

App Inventor Interfaced Massage Seat

Hasbi Apaydın^{a*}, Şükrü Kitiş^b

^{a,b}*Simav Vocational School, Dumlupınar University, Simav, Kütahya, Turkey*

^a*Email: hasbi.apaydin@dpu.edu.tr*

^b*Email: sukru.kitis@dpu.edu.tr*

Abstract

Massage has gotten a foothold to itself in the medicine literature as a supplementary treatment. Especially, it is a method to be used for physical therapy often. Massage is an important factor for alternative medicine. We encounter with massage seat in coach stations, airports, rest areas, and many other places. In this study, a cushion existing in market was procured and the control mechanism was changed. The control of massage cushion can be provided in different ways with the interface program created for android based cell phone. The control of vibration motors in the area of neck, back, waist and limb are wirelessly ensured with the interface.

Keywords: Massage; Massage cushion; Google app inventor; Arduino.

1. Introduction

Massage is the stimulation of soft tissue of body manually or mechanically. Peripheral receptors in skin are stimulated and stimulation reach to brain via spinal cord way. The effect of massage shows itself as speedup blood and lymph circulation, relaxation in muscles, and dilatation in arterioles. Massage is used as supplementary to treat many diseases. It helps to treat lymph edema creating after lymph node dissection, isometric, insomnia, anxiety, and depression in cancer patients [1-6].

Low back pain is a situation that four of every five-person face with it at least one time in their lives nowadays and that causes function loses in serious cases. Pains become chronic in 12,5% of acute low back pains, which are not treated. Pains become chronic in 12.5 % of untreated low back pains [7-11]. Massage is the one of the suggested method to treat back and waist pains.

* Corresponding author.

Back and waist massages are more helpful if physiotherapists apply them, however; patients can apply massages by their self with semi-professional massage devices instead of going to physiotherapists for every pain. One of the method for patients to treat pain is massage seats, too. Massage seats come to a state of confronting us in rest areas, airports and many other places. In this study, a massage seat controlled by android-based application and providing massage and heat to four areas as back, waist, neck and limb was designed. 7 motors were controlled by only one designed driver card. Arduino card and bluetooth module was used to work system as android-based. The interface was created by preferring Google APP inventor application for interface design in order to choose area, control heat and speed from cell phone.

2. Materials and Methods

The massage cushion that has vibrations motors in the area of neck, waist, back, and limb, 1, 2, 2, 2, respectively, was used in this study as seen in figure 3. Control mechanism of this cushion was removed, and it was redesigned to control from cell phone. Control card section is showed in figure 2. HC05 Bluetooth-serial module was used to provide wireless connection in control card and massage cushion. An interface as showed in figure 1 was carried out for usage convenience with Google App Inventor application. Arduino uno microcontroller was preferred as seen in figure 4 and cycle was designed as suitable to this.

2.1. Google App Inventor Application

With Google App Inventor application, start, connect, stop slow, heater, fast buttons and buttons for area of neck, shoulder, waist and limb in simulated human body were placed, and the interface design was performed in the way that the information from cell phone to control card about what the process of massage seat will be transferred according to clicked button. This application was preferred for the reason that it enables to develop Android applications simply and fast without needing code information and to use toolbox such as button, textbox, label easily [12].

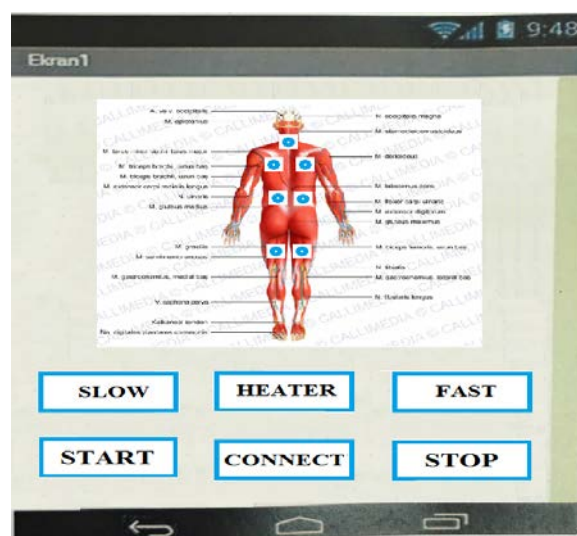


Figure 1: Google App Inventor Interface [15*Picture]

2.2. Control Card

Vibrations engines in the area of neck, waist, back, and limb, 1, 2, 2, 2, respectively works with 12 V D.C. with designed the driver card and the interface, engines in three areas can be operated separately, together, fast or slowly, and the massage seat can be heated. It was thought that designed system communicates by Bluetooth with the interface in cell phone, and HC05 Bluetooth serial module was used for that. This module was designed for the use of Bluetooth SSP and applications of wireless communication.

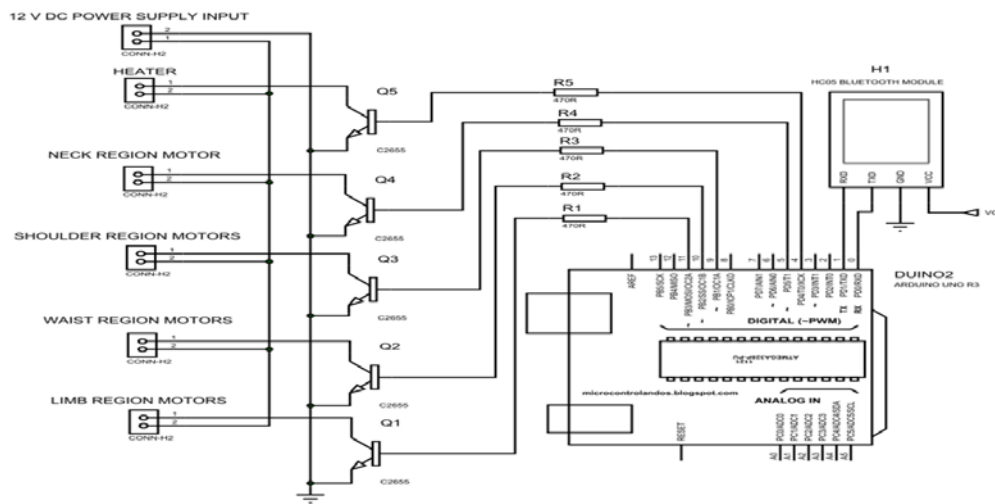


Figure 2: Control Card

Reasons for using this module are to have 2,4 GHz communication frequency, to enable authentication and encrypting properties, and to have 3,3 V D.C. working voltage, 50 mA working current and the sizes of 26,9*13,2*2,2 mm [13].

Arduino Uno was chosen as control card processor. Arduino Uno has 5 V D.C. working voltage, EEPROM, SRAM properties, PWM pins with digital and analogue pins, and 65*50*1,5 mm sizes. These are the reason to be preferred this control card processor [14].



Figure 3: Massage Cushion

3. Conclusion

The use of smart phones becomes widespread in our country and developing countries. Control of devices used in our daily lives can be provided easily by taking advantage of hardware and software properties of smart phones. In this work, the control of a massage seat based on this technological progress was performed by software created as android based from Bluetooth connection of a smart phone. Users using the software put into use or remove the function of massage seat by the program installed to their phones in such a way that they specify. The required motors which are located in 4 different zones and heaters can be operated with designed this massage seat at GSM. There is not such control system at used systems in the currently. There are different programs at used massage seats now. These programs are choose and massage seat is begin to start and all motors are working but our system is working with GSM at desired areas which are neck, waist, back and limb and desired times. Google app inventor is very easy program and all of people are download to their GSM. So that all of them controlled to the massage seat.

4. Recommendations

This system can create other operation systems for GSM. This massage seat is suggestable to the constantly working on the armchair, long-distance voyaging bus and plane, light physical therapy for waist and back pain.

Acknowledgments

This study was not funded by anyone. Author Şükrü Kitiş and Hasbi Apaydın ara lecturer at Simav Vocational School/Dumlupınar University. Author Şükrü Kitiş and Hasbi Apaydın declares no conflict of interest. All individual participants included in the study.

References

- [1] Nazlıkul H, Eraltan “Tamamlayıcı Tıp.” Nobel Tıp Kitabevleri, 4-51, 62-67. EH (2002).
- [2] Yıldırım YY, Fadiloğlu Ç, Uyar M (2006). “Palyatif kanser bakımında tamamlayıcı tedaviler.” Ağrı,18 (1): 26-32.
- [3] Aslan FE (Editör), Yavuz M “Ağrıda Kullanılan Nonfarmakolojik Yöntemler.” “Ağrı Doğası ve Kontrolü.” İstanbul: Mart Matbaacılık, 135-147. (2006).
- [4] Cassileth RA, Deng G, Vickers A, Yeung KS, Chwistek M, Garrity D, Gubili J, Vroom P (2007). “PDQ Onkoloji Kanserinde TamamlayıcıTıp.” İstanbul: İstanbul Medikal Yayıncılık. (Çeviri Ed: E. Topuz).
- [5] Karaman N (2008). “Cerrahi girişim uygulanan adölesanlar ile anne/babalarının anksiyete düzeyleri arasındaki ilişki ve anksiyete nedenlerinin incelenmesi.” Hemşirelik EsaslarıAD Yüksek Lisans Tezi, İstanbul Üniversitesi Sağlık Bilimleri Enstitüsü. İstanbul. Karaman 2008.
- [6] Nuray Turan , Aylin Öztürk, Nurten Kaya. “Hemşirelikte Yeni Bir Sorumluluk Alanı: Tamamlayıcı

Terapi” Maltepe Üniversitesi Hemşirelik Bilim ve Sanatı Dergisi, Cilt:3,Sayı:1.2010

- [7] O’Sullivan PB. “Lumbar segmental 'instability': clinical presentation and specific stabilizing exercise management.” *Man Ther.* 200;5:2-12
- [8] Van Tulner M, Koes B, Bombardier C. “Low back pain.” *Best Pract Res Clin Rheumatol.* 2002;16:761-775
- [9] Arokoski JP, Valta T, Airaksinen O, et al. “Back and abdominal muscle function during stabilization exercises.” *Arch Phys Med Rehabil.* 2001;82:1089-1098
- [10] Demoulin C, DÍstree V, Tomaselle M, et all. “Lumbar functional instability:a critical appraisal of the literatüre.” *Ann Readapt Med Phys.* 2007;50:677-684
- [11] Gürsoy Coşkun, Filiz Can “Kronik bel ağrısında dinamik ve statik stabilizasyon egzersizlerinin ağrı ve fonksiyonel düzeye etkileri.” *Fizyoterapi Rehabilitasyon.* 2012;23(2):65-72
- [12] Web site: <http://appinventor.mit.edu/explore/get-started.html>, last date accessed 1\11\2016.
- [13] Web site: http://www.wavesen.com/mysys/db_picture/news3/2015121885021101.pdf, last date accessed 1\11\2016.
- [14] Web site: <https://www.arduino.cc/>, last date accessed 1\11\2016.
- [15] Web site: <http://www.natomimages.com/tr/sinir-sistemi/506-butun-vucut-arkadan-gorunum-kaslar-damarlar-ve-yuzeyssel-sinirler.html>, last date accessed 1\11\2016.