الآية

بسم الله الرحمن الرحيم

قال تعالى :

"اللَّهُ الَّذِي خَلَقَكُمْ مِنْ ضَعْفٍ ثُمَّ جَعَلَ مِنْ بَعْدِ ضَعْفٍ قُوَّةً ثُمَّ جَعَلَ مِنْ بَعْدِ قُوَّةٍ ضَعْفًا وَشَيْبَةً يَخْلُقُ مَا يَشَاءُ وَهُوَ الْعَلِيمُ الْقَدِيرُ (54)"

سورة الروم الاية (54)

Dedication

As well as everything that we do, we would be honored to dedicate this work to our parents for their emotional and financial support, our brother, our sisters and our friends specially our friends USM whose affection and encouragement make us able to get such success and honor.

This project would have never been possible without their support and love.

ACKNOWLEDGEMENT

First and foremost we thank fully our god (Allah) who bestowed his blessings upon us. We would like to express our sincere gratitude to our advisor **Ust.Galal Abdalrahman Mohammed** for his directions, excellent guidance and support to complete the work in his fair way.

Lastly we need to thank our teachers in electrical and nuclear engineering school for their support.

Abstract

Communication disorders are more common in elderly people and paralyzed because they are more likely to suffer from health conditions that can affect hearing, speech and comprehension. It will be hard for medical staff or the person in charge to understand what they want to convey and in helping them to manage their daily needs such as eating, drinking, bathing and etc.

So we planning to develop a virtual assistant that neatly fits around arm in the form of a band, which takes care of this time consuming job leaving with who is care about ones in safe hands!

The system makes use of a microcontroller based circuitry to achieve this functionality. It makes use of a hand motion recognition circuit and a receiver plus transmitter circuit. The hand motion circuit is used to detect hand movements using accelerometer+gyro and then transmit this information over GSM .

Therefore, this project provides a low cost solution that eliminates the communication barriers and provides an efficient way of communication between elderly/paralyzed people and co-patient/ doctors.

مُستخلص

تعد اضطرابات التواصل أكثر شيوعًا عند المسنين والمصابين بالشلل لأنهم أكثر عرضة للإصابة بحالات مرضية يمكن أن تؤثر على السمع والكلام والفهم، حيث سيكون من الصعب على الطاقم الطبي أو الشخص المسؤول فهم ما يريدون نقله ومساعدتهم على إدارة احتياجاتهم اليومية مثل الأكل والشرب والاستحمام وما إلى ذلك .

لذلك تم التخطيط لتطوير مساعد افتراضي يتناسب بشكل أنيق ومريح حول الذراع ، والذي يعتني بهذه الوظيفة التي تستغرق وقتًا طويلاً ويترك مع من يهتم في أيد أمينة .

يستفيد النظام من دارة تعتمد على متحكم دقيق لتحقيق هذه الوظيفة، يستخدم دائرة التعرف على حركة اليد وجهاز الاستقبال بالإضافة إلى دائرة الإرسال. تُستخدم دائرة حركة اليد للكشف عن حركات اليد باستخدام مقياس التسارع + الجيروسكوب ثم نقل هذه المعلومات عبر GSM.

بذلك فإن هذا المشروع يقدم حل منخفض التكلفة يلغي حواجز التواصل بين المصابين بالشلل/المسنين والمرافقين والاطباء ويزيد من كفاءة التواصل .

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LIST OF ABBREVIATIONS

LCD	Liquid Crystal Display
LED	Light Emitting Diode
MC	Microcontroller
HAR	Human Activity Recognition
ALS	Amyotrophic Lateral Sclerosis
SoC	System on a Chip
RAM	Random Access Memory
ROM	Read Only Memory
OTP	One Time Programmable
CPU	Central processing unit
RISC	Reduced Instruction Set Computer
CISC	Complex Instruction Set Computer
IDE	Integrated Development Environment
GSM	Global System for Mobile communication
PCB	Printed Circuit Board
RS	Register Selector
PC	Personal Computer
TTL	Transistor – Transistor Logic
ISDN	Integrated Services Digital Network
FDN	Fixed Dialling Number
SMS	Short Message Service
SIMCom	Simulation Communication
USB	Universal Serial Bus
RX	Receiver
TX	Transmitter
PWM	Pulse Width Modulation

SPI	Serial Peripheral Interface
SS	Slave Select
MISO	Master In Slave Out
SCK	Serial Clock
AREF	Analog reference
TWI	Two wire interface
SDA	data line
SCL	clock line
MEMS	Micro Electro-Mechanical System
DMP	Digital Motion Processor
VCC	Voltage Common Collector
GND	Ground
INT	Interrupt Digital output
RW	Read/Write
E	Enable
EDA	Electronic Design Automation
ISIS	Intelligent Sensing for Innovative Structures
VSM	Virtual System Modelling