrast to isometric testing, in isotonic testing strength is measured through a range of motion of a body segment using a yielding, constant velocity device to which a force measuring device is attached. The isometric testing modality has become more popular due to the availability of testing products.

The isometric testing devices usually measure only the maximal force. In the presented device testing was used. It enables storing the measured data and therefore time evaluation of force. However, dynamical measuring of strength is also possible. The combination of hardware and software allows the physician to determine important physical properties of tested person, related to different mode of skeletal muscle load.

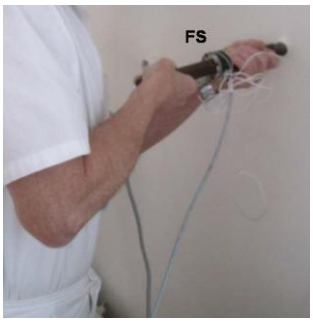
The development of WBANs presents some unique challenges and opportunities due to ongoing design and improvement in sensor technology as well as an evolving set of standards that govern low-power wireless communications. As such, the systems are good at performing simple operations over large-scale data. In contrast, WBANs require complex operations on relatively small-scale data. While our test subjects were open to wearing sensor systems, only a modest amount of hardware was comfortable. The end goal of this research was to field-deploy the WBAN and collect data in free living conditions from targeted individuals selected by our preventive health collaborators.

Second, we used off-the shelf system components to create a functioning WBAN and hence had to make our design work with existing wireless communication proto cols, such as zig-bee, were to be written for multiple sensors access to a computer platform, they should be substantially different from what is currently in place. We came to this conclusion after observing the significant amount of design effort required to accommodate the existing zig-bee Implementation in the computer operating system.

2. SIMPLIFIED MODEL

In our previous works, we proposed a simplified strength model that can estimate the motion in real time. The results of this examination can be used for evaluation of several effects of strength exercises: maximal muscle force, development of local fatigue during different training tasks, effect of long term training on the muscle strength.

Rubber Rope or Rubber Switch Exercises equipped with FS and measuring system is another example of system application. Rubber Switch/Rope better known as exercise bands or resistance bands, are a versatile workout tool. With a little creativity, you can use a rubber switch/rope to replicate almost every free weight or resistance training exercise. Rubber switch/ ropes are portable and light, making them ideal if you are a frequent traveler or prefer to work out at home. They also represent good value compared with more expensive free weights and resistance machines.



3. PROPOSED METHOD

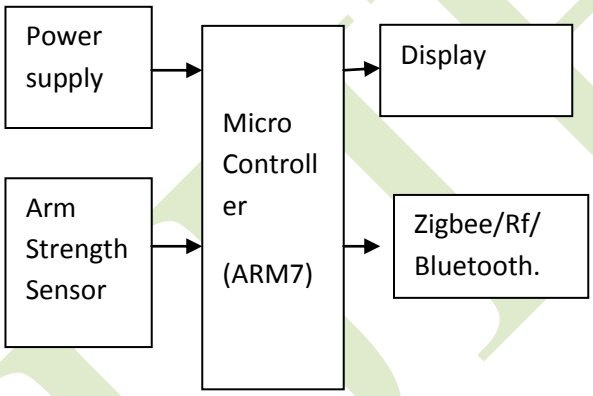
When using a simple arm strength sensor, how we reduce the accuracy arm strength signals as artifacts is a serious problem. In order to address this problem, we apply our arm strength detection method. Accordingly, the timing of arm strength are able to be accurately synchronized since our method works fast. If we can generate the arm strength signal template. This template is used for calculating cross-correlation between the template and real time signals. As a result, arm strength artifact removal is easily possible.

4. EXPERIMENTAL SETUP

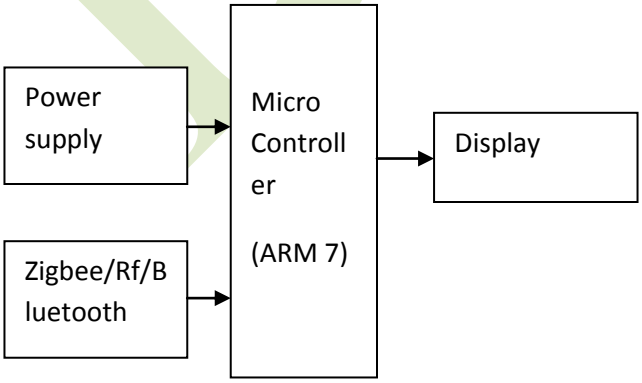
In this experiment, the main equipment used in WBSN is controlled by 89C51 microcontroller with features like 10 KB of RAM, 48 KB of flash memory, 128 bytes of data storage and 8 channels of 12-bit analog to digital converter and is displayed on screen, which is connected to WSN node via Zig-bee. This information collects from the sensors and the same information is sent to display node as well .These measured signals are transmitted wirelessly using an IEEE 802.15.4 complaint RF transceiver ,zig bee , wi-fi or blue tooth as per requirement but we used zig bee. The advantages of Zig Bee are low cost, less delay, low current consumption and capability to support huge number of nodes virtually. Zig Bee is superior technology when compared to Bluetooth and WLAN.

4.1 BLOCK DIAGRAM

4.1.1 Transmitter section



4.1.2 Receiver



5. EXPERIMENTAL RESULTS

In order to show the effectiveness of the proposed method, we conducted the demonstration tests of real-time arm strength. The proposed system is able to accurately express the arm motions although arm strength consist of the rapid motion strength of muscle For comparison, the other recent system with the similar environment works in the reference. Our system has therefore an advantage of working fast over the preexisting system while tracking, the subject was moving the signal detected by arm strength sensor and preceding it and given parametric result to the display unit. Parameters can be estimated by the proposed method. In addition, we believe that there is adequate tracking range for this method to be used as an effective communication tool. Considering the experimental results, we can confirm the effectiveness of the proposed method. The proposed method only requires a monocular system, works in real time, and automatically updates the diffusion parameters in real time. Through our method, it is expected that practical applications such as communication tools for personal use will be realized.

6. CONCLUSIONS

In this paper, we propose a novel method to estimate diffusion parameters within particle filter in order to accurately track the strength state for analysis.

Additionally, the experimental results indicate the existing of the characteristic arm strength signals, the described method allows coaches and physiotherapists to monitor the effect of the training process on the athlete's muscles and appropriately adjust the effort/recreation ratio and recovery procedures. Monitoring an solder's muscle condition is important in order to avoid overtraining and subsequent injuries due to overload (studies have shown that some injuries are related to overtraining). Detecting the over trained condition of skeletal muscles in time is a serious challenge. Registering the muscle's tone and biomechanical properties should certainly be considered. This allows to forming an assessment, as these properties help to describe both the functional condition of the muscle and the condition of blood supply in the muscles. The properties of these muscles also determine the limitations of the solder's movements. The study shown that muscle properties are directly related to solder performance.

Furthermore, through comparison experiments, we show the effectiveness of the incremental approach. The proposed method is therefore effective for practical uses as it will able to be applied to various applications for personal use. In the future, we will endeavor to create some applications. We also believe that the proposed method will be useful in a wide range of applications and environments.

7. REFERANCE

[1] S. Su, L. Wang, B. Celler, A. Savkin and. Y. Guo, *" Modeling and control for heart rate regulation during treadmill exercise,"* Proc. 28th Annu. Int. Conf. IEEE Engineering in Medicine and Biology Society (EMBS), New York, Sep. 2006, pp. 4299–4302.

[2] M. Kobusch, Th. Bruns, *"The New Impact Force Machine at PTB"*, Proceedings of the XVII IMEKO World Congress,
June 22-27, 2003, Dubrovnik, Croatia, pp. 263-267.

[3] Th. Bruns, M. Kobusch, *"Impulse Force Calibration: Design and Simulation of a New Calibration Device"*, Proceedings of the 17th International Conference on Force, Mass, Torque and Pressure Measurements, IMEKO TC3, 17-21 Sept. 2001, Istanbul, Turkey, pp. 85-91.

[4] Th. Bruns, R. Kumme, M. Kobusch, M. Peters, *"From oscillation to impact: the design of a new force calibration device at PTB"*, Measurement, 32, pp. 85-92, 2002.

[5] M. De Amorim Aquino, L. E. Leme, *"Isokinetic dynamometry in elderly women undergoing total knee arthroplasty: a comparative study,"* Clinics. 2006;61:215–22. [PubMed], 2006.

[6] N. A. Carvalho, S. T. Bittar, F. R. Pinto, M. Ferreira, R. R. Sitta, *"Manual for guided home exercises for osteoarthritis of the knee,"* Clinics. 2010;65:775–80. [PMC free article] [PubMed], 2010.

[7] S. Demura, K. Miyaguchi, H. Aoki, *"The difference in output properties between dominant and non dominant limbs as Measured by various muscle function tests,"* J Strength Cond Res. 2010;24:2816–20. 10.1519/JSC.0b013e3181e38293 [PubMed], 2010.

[8] S. I. Rabin, M. Post,"*A comparative study of clinical muscle testing and Cybex evaluation after shoulder operations,"* Clin Orthop Rel Res. 1990;258:147–156, 1990.

[9] A. Hsu, P. Tang, M. Jan, *"Test-retest reability of is kinetic muscle strength of the lower extremities in patients with stroke and traumatic brain injury,"* Arch Phys Med Rehabil. 2000;83:483–90, 2000.

[10] C. J. Standaert, S. A. Herring, *"Expert opinion and controversies in musculoskeletal and sports medicine: stingers,"* Arch Phys Med Rehabil.2009;90:40210.1016/j.apmr.2008.09.569 [PubMed], 2008.

[11] J. J. Nicholas, L. R. Robinson, A. Logan, R. Robertson, *"Isokinetic testing in young nonathletic able-bodied subjects,"* Arch Phys Med Rehabil. 1989;70:210–3. 10.1016/0003-9993(89)90033-6 [PubMed] , 1989.

[12] C. P. van Wilgen, L. Akkerman, J. Wieringa, P. U. Dijkstra .*Muscle strength in patients with chronic pain*. Clin Rehabil. 2003;17:885–910.1191/0269215503cr693oa [PubMed],2003.