



POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

**FINAL YEAR PROJECT REPORT
AN ATTRACTIVE EXCHANGEABLE FOOD FEEDER FOR
PARKINSON'S**

SUPERVISOR NAME: DR. BAHARUDDIN BIN MUSTAPHA

NAME	MATRICES NUMBER
NUR SURAYA BINTI KAMALUDDIN	08DEU17F2004
RABIATUL ADAWIYAH BINTI AYOB	08DEU17F2017

ABSTRACT

Essential disorders (ETs) are neural disorders characterized by uncontrollable tremors or “tremors,” in different parts of the body. Important vibrations are characterized by rhythmic vibrations that occur during voluntary movements or while maintaining a position on gravity. The affected areas usually include the hands, arms, heads, larynx (voice box), tongue, and chin. Then, the lower body is rarely affected. Most people with significant tremors experience both postural and functional tremors and then they can live a normal life with these conditions although they may find daily activities such as eating, dressing, or writing difficult. Moreover, they have two types of tremors. Firstly, behavioural disorders which is voluntary movements such as lifting a cup to one`s mouth. Secondly, postural tremors which is voluntarily occupy positions of gravity such as reaching or extending arms. The main objective of this project is to design a tool for patients with severe disabilities who can undo the tremors produced at hand with the highest efficiency percentage and are ergonomically design for easy use. Then, we aim of this project to focus on the design of smart devices that can detect vibrations automatically by differentiating frequency at normal and vibrating levels to achieve neutralizing effects in the shortest possible time, such as spoon, fork and small and they can be washable after used.

Keywords: Essential Tremor, assistive device, action tremor, postural tremor.

CHAPTER 1

1.1 INTRODUCTION

Parkinson's Disease is one of the most common neurological disorder and has influenced individuals in different age groups. It is the second most common neurodegenerative disorder in the world after Alzheimer. According to Dexter and Jenner (2013) 2% of the world population, over 60 years old, lives with PD . It is a progressive disorder that is caused by degeneration of nerve cells in the part of the brain called the substantia nigra, which controls the movement. These nerve cells die or become impaired, losing the ability to produce an important chemical called dopamine. Without enough dopamine, this balance is disrupted, resulting in tremor (trembling in the hands, arms, legs and jaw); rigidity (stiffness of the limbs); slowness of movement; and impaired balance and coordination. Studies have shown that symptoms of Parkinson's Disease develop in patients with an 80 percent or greater loss of dopamine-producing cells in the substantia nigra.

PD is a chronic, degenerative neurological disorder that affects one in 100 people over age of 60 years. While the average age at onset is 60 years, people have been diagnosed as young as 18 years. Estimates of the number of people living with the disease therefore vary. The cause of Parkinson's essentially remains unknown. However, theories involving oxidative damage, environmental toxins, genetic factors and accelerated aging have been discussed as potential causes for the disease.

1.2 PROBLEM STATEMENT

Most people are able to live normal life with this condition. Although essential tremor usually occurs with movements, thus the people affected with attractive exchangeable spoon for Parkinson's face difficulties while doing everyday activities like eating, drinking or writing.

Some common problems that old age people face are:

- Intractable tremors that onsets during eating.
- Hand shivering during writing.
- Difficulty in balancing when grasping or holding something

1.3 OBJECTIVE

- ✓ Develop to special case which is parkinson's diseases
- ✓ To provide comfort while using it
- ✓ To introduce an Affordable, low cost, user friendly and easy to holder
- ✓ To help them to eat without relying any outside
- ✓ To sufferer while eating which help to control the tremor violated

1.4 SCOPE OF PROJECT

- ✓ Assistive device for older age people who has Parkinson disease.

1.5 IMPORTANT OF RESEARCH

- ✓ It's built around an Arduino and an MPU6050 inertial measurement unit with two generic serve motors.
- ✓ Usually this comes up around prosthetics, but can also help out by making biological compounds like insulin directly for less than a medical company can provide it.

CHAPTER 2

LITERATURE REVIEW

This chapter extends the literature reviews that cater the information in accordance with the objectives of this project. The relevant information and other extra features were gathered in the following paragraphs. Unlike most other tremors, parkinsonian tremor is a resting tremor that can affect any part of the body, including the fingers, hands, jaw, and feet. As defined above, resting tremors primarily affect an individual's appendages when they are at rest. However, Parkinsonian tremor is also very apparent in isometric and task specific situations as well. This makes common tasks like eating soup with a spoon particularly difficult because parkinsonian tremor inhibits the body's ability to make the smooth and precise motions necessary to keep the spoon steady and level. Parkinsonian tremor is also an asymmetric condition, meaning that both sides of the body are independent of the other's condition. Although once one side is affected, it will always remain the more affected side (APDA). Parkinsonian tremor is a very common side effect of the well-known Parkinson's disease. Parkinson's disease is a degenerative nervous system disorder that affects the movements of the body. Parkinson's is most commonly caused by failed nerve cells within the brain, various genetic mutations that can increase the risk of Parkinson's, or to environmental contaminants, such as exposure to damaging toxins, that can trigger its presence. Along with tremors, Parkinson's disease can also cause slowed movement, rigid posture, impaired balance, and speech impediments (Mayo, 2018).

PARKINSON TREMORS MEDICATION

Unlike Essential Tremor, Parkinson's Disease does have several medications that are made to directly treat the underlying disease. One of the most popular prescriptions is Levodopa, which has been in use for over 40 years. Levodopa works by entering the brain and turning into dopamine. Parkinson's Disease creates a deficiency of dopamine in the brain, and this lack of dopamine is what causes the tremors to occur. By feeding Levodopa as a supplemental source of dopamine, the tremors are then reduced. It is considered to be largely effective, especially when dopa-decarboxylase inhibitors (DDCI) are taken in conjunction with it. DDCI drugs, such as Cardidopa, slow Levodopa's peripheral conversion to dopamine, which reduces side effects and increases its half-life, allowing it to be more effective for longer periods of time (Salat, 2013). The treatment is considered to be one of the most effective forms of treatment, however it is not without side effects. These include: somnolence (intense drowsiness), mood changes, nausea, hypotension, vomiting, and in rare cases worsening in their condition and depression (Salat, 2013). Long term Levodopa treatment has been shown to potentially lead to motor complications and dyskinesia. Despite these side effects, its effectiveness in reducing symptoms makes it a preferable option. This may especially appeal to young patients as they typically want to remain employable and physically active for as long as possible (Salat, 2013).

CHAPTER 3

METHODOLOGY

SG90 MICRO-SERVO MOTOR



Figure 3.1

The SG90 micro servo motor. In the background is a rotary angle sensor module and a potentiometer. The SG90 is such a servo motor that can rotate approximately 180°.

INERTIAL MEASUREMENT UNIT (IMU) (6 DEG OF FREEDOM) MPU6050



Figure 3.2

An inertial measurement unit (IMU) is an electronic device that measures and reports a body's specific force, angular rate, and sometimes the orientation of the body, using a combination of accelerometers, gyroscopes, and sometimes magnetometers. The MPU6050, a 6-D Motion Variant, is designed to provide six dimensional motion sensing from a single device over six degrees of freedom by sensing translational movement in three perpendicular axes (surge, heave, sway) and rotational movement about three perpendicular axes (roll, pitch, yaw).

ARDUINO NANO

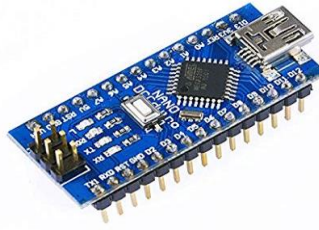
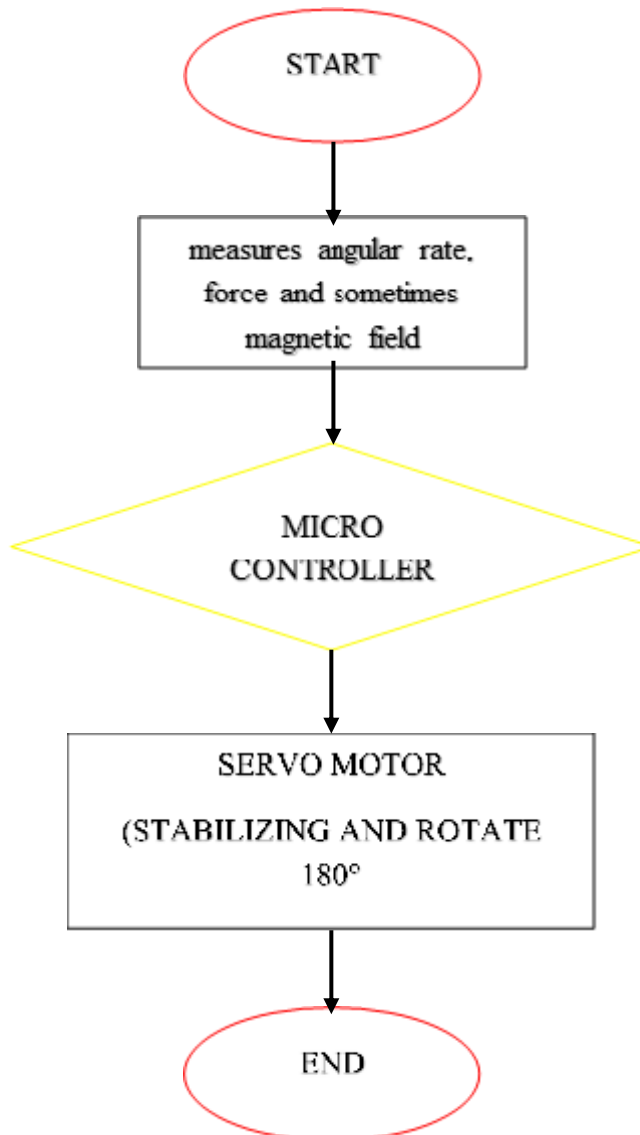


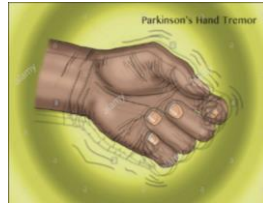
Figure 3.3

Arduino Nano is a small, compatible, flexible and breadboard friendly Microcontroller board, developed by **Arduino.cc** in Italy, based on ATmega328p (Arduino **Nano** V3.x) / Atmega168 (Arduino **Nano** V3.x). It comes with exactly the same functionality as in **Arduino UNO** but quite in small size.

FLOWCHART



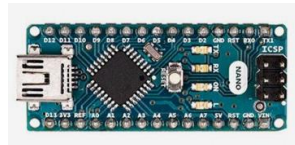
BLOCK DIAGRAM



HAND SHAKING



SENSOR MOVEMENT



ARDUINO NANO



SERVO MOTOR STABILIZING



EATING WELL

Figure 3.4

- Sensor will help to detected any movement (hand shaking) by six-axis which is accelerometer value and gyroscope value.
- The input that get from sensory will transfer in Arduino Nano for run the programs which is can make any programme inside their app.
- Servo motor as output which is make rotation for stabilizing the food.

SCHEMATIC DIAGRAM

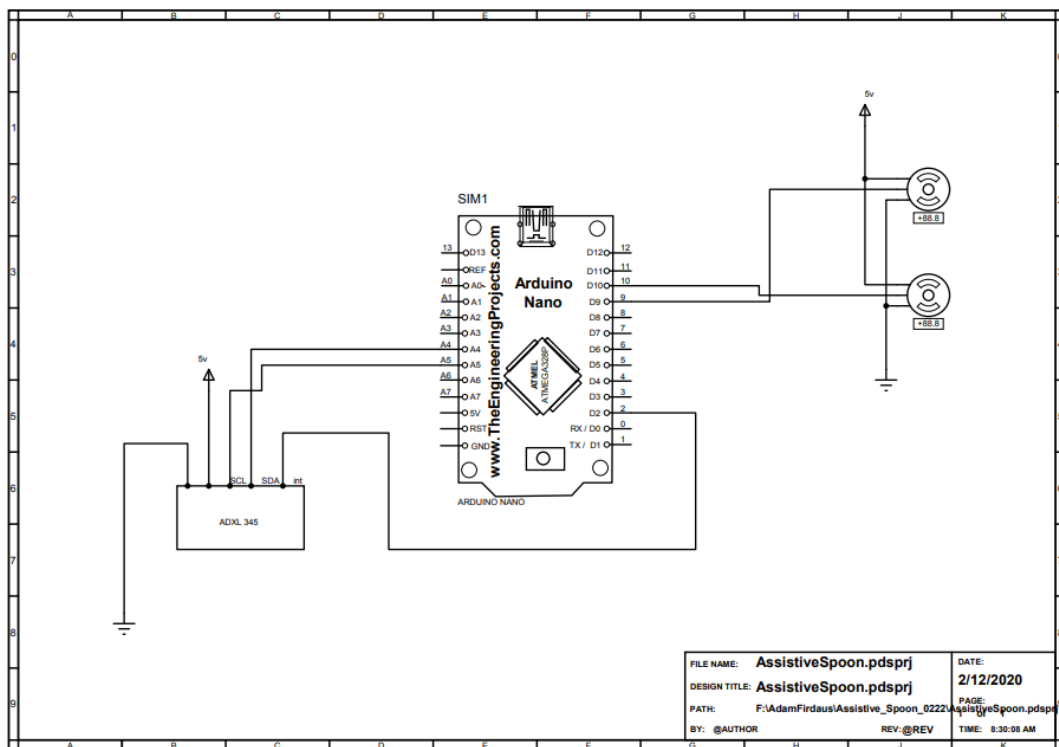


Figure 3.5

CHAPTER 4

DATA ANALYSIS AND RESULT

This is some survey that we ask from the people and their respond prove that an attractive exchangeable food feeder need to Parkinson's patient.

Now days ,Parkinson's patient have difficult during eating and also doing their daily routine .This is because uncontrollable shaking hand of their hand.So the aim of our project is to design a 'spoon' that suffering Parkinson's patient to eat easily and also give self confident to Parkinson's patient while their eating.

DATA ANALYSIS

QUESTION 1 : PERSONAL INFO

PERSONAL INFO *

Short answer text

PERSONAL INFO *

Student

public

WHAT IS YOUR AGE ? *

18 - 27

28 - 37

38 - 47

48 - 57

QUESTION 2 : ABOUT KNOWLADGE OF PARKINSON

DO YOU KNOW ABOUT PARKINSON'S DISEASE ?

- Yes
- No
- Maybe

QUESTION 3: ASK DID ONE OF YOUR FAMILY MEMBERS SUFFER FROM PARKINSON'S DISEASE

DID ONE OF YOUR FAMILY MEMBER SUFFER FROM PARKINSON'S DISEASE ?

- Yes
- Option 2

QUESTION 4 : ASK THEM ABOUT SUITABLE OF SPOON FOR USER

ARE YOU SURE THAT OUR SPOON IS SUITABLE FOR THE PARKINSON'S PATIENT TO USE ?

- YES
- No

QUESTION 5 : ASK PEOPLE VIEW ABOUT HARD FOR PARKINSON PTIENT TO EAT

DO YOU THINK IT'S HARD FOR PARKINSON'S PATIENT TO EAT WITH HAND SHAKING ?

- Yes
- No

QUESTION 6 : ASK ABOUT HELPFULLY OUR PROJECT TO PARKINSON PATIENT

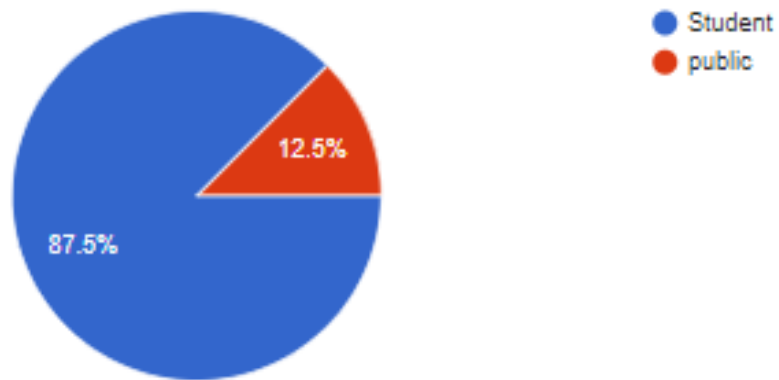
DID YOU THINK THIS SPOON IS VERY HELPFULLY FOR PARKINSON'S PATIENT ?

- Yes
- No

RESULT:

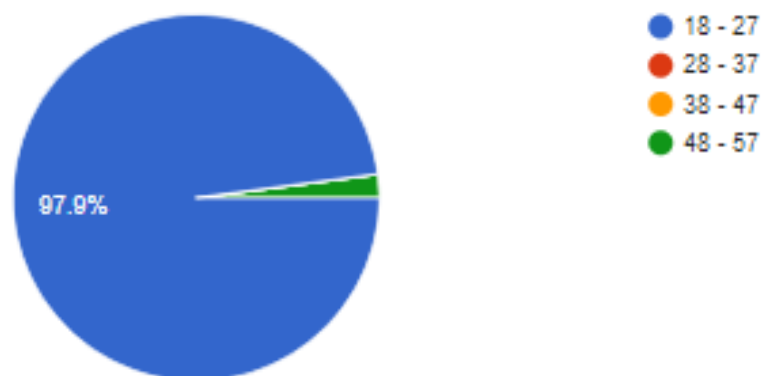
PERSONAL INFO

48 responses



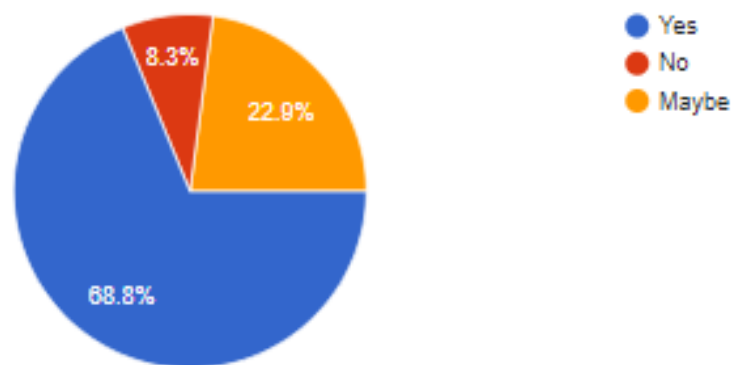
WHAT IS YOUR AGE ?

48 responses



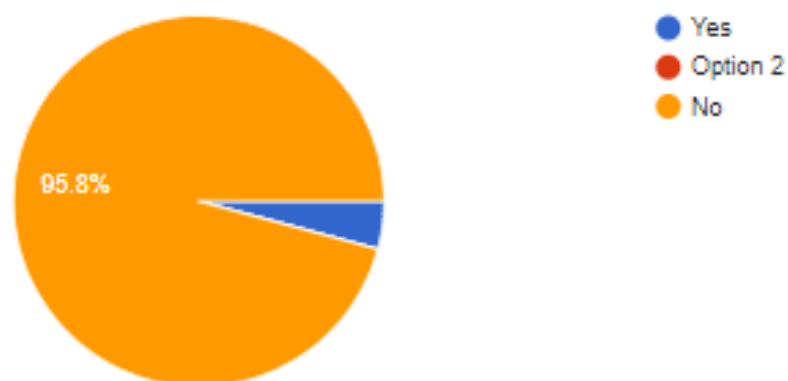
DO YOU KNOW ABOUT PARKINSON'S DISEASE ?

48 responses



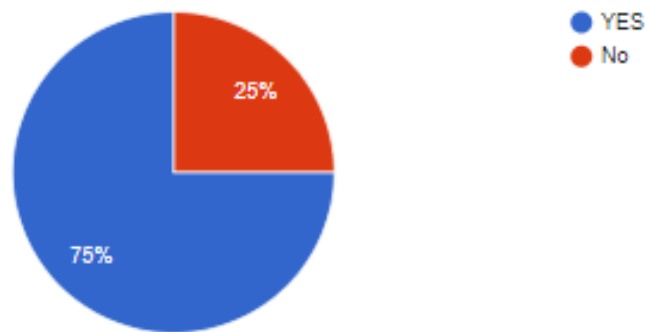
DID ONE OF YOUR FAMILY MEMBER SUFFER FROM PARKINSON'S DISEASE ?

48 responses



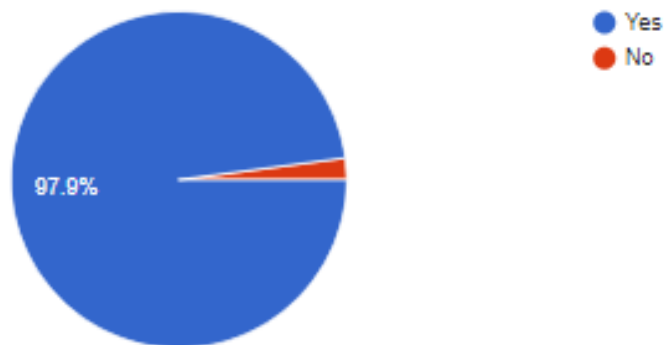
ARE YOU SURE THAT OUR SPOON IS SUITABLE FOR THE PARKINSON'S PATIENT TO USE ?

48 responses



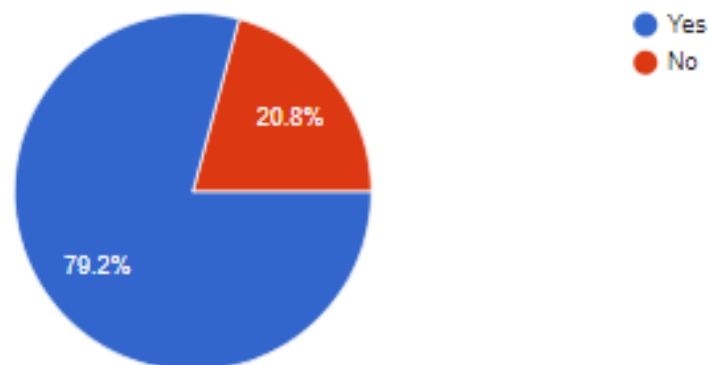
DO YOU THINK IT'S HARD FOR PARKINSON'S PATIENT TO EAT WITH HAND SHAKING ?

48 responses



DID YOU THINK THIS SPOON IS VERY HELPFULLY FOR PARKINSON'S PATIENT ?

48 responses



From This Result, We Can Observe That How Difficult Parkinson's Patient To Eat During Meal Time. That Show 79.2% The Spoon Very Helpfully for Parkinson's Patient to Enjoy Their

CHAPTER 5

CONCLUSION

In conclusion, we purposed to develop a hardware and software of attractive exchangeable food feeder for parkinson`s. This product can perceive the tremor produced in the hands of older people based on the design of an intelligent sensor. Secondly, the device would recognize automatically by differentiating the frequency at normal stage and at the shaking stage. Thirdly, the device should be easy to carry and ergonomically designed to provide comfort while using it and then the device also easy being used to operate and handle. At the end, we able to create the product which is help solve the problems faced by people with parkinson`s disease.

REFERENCES

1. <https://create.arduino.cc/projecthub/RupinC/assistive-spoon-for-patients-with-parkinson-s-3628b6>
2. <https://pdfs.semanticscholar.org/d60b/0a68d98915eb455ff388948cae29129a809d.pdf>
3. <https://hackaday.com/2019/01/09/adaptive-spoon-helps-those-with-parkinsons/>
4. <https://www.rsisinternational.org/journals/ijrsi/digital-library/volume-5-issue-5/27-28.pdf?x49905>
5. <https://www.theatlantic.com/technology/archive/2013/09/a-spoon-for-people-with-parkinsons/279984/>
6. file:///C:/Users/HP/Downloads/feeding%20device.pdf
7. file:///C:/Users/HP/Downloads/assistive%20spoon%20for%20parkinson.pdf
8. file:///C:/Users/HP/Downloads/second%20design%20for%20assistive%20spoon%20(2).pdf
9. <https://www.hackster.io/RupinC/assistive-spoon-for-patients-with-parkinson-s-3628b6>