PARKINSONS GLOVE WITH NON- INVASIVE BLOOD GLUCOSE

Computer & Network Connections Project

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THE PROJECT



OVER VIEW

▶ Parkinson's disease attacks brain cells that make dopamine, a chemical that is key to nerve communication for functions like movement, mood, and behavior. With the onset of Parkinson's Disease, neurons begin abnormally firing together, creating unwanted movement patterns like tremors, rigidity, or difficulty initiating movement

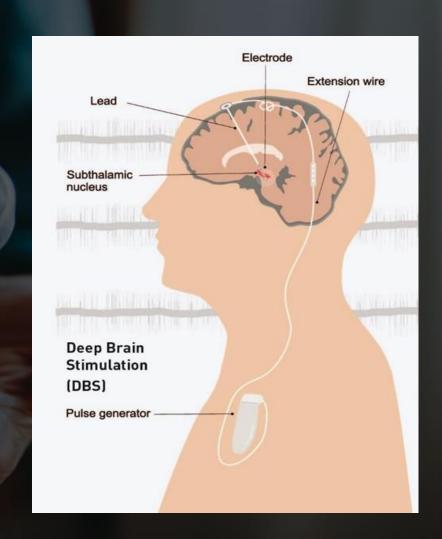
CAUSES OF PARKINSON'S DISEASE

Normally these nerve cells or neurons produce an important brain chemical known as dopamine. Scientists still do not know what causes the neurons to die. The most prominent signs and symptoms of Parkinson's disease occur when nerve cells in the basal ganglia, an area of the brain that controls movement, become impaired and/or die

EXPLANATORY VIDEO

TREATMENTS FOR PARKINSON'S DISEASE

- ► Medicines for Parkinson's disease
- ► Levodopa
- ► Drugs
- ▶ Deep brain stimulation
- ▶ Vibration



THE WORK PRINCIPLE OF GLOVES

The gloves deliver light vibration through the fingertips. this stimulation can 'reset' abnormal electrical activity in the brain, which happens in Parkinson's disease.

reason for applying vibration on fingertips

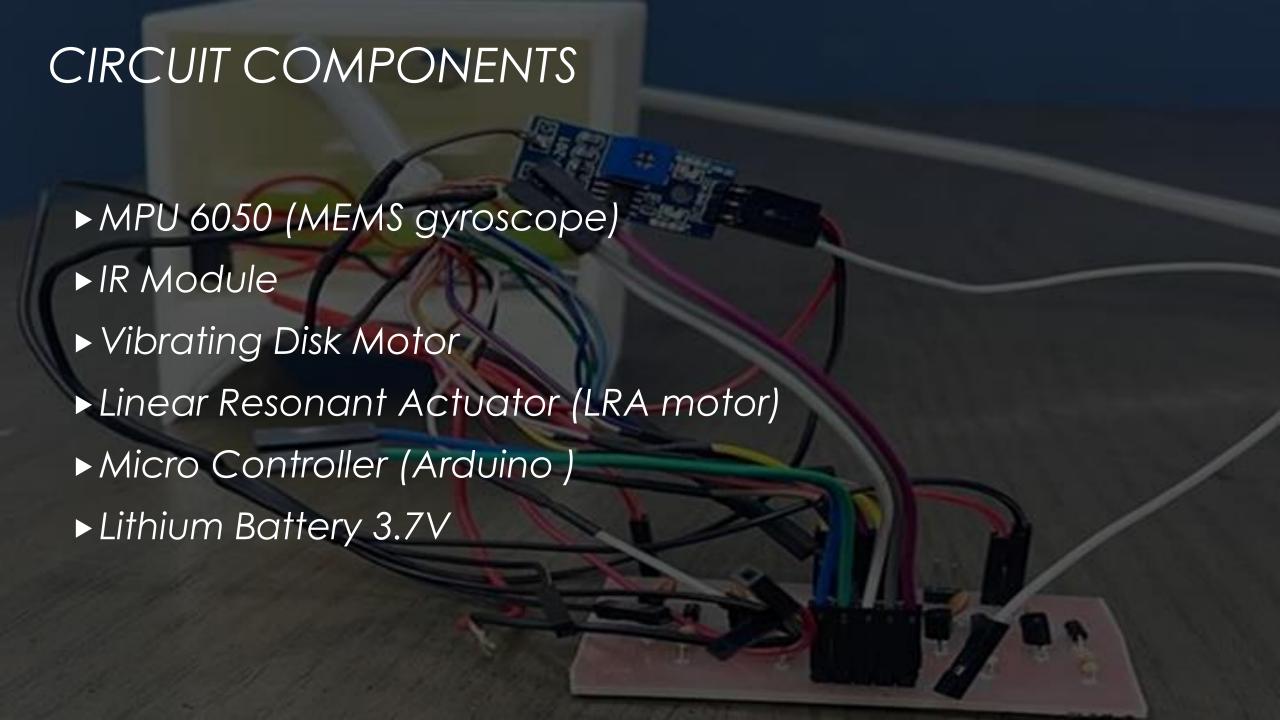
Fingertips have many sensory neurons, which means a large portion of the sensory cortex of the brain is dedicated to receiving signals from them. This is important because a noninvasive therapy must act on a sufficiently large portion of the brain to have similar benefits as deep brain simulation.

The relationship between Parkinson's disease and diabetes

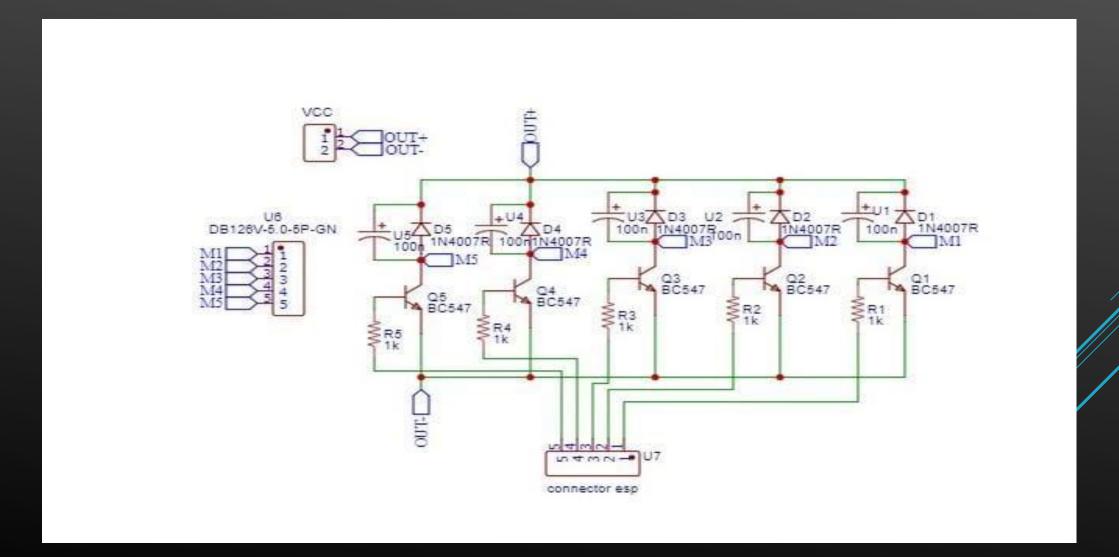
Glucose dysregulation in Parkinson's disease

Blood glucose levels can potentially affect Parkinson's disease (PD) in several ways. Here are a few important points to consider:

- ► Chronic hyperglycemia: Prolonged high blood glucose levels
- ▶ **Glycation:** Elevated blood glucose levels can lead to a process called glycation, where excess sugar molecules attach to proteins and form harmful compounds
- ► Insulin resistance: Insulin is not only responsible for regulating blood sugar levels but is also involved in various brain functions, including dopamine regulation
- ► Hypoglycemia: On the other hand, lower blood glucose levels can also affect Parkinson's disease can sometimes cause blood glucose levels to drop. That worsen the motor and non-motor symptoms



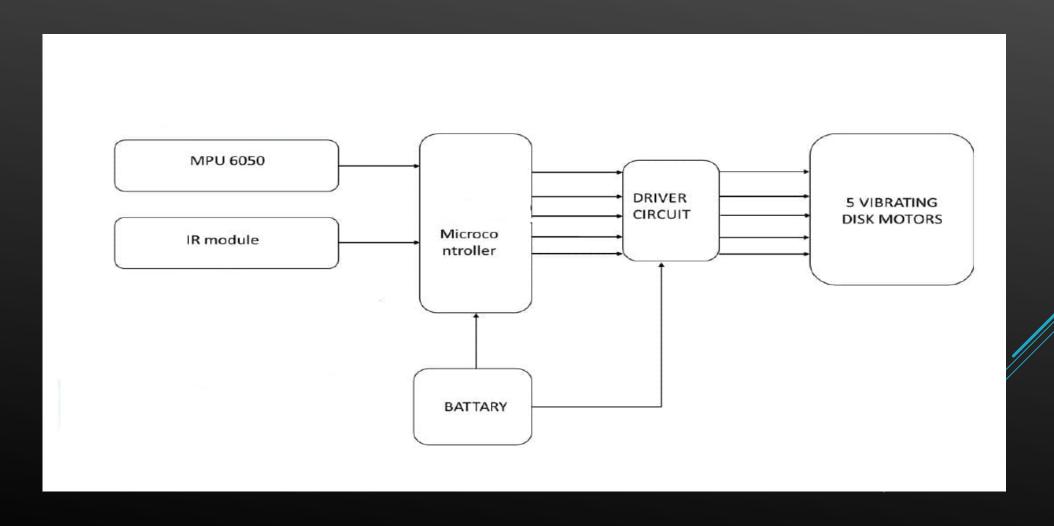
DRIVER CIRCUIT



DRIVER CIRCUIT



BLOCK DIAGRAM



SOFTWERA CODE

```
#include <Wire.h>
#include <Adafruit_MotorShield.h>
#include <math.h>
float frequency, level;
int ir_value = 0;
int temp = 0;
const int ir_sen = A0; // Replace A0 with the
  actual pin number for the infrared sensor
const int MPU6050_ADDR = 0x68; // Replace with
  the actual I2C address of your MPU6050 sensor
```

```
Adafruit MotorShield AFMS =
Adafruit MotorShield();
Adafruit_DCMotor *motor1 =
AFMS.getMotor(1);
Adafruit_DCMotor *motor2 =
AFMS.getMotor(2);
Adafruit_DCMotor *motor3 =
AFMS.getMotor(3);
Adafruit_DCMotor *motor4 =
AFMS.getMotor(4);
const int f_1 = 3; // Replace with the actual
pin number for motor 1
const int f_2 = 4; // Replace with the actual
pin number for motor 2
const int f_3 = 5; // Replace with the actual
pin number for motor 3
const int f_4 = 6; // Replace with the actual
pin number for motor 4
```

```
void setup() {
 Wire.begin();
Serial.begin(9600);
pinMode(ir_sen, INPUT);
 Wire.beginTransmission(MPU6050_ADDR);
 Wire.write(0);
 Wire.endTransmission();
 Wire.beginTransmission(MPU6050_ADDR);
 Wire.write(0x1A); // CONFIG
 Wire.write(0x03);
 Wire.endTransmission();
```

```
Wire.beginTransmission(MPU6050_ADDR);
 Wire.write(0x19); // SMPLRT_DIV
 Wire.write(0);
 Wire.endTransmission();
void loop() {
 int16_t ax, ay, az, Tmp;
 float accelerationMagnitude;
 ir_value = analogRead(ir_sen);
 level = map(ir_value, 0, 10, 90, 150);
 Wire.beginTransmission(MPU6050_ADDR);
 Wire.write(0x3B); // ACCEL_XOUT_
 Wire.endTransmission(false);
 Wire.requestFrom(MPU6050_ADDR, 8, true);
```

```
ax = (Wire.read() << 8) | Wire.read();
 ay = (Wire.read() << 8)
  Wire.read();
 az = (Wire.read() << 8) |
  Wire.read();
 Tmp = Wire.read() << 8 |
  Wire.read();
 temp = (Tmp / 340.00 + 36.53);
 accelerationMagnitude = sqrt(ax *
  ax + ay * ay + az * az);
 frequency =
  abs((accelerationMagnitude - 1.0)
  * 1000.0);
```

```
Serial.println("=== Sensor Readings
===");
 Serial.print("Frequency: ");
 Serial.println(frequency);
 Serial.print("IR Value: ");
 Serial.println(ir_value);
 Serial.print("Level: ");
 Serial.println(level);
 Serial.print("Temperature: ");
 Serial.println(temp);
analogWrite(f_1, random(100, 255));
 analogWrite(f_2, random(100, 255));
 analogWrite(f_3, random(100, 255));
 analogWrite(f_4, random(100, 255));
```

```
delay(5000);
 analogWrite(f_1,0);
 analogWrite(f_2, 0);
 analogWrite(f_3, 0);
 analogWrite(f_4, 0);
 delay(2000);
```

ANY QUESTION.....?? THANKS