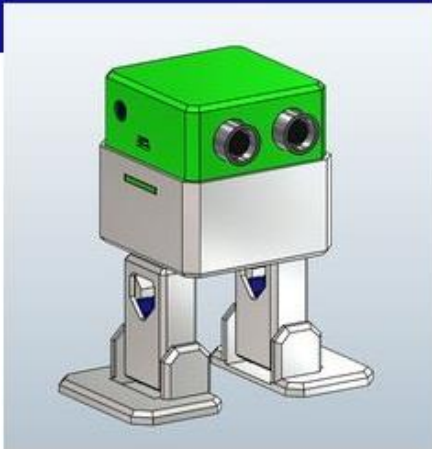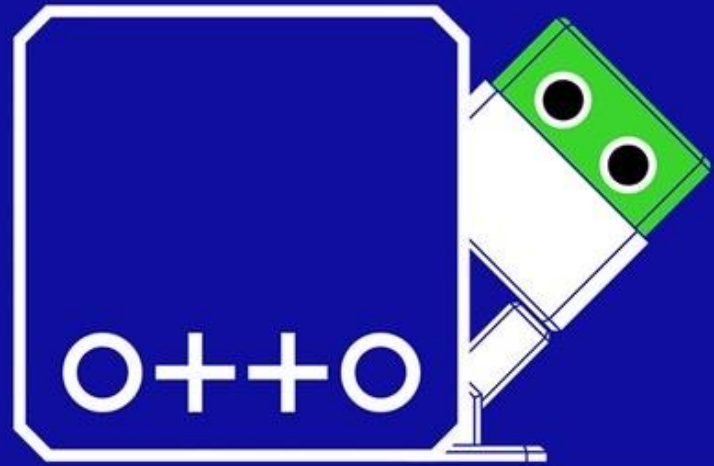Otto is an
interactive robot
that anyone
can make!

O++O

OTTO
- *An interactive robot*

Submitted By:

    Name: Pranta Palit

    Registration: 14201019

    Course: Computer Interfacing

    Department: Computer Science & Engineering

Submitted To:

    A. S. Zaforullah Momtaz,

    Assistant Professor, CSE, UAP.

Introduction:

Otto is an interactive robot that is truly open source. It means the hardware is easily discerned so that others can make it. It is Arduino compatible, 3D printable and customizable. The act of building and coding own Otto creates an emotional attachments between you and Otto. It brings children and people closer to technology. Building Otto, one can learn logical connection between code and action, and by assembling it they understand how its components and electronics work. The ideal companion for developing steam skills. Via the instructions, people exercise mathematical thinking, reinforce their technological and physical knowledge and enhance abilities such as problem solving and creativity. Through play and experimentation people can learn about this technological product in a fun and educational way.
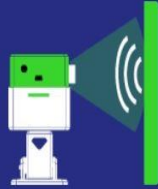
Learning Objectives:

● Learners can describe the components of a Robotic system, including hardware, software systems, and applications.

● Learners can give examples of how Robots are used in the real world.

● Learners build Ottos and drag and drop blocks of code.
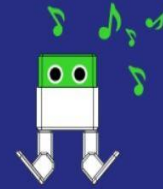
what can Otto do?

walk
go straight, back & turn

avoid obstacles
ultrasound sensor to detect

dance
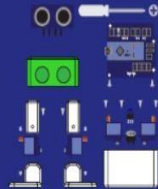multiple style moves

makes sounds
robot beeps & 8bit music

3D printable
easy in less than 10 hours

DIY
ready to build in 1 hour

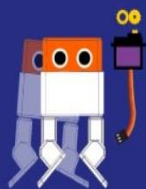**truly open source**
design totally FREE & open

easy to program
USB for power & coding

+touch sense
feeling & emotion reaction

+strong
metal gear servos

+bluetooth control
android FREE APP

+expandable
take to the next level

Materials & Tools needed (per Otto):

- Arduino Nano
- Arduino Nano Shield
- Mini USB cable
- HC-SR04 Ultrasound sensor
- Mini servo SG90 9g x4

(each comes with 2 pointed screws and one small screw also arm keys to attach legs and feet)

- 5V passive Buzzer 12mm
- Female to Female breadboard connectors cable 10cm x6
- 4 AA Battery case
- 1.5V AA batteries x4
- Phillips screwdriver (important: magnetized)
- Square micro Switch 8x8mm
- 3D printed head
- 3D printed body
- 3D printed leg x2
- 3D printed right foot
- 3D printed left foot
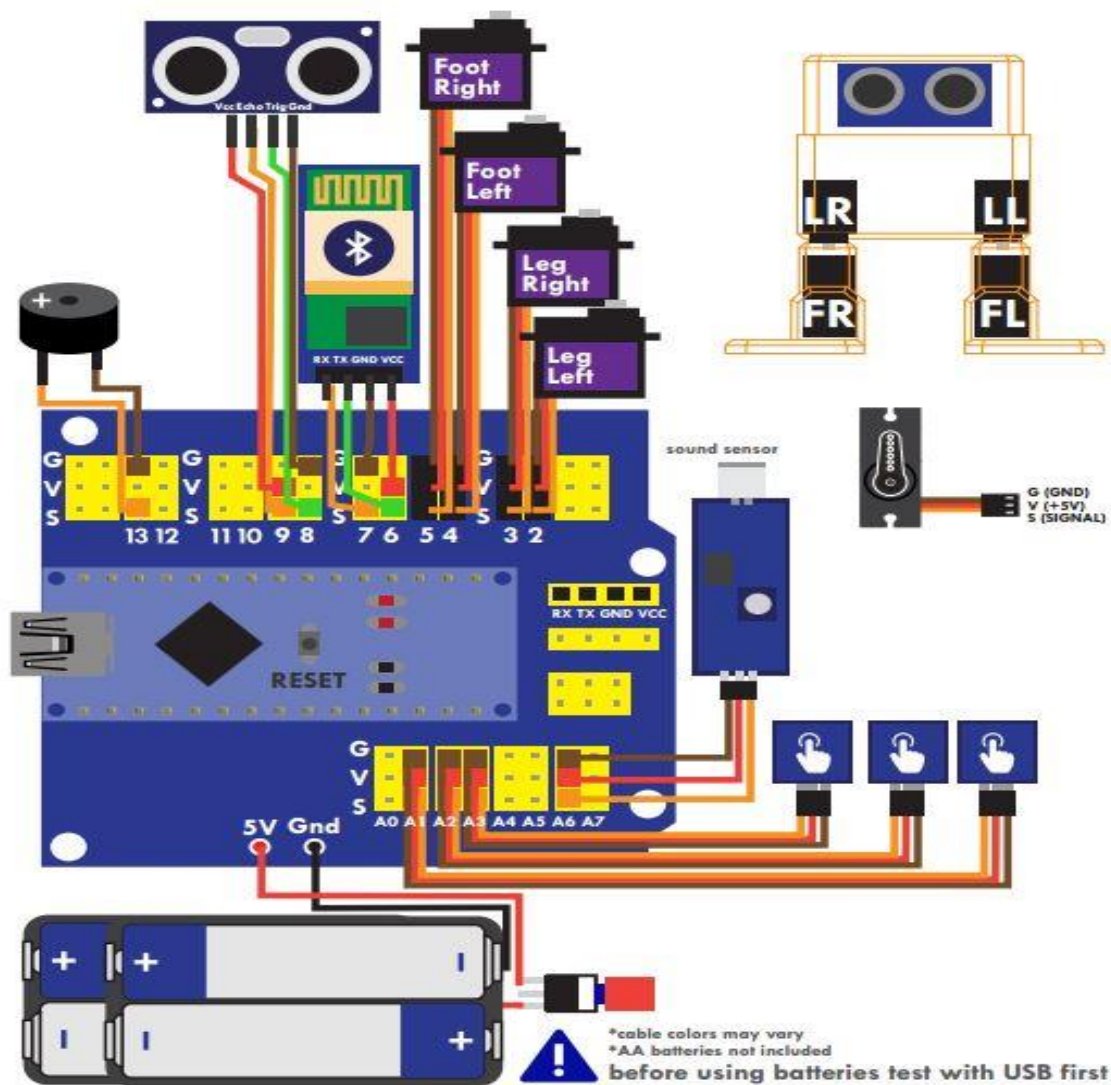- Computer with mblock installed and tested
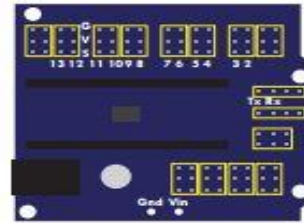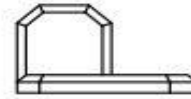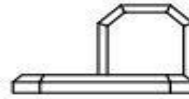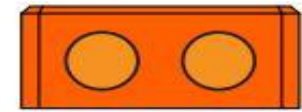
*AA batteries not included
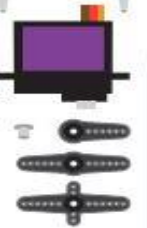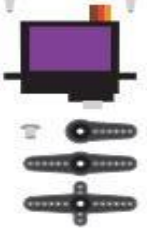
Task Activity:

Day 1: Collected all those materials mentioned and ordered the 3D printed design to be printed.

Day 2: There are some materials like Arduino Nano, Servo Motors, Ultrasound and Bluetooth Module. We just need to test some basic codes to check the device is working properly or not.

Day 3: Components need to be tested for better result.

Day 4 & 5: I divided the task in several units like servo home state where Otto will get a home state from any position. There are many more units like ultrasound obstacles avoiding state, position trimming state, foot align state, walk state, run state, dancing steps, emotion expressing states and Bluetooth module setup steps..

Day 6 & 7: The 3D printed model was not exactly what I expected. I spent 2 days to wash it and resize finishing the design.

Day 8: Wrote the code of songs Criminal, Single ladies, Dame-to-cosita and applied code. Bluetooth setup code is also necessary to modified based on model like HC-05 or HC-06. For Bluetooth control, need to design .apk file to send command to Otto. I used MIT app inventor to design one.

Day 9: A lots of bugs faced during the whole process. Just fixed it applying necessary codes.

Day 10: Assembled the whole system into Otto 3D model.