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Artificial Touch (PARISM) Using Arduino Uno

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ABSTRACT: The main aim of this project is to develop a communicating medium which uses touch as a sensory organ.Till now communication network of humans covers only their audio and visual sensory part (ears and eyes).The sense of touch is not yet touched which is the largest sensory organ of humans.This idea opens new door for bind, dumb,security,research ,development, manufacturing , etc. This project is extremely useful for blind by helping them touch the surroundings without actually touching it and the same is true for high temperature manufacturing and security purpose.

KEYWORDS: Parism , Artificial Touch , Texture feeling equipment , Device for blind

I. INTRODUCTION

As the evolution of Humans started , The Neandral Man evolved to modern human with change in Physiology. Since we use Eyes, Ears , Tongue and Mouth largely for interaction with others or with the Universe . So , The sense of Touch is reduced . Generally Blind people use it widely but not the normal one's . So what we have done is to make an Equipment which Increases the Sense of the People with Touch .

Along with this there were many needs for stimulating the texture of the distance object without actually touching It (Scanning it to stimulate texture) .This Project mainly focus on the Equipment which scans the 3D Object and Replicates its texture in a Projection and make it feel like the same as original Object to the user (say Blind, Security , Researchers)

II. PROBLEM STATEMENT

Till now communication network of humans covers only their audio and visual sensory part (ears and eyes).
The sense of touch is not yet touched which is the largest sensory organ of humans.
So , we (Humans) were constantly lowering our sense of Touch .

- It is impossible to touch and feel an Object when it is :
- Far away
- In High temperature
- Highly expensive and Valuable
- Easily destroy-able material
- Affected by room temperature
- Affected by environmental factors such as humidity and coldness
  Such thing's texture is hard to feel for various purposes.

III. SURVEY

Small survey was done on random people who were unable to see clearly (Blind) , with Their intellect they were in hard situation to understand and Observe the 3D Objects .

IV. BLOCK DIAGRAM
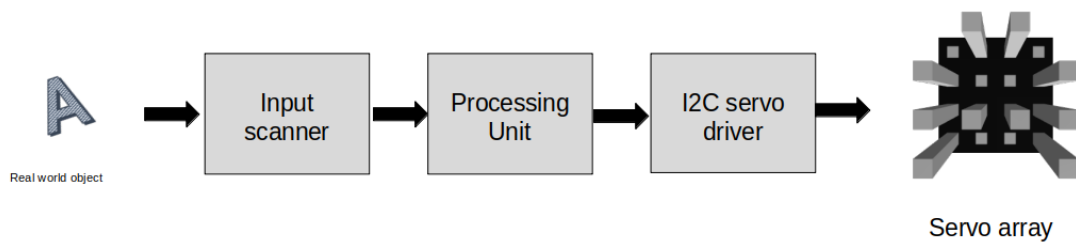
V. HARDWARE COMPONENTS

In our project,artificial touch(parism), we have developed a mechanical setup for continuous and efficient process. The following are the hardware components used,

1. Arduino UNO

2. PCA 8695

3. Ultrasonic Sensor

4. SG90 micro servo

VI. MAIN FUNCTION UNIT

Arduino is an open-source hardware and software company, project and user community that designs single-board microcontrollers for building digital devices. It is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz 24 crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

Fig 1: ARDUINO model

Arduino gets the data from each sensor and evaluates the sensor data with the perdefined value set in the program. Then the arduino sends the measured value from the sensor to the output part.then the Proportional value of data sends to Projection Unit with minor calibrations to get required matrix in turns the Projections made by servo motor

VI. PCA8695

PCA8695 is a 16 channel 12 bit servo driver . The Adafruit 16-Channel 12-bit PWM/Servo Driver will drive up to 16 servos over I2C with only 2 pins. The on-board PWM controller will drive all 16 channels simultaneously with no additional Arduino processing overhead. What's more, you can chain up to 62 of them to control up to 992 servos - all with the same 2 pins!
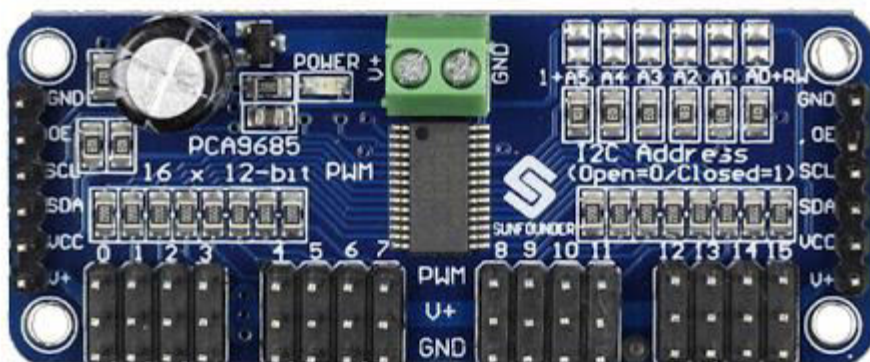

Fig 2: PCA8695

VI. ULTRASONIC SENSOR

Fig 3: Ultrasonic sensor

Ultrasonic sensors work by sending out a sound wave at a frequency above the range of human hearing. ... The **sensor** determines the **distance** to a target by measuring time lapses between the sending and receiving of the **ultrasonicsound wave .**This wave frequency ranges nearly 40 kilo hertz. The time difference between sent and received wave gives exactly the distance between the target object and sensor unit
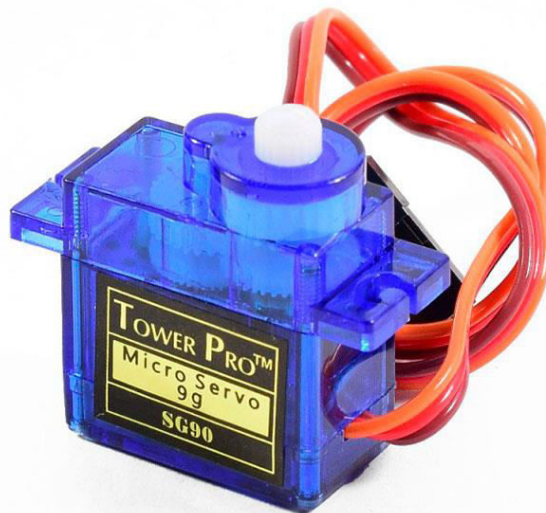.

VII. SG90

Fig 4: sg90 micro servo motor

Tiny and lightweight with high output power. Servo can rotate approximately 180 degrees (90 in each direction), and works just like the standard kinds but smaller. You can use any servo code, hardware or library to control these servos. Good for beginners who want to make stuff move without building a motor controller with feedback & gear box, especially since it will fit in small places. It comes with a 3 horns (arms) and hardware.
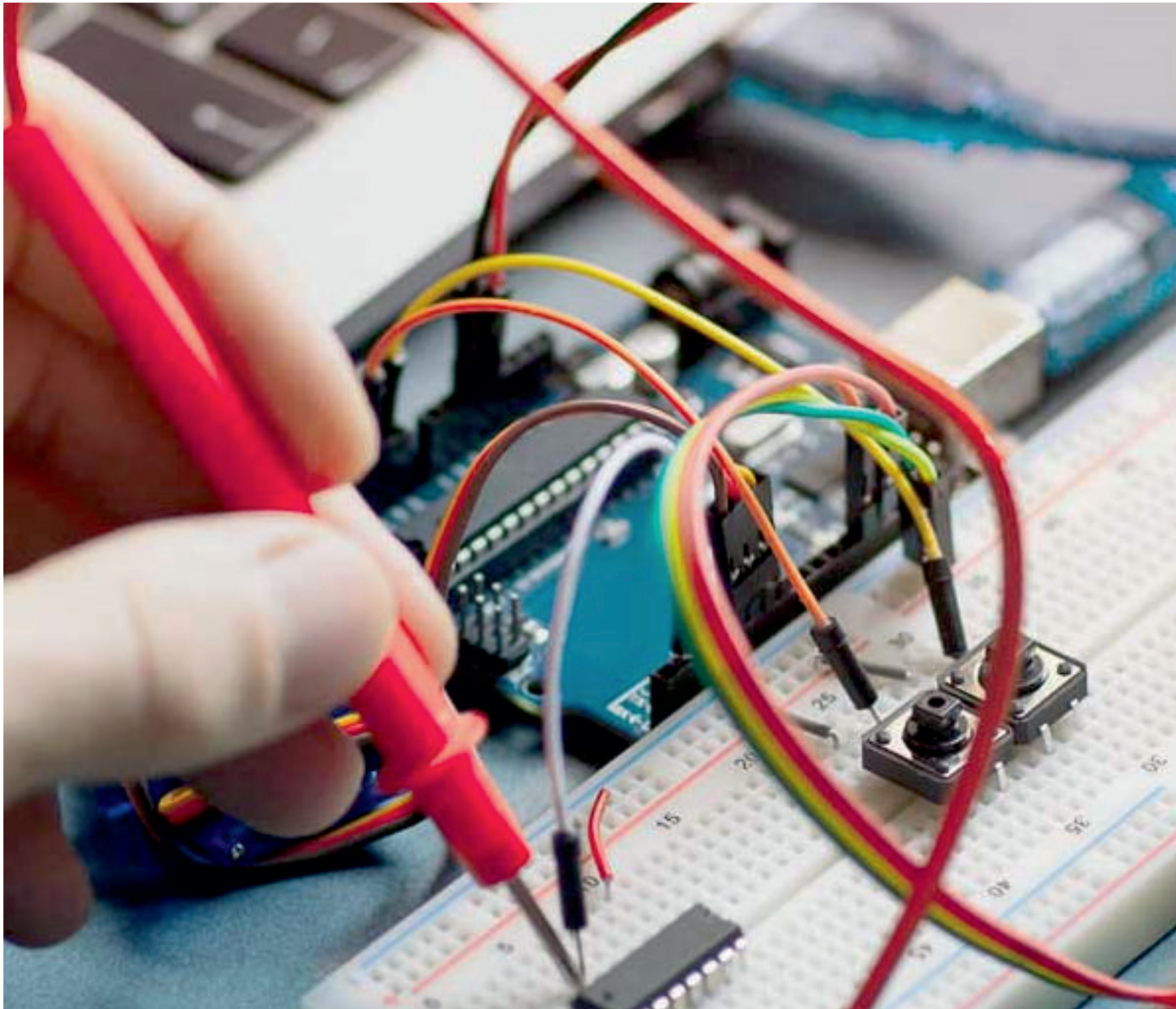
VIII. CONCLUSION

The following results can be achieved from this project.it can scan the surrounding and produce a low resolution projection in which can be touch and felt. Blind people can find this project extremely helpful as they can feel the texture of any object without touching the object .this enables blind people to work safely as they can avoid direct contact to people and objects . This project also allows creating good practical experience to students .In industries it has a wide range of application from predicting textures and advancement of industrial automation.

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