Glove controlled Wheelchair

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Wheelchairs

Roughly 3.6 million people (aged 15 or older) are using a wheelchair.

Using a manual wheelchair can cause repetitive strain injury, mostly shoulder and wrist.
Electric Wheelchair

- Electric Wheelchair was invented in early 1900s
- Conventional Control - Joystick control
Controlled by Fingers

Gloves that is attached with flex sensors
Read movement of fingers to control motion of wheelchairs
Circuit Diagram
Why not go further?

Ultrasonic sensor

- It will detect an obstacle in front of the wheelchair
Cliff Detector

IR-sensor
Detect the back and the front cliff.

IR sensor

IRS:
DO WHILE(IN6 = 0) OR (IN7 = 0)
PULSOUT LeftServo, 750
PULSOUT RightServo, 750
DEBUG CR,"STOP IR Sensor"
SEROUT 1cd, 84, [12]
PAUSE 5
SEROUT 1cd, 84, [128,"CLIFF DETECTED"]
PAUSE 5
PAUSE 20
LOOP

'Check for IR Sensor 1 and 2 HIGH
' Left Servo Move Pulse Value
' Right Servo Move Pulse Value
How to interface with User?

Monitor the statues of wheelchair
- Forward
- Back
- Right
- Left
- Stationary
- Cliff Detected etc..
Safety

Two fingers movement (here 3 and 4) will stop the motion of wheelchair and put it in suspended mode.
# Bill of Material

## Bill of Material for Mechatronics Term Project

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost per Item</th>
<th>No of Item</th>
<th>Total</th>
<th>Mass Production</th>
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<tr>
<td>Flex Sensor</td>
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<td>4</td>
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<td>IR Sensor</td>
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<td>2</td>
<td>24</td>
<td>16</td>
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<td>3</td>
<td>9</td>
<td>3</td>
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<td>Ultrasonic</td>
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<td>1</td>
<td>15</td>
<td>12</td>
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<td>1</td>
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Advantage and Disadvantage

- Pros
  - People who have RSI on their wrist can control wheelchair easily
  - Wearable
  - It can use as little as two and at most four fingers so the system can be customized for different users.

- Cons
  - The glove is wired so it is clunky and obtrusive
References


THANK YOU